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**COMMUNITY AND ECONOMIC DEVELOPMENT  
DEPARTMENT  
STAFF REPORT**

**BOCC Staff Report**

**November 8, 2017**

CASE No.: <b>USR2016-00006</b> CASE NAME: <b>Ward Petroleum – Ivey Wellpad Site</b>
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Owner's Name:	Ward Petroleum Corporation
Applicant's Name:	Marshall Hall
Applicant's Address:	215 W. Oak Street, Suite 1000, Fort Collins, CO 80521
Location of Request:	Section 11, Township 1S, Range 68W
Parcel number:	0157311400006
Nature of Request:	A Use by Special Review Permit to allow twenty six (26) horizontal wells on one (1) well pad for the production of oil and natural gas
Zone District:	Agriculture - 3 (A-3)
Site Size:	Approximately 6.8 acres (31.7-acre parcel)
Proposed Uses:	Multi-well oil and gas facility
Existing Use:	One oil and gas well and associated production facility
Report Date:	November 1, 2017
Case Manager:	Christopher LaMere
Director Options:	Approval with 4 Findings of Fact, 5 Conditions Precedent, and 23 Conditions; Denial; or Referral to the Board of County Commissioners
Staff Recommendation:	Approval with 4 Findings of Fact, 5 Conditions Precedent, and 23 Conditions

**SUMMARY OF PREVIOUS APPLICATIONS**

This parcel is zoned A-3 and contains one producing oil and gas well with associated production facility. There is one previous application for this parcel and it is for a segment of the Boardwalk Pipeline, which is intended to transport oil, natural gas, and produced water from this site.

## SUMMARY OF APPLICATION

### Background

Ward Petroleum Corporation (Ward Petroleum) is based in Fort Collins, Colorado and engages in the exploration and development of oil and natural gas, primarily in the Denver-Julesburg Basin. Ward Petroleum has proposed an oil and gas well pad location in unincorporated Adams County to continue developing those minerals. The proposed project, the Ivey Pad, consists of the construction of one well pad with up to 26 wells, a production facility, and one access road.

The proposed pad location is on a 31.7-acre parcel, southwest of the intersection of Highway E-470 and York Street. Access to the site is proposed to be from East 152<sup>nd</sup> Parkway, which is located on the southern boundary of the property. Surrounding land uses are agricultural with dispersed residential communities located within the City of Thornton, with the closest home over 1,500 feet from the proposed facility.

### Summary of Application

The project proposed by Ward Petroleum consists of twenty-six (26) wells on a single well pad, with one (1) access road to accommodate all traffic during construction, production, and long-term maintenance. Site preparation, including development of the access road and leveling the pad site, is anticipated to take 14-21 days. Drilling of the wells is anticipated to take 7-12 days per well, followed by the completion phase, which will take 3-6 days per well. If all wells are drilled, the total time could be up to 489 days.

The well pad size during the drilling and completion phases is proposed to be approximately 6.8 acres; this will be reduced to 3.4 acres after the completions phase has ended. The on-site production facilities include 26 wells, 26 separators, 10 VOC combustors, 10 water tanks, and 10 low-profile oil tanks. Ward Petroleum partnered with Discovery Midstream on a segment of the Boardwalk Pipeline (RCU2017-00017), which was approved by the Board of County Commissioners on Tuesday, October 17, 2017. This portion of the pipeline will be comprised of three separate pipelines that will allow for the transport of produced water, oil, and natural gas off-site. The Boardwalk Pipeline will connect the Ivey Well Pad to a Central Delivery Point Facility and ultimately transport the products north to Weld County for processing.

The mitigation measures that have been proposed by Ward Petroleum include the following:

- **Noise:** Ward Petroleum has conducted a sound study to determine potential noise impacts to nearby residents and will implement 1,060' of sound barrier walls accordingly to maintain compliance with Rule 802 of the Colorado Oil and Gas Conservation Commission (COGCC). Ward Petroleum will also provide and post 24-hour, 7 days per week contact information for any noise related complaints.
- **Odor:** Ward Petroleum will utilize an Emission Control Device to reduce odor emissions during production to comply with COGCC Rule 805 and the Colorado Department of Public Health and Environment (CDPHE) Air Quality Control Commission regulations.
- **Dust Mitigation:** In order to minimize dust, Ward Petroleum will implement speed restrictions, regular road maintenance, restrictions of construction activities during high wind days, and silica dust controls when handling sand used in hydraulic fracturing operations. The access road will be constructed with road base aggregate material and

additional management practices such as road surfacing, wind breaks and barriers may be used. A street sweeper and/or water tank will be on call to limit dust when necessary.

- **Visual Mitigation:** Sound walls will be erected that will act as a visual barrier during drilling and completions operations. The tank battery shall be painted in uniform, non-contrasting, non-reflective color tones with the colors matched to but slightly darker than the surrounding landscape.
- **Weed Control and Management:** Ward Petroleum will manage weeds at the oil and gas facility and along the access road during construction operations and until final abandonment and final reclamation is completed.
- **Traffic Control:** Ward Petroleum will construct all leasehold roads to accommodate local emergency vehicle access requirements. The applicant has also submitted a traffic plan to which their vehicles and equipment are required to follow.
- **Erosion Control Measures:** Ward Petroleum will maintain a Stormwater Management Plan with site specific measures to address erosion control.
- **Waste:** Ward Petroleum agrees that all trash, refuse pipe, equipment, liquids, chemicals of other materials that are not necessary for the continued operations of the wells will be removed and disposed of no later than 30 days after completion.
- **Pipelines:** Ward Petroleum has worked with Discovery Midstream to ensure the oil and gas facility will be connected to produced water, oil, and natural gas pipelines to be transported off-site. This will result in significant reductions in truck traffic into and out of the facility.

### **Development Standards and Regulations Requirements**

In order to obtain an Administrative Use by Special Review approval, an Oil and Gas Facility must satisfy certain criteria.

#### ***1. Memorandum of Understanding (MOU)***

The form Oil and Gas MOU was signed by Ward Petroleum Corporation and executed by the Adams County Board of County Commissioners on June 30, 2015. The MOU includes all the best management practices determined necessary by the County Manager.

#### ***2. Satisfy Submittal Requirements***

The applicant has satisfied the required submittal items, as outlined in the Development Standards and Regulations. These include the following:

- Conceptual Review Meeting – Ward Petroleum attended a Conceptual Review Meeting held on December 12, 2016 with the Adams County Development Review Team where their proposed site was discussed.
- Neighborhood Meeting – Ward Petroleum held a neighborhood meeting on November 15, 2017 at the Heritage Todd Creek Golf Club in Thornton, CO. Approximately 60 residents attended the meeting.
- Application Form and Fees – Ward Petroleum submitted the required Administrative Use by Special Review application form and paid the applicable permit fees. Prior to construction and operation, the operator will obtain the required Public Utilities

permits, including an access permit for the access road and oversize load permits for the drill rigs and other oversize equipment.

- Oil and Gas Operations Plan – Ward Petroleum submitted an oil and gas operations plan that included an impact area map that shows all oil and gas wells and water wells within one half mile, a drilling operation plan map that shows a site plan with drilling equipment, a production plan map that shows a site plan during the production phase, and a sign plan that shows the signs to be posted and describes their location.
- Emergency Preparedness Plan – Ward Petroleum submitted a site-specific emergency preparedness plan that has been reviewed and approved by the Adams County Office of Emergency Management.
- Engineering Documents – Ward Petroleum provided grading, erosion, and sediment control report & plan, as well as a traffic impact study, in accordance with the Development Standards and Regulations.
- Surface Owner Documentation – Ward Petroleum provided a memorandum of surface use agreement to show that the proposed oil and gas facility is authorized by the surface owner.

### ***3. Compatibility / Land Use Impacts***

The subject site is 31.7 acres and currently zoned Agricultural-3 (A-3). The purpose of the A-3 District is to provide land primarily in holdings of at least thirty-five acres for dryland or irrigated farming, pasturage, or other related food production uses; the current uses meet the purpose of the A-3 zone district. The surrounding area is a mix of A-3 and land located within the municipal limits of the City of Thornton. To the north is Highway E-470 and land used for farming and agricultural purposes. The area east of the subject parcel is within the City of Thornton Big Dry Creek Open Space, which is part of the Big Dry Creek Recreation and Floodplain Restoration Master Plan and anticipated to contain a multi-use trail in the future. To the southwest is more land located within the City of Thornton and within their Open Space Master Plan. A platted subdivision within the City of Thornton is located southeast of the subject site where residences are currently being built. Richmond Homes is developing the subdivision, Fairfield Filing 1, which was approved by Thornton in March 2016. The closest lot to the proposed well pad is approximately 1,500 feet away. There are also residential neighborhoods that are within the City of Thornton located approximately one half mile south, east, and northeast of the subject site. Agricultural uses and zoning are located to the west of the subject site and contain several active conventional oil and gas wells.

The future land use designation of the site, according to the Adams County Comprehensive Plan, is Mixed-Use Employment. This designation is intended to accommodate light manufacturing, distribution, offices, and other similar commercial and light industrial uses. The future land use designation to the north is also Mixed-Use Employment, there are lands designated Parks and Open Space to the south and east, and there is an Activity Center designation to the southwest for the future station area for the North Metro line of FasTracks. Parks and Open Space are areas designated for recreation, wildlife, and to protect land from future development. This designation follows the floodplain for Big Dry Creek and the land is currently used as open space within the City of Thornton. The Activity Center designation

is for areas with planned high intensity residential, retail and office spaces, and the Activity Center is often located near current or planned transit stations.

The proposed Ivey location will access minerals towards the south from the well pad location, utilizing up to 26 lateral well bores that extend up to three miles south from the surface location. This is important because the use of the Ivey location enables the surface impacts to be located farther away from existing development. In 2015, a previous operator that preceded Ward Petroleum's interest in these assets had proposed the use of a surface location on a 35-acre parcel in the middle of the Wadley Farms neighborhood to access these minerals. Ward acquired these assets from that operator in 2016. Through evaluating multiple surface development options for the placement of the well pad, this location was chosen because it is outside of existing neighborhoods and close to E-470 for ease of access to the highway and a pipeline corridor. This well pad is capable of extracting the same minerals that had been the target of the well pad in Wadley Farms, but with fewer direct impacts to existing neighborhoods. This change in the total number and location of well pads that will be utilized to extract the minerals in this area of the County is one of the key factors that has made this proposal compatible with existing and future land uses.

#### Mitigation Measures

In addition to the selection for the location of the well pad, the operator and the County have identified various mitigation measures to be applied to this site in order to make it compatible with the existing and future land uses. These mitigation measures have been developed over a number of months after careful review of the application, consideration of the public comments and agency comments, and after review of the applicant's responses to referral comments from staff, the public, and agencies. Several of these mitigation measures are detailed below and the entire set of mitigation measures is outlined in the staff's recommended conditions of approval.

During the development of the oil and gas facility, including well pad construction and the drilling and completion of the wells, there will be impacts to the surrounding area. Specific impacts include noise, lights, traffic, and dust. To make this facility compatible with the surrounding uses, the operator has conducted several studies to evaluate these impacts and developed the following means to mitigate their effects on neighboring residence.

An Ambient Sound Study was conducted on October 26, 2016 and provided average noise levels for hourly and 15 minute intervals. As a result of the study, the operator was provided two noise mitigation models for each phase of the project that would allow the COGCC requirements to be met or exceeded. All mitigation models require the use of acoustical walls up to 32 feet in height. Details of the Sound Study and mitigation plan can be found in exhibit 5.3 (Ambient Sound Study).

Visual impacts from oil and gas well pads can be divided into two phases, the construction and development of the well pad and the long-term impacts of the pad and production equipment. To address potential impacts of light travelling off-site from the oil and gas facility during the construction phase, the applicant has conducted a Photometric Study (Exhibit 5.4) to determine the mitigation measures needed. The study analyzed typical

drilling rig lighting arrangements and the proximity of the sound walls, which will also aid in light mitigation. Additional mitigation actions include directing lights downward and inward to the pad, wrapping the mast of the derrick to prevent light trespass, and utilizing LED lights only on one side of the rig mast.

Visual mitigation for post-construction and drilling will be addressed with the use of landscaping. The applicant has submitted a landscaping plan that includes a variety of vegetative species with variant sizes and densities to both screen the facility and provide aesthetically appealing line-of-sight. Six-foot wood fencing will be utilized around the site, in conjunction with landscaping, to make the site more compatible with the surrounding land uses. Approximately two acres of the disturbed area will be reclaimed following the pad construction with the use of native grass. Trees and shrubs used along the perimeter will be established with the use of a drip irrigation system connected to a water tank that will be placed on-site until the trees are properly established. The applicant will be required to maintain the landscape in accordance to Adams County Development Standards and Regulations 4-16-11 *Landscape Maintenance Standards*, which includes long-term viability requirements.

Dust, which is most commonly associated with traffic along the access road, will be mitigated with a combination of speed restrictions, regular road maintenance, and use of road base aggregate which provides a more stable surface than disturbed soils alone. Additional controls include the use of water trucks to moisten the disturbed surfaces during periods of high winds. Off-site mitigation will include the use of a street sweeper to minimize sediment deposits on asphalt surfaced roads.

Traffic routing and associated impacts are a concern of neighboring community members. To address this, Ward Petroleum has conducted traffic impact studies and participated in the design and development of the Boardwalk Pipeline to transfer produced water, oil, and natural gas off-site. When assessing the potential impacts from truck traffic, one must consider the impacts in two phases. First is the development phase of the well pad, when trucks, drilling rigs, and the greatest number of employees are on-site. This is followed by the second phase, production, which primarily involves trucks hauling product off-site and employees monitoring the facility. Traffic impacts can greatly influence the compatibility of a site with surrounding neighborhood, current land uses, and planned future land uses.

During the development phase of the well pad, approximately 39,500 truck trips would occur over 111 days (about 3.5 months), if all 26 wells were drilled and completed at once. This includes 500 truck trips for construction of the well pad, 4,300 truck trips for drilling the 26 wells, and 34,700 truck trips for the completion of the wells. During the flowback and production phase of the well pad, 18,000 truck trips are anticipated over one year, if all wells are developed at once and a pipeline is used. In contrast, without a pipeline, approximately 70,300 truck trips would occur over that that same one year period. Due to the long-term truck traffic impacts that could be associated with this development, the use of a pipeline is being required for the transportation of products. In addition, the recommended conditions of approval also include a requirement for the use of above ground water lines. According to the Traffic Impact Study (Exhibit 5.5), the applicant's use of a pipeline for produced oil and

natural gas will reduce the number of trucks in and out of the site by nearly 50% during the development phase and the first year of production. By taking approximately 55,000 trucks off of 152<sup>nd</sup> Parkway and the neighboring roads, Ward has significantly reduced their anticipated impacts to the surrounding area. The reduction of truck traffic and associated impacts will be realized throughout the life of the well pad, resulting in a better overall compatibility with the surrounding area.

Specifying truck traffic routes can greatly reduce impacts of development on surrounding neighborhoods, requiring the trucks to use highways and other major thoroughfares rather than local roads through subdivisions. Ward Petroleum developed primary and secondary traffic routes that will dictate their truck traffic. The primary traffic route has trucks accessing the site from E-470 to York Street where they will exit and travel south to 152<sup>nd</sup> Parkway, then enter the facility via the access road. Vehicles not permitted to use E-470, will utilize the secondary traffic route with trucks exiting from Interstate-25 onto 168<sup>th</sup> Avenue, 168<sup>th</sup> Avenue to Washington Street, Washington Street to 152<sup>nd</sup> Parkway, then entering the facility from the access on 152<sup>nd</sup> Parkway. Through neighborhood meetings and public comments, the applicant modified their traffic plan to access state highways as soon as possible and avoid local roads and school bus routes. In addition, after numerous resident comments and concerns from the City of Thornton regarding a sub-standard bridge on York Street, the applicant revised the traffic plan so that truck traffic will no longer travel over the bridge.

Through consultation with the City of Thornton, the adjacent jurisdiction, several concerns were raised about traffic impacts. In addition to agreeing to connect to a pipeline, the operator will be constructing a deceleration lane on 152<sup>nd</sup> Parkway for traffic entering the well pad. The design and approval of the turn lane is through the City of Thornton and is currently under way. In addition, the secondary traffic route has trucks utilizing Washington Street north to 168<sup>th</sup> Avenue rather than York Street, which has a weight-restricted bridge.

Through consultation with Adams 12 Five Star Schools and consideration of public comments, the applicant has agreed to modify their traffic routes to keep HAZMAT vehicles that are unable to use E-470 from driving by the Silver Creek Elementary School, which is located approximately 3,200 feet to the southeast of the proposed well pad. The original application had HAZMAT trucks exiting the site, driving east on 152<sup>nd</sup> Parkway, then north on York to 168<sup>th</sup> Avenue, a route that travels by the school. The new plan has HAZMAT trucks exiting the site, driving west on 152<sup>nd</sup> Parkway, then north on Washington Street, a route that avoids the area by the school entirely. The elementary school has access from Fillmore Street, a side street off of York Street, so limiting truck traffic in that area is important. In addition, the applicant has committed to limiting truck traffic as much as possible on York Street during school bus hours, in coordination with Silver Creek Elementary School and Adams 12 Five Star Schools.

The applicant has thoughtfully considered the impacts to the surrounding properties, future land use, and local roadways. These have been mitigated through a combination of site planning decisions, traffic and access management, utilization of a pipeline for all products, and long-term compatibility is addressed through the requirement for reclamation upon

conclusion of surface operations. It is staff's recommendation that this criterion has been satisfied by the applicant's proposal, and through the recommended conditions of approval within this staff report.

#### ***4. Emergency Service Providers***

The applicant provided the required 'will serve' letter from the North Metro Fire District, the emergency service provider for that area.

#### **Referral Comments:**

Adams County Development Services stated that a landscape and visual mitigation plan will be required that conforms to section 4-16 of the Adams County Development Standards and Regulations. Solid screen fencing will be required for visual mitigation from the existing and proposed residences. The visual mitigation/landscape plan must also outline a watering plan to keep the plantings alive.

Adams County Development Engineering stated that erosion and sediment control BMPs are required for compliance with federal, state, and local water quality construction requirements. A grading and drainage plan will be required if any change in grade or improvements to the site are proposed.

Adams 12 Five Star Schools has requested the applicant consider school hours and bus routes when developing traffic plans. The applicant has taken this into consideration and has selected an alternate route to minimize impacts to school operations. A deceleration lane is being installed on 152<sup>nd</sup> Parkway to minimize impacts to traffic and student bus schedules.

The City of Thornton expressed several concerns about this proposed development, including potential environmental and visual impacts to the neighboring open space and truck traffic impacts to the surrounding area. The applicant has agreed to fence the oil and gas facility and install landscaping to provide visual mitigation from the open space. Routine monitoring of the facility will be performed to ensure any environmental threats are identified and remediated. Thornton has also requested a deceleration lane into the facility off of 152<sup>nd</sup> Parkway and it is currently under review by the City of Thornton and is anticipated to be approved and constructed prior to developing the well pad. Continued cooperation with the Thornton Fire Department and North Metro Fire District was also desired, including initial and ongoing response training. Ward works closely with the Local Emergency Planning Commission and has already conducted tabletop exercises with the fire districts.

#### **Staff Recommendation:**

Based upon the application, the criteria for an Administrative Use by Special Review permit, staff recommends approval of this request with 4 findings-of-fact, 5 conditions precedent, and 23 conditions.

**Findings of Fact:**

1. The applicant and the County have executed a Memorandum of Understanding (MOU) that is currently in full force and effect, and the oil and gas facility is in compliance with the provisions of the MOU.
2. The applicant has satisfied the submittal requirements for an Administrative Use by Special Review application, as outlined in the Development Standards and Regulations.
3. Based upon compliance with the recommended conditions of approval, the oil and gas facility is compatible with the surrounding area and does not create site specific or material impacts to nearby land uses.
4. The applicant has provided a commitment to serve the facility from the authority having jurisdiction for providing emergency services.

**Recommended Conditions of Approval:**

**Conditions Precedent:**

1. Pad construction and/or drilling shall not commence until combined State approval of Colorado Oil and Gas Conservation Commission (COGCC) Form 2 and 2A and County approval of AUSR permit. Drilling shall only occur during the COGCC Form 2 permit validity timeframe.
  - a. Per section 4-10-02-05-10 of the Adams County Development Standards and Regulations, proposed changes to the plans, including but not limited to, any changes in the source or location of water to be used by the Oil and Gas Facility, shall be submitted as amendments to the Administrative Use by Special Review application, reviewed by staff, and approved by the Director or BOCC (if the BOCC approved the original application).
2. Prior to initiation of construction, the applicant shall provide the applicable title commitment documents to Adams County for review of the easement rights necessary to construct the oil, water, and gas pipelines for the facility.
3. The applicant or the applicant's subcontractors may be required to obtain Oversize Load Permits and/or Rig-Move permits. These permits may be obtained through the Adams County One-Stop Customer Center.
4. The applicant shall initiate the permitting process with the City of Thornton for the installation of the deceleration and turn lane requested by the City of Thornton prior to the construction of the well pad site.
5. The applicant shall receive a "Notice to Proceed" from the Department of Community and Economic Development. Written proof that all of the conditions precedents have been satisfied shall be required prior to receiving this notice.

**Conditions:**

1. The primary traffic route for this permit shall be the site access road to East 152<sup>nd</sup> Parkway, East 152<sup>nd</sup> Parkway to York Street, York Street to E-470. The secondary traffic route shall be the site access to 152<sup>nd</sup> Parkway, 152<sup>nd</sup> Parkway to Washington Street, Washington Street to 168<sup>th</sup> Ave., 168<sup>th</sup> Ave. to Interstate 25. The transportation of hazardous materials shall be subject to federal regulations.
2. The E-470 Authority is currently exploring the possibility of seeking a Hazardous Materials (HAZMAT) designation for some or all of E-470. If E-470 is designated as a Colorado HAZMAT Route at any point within the duration of this use, the applicant shall submit a modified traffic plan to Adams County for review and approval depicting all traffic using E-470 within 60 days of the formal designation.
3. The applicant shall implement the best management practices as identified in the Ambient Sound Study provided as part of the application and provided in Exhibit 5.3 (Ambient Sound Study). These mitigation measures include 12-foot high sound walls around the equipment within the site during drilling operations; 24-foot high sound walls along the northwestern pad perimeter and 32-foot high sound walls along the northeastern, southeastern, southern, and southwestern pad perimeters during the hydraulic fracturing (completion) operations.
4. The applicant shall submit written certification that the facility is connected to a pipeline for the transfer of product off-site prior to the initiation of production.
5. The on-site storage of oil shall be limited to ten (10) low-profile 533-barrel tanks. The tank battery shall be painted in uniform, non-contrasting, non-reflective color tones with the colors matched to but slightly darker than the surrounding landscape.
6. The applicant shall be required to implement the approved landscaping and screening plan for the site. Screening of the site shall be provided through a combination of six-foot wood screen fencing and landscape materials. This plan shall be implemented by the applicant within 90 days of completion of the construction of the final well, if all twenty-six approved wells are drilled and completed at the same time. If applicant staggers well completion (i.e., completes a lesser number of wells initially with plans to complete the remaining wells at a future date), then this plan shall serve as the interim restoration plan, and it shall be implemented within 90 days of completion of the initial set of wells.
7. Maintenance of required landscaping and fencing shall be in compliance with the Adams County Development Standards and Regulations at all times.
8. As referenced in 8(c.) of the Ward Petroleum/Adams County MOU, the applicant agrees to conduct a baseline test of any registered water well requested by the owner, on a one-time basis, if such well is within a ½ mile radius of the new oil and gas facility.

9. The deceleration and turn lane, approved by the City of Thornton, and immediate entrance to the site shall be paved. In addition, the access road to this site shall be outfitted with a vehicle tracking pad. The construction of the turn lane and deceleration lane shall be completed prior to the commencement of production.
10. Noise levels during the construction, drilling, completions, and production life-cycles shall not exceed those outlined in COGCC Section 802.
11. Per Section 14 of the executed MOU, fresh water as referenced in the COGCC's rules and Regulations, or another source as approved by the County on a case by case basis, may be applied to roads and land surfaces for purpose of dust mitigation. Absolutely no other liquid or substance generated by the production of the operator's facility, including, but not limited to, exploration and production waste (as defined by the COGCC) or any other application of liquids that would have negative impact to natural resources, shall be permitted to be applied to roads and land surfaces.
12. Financial assurance shall meet or exceed the requirements of COGCC 700 Series Rules Financial Assurance and Oil and Gas Conservation and Environmental Response Fund.
13. A closed loop system shall be used, as depicted in the permit application.
14. Per COGCC Rule 604.c. G Overflow containment facilities shall be constructed around crude oil, condensate, and produced water storage tanks and shall enclose an area sufficient to contain and provide secondary containment for one-hundred fifty percent (150%) of the largest single tank. Berms or other secondary containment devices shall be sufficiently impervious to contain any spilled or release material.
15. Per Section 5 of the executed MOU, in an effort to reduce truck traffic, where feasible, the Operator will identify a water source lawfully available for industrial use, including oil and gas development, close to the facility location, to be utilized by Operator and its suppliers. Operator will comply with the Colorado Department of Public Health and Environment requirements and Tri-County Health Department (TCHD) regulations concerning water quality. With respect to wastewater treatment, Operator agrees to comply with TCHD's Regulations NO O-14, On-site Wastewater Treatment Systems, as adopted or modified. The Operator agrees to contact TCHD in a timely manner to arrange for the processing of appropriate application matters as required inspections.
16. This location shall utilize above-ground water pipelines for the transport of water into the site for the hydraulic fracturing operations.
17. Per COGCC Section 604.c (4) B. IV. Zero Flaring or venting of gas upon completion of flowback, excepting upset or emergency, or with prior written approval from the COGCC Director for necessary maintenance operations.
  - a. The applicant shall provide a copy of written COGCC Director approval to the CEDD Director within 24 hours of flaring operations and/or approval, whichever occurs first.

18. Upon conclusion of construction, drilling, and completion, the site shall be fenced according to the Adams County Development Standards and Regulations Section 4-10-01-03. The fence shall be solid screen wood fence, with a locked gate, as depicted in the landscape plan and shall be maintained in good condition through the life of the well pad.
  - a. The local fire district shall have access to ALL gate key(s)/combination(s) at all times for use in case of emergency.
  - b. Adams County oil & gas inspector shall have access to ALL gate key(s)/combination(s) at all times for use in case of emergency.
19. The applicant is required to receive an approved completion of reclamation from Adams County upon abandonment and reclamation of well pad and associated facilities.
20. Well pad, associated facilities, and access road shall be free of any county and state identified noxious weeds throughout the drilling, completion and production portions of operations.
21. A tabletop exercise pertaining to the Emergency Response Plan will be required. This may be requested by the County's Local Government Designee, Emergency Manager, Local Emergency Planning Commission, Sherriff's Office, site-specific Fire District, or Transportation Department.
22. All permanent lighting shall be directed downward and internally. Temporary lighting shall conform to COGCC Rule 803 and not adversely affect adjacent residential properties. Temporary lighting shall be directed downward to minimize light and the recommendations of the Photometric Study (Exhibit 5.4) shall be followed. Any complaints regarding lighting shall be communicated to the Adams County Oil & Gas Inspector in order to ensure resolution.
23. All representations and commitments of the applicant made during the AUSR process are incorporated herein as conditions of approval, including representations and commitments made during the public hearing on November 8, 2017.
24. The applicant shall amend the COGCC 2A permits to include all conditions of approval of this AUSR permit, subject to approval by the COGCC.
25. For the first two years following commencement of construction of the new well pad site, unless otherwise approved by the Director of Community & Economic Development, the operator shall facilitate quarterly neighborhood meetings to encourage collaboration and open lines of communication between company representatives and the nearby neighborhood(s). Operator shall provide written notice for each neighborhood meeting to property owners within one half mile from the Ivey well pad at least 10 days prior to the meeting.
26. The landscaping material maturity shall be reviewed and approved by Adams County in order to provide additional screening upon planting.

27. The applicant shall plug and abandon all wells owned by Ward Petroleum within the subject spacing units to be accessed by this site.
28. The compatibility of the proposed well sites is enhanced as a result of the non-use of the 35-acre potential well site located in Wadley Farms. The operator agrees that based on the approval of the current Ivey site, it will not in the future allow the Wadley Farms property to be used for oil and gas development.
29. The applicant shall work with Adams 12 Five Star Schools to address concerns related to truck traffic. To the maximum extent possible, the truck traffic shall be planned to avoid school bus hours. The applicant shall meet monthly with Adams County 12 Five Star School district staff monthly during the first two years of the permit to address any concerns of the school district.
30. All complaints received by the applicant concerning the conditions of this permit, and the resolution of those complaints, shall be conveyed to the Adams County Local Government Designee. Impacts from the conditions of this permit shall be responded to and resolved immediately by the applicant.

### **CITIZEN COMMENTS**

Of the 510 referral notices sent to property owners within one-half mile of subject parcel boundary, 99 comments were received. The application and Request for Comments were also posted on the Adams County website for the review of the general public. Concerns presented by the residents include environmental impacts to air, water, and soil, specifically due to the geography of the site and the proximity to the Big Dry Creek. The residents expressed concerns about potential impacts to property values. Significant concerns were raised about truck traffic impacts to the surrounding neighborhoods and this has been addressed through designated traffic routes and the requirement of a pipeline to transport produced water, oil, and natural gas.

Referral Notifications Sent	Referral Comments Received
510	99

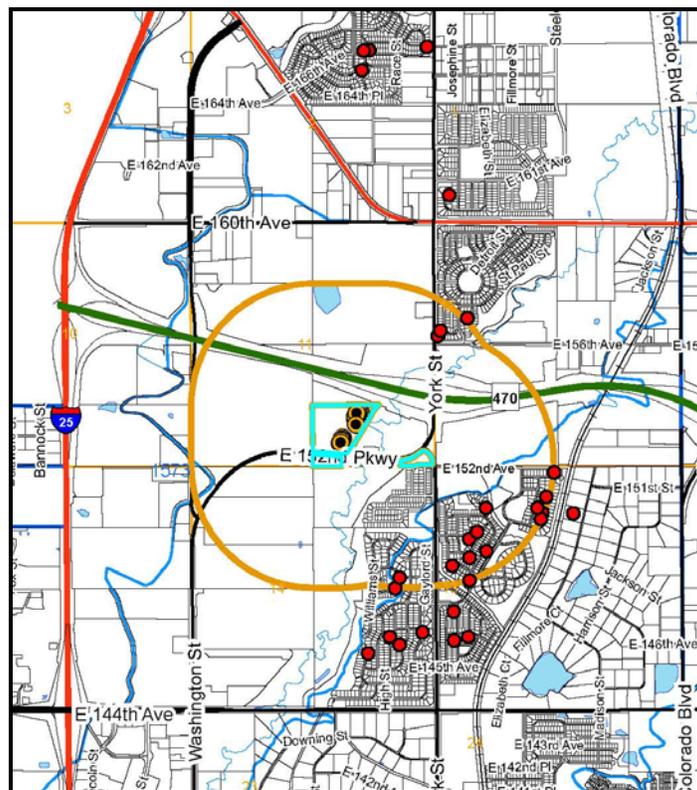


Figure 1. Map showing the 1/2 mile mailed referral radius from the parcel boundary and the received citizen comments (red = negative comment; green = positive comment).

## REFERRAL AGENCY COMMENTS

### **Responding with Concerns:**

Adams 12 Five Star  
City of Thornton

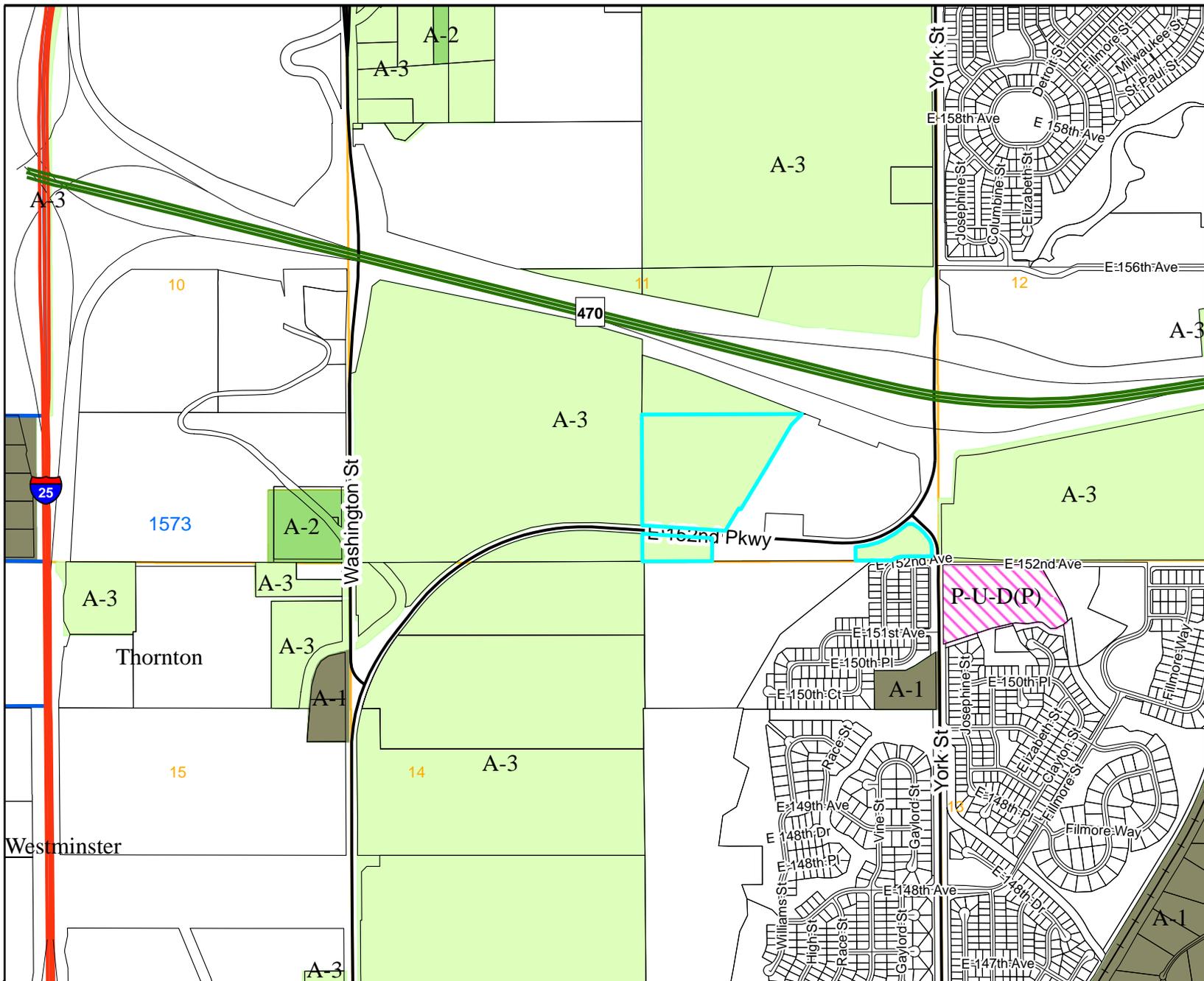
### **Responding without Concerns:**

United Power

### **Notified but not Responding:**

Colorado Department of Public Health and Environment  
Colorado Parks & Wildlife  
Tri-County Health Department  
Xcel Energy

EXHIBIT 1.1  
ZONING MAP



### LEGEND

- Special Zoning Conditions
- Section Numbers
- Railroad
- Major Water
- Zoning Line
- Sections

#### Zoning Districts

- A-1
- A-2
- A-3
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA
- P-U-D
- P-U-D(P)
- Airport Noise Overlay

**Ward - Ivey**  
**Zoning Map**

**Exhibit 1.1**

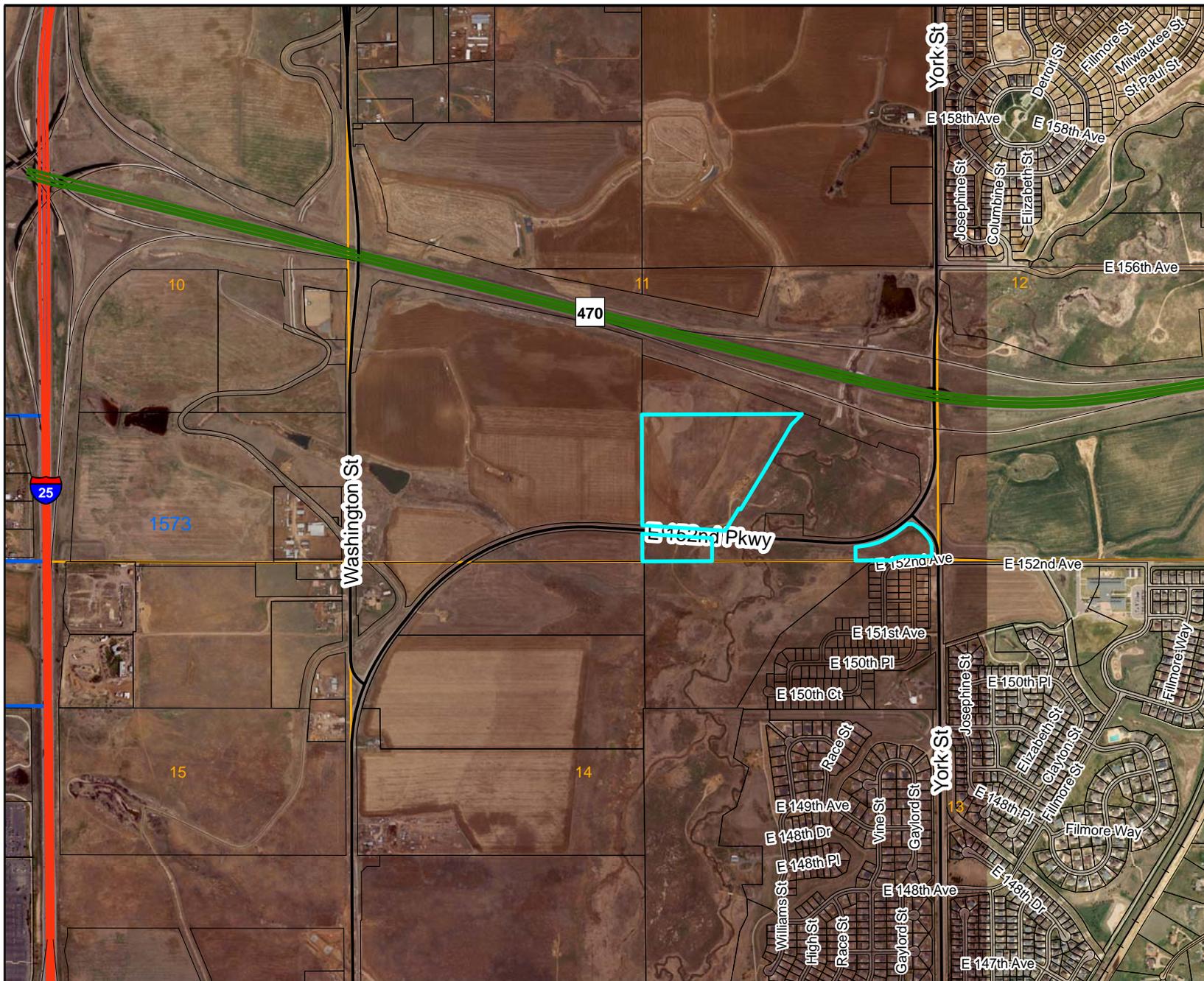


For display purposes only.

**AD** **TY**

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EXHIBIT 1.2  
AERIAL MAP



### LEGEND

- ★ Special Zoning Conditions
- 3 Section Numbers
- Railroad
- Major Water
- Zoning Line
- Sections

#### Zoning Districts

- A-1
- A-2
- A-3
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA
- P-U-D
- P-U-D(P)
- ⊞ Airport Noise Overlay

Ward - Ivey  
Aerial Map

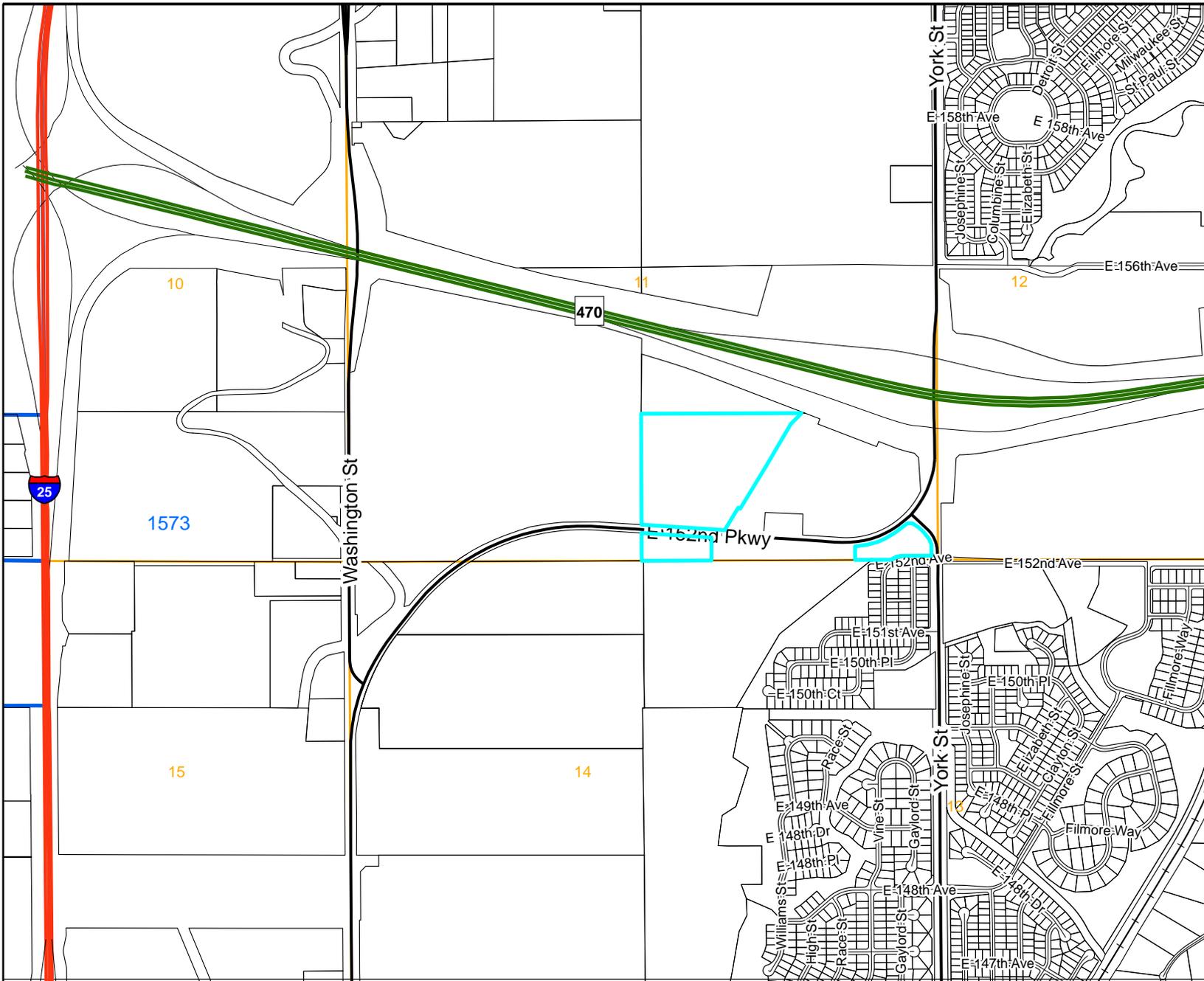
Exhibit 1.2



For display purposes only.

AD TY  
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EXHIBIT 1.3  
SIMPLE MAP



### LEGEND

- ★ Special Zoning Conditions
- 3 Section Numbers
- +— Railroad
- Major Water
- Zoning Line
- Sections

#### Zoning Districts

- A-1
- A-2
- A-3
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA
- P-U-D
- P-U-D(P)
- Airport Noise Overlay

Ward - Ivey  
Simple Map

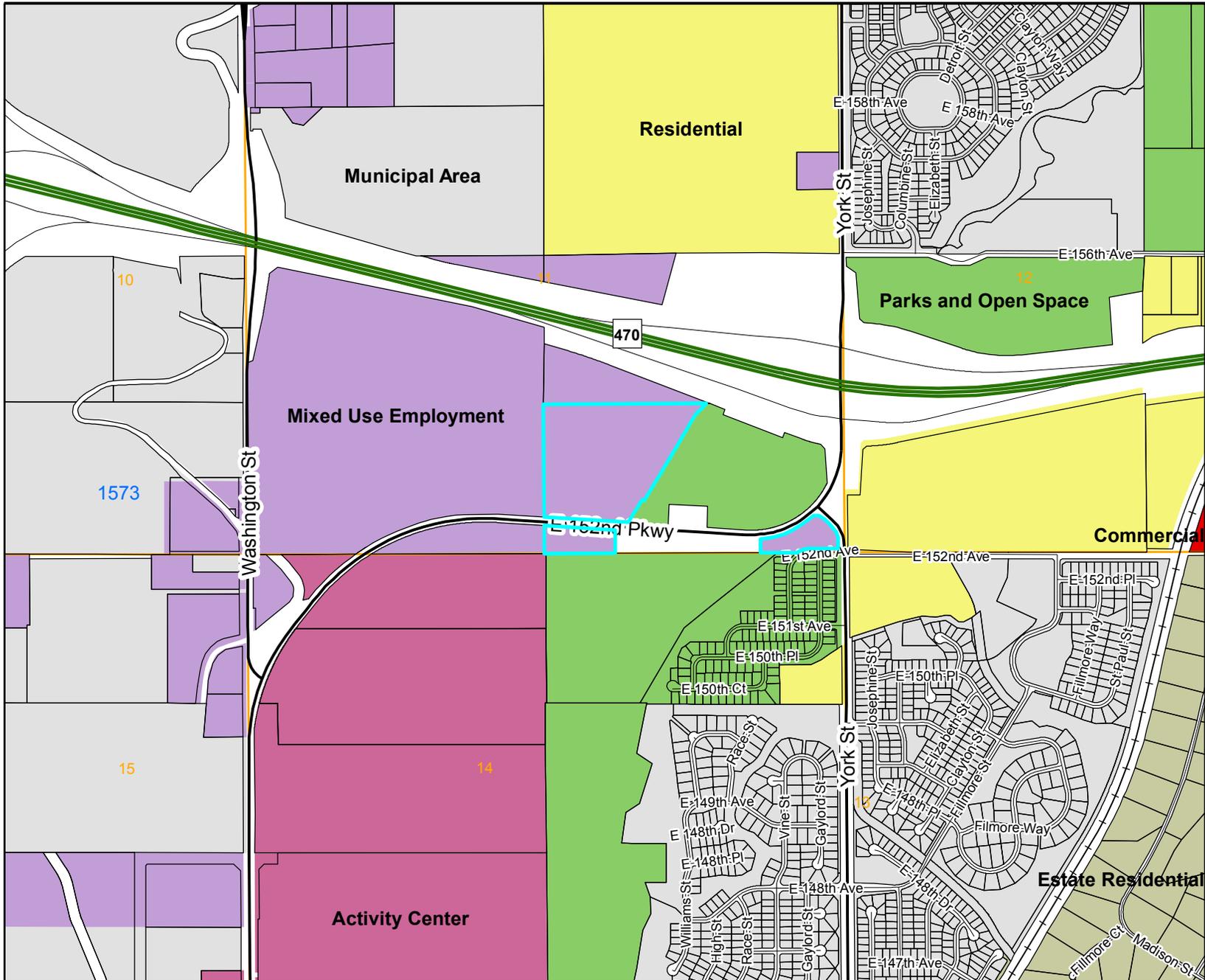
Exhibit 1.3



For display purposes only.

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EXHIBIT 1.4  
COMPREHENSIVE PLAN MAP



### LEGEND

- Special Zoning Conditions
- Section Numbers
- Railroad
- Major Water
- Zoning Line
- Sections

#### Zoning Districts

- A-1
- A-2
- A-3
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA
- P-U-D
- P-U-D(P)
- Airport Noise Overlay

**Ward - Ivey**  
**Comprehensive Plan Map**

**Exhibit 1.4**



For display purposes only.



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EXHIBIT 2.1  
APPLICANT WRITTEN EXPLANATION

Ward Petroleum Corporation  
**Ivey Wellpad**  
SW/4 SE/4  
Sec. 11 T1S R68W  
Adams County, Colorado  
Surface: Fee  
Mineral Lease: Fee

The proposed project consists of the construction of 1 wellpad with up to 26 wells and access road for an oil and gas well to be operated by Ward Petroleum Corporation (Ward). Ward does not intend to drill all 26 wells consecutively. The drilling schedule is subject to change due to economic conditions, business development priorities and equipment availability.

**Sequence of Major Activities and Estimated Completion Date**

**Access Road and Wellpad:**

**Phase I-Pre-Drilling (14 - 21 days)**

The existing access road will be upgraded and graveled to crown/ditch standards. Ripping and dozing will be done on the contour to prevent erosion while improving the road. There will be minimal traffic during construction. Pad construction will be done simultaneously with road construction. The drilling rig will be moved onto the pad over the bladed road and drilling will begin. The private surface owner or good engineering practices (i.e. if a culvert is needed for drainage to prevent washout) will stipulate whether culverts will be installed at this point. A silt fence and/or ditch with catch ponds, and/or straw bales/waddles will surround the wellpad area during the drilling operations to prevent erosion pursuant to stormwater requirements.

The access road will be graveled. After the drilling rig is moved out, a truck mounted service rig will be moved in for well completion activities. Any additional operations, including well stimulation will be done at this point.

**Phase II-Drilling and Completion (Drilling: 7 – 12 days per well, Completion: 3-6 days per well)**

After the drilling rig is moved out a truck mounted service rig will be moved in for well completion activities. Any additional operations including well stimulation will be done at this point.

Final drainage design as designated or approved by the private surface owner will be implemented. Stormwater/erosion controls will continue, culverts, low water crossings, equipment installation, etc. will be done in this phase.

**Phase III-Production**

Well completion activities will be completed by this point and the well may be put online. Phase III can last 20 to 40 years. There will be minimal vehicle traffic; 1-2 light trucks per day may travel the road to check the wells and perform maintenance. Depending on liquid production, a tanker truck may come to the site once every 1-30 days. During the life of the well, declining production would result in less tanker truck activity. Periodic downhole maintenance and repair will be done on an as needed basis with truck mounted service rigs or similar equipment

**Construction Standards**

**Access Road:**

Running surface width to be 20'-26', with a maximum running road surface of 30', total distributed width to be no more than 40'. A minimum of one turnout will be constructed along the access road.

Borrow ditches are to be back-sloped 3:1 or shallower or as stipulated by the private surface owner. The borrow ditches along the access roads will be reseeded if the well is completed as a producer. Reseeding of the borrow ditches will reduce the area that will be utilized.

If necessary, culverts will be installed prior to commencement of drilling operations. Drainage to consist of borrow ditches on both sides. Low water crossings are not anticipated. However, if necessary, low water crossings will be used during drilling, as conditions dictate and upon completion. Crossings will be upgraded with corrugated metal pipes and/or gravel-bottomed low water crossings. Culverts will be placed on grade and aligned with the natural channel bed. Culvert sizes will be a minimum of 18" diameter or as stipulated by private surface owner.

The surfacing materials will consist of native material from road crown and the topsoil will be windrowed during construction and placed in the borrow ditch back slope upon road completion. The back slope of the borrow ditch will be reseeded.

Construction materials will be obtained from available permitted sources, if needed, and consist of pit gravel.

**Wellpad:**

The Wellpad is anticipated to cover approximately 6.8 acres and then approximately 3.4 acres after interim reclamation. Wellpad construction will commence approximately two (2) to five (5) weeks prior to drilling.

The traveled portion of production site will be gravel-surfaced prior to moving the drilling rig onsite. Site preparation will be done with standard excavation equipment using native materials. Additional surface material will be obtained from commercial sources or an approved borrow area. Salvaging and spreading topsoil will not be performed when the ground or topsoil is frozen or too wet to adequately support construction equipment. If such equipment creates ruts in excess of four (4) inches deep, the soil will be deemed too wet. In this case, all construction activities which may result in erosion will cease until the soil is deemed dry enough to resume activities.

Production facilities may vary according to the actual reservoir discovered and will be engineered upon completion of well tests. Production facilities will be clustered and placed away from cut/fill slopes to allow maximum recontouring of cut/fill slopes.

**Compliance Statement:**

The Ivey Wellpad complies with Section 4-10-02-05-02(3). Ward purchased the Ivey Wellpad and associated previously approved COGCC permitted wells and production facilities. The location was chosen due to surface owner request, preservation of cropland, topography and avoiding nearby neighborhoods. In addition, the location falls outside of the Colorado Oil and Gas Conservation Commission Buffer Zone of 1,000' to any residence. Ward will employ Best Management Practices (BMP's) to reduce or eliminate impacts. BMPs may change at any time due to site conditions, enhanced knowledge and technology. The county will be advised of any significant or structural BMP changes. The location was chosen as the ideal site for the following reasons:

- The location does not fall within a floodplain and wetlands.
- The location is outside the COGCC Exception and Buffer Zones and Urban Mitigation Area.
- The proximity to the E-470 will assist in mitigating noise during drilling and completions.
- The topography is conducive to a multi-well pad.
- There are existing oil and gas facilities and access road adjacent to the site which will be

- utilized, negating any new road disturbance.
- The Ivey site would eliminate the need to utilize the surface of the undeveloped 35 acre Wadley Farms site for drilling and production activities. Ward instead intends to drill and produce (if economically and technically feasible) the minerals beneath the undeveloped 35 acre Wadley Farms site from the Ivey surface location.
  - The location is outside any city limits.
  - The location will not affect any current open space.
  - The wellpad is over 3,000' from any public gathering area.

**Estimated Project Start Date:**

April, 2017.

**Proposed Mitigation Measures:**

**Community Outreach**

Ward has already spoken with and met with Adams County Communities for Drilling Accountability Now (ACCDAN) representatives to discuss the Ivey Wellpad and learn about their questions and concerns regarding the location. Ward held two (2) neighborhood meetings on November 15 and 16, 2016. Ward continues to be available for discussion with the community.

**Planning**

Development from existing well pads: Ward has permitted an Oil and Gas Location Assessment - Form 2A as a multi well pad through the Colorado Oil and Gas Conservation Commission (COGCC). This will eliminate the need for multiple well pads which would ultimately require more surface disturbance. The location was chosen after careful consideration of setbacks, including existing overhead utility lines, topography, and discussions with the surface owner. The location is not within 1,000' of any building unit (COGCC Buffer Zone) and is adjacent to existing production facilities.

**Noise Mitigation:** The requirements of Rule 802 of the COGCC regulations will be met. An ambient sound study has been conducted to determine noise impacts to the nearby residents. Sound walls will be erected to reduce noise pollution during drilling and completions. Ward plans on installing 1,060' of sound walls. Please the attached Exhibit showing the location.

**Odor Mitigation:** Ward will comply with Rule 805 and Department of Public Health and Environment, Air Quality Control Commission, Regulation No. 2 Odor Emission, 5 C.C.R. 1001-4, Regulation No. 3 (5 C.C.R. 1001-5), and Regulation No. 7 Section XVII.B.1 (a-c) and Section XII. Ward will utilize an Emission Control Device to reduce odor emissions during production.

**Visual Mitigation:** Pursuant to Rule 804, the tank battery shall be painted in uniform, non-contrasting, non-reflective color tones with the colors matched to but slightly darker than the surrounding landscape. Sound walls will be erected that will act as a visual barrier during drilling and completions.

**Lighting:** All permanent lighting will be directed downward and internally. Temporary lighting shall conform to COGCC Rule 803 and not adversely affect adjacent residential properties. Temporary lighting will be directed downward to minimize light. Sound walls will partially block temporary ground level lighting.

**Landscaping:** Ward will adhere to County requirements and/or surface owner preferences. Where feasible, native vegetation will be minimally impacted. Motorized equipment will be restricted to the well sites and access roads to the well sites. If approved by landowner, additional landscaping may be added.

**Weed Control and Management:** Ward will manage weed control at the oil and gas facility and along the access road during construction, operations and until final abandonment and final reclamation is completed per county or COGCC regulations.

**Dust Mitigation:** Dust mitigation measures shall include but are not limited to the use of speed restrictions, regular road maintenance, restrictions of construction activities during high wind days, and silica dust controls when handling sand used in hydraulic fracturing operations. The access road will be constructed with road base aggregate material. Additional management practices such as road surfacing, wind breaks and barriers may be used. A street sweeper and/or water tank will be on call to limit dust when necessary.

**Erosion Control Measures:** Ward will maintain a Stormwater Management Plan with site specific measurements to address erosion control. Ward will make thorough inspections, in accordance with the requirements set forth by CDPHE Water Quality Division (WQD) and the COGCC Rule 1002 f. The inspection schedule is as follows:

While the site is under construction, an inspection is required at least every 14 calendar days; post storm event inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.

Inspection records will be kept on file for a minimum of three (3) years from expiration or inactivation of permit coverage. These records will be made available to the regulatory agencies upon request.

**Traffic Control:** Ward will construct all leasehold roads to accommodate local emergency vehicle access requirements and will be maintained in a reasonable condition. Please see the Traffic Plan for details.

### **General Housekeeping**

**Guy Line Anchors:** All guy line anchors left buried for future use will be identified by a marker of bright color not less than four feet in height and not greater than one foot further of the guy line anchor.

**Removal of Surface Trash:** Ward agrees that all trash, refuse pipe, equipment, liquids, chemicals or other materials that are not necessary for the continued operations of the wells will be removed and disposed of no later than 30 days after completion. No such items will be burned or buried on location.

### **Material Handling and Spill Prevention**

To ensure protection for the surface during fracturing treatment, the location will be specifically constructed to contain any releases or spills. Secondary containment from any chemical spills or leaks will surround any trucks that carry, mix, or add chemicals associated with production operations as well as connections that could possibly leak fluid. Should any spill or release occur, every reasonable step will be taken to quickly remediate the area disturbed. Daily audio, visual, olfactory inspections will be recorded and kept in Ward's District office and available to regulatory agencies. Records will be kept electronically indefinitely. Ward will also abide by EPA mandated SPCC rules to ensure proper fluid containment.

For any spills and releases reportable to COGCC, Ward will also notify Adams County verbally or in writing to the County's LGD, Local Planning and Development Department, Sheriff's Office, and the local fire district immediately, but no more than 24 hours after discovery of the spill or release by Ward. This includes spills/releases: 1) of any size that impacts or threatens to impacts any waters of the state, a residence or occupied structure, livestock, or public byway; 2) in which one (1) or more barrels or more of Exploration and Production Waste or produced fluids is spilled or released outside of berms or other secondary confinement; and 3) of five (5) or more barrels regardless of whether the spill/release is completely contained within berms or other secondary confinement. In addition, Ward will notify the surface owners or the surface owner's tenant of spills and releases in compliance with COGCC rules.

**Control of Fire Hazards:** Ward and its contractor's will employ best management practices during the drilling and production of its wells and facilities. They will comply with appropriate COGCC and any county rules concerning fire and safety. Ward will ensure that any flammable material will remain no less than 25 feet from the wellhead (s), tanks and separator(s).

**Berm Construction:** A steel containment berm or structure will be erected around the oil and water storage tanks. A synthetic liner will be installed inside the berm. The berm will be inspected at least every 14 calendar days while the site is under construction and within 24 hours of a precipitation event. Inspection records will be kept on file for a minimum of three (3) years from expiration or inactivation of permit coverage. These records will be made available to the regulatory agencies upon request.

SDS (Safety Data Sheets) for materials and chemicals used will be kept onsite and updated/modified for each phase of operations

### **Fencing**

Fencing: The wellsite will be fenced if requested by the private surface owner and pursuant to COGCC Rule 605. C.(3).

### **Drilling/Completion Operations**

**Closed Loop System:** A Closed Loop System will be used for drilling and fluid management. No reserve pit will be used. Water based cuttings will be generated and assessed for land farming applications. Any cuttings other than water based will be hauled to an approved waste disposal site

**Green Completions: Emission Control Systems.** Test separators and associated flow lines and sand traps shall be installed on-site to accommodate Green completion techniques pursuant to COGCC Rules 805 b.(3) and 604 c(2)C.

**Air Emissions:** Air containment emission sources shall comply with the permit and control provisions of the state air quality control program and the rules and regulation promulgated by the State Air Quality Control Division pursuant to Regulation #7. Ward will employ such control measures and operating procedures as are necessary to minimize fugitive particulate emissions into the atmosphere. Emission Control Devices will be used.

**Wildlife and Wildlife Habitat:** The proposed oil and gas wells are not within a sensitive wildlife habitat as defined in Section 100 of the COGCC regulations. Consequently, Ward, to the extent possible, will not cause significant degradation of wildlife.

**BOPE for well servicing operations:** Adequate blowout prevention equipment will be used on any servicing operations associated with this well. Backup stabbing valves shall be required on well servicing operations during reverse circulation. Valves will be pressure tested before each well servicing operation using both low-pressure and high-pressure fluid.

**Water Sampling:** Ward will adhere to COGCC Rule 318.A. and Ward Petroleum's MOU (Memorandum of Understanding) with Adams County. Ward will utilize COGCC's criteria and protocol for analysis and submission to the COGCC data system. If there are no available water sources within a ½ mile radius of the proposed oil and gas facility, Ward will test the nearest downgradient water source within a one mile radius prior to construction.

**Interim Restoration (Production):** As required by the COGCC Rule 1003, rehabilitation of unneeded, previously disturbed areas will consist of back sloping, and contouring all cut & fill slopes. These areas will be reseeded. The portions of the cleared well site not needed for operational and safety purposes will be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible consistent with surface owner preferences. Sufficient level area will remain for setup of a workover rig and to park equipment. In some cases, rig anchors may need to be pulled and reset after recontouring to allow for maximum interim reclamation.

**Final Reclamation**

Well site cleared. Within 90 days subsequent to the time of plugging and abandonment of wellbore(s) the entire site, superfluous debris and equipment shall be removed from the site. Final reclamation will be conducted pursuant to the preference of the landowner consistent with COGCC regulation Rule 1004.

**Estimated Project Completion Date:**

Final stabilization of the well area will mean revegetation of all areas not including the permanently installed well anchor points. All other areas will be revegetated or covered by permanent materials before they are considered finally stabilized and complete.

EXHIBIT 2.2  
APPLICANT SITE PLAN



# Ivey Well Pad Renderings

York Street Looking West



York Street Looking West Mature Landscape



WARD PETROLEUM



Preliminary renderings created for conceptual use only.

# Ivey Well Pad Renderings

152nd Street Looking North



152nd Street Looking North Mature Landscape



Preliminary renderings created for conceptual use only.

# Ivey Well Pad Renderings

**E-470 Looking Southwest**

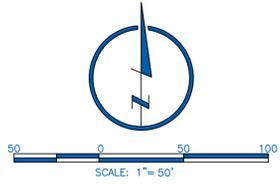


**E-470 Looking Southwest Mature Landscape**



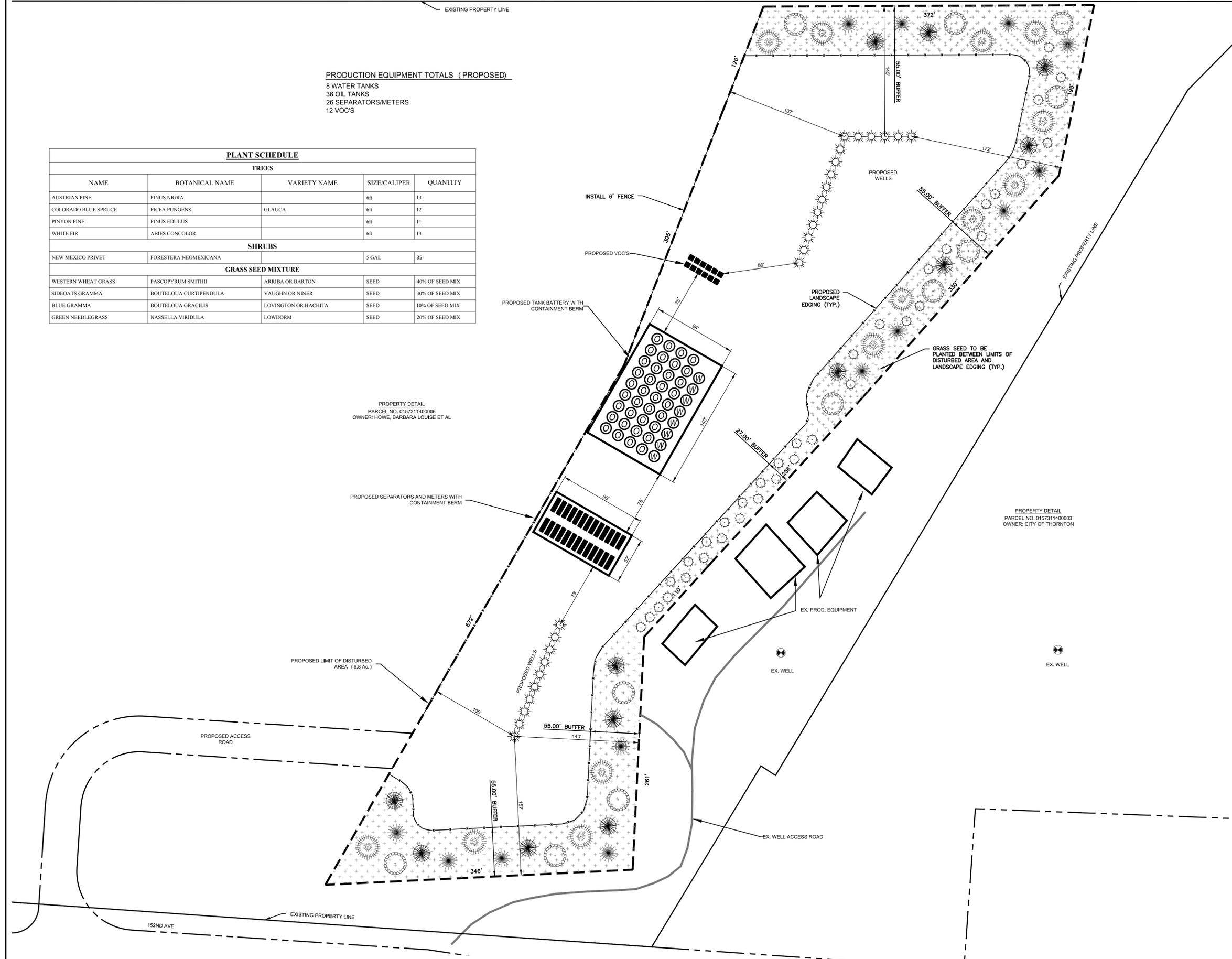
Preliminary renderings created for conceptual use only.

EXHIBIT 2.3  
LANDSCAPE PLAN



**PRODUCTION EQUIPMENT TOTALS ( PROPOSED )**  
 8 WATER TANKS  
 36 OIL TANKS  
 26 SEPARATORS/METERS  
 12 VOC'S

PLANT SCHEDULE				
TREES				
NAME	BOTANICAL NAME	VARIETY NAME	SIZE/CALIPER	QUANTITY
AUSTRIAN PINE	PINUS NIGRA		6ft	13
COLORADO BLUE SPRUCE	PICEA PUNGENS	GLAUCA	6ft	12
PINYON PINE	PINUS EDULUS		6ft	11
WHITE FIR	ABIES CONCOLOR		6ft	13
SHRUBS				
NEW MEXICO PRIVET	FORESTERA NEOMEXICANA		5 GAL	35
GRASS SEED MIXTURE				
WESTERN WHEAT GRASS	PASCOPYRUM SMITHII	ARRIBA OR BARTON	SEED	40% OF SEED MIX
SIDEOATS GRAMMA	BOUTELOUA CURTIPENDULA	VAUGHN OR NINER	SEED	30% OF SEED MIX
BLUE GRAMMA	BOUTELOUA GRACILIS	LOVINGTON OR HACHITA	SEED	10% OF SEED MIX
GREEN NEEDLEGRASS	NASSELLA VIRIDULA	LOWDORM	SEED	20% OF SEED MIX



**LEGEND**

- BLUE SPRUCE (PICEA PUNGENS)
- PINION PINE (PINUS EDULUS)
- AUSTRIAN PINE (PINUS NIGRA)
- WHITE FIR (ABIES CONCOLOR)
- NEW MEXICO PRIVET (FORESTERA NEOMEXICANA)
- NATIVE GRASSES
- LANDSCAPE EDGING
- DISTURBED AREA LIMIT

- NOTES**
- 1) A TEMPORARY DRIP IRRIGATION SYSTEM WILL BE INSTALLED TO WATER TREES UNTIL ESTABLISHED USING AN ONSITE WATER TANK.
  - 2) SOAK TREES ONCE PER WEEK AND MONITOR TO PREVENT OVER OR UNDER WATERING.
  - 3) GRASS SEED SHALL BE WATERED UNTIL ESTABLISHED.
  - 4) AREA TO BE SEEDED IS APPROXIMATELY 2.05 ACRES.

- MAINTENANCE STANDARDS**
- ALL LANDSCAPING AND REQUIRED BUFFERING SHALL BE CONTINUALLY MAINTAINED INCLUDING IRRIGATION IF APPLICABLE, WEEDING, PRUNING AND REPLACING IN A SUBSTANTIALLY SIMILAR MANNER AS ORIGINALLY APPROVED. THE FOLLOWING SURVIVAL STANDARDS SHALL APPLY TO ALL LANDSCAPING AND REQUIRED BUFFERING:
1. LIVING GROUND COVERS: LIVING GROUND COVERS MUST BE FIFTY PERCENT (50%) ESTABLISHED AFTER THE FIRST GROWING SEASON, AND NINETY PERCENT (90%) ESTABLISHED THEREAFTER.
  2. NON-LIVING GROUND COVERS: NON-LIVING GROUND COVERS, SUCH AS ROCK OR MULCH MUST BE ONE HUNDRED PERCENT (100%) INTACT AFTER ONE (1) YEAR AND EIGHTY PERCENT (80%) INTACT THEREAFTER.
  3. TREES AND SHRUBS: TREES AND SHRUBS MUST HAVE A ONE HUNDRED PERCENT (100%) SURVIVAL RATE AFTER ONE (1) YEAR AND A NINETY PERCENT (90%) SURVIVAL RATE THEREAFTER.

PROPERTY DETAIL  
 PARCEL NO. 0157311400006  
 OWNER: HOWE, BARBARA LOUISE ET AL

PROPERTY DETAIL  
 PARCEL NO. 0157311400003  
 OWNER: CITY OF THORNTON

DRAWN BY	INC
CHECKED BY	
DATE	
JOB NUMBER/TAB	
DATE	
BOOK AND PAGE	

REVISIONS

4715 Innovation Drive 970.226.0342 | P  
 Fort Collins, CO 80525 970.226.0879 | F  
 www.LRA-Inc.com

**LAMP RYNEARSON & ASSOCIATES**

WARD PETROLEUM, IVEY WELL PAD  
 ADAMS COUNTY, COLORADO

IVEY WELL PAD  
 LANDSCAPE PLAN

LAMP RYNEARSON - ENGINEERS

PRELIMINARY

NOT RELEASED FOR CONSTRUCTION

SHEET

1 of 1



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EXHIBIT 2.4  
SITE SIGNAGE

Signage during Drilling and Completion  
Operations

Exhibit 2.4



All signage will adhere to COGCC Rule 210. Proper signage will be posted in a conspicuous place from time of initial drilling until final abandonment. It will be posted at the intersection of the lease road and the public road providing access to the well site.

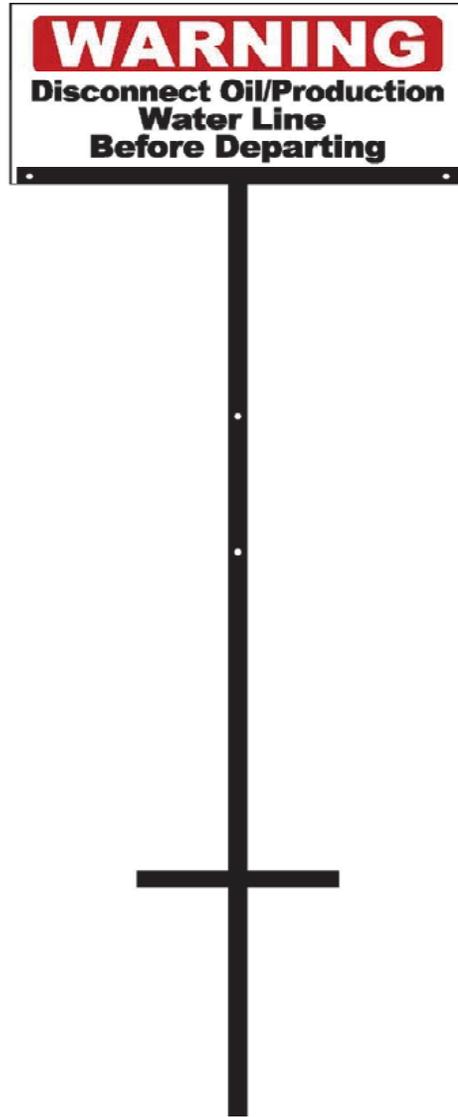
During drilling and completion operations, directional signs will be provided by the contractor. They will be posted at significant locations for emergency response crews. At a minimum, they will be posted at the first point of the access road and Riverdale Rd. The sign will be made out of sheet metal and the signs will be no less than three (3) and no more than six (6) square feet in size.

Permanent Signage



Ward Petroleum  
Ivey I-11-2HC  
API #: 05-001-09898

All signage will adhere to COGCC Rule 210. Within 60 days of completion, a permanent sign, 8" x 18" will be installed at the wellhead.



This above sign will be installed next to all drip pots.

EXHIBIT 3.1  
REFERRAL COMMENTS (County Agency)

**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.

EXHIBIT 3.2  
REFERRAL COMMENTS (Adams 12)

**From:** [Arthur Dawson - ESC](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments on Ward Petroleum Ivey Well Pad Permit Application  
**Date:** Monday, March 06, 2017 4:05:16 PM

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Dear Ms. Simmons,

My name is Art Dawson and I am the Executive Director of Facilities for Adams 12 Five Star Schools. I am writing in response to your February 13, 2017 correspondence entitled, "Request for Comments" regarding the application made by Ward Petroleum for a Use by Special Review Permit for development of oil and gas extraction operations at the Ivey well pad.

There are four Adams 12 schools within two miles of the Ivey well pad:

1. Silver Creek Elementary School, 15101 Fillmore St. (~0.75 miles away)
2. Stargate Charter School, 14530 Washington St (~1.2 miles away)
3. Rocky Top Middle School, 14150 York St. (~1.5 miles away)
4. Horizon High School, 5321 E. 136th Ave. (~2.0 miles away)

On behalf of Adams 12 Five Star Schools, I respectfully submit the following comments which focus on matters regarding the safety and security of our students and staff at these schools:

1. **Emergency Preparedness Plan** - Adams 12 personnel met with representatives of Ward Petroleum and the Anfeald company (one of Ward's consultants for this plan) on January 26, 2017. During this meeting we discussed the Emergency Preparedness Plan. Adams 12 personnel were encouraged to see the amount of thought and effort that went into creating the plan. We are confident that should an emergency incident occur at the Ivey well pad, following this plan will minimize risk to the surrounding community including our schools. We would, however, prefer to see the "Roles and Responsibilities" section of the plan expanded to include details regarding collaboration with community organizations such as ours. We hope to continue our collaboration with Ward during further development of the Emergency Preparedness Plan as well as during construction and operation of the site.
2. **Traffic Plan** - Adams 12 and Ward Petroleum personnel also discussed the Traffic Plan at our January 12, 2017 meeting. As with the Emergency Preparedness Plan, we are encouraged the thorough evaluation of potential traffic concerns considered by Ward and their consultant, Kellar Engineering, LLC. Per the plan's discussion of emphasizing off peak truck trips, Adams 12 requests that as much as feasible, Ward restrict truck traffic along the York St. corridor during school busing hours as follows:
  - o 7:00AM-9:00AM Mon-Fri
  - o 1:00-PM-4:00PM Mon-Tue & Thu-Fri
  - o 11:00AM-1:00PM Wed

Sincerely,

Art Dawson  
Executive Director, Facilities  Business Services  
Adams 12 Five Star Schools

EXHIBIT 3.3  
REFERRAL COMMENTS (City of Thornton)



City Hall  
9500 Civic Center Drive  
Thornton, CO 80229  
[www.cityofthornton.net](http://www.cityofthornton.net)

City Manager's Office  
303-538-7200  
FAX 303-538-7562

**TO:** Chris Simmons, Adams County Community and Economic Development Department  
**FROM:** Robb Kolstad, City of Thornton City Manager's Office *RK*  
**DATE:** February 28, 2017  
**SUBJECT:** Ward Petroleum Ivey Well Pad (#USR2016-00006)

Please accept the following comments regarding the Ward Petroleum Ivey Well Pad (#USR2016-00006). Based on the response to the comments below, the City of Thornton may have additional comments or request for information. The City formally requests consultation with the operator.

#### Site Mitigation

Based on the application materials, the City cannot determine if the landscaping and overall site mitigation provides adequate buffering for the adjacent community as well as the future trail and open space to the east of the site. The City requests a formal landscaping plan, including information on proposed planting, irrigation, and berms. In addition, the City requests a wildlife study, vegetated buffer, and ongoing water quality testing to help preserve the Big Dry Creek as an open space, recreational, and wildlife corridor as called for in the Big Dry Creek Recreation and Restoration Masterplan. A trail connecting the two pedestrian underpasses (152nd Avenue and E-470) and a trailhead are planned for the open space to the east of the site and the City anticipates obtaining a number of easements to facilitate those improvements. Regarding fencing, tank design, and signage, the City requests permanent security fencing that provides visual screening from the completed site, low profile tanks, and permanent warning signs. The City requests a lighting plan for evaluation and believes that the plan should eliminate any light spilling off the site. The City requests a noise wall around the entire site and adequate gating and security measures during the drilling and completion stages.

#### Traffic Management

The traffic study assumed that all water would be piped onsite and all product would be piped offsite. Given that none of the pipe infrastructure is currently in place, the City requests an updated traffic study that evaluates the impact of this development assuming water and product is trucked onsite and offsite. Regarding the trucking routes, the City is concerned about heavy volumes of truck traffic on York Street north of E-470 and access onto Highway 7 from York Street. The current route crosses a two-lane bridge, passes by a residential development, and accesses an undersized intersection. The City requests that the truck routes be modified to use E-470 from York Street. There are also access issues to the site from 152nd Avenue and the City will require the construction of a deceleration lane on westbound 152nd Avenue. The City requests that the access road be paved leading up to 152nd Avenue and install signage restricting right turns out of the site and left turns into the site to ensure no trips occur west of the site. Finally, the City is considering implementing an Access Road Permit and Access Road Fee that would be applicable to this development and will look to negotiate compensation for anticipated road degradation.

#### Emergency Response

The City requests that no flaring occur at this site, but if flaring does occur that the City of Thornton Emergency Communications Center be notified prior to the event. The City requests that the operator continue to engage with the Thornton Fire Department and North Metro Fire Rescue District regarding emergency response planning. In addition, the City requests initial and ongoing response training with the operator on the Ivey site.

EXHIBIT 3.4  
REFERRAL COMMENTS (United Power)

**From:** [Marisa Dale](#)  
**To:** [Chris Simmons](#)  
**Subject:** Project # USR2016-00006 Ward Petroleum Ivey Well Pad  
**Date:** Friday, February 17, 2017 10:01:18 AM

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Christopher,

Thank you for allowing United Power, Inc. the opportunity to review and comment on the Ward Petroleum Ivey Well Pad project.

United Power, Inc. has no objection.

United Power, Inc. owns and maintains existing electric facilities in the area. Please contact Catherine Bailey at 303-637-1360 for any modification of existing or new installation of service.

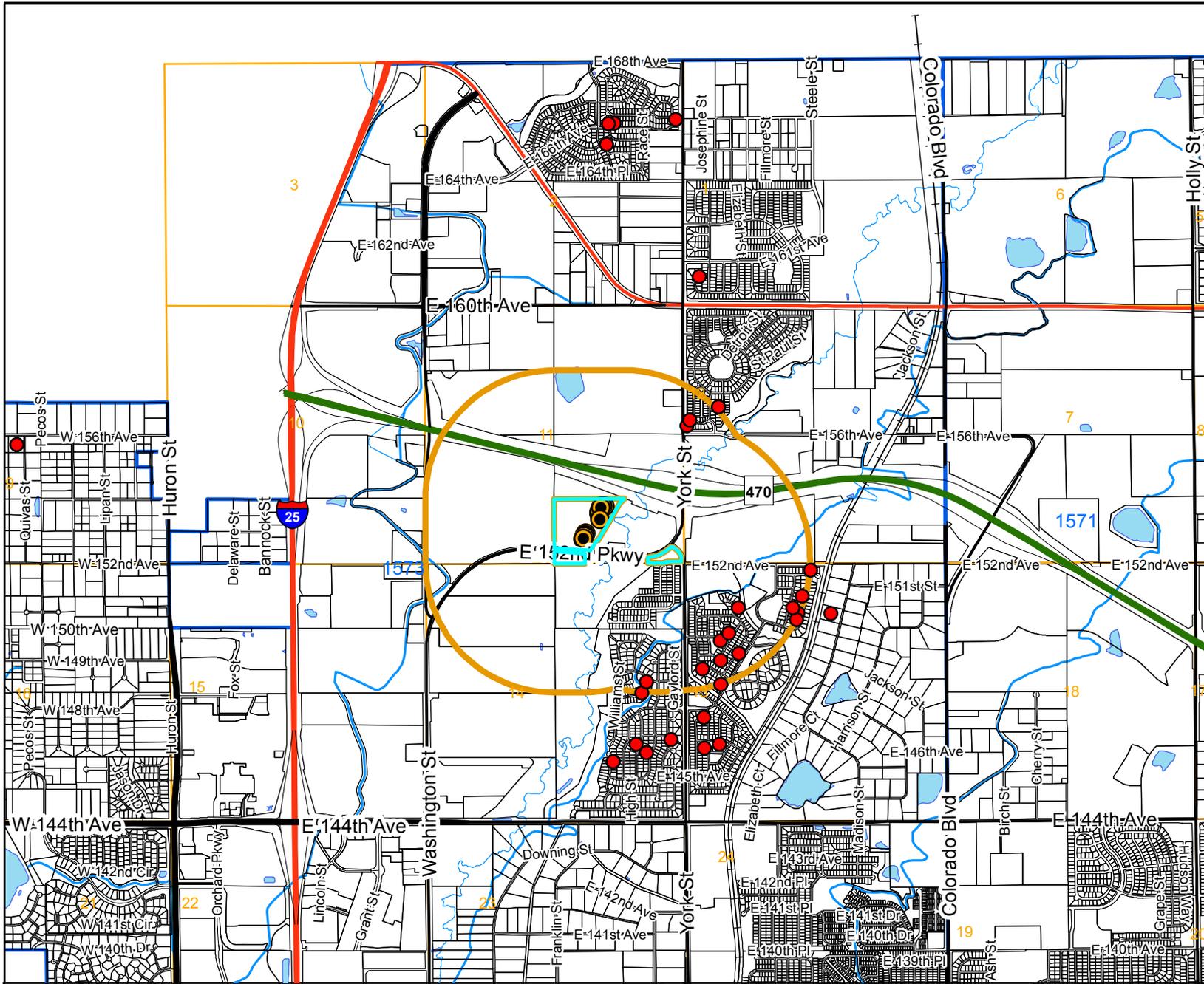
Thank you,  
Marisa

Marisa Dale, RWA | [Engineering & Rates ROW](#)  
500 Cooperative Way, Brighton, CO 80603 | O 303.637.1387 | C 720.334.5282

Schedule: M-Th 7:00-4:30, F 7:00-3:30  
Out of the office: Feb 24, Mar 10 & 24, Mar 27 - Apr 3



EXHIBIT 4.1  
CITIZEN COMMENTS



**LEGEND**

- ★ Special Zoning Conditions
- 3 Section Numbers
- Railroad
- Major Water
- Zoning Line
- Sections
- Zoning Districts**
- A-1
- A-2
- A-3
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA
- P-U-D
- P-U-D(P)
- ⊠ Airport Noise Overlay

**Ward Petroleum - Ivey Well Pad**

**USR2016-00006**

**Exhibit 4.1**



For display purposes only.



This map is made possible by the Adams County GIS group, which assumes no responsibility for its accuracy

**From:** [Teri Shimotori](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Comments  
**Date:** Sunday, March 05, 2017 1:14:20 PM  
**Attachments:** [IveySite\\_Comments.docx](#)

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I oppose fracking in residential areas without due diligence to protect the air, ground and water in and near surrounding neighborhoods that could have adverse impacts on our health. Health before profit. I support these comments for the Ivey Site.

<<...>>

Teri Shimotori

128<sup>th</sup> & Claude Ct, 80241

March 5, 2017

To Chris Simmons

[csimmons@adcogov.org](mailto:csimmons@adcogov.org)

**Comments on Ward Ivey Site SEC. 11 TIS R68W (SW/4 SE/4) NW of E 152nd PKWY and York ST. Adams County, Colorado Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas Northwest of Intersection of 152nd and York Street, Brighton**

Submitted as a member of **North Metro Neighbors for Safe Energy** (NMNSE) regarding the proposed Ivey Site. I respectfully request a response to all comments.

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

Given the information we are providing below, NMSNSE finds that Adams County must reject Ward Petroleum's application for drilling at the Ivey site due to the deficiencies in the application and the unacceptable risks and impacts that Ward Petroleum's project would have on our communities.

NMSNSE and Adams County Citizens for Drilling Accountability Now (ACCDAN) worked collaboratively to circulate the petition submitted by ACCDAN to the county on February 14, with 1,008 signatures supporting this statement:

"As residents of Adams County in Colorado, by signing this petition, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county's Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (410-02-05-07). The reason for this petitioned request is that we, the undersigned, believe that all large-scale oil and gas developments within 2,000 feet of an existing or planned neighborhood should require a vote of the Adams County Commissioners and a public hearing allowing ample opportunity for public education, involvement and formal public comment."

**1) Public hearing requested:** NMSNSE and ACCDAN strongly believe that "With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado." Therefore, NMSNSE requires the Ward Ivey permit include a public hearing and the application be put to a vote of the Adams County Board of Commissioners for the following reasons:

**2) Health assessments:** Dave Ellison, a civil engineer residing in Adams County, has submitted an assessment of the proposed Ivey Site, including access to the proposed site and exposure impacts caused by air inversion. St. Anthony North Hospital, Silver Creek Elementary School, Rocky Top Middle School, a childcare facility, Stargate Charter School, along with 2,600 homes are all located within the air inversion envelope.

The Big Dry Creek Valley experiences several air inversions a month, exposing 2,600 homes (for a total of 8,500 residents), to dangerous VOC's and other hazardous industry pollutants. This greatly increases the potential risk of developing and experiencing hospitalization due to asthma attacks.

*JAMA Intern Med.* doi:10.1001/jamaintermmed.2016.2436

The Colorado Department of Health and Environment (CDPHE) reports "health effects of people living near oil and gas operations include irritation of the eyes, nose, throat, lungs or skin, or other symptoms like headache, dizziness, or nausea, and vomiting. Some people living near oil and gas operations also report sleep disturbances or anxiety."

Due to the many acute and chronic health concerns regarding the effects of living in proximity and/or exposure to concentrated emissions caused by the air inversion envelope near the Ivey site, NMNSE requests that Adams County work with the CDPHE, Tri County Health, the City and County of Broomfield, the University of Colorado, and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality **before any oil and gas development or drilling occurs.**

### 3) As suggested by the CDPHE, studies must include:

- *Continued evaluation of health risk using more comprehensive exposure data such as data from the Colorado State University studies directly measuring oil and gas emissions in Garfield County and the north Front Range and data collected by the Colorado Air Mobile Monitoring Laboratory.*
- *Continued monitoring of health effects in areas with substantial oil and gas operations including:*
- *High-quality epidemiological studies with improved characterization of exposures to directly assess the possibility of health effects in communities with substantial oil and gas operations.*
- **Exposure assessment:**
  - *The maximum air concentration of a substance represents an estimate of an acute (short-term) exposure. An acute exposure is an intermittent, infrequent exposure that could occur for a few hours to a few days. This is what the air might be like from an unanticipated release of emissions during oil and gas activities.*
  - *The highest average air concentration for a substance across all datasets is used to represent an estimate of a chronic (long-term) exposure. A chronic exposure is a prolonged continuous exposure, generally over the lifetime of an individual. The air data likely indicates what the average outdoor air is like near residences over the life of a normal operating well or wells.*
- **Health effects assessment: What are the "safe" levels of exposure for these substances?**

- **Risk Characterization:** *Are the exposures to people living near oil and gas operations above or below “safe” levels?*
- **Combined substances**
  - *Evaluating the combined risks to human health from multiple substances is an important component to understanding the potential for health effects to occur from oil and gas emissions.*
  - *Assessment of Potential Public Health Effects from Oil and Gas Operations in Colorado February 21, 2017 <https://www.colorado.gov/pacific/cdphe/oil-and-gas-health-assessment>*

**4) Conduct a human health risk assessment:** Given the CDPHE recommendations listed above, NMNSE believes that the medical community needs to be informed and engaged in order to collect and document objective data, and that to adequately study and review standards of acceptable exposure risk, any assessment must consider impacts on the most vulnerable in our community— pregnant women and their embryos and fetuses; children; the immunocompromised; and the elderly. Potential risk assessment must include, but is not limited to, effects on the cardiovascular, pulmonary, respiratory, endocrine, immune, neurological, integumentary, hematologic, gastrointestinal, genitourinary, reproductive, musculoskeletal systems and psychological effects.

**5) Conduct a property value impact assessment:** NMNSE requires that an independent property value and tax impact assessment be performed before a permit is issued.

Dave Ellison’s analysis:

1,322 homes are directly over the proposed south horizontal drilling and fracking area. Total number of homes over the proposed fracking area is 1,754. The homes within sight of the proposed Ivey site have an estimated value of \$760 million. For these homes, it has been estimated that their property values will be impacted by 25%. As a homeowner, I cannot afford to lose 25% of my property value. As a County, can you afford to lose the income with the decreased value?

**6) Conduct a floodplain evaluation assessment:** Approval of the Ivey permit application should be subject to a full review of probable impacts on the floodplain. As shown in Dave Ellison’s presentation, the proposed Ivey site is not in compliance with FEMA’s 500-year floodplain. This puts the immediate environment, Big Dry Creek, and the community at significant risk due to historical flooding of the area.

The COGCC Spill analysis by year 2010-2016 reports 3,980 spills.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

On January 23, 2017, Anadarko in Weld County had a release from one well that affected an area approximately 2,900 x 1,400 ft. <http://cogcc.state.co.us/weblink/results.aspx?id=449004>

A design floodplain level for a 500-year rainfall implemented with construction of proposed culvert(s) for drainage to prevent washout, a silt fence and or ditch with catch ponds, and or straw bales/waddles to surround well pad area, would not be sufficient to reduce the environmental risks from more intense, upslope storms or flooding.

Oil and Gas and fracking operations bring an inherent risk of spills and releases to every site. Thornton has had eight historical spills in the last fifteen months, two of which were at least 10-15 years old.

Given the risk of spills, releases, and other impacts, placing a large industrial operation in the floodplain could be catastrophic to the functioning of Big Dry Creek for irrigation purposes and to adjacent homes and the community at large.

**7) Traffic impacts must be included in Ward Petroleum's application:** The permit application cannot be adequately evaluated or approved unless and until it depicts Ward Petroleum's actual plan. The traffic impact study submitted by Ward assumes a pipeline is used for all product, water, etc., and yet the diagram on Ward Petroleum's pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. The current traffic impact study based on using a pipeline is not applicable when a pipeline has not been officially proposed or approved. Proposed access to the Ivey site includes heavy truck traffic through high population areas and past at least 3 schools, and does not address the very dangerous "Pinch Point" at York Street at Big Dry Creek.

Colorado Department of Transportation states that an estimated 9,400 semi-trucks are required for a 6-well pad. The Ivey site truck trip estimate is 40,733 -50,000 semi-trucks during Phase I- Pre- Drilling and Phase II-Drilling and Completion. On Ward Petroleum's Request for Comments, page 3 under Phase III- Production, 4<sup>th</sup> sentence, they clearly anticipate using a tanker truck every 1-30 days per well for the next 20-40 years.

As mentioned above during Phase III- Production, Ward anticipates using at a minimum 26 tanker truck visits per month and a maximum of 780 tanker truck visits per month, 312 to 9,360 tanker trucks per year for the next 20-40 years. The current permit application must be amended or denied if it requires that residential communities be subjected to the risks of semi-trucks and tanker trucks carrying hazardous chemicals, hydrocarbons and toxic waste materials traversing through neighborhoods and past our children's schools. <https://www.codot.gov/about/transportation-commission/documents/2015-archive-of-agendas-and-supporting-documents/april-2015/14-information-only.pdf>

**8) Require Ward Petroleum to submit easement documentation and pipeline mitigation plans:** Ward Petroleum has made misleading statements regarding pipeline approval and use during community meetings. Ward stated their intention to use a pipeline, but no pipeline plan is mentioned in its Request for Use by Special Review Permit. Ward Petroleum has indicated that it has secured the easements needed for access and pipelines to support the project, but has not provided easement documentation in its application. The requested easement documentation must be provided for pipelines, since the application details are based on the presupposition that Ward Petroleum will use a pipeline.

**9) Adams County must evaluate and assess pipeline mitigation limitations and risks:**

Ward's proposed pipeline mitigations reduce truck traffic impacts on the community by relocating the gathering station to a different area. However, pipelines do not eliminate risks of injuries, environmental damage, and property damage.

Pipelines are a risk to the community. Between 2010 and November 2016, 4,215 pipeline incidents have been documented nationally, resulting in 100 reported fatalities, 470 injuries, and property damage exceeding 3.4 billion. <https://www.fractracker.org/2016/11/updated-pipeline-incidents>

The use of pipelines does not decrease risk of human life and environmental pollution, and because pipelines increase the amount of product (oil, gas, produced water) to be transported throughout the county, requiring pipelines is not a sufficient mitigation for large-scale production near populated communities.

**10) Conduct Water Assessment:** Water required per well subject to hydraulic fracture ranges from 1.5 million to 15.8 million according to the US Geologic Survey <https://www2.usgs.gov/faq/categories/10132/3824>. Colorado is a drought sensitive area. Impacts on local water supplies and prices for residents must be considered in reviewing Ward's application.

**11) Ward Petroleum must submit a plan for transport and disposal of wastewater.** At Ward Petroleum's community meetings, their staff provided conflicting information in response to inquiries from residents at different information tables. At one of Ward's tables, NMNSE members were told that toxic wastewater, also known as produced water, would be transported by pipeline; at another table, we were told that the produced water would be transported by truck. At this time, it is clear that Ward does not have a safe plan for the transport of the toxic produced wastewater.

The Rocky Mountain Low-Level Radioactive Waste Board "has received information indicating that low-level radioactive waste in the form of NORM or TENORM from oil and gas operations may be coming into or being removed from the Compact region to be treated and disposed of at landfills and other facilities without authorization from the Board. Import and management or disposal of this waste into the Compact region requires authorization of the Board. Board Rule 12.2."

[http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice\\_Colorado%2020160818.pdf](http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice_Colorado%2020160818.pdf)

Ward Petroleum also reported at their second meeting that wastewater would be recycled back into the system. When pressed for details and facts about the toxicity of the water, Ward Petroleum then said that the water would be sent to injection wells. Injection wells have been proven to be the cause of manmade earthquakes, therefore a complete application must include a full accounting for handling and transport of produced wastewater and plans to minimize risks during every aspect of that handling and transport.

<https://pubs.usgs.gov/of/2015/1070/pdf/ofr2015-1070.pdf>

The COGCC Spill Analysis by Year 1999 -4<sup>th</sup> Qtr 2016 reports between 2010 – 2016 Water produced was 2,312,206,255 BBL, or 97,112,661,450 gallons of toxic wastewater that may have contained NORM and TENORM and may not have been reported to The Rocky Mountain Low-Level Radioactive Waste Board or disposed of properly.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

**12) Emergency response specific to Firefighter, Hazmat and Medical Response:**

- A) Emergency Response Plan:** Ward Petroleum must provide the County with an Emergency Response Plan (ERP) to address all potential emergencies that may be associated with its oil and gas facility. Operator must also provide a copy of such plan to all emergency service providers that would respond to such emergencies. A "will-serve" letter must be obtained from the appropriate emergency provider(s).
- B) Training:** Fire Districts, Departments, and emergency medical responders within response designation must receive training to be hosted and run by Ward Petroleum at a minimum of two times per year. At the minimum, one operator hosted/run training must be completed before the onset of any activity takes place at proposed site.
- C) Personal Protective Equipment, Apparatus Equipment:** All personal protective equipment (PPE), apparatus, and equipment specific to a gas and oil emergency or incident, including but not limited to fire and hazmat, shall be supplied to all firefighters and first responders, including medical, at the expense of Ward Petroleum before onset of gas and oil activity at said site.

**13) Insurance, Liability, Responsibility:** In the event of a catastrophic event, including a spill, release, fire, or explosion – caused by human error, lightning, equipment failure, earthquake, tornado potentially impacting human life AND property value, Ward Petroleum must accept responsibility and must carry enough liability insurance to cover the damage to homes/property and lawsuits resulting from impact on the health of the community and or of children, immunocompromised and elderly. In the event of an emergency or incident including but not limited to fire, hazmat, or medical response, Ward Petroleum must be held liable and responsible and must be adequately insured for the cost of resupplying all firefighter, hazmat, first responder Personal Protective Equipment (PPE), apparatus, and/or equipment lost or damaged during response.

**14) Requirements regarding Oil and Gas Development in Adams County:** The proposed site is adjacent to Thornton Open Space. Thornton's master plan for open space is to connect neighborhoods with bike and walking pathway, to preserve the heritage and quality of life in Thornton, and enhance and build upon Thornton's environmental assets, and enhance the community's identity. Residents chose to live in Thornton and Adams County because we believed in this master plan and believed this was an area in which we could have a high quality of life. Further, we chose to raise our families here because we believed that this was a safe and healthy community.

Please exercise your legislative powers, work to protect the health, safety and welfare of the residents and communities you represent, and do everything in your power to prevent these unacceptable risks from occurring in Adams County, including:

- A) Demand that state legislators, the governor, and state agencies change state policies to prioritize the health and safety needs of Coloradans—as is promised in the oath of office for all public officials—over the demands of the oil and gas industry.
  
- B) Consider placing small modular County offices one thousand feet from each other in open spaces subject to drilling, so that the state setback will apply to protect communities. These offices could be used to conduct baseline air, soil, storm water and other testing and otherwise document the conditions in the open space, and/or test the viability of using solar and wind power to run such offices, but they could also be used to conduct any type of business the county desires.
  
- C) Maintain the image of Adams County as positive, healthy place to live, play, and work.

The proposed Ivey site is clearly in conflict with Thornton’s vision for the city, as well as the people’s choice to live and raise families here. Our health, safety, quality of life, and property values are at an unacceptable risk. We are greatly concerned for ourselves, our children, our families, and our community. We require and expect that the County will do everything in its power to show us that they care about the wellbeing of our families as much as we do.

**Comment 1**

**From:** [Amy Busch](#)  
**To:** [Chris Simmons](#)  
**Subject:** Oil and Gas Site  
**Date:** Thursday, February 16, 2017 11:51:16 AM

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Hello, I am extremely concerned about the proposed oil and gas site near my home and kid's school. We live in the Haven neighborhood and back up to the open space on 152nd. This project should not be allowed to continue considering the proximity to our home and school. It is dangerous, loud, and an eye sore. We have had issues in the past with the lights and noise from the site just northeast of us. Please do not allow this to happen!!

Best Regards,  
Amy Busch  
3129 E 152nd Pl  
Thornton, CO 80602  
720-427-8962

**Comment 2**

**From:** [Jennifer Gamble](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Norman Wright](#); [Kristin Sullivan](#); [Jen Rutter](#); [Erik Hansen](#); [Eva Henry](#); [Mary Hodge](#); [Steve O'Dorisio](#); [Chaz Tedesco](#)  
**Subject:** ACCDAN Comments on Ward Ivey Site Permit Application  
**Date:** Wednesday, February 22, 2017 6:31:44 PM  
**Attachments:** [ACCDAN Comments on Ward Ivey Site -- Submitted 02 22 2017.pdf](#)

---

Dear Mr. Simmons,

Attached are comments from Adams County Communities for Drilling Accountability Now (ACCDAN)'s on the Ward Ivey Site permit application. Please confirm receipt.

Submitted by Jennifer Gamble, President, Adams County Communities for Drilling Accountability NOW and resident of Adams County, 2280 E. 138<sup>th</sup> Avenue, Brighton, CO 80602

**Comments on Ward Ivey Site Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas**

Northwest of Intersection of 152<sup>nd</sup> and York Street, Brighton

The attached are Adams County Communities for Drilling Accountability Now's comments on the Ward Ivey Site Permit Application in accordance with the comment period which closes March 6, 2017. ACCDAN requests a response in writing to each of its individual comments listed in the three sections of the attached letter.

Thanks, Jennifer



--

Jennifer Gamble  
Managing Director  
**OnPoint Power, LLC**  
2280 E. 138th Avenue  
Brighton, CO 80602  
+1 720-334-0709  
[jennifer.gamble@oppowerllc.com](mailto:jennifer.gamble@oppowerllc.com)



February 22, 2017

To Chris Simmons

[csimmons@adcogov.org](mailto:csimmons@adcogov.org)

Submitted by Jennifer Gamble, President, Adams County Communities for Drilling Accountability NOW and resident of Adams County, 2280 E. 138<sup>th</sup> Avenue, Brighton, CO 80602

**Comments on Ward Ivey Site Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas**

Northwest of Intersection of 152<sup>nd</sup> and York Street, Brighton

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

The following are Adams County Communities for Drilling Accountability Now (ACCDAN)'s comments on the Ward Ivey Permit Application in accordance with the comment period which closes March 6, 2017. ACCDAN respectfully requests a response in writing to each of its individual comments listed in the three sections of this letter.

**Comments to Adams County**

We respectfully request that Adams County:

- 1) Require the Ward Ivey permit application to be **put to a vote of the Adams County Board of Commissioners including a public hearing.** With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado. On February 14, ACCDAN submitted 1,008 petition signatures to the county stating -- As residents of Adams County in Colorado, by signing of this petition, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county's Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (4-10-02-05-07). The reason for this petitioned request is that we, the undersigned, believe that all large-scale oil and gas developments within 2,000 feet of an existing or planned neighborhood should require a vote of the Adams County Commissioners and a public hearing allowing ample opportunity for public education, involvement and formal public comment.
- 2) Conduct a review of the flooding concerns raised by a resident engineer, including consideration for **application of 500-year flood design standards** and/or relocating the pad to higher ground.
- 3) Since Ward's application and transportation impacts clearly state Ward's intention to use a pipeline and use of pipeline will reduce onsite environmental/health and local traffic impacts, Adams County should place a condition of approval on the Ward Ivey application, that a pipeline be in place **prior to any drilling** on the Ward Ivey site – i.e. **make use of a pipeline for product transportation a condition of approval.**



- 4) For any activities that may occur prior to a pipeline being in place, Adams County should require the use of E-470 for all Ward Ivey traffic rather than relying on local roadways.
- 5) Due to nearby resident raised concerns regarding the effects of temperature inversions on trapping of airborne emissions from the Ivey site, Adams County should work with CDPHE, Tri-County Health, City and County of Broomfield, the University of Colorado and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality both before substantial drilling occurs and then following up when a majority of the more than 400 wells planned for along the E-470 corridor are drilled and in operations to enhance understanding of air quality and health impacts of large-scale urban oil and gas activities. This study should be funded in part through fees and fines collected from oil and gas activities in the northern urban corridor.
- 6) **Address the pinch point bridge on York Street north of the E-470 interchange.** This bridge is planned by Ward to be used for tanker traffic. It is too narrow. Barely wide enough for two cars and a fatality occurred at this location from a traffic accident in January 2017. This bridge needs to be repaired, widened and upgraded if it is going to be used for heavy trucks/oil tanker traffic. Please carefully evaluate and mitigate the safety of this proposed route. Preference would be to use E-470 and avoid this stretch of York Street entirely and keep traffic away from neighborhoods.
- 7) **Require traffic impact study to address school bus route considerations.**

**Application Completedness Comments and Questions for WARD PETROLEUM and ADAMS COUNTY on the Permit Application Package for Ward Ivey Site**

Please provide an operator written response to each question and comment.

- 1) The will serve letter is a requirement of the permit application and has not been submitted. The application should not be processed until the will serve letter is provided.
- 2) In the cover letter, Ward seems to indicate that it has all of the easements for access and pipelines to support the project, but the easement documentation is not provided. The requested easement documentation should be provided for pipelines, since the application details are based on the presupposition that Ward will use a pipeline for the site. **ACCDAN supports the use of pipelines for the Ivey Site and encourages Adams County to make pipelines a condition for approval.**
- 3) The county regulations require a drilling schedule to be provided. By definition, a schedule includes the start and end dates for the various activities to complete the project. Ward has not provided a drilling schedule and therefore the current application is incomplete. The information provided is generic information on how long it takes to drill any well, how long it takes to complete any well and is not a schedule for the proposed Ward Ivey project that Ward is asking the county to approve. **Schedule details are provided in the traffic impact study section? Is that the planned schedule? If so, it means that you will be drilling and fracking at the Ivey site for two straight years – from August 2018 to August 2020. This is an unacceptably long period of time to impact the surrounding area.**
- 4) The sound mitigation fencing diagram on page 15 of the pdf only shows it for location 2, what about the sound wall for location 1? On pdf page 38, the drilling operations plan site layout



shows a sound wall around the entire site. Please consistently and clearly depict the plans for the sound wall.

- 5) What will the capacity of the steel berms be? 1.5 times the capacity of the largest tank?
- 6) Please include a description of the security fencing to be installed to keep children out of all equipment areas – wells, tank batteries, etc.
- 7) The Site Plan shows no separators, no ECD (combustion units) and no tanks, does this mean you do not intend to build any ancillary equipment? However, the renderings on pdf pages 22 and 23 show a couple of VCUs and a couple of tanks. It is unclear what the project will entail.
- 8) The traffic impact study assumes a pipeline is used for all product, water, etc. and yet the diagram on pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. Most of this equipment is not needed since Ward will be using a pipeline. The application needs to depict what Ward's actual plan is consistently in the permit application. You can't have a traffic study that says pipeline and then not use a pipeline.
- 9) The Stormwater Management Plan information provided does not specifically tell how you will protect Big Dry Creek? The stormwater information is all generic but it needs to be site specific for this project.
- 10) There is no discussion in the traffic impact study of the damaged bridge on York Street north of the E-470 interchange where a fatality occurred last month because the bridge is too narrow and unsafe.
- 11) There is no discussion of what will be done with fracking waste water in terms of will it be piped or trucked out?
- 12) Page 12 of the traffic impact study says there will be 19,263 trucks during drilling and completion (is this with or without pipelines?).
- 13) On page 13 of the traffic impact study it references 144 one-way truck trips per ye (which we assume is per year?) during production/operations? Is this with or without pipelines? This does not seem to make sense with the statement below that indicates 21 daily trips in weekdays which would be 5,460 trips per year. Please provide a better description/explanation of the "production phase truck trips".
- 14) The traffic impact study DID NOT LOOK AT SCHOOL BUS ROUTES and times. This is a big omission as protecting our children as they travel to and from school is a key concern. Please add an analysis of this and describe what you will do to minimize impacts. For example, what if a school bus and an oil tanker both have to use the narrow bridge on York Street at the same time? Would the bridge hold the weight? Would it be safe? Furthermore, the traffic data was gathered on Wednesday afternoon which is an early release day for Adams County schools so the traffic study is not reflective of school day traffic.
- 15) The traffic plan avoids Stargate school but sends the traffic right past the Silver Creek Elementary School?

**Comments for Ward Petroleum and Adams County – Please require the following Best Management Practices/Conditions for Approval.**

- 1) The applicant shall transport all oil, water and gas via pipelines in order to minimize traffic impacts on local roadways and emissions impacts from the Ivey site. The applicant's transportation impacts and other aspects of its permit application are predicated on a pipeline



being in place and therefore, pipelines for water, waste water and all product transport should be a condition of permit approval. Prior to initiation of construction, the applicant shall provide the applicable title and easement commitments required to construct the oil, water and gas pipelines for the facility. The pipelines must be in place prior to drilling.

- 2) Prior to initiation of construction, applicant shall submit a fencing plan addressing BOTH fencing during construction and permanent fencing during operations. The permanent fencing shall be a security fencing a minimum of 6 feet tall and shall fully surround all oil and gas wells, tanks, ECDs and other ancillary oil and gas equipment. The access gate shall be locked. Fencing is not optional and not left up to the surface owner to decide. It is a public safety issue when you are within walking distance of neighborhoods and schools.
- 3) Prior to initiative of construction, applicant shall submit a landscaping plan which includes a combination of berm(s), mature trees (8-plus feet in height), bushes and groundcover to adequately serve as a visual barrier between the site and surrounding neighborhoods and roadways. The landscaping plan shall be compatible with the surrounding area and is subject to county approval prior to construction initiation. The landscaping plan shall include a means and schedule for watering during establishment of vegetation and then thereafter for maintenance. Vegetation must be watered/irrigated to ensure its survival.
- 4) The sound mitigation plan shall include a sound wall during drilling and completion operations regardless of the results of the sound study. In addition, any additional controls recommended by the required sound study will be implemented.
- 5) The applicant agrees to conduct a baseline drinking water test for any drinking water well owner within 1 mile both prior to drilling and following six months, one year and five years of operation upon the request of the owner.
- 6) Prior to initiating construction, the applicant shall request of COGCC and CDPHE that a CDPHE evaluation of the site be conducted and shall subsequently then agree to comply with the resulting CDPHE recommendations. If CDPHE will not conduct said evaluation, the applicant shall secure the services of an independent company to conduct a similar evaluation and shall agree to comply with its recommendations.
- 7) The applicant shall agree to perform Bradenhead Annulus Pressure Monitoring (Rule 341), regardless of whether directed by COGCC or not. Operator shall monitor and record bradenhead annulus pressure during hydraulic fracturing operations, and to promptly report to Adams County and COGCC increases in pressure greater than 200 psig. These requirements help to ensure that groundwater is protected and that prompt action is taken if conditions arise that could lead to the subsurface release of hydraulic fracturing fluids.
- 8) The applicant agrees to use electric drill rigs or best available clean and quiet drilling technology to achieve sound levels of less than 45 dBA measured 200 feet from the drill rig.
- 9) The applicant agrees to use of closed loop system and to not use any open pits.
- 10) The applicant agrees to pipe in water for fracking operations and not to use truck transport for water and the applicant agrees to no use of local wells unless the well is owned by the operator and is permitted by the state for industrial use (versus residential use).
- 11) Applicant agrees to use only low-profile tanks (12-foot tall maximum during for operations) for operations. Larger temporary tanks may be used during drilling and completion. Applicant further agrees to comply with a maximum equipment height for any equipment to remain on



- the site for operations (such as VCUs, shafts, etc.) of 25 feet or less (Note this is in addition to the height restriction of 12 feet for all product storage tanks to be used at the site).
- 12) Applicant agrees to install steel-rimmed berms and synthetic liners everywhere and in all cases. Applicant further agrees to install berm capacity capable of containing 1.5 times the amount of liquids in the single largest tank to be present on the site at any given time.
  - 13) Applicant agrees to increased liability insurance for operators at a minimum of \$5 million per incident to cover the increased risk of drilling in or near neighborhoods.
  - 14) Requirement for no flaring except in the case of an emergency/repair after completion. Applicant agrees to requirements of Green Completion.
  - 15) Strengthened requirements for dust control during operations, requiring that "no visible dust" is created which impacts neighboring properties or dust on roads impacting children.
  - 16) Restrictions on well drilling traffic for safety considerations and to avoid school schedule times, rush hour and evening sleeping hours.
  - 17) Requirement that once drilling starts on the first well that all planned wells for that phase must be completed within 9 months or they lose the right to drill and must repeat the permit process for remaining wells. Applicant agrees to complete all permitted wells in two phases or less to minimize disturbance on surrounding area.
  - 18) Applicant shall verify prior to commencement of drilling operations that the designated emergency responders have appropriate fire suppressant foam on hand and that they are trained and capable of responding to oil and gas fires. Applicant shall secure a signed letter of preparedness from the designated emergency response agency attesting to these facts.
  - 19) Applicant agrees to provide Adams County with the use of FLIR camera three days per month for the county's independent inspection use for monthly inspections of facilities proximate to neighborhoods.
  - 20) Requirement for all lighting used to be directed downwards and shielded upwards to minimize light pollution during nighttime operations.
  - 21) If well operations are stopped for a period of 12 months, the operator must initiate removal of all well structures within 6 months of the 12th month that operations are ceased and complete full removal within 24 months of the last operations day and re-vegetate the site.
  - 22) Applicant agrees to provide Adams County access for inspections with notification, but without advance notification.
  - 23) Requirement for an emergency response plan to be developed including a minimum of one public meeting and then an educational pamphlet to be distributed to the ½ mile radius on the emergency response plan and safety mitigation measures.

### **Comment 3**

March 5, 2017

VIA EMAIL ONLY

Christopher Simmons, Case Manager  
Department of Community and Economic Development  
4430 South Adams County Parkway, Suite W2000A  
Brighton CO 80601-8216  
Email Address: [csimmons@adcogov.org](mailto:csimmons@adcogov.org)

Re: Case Name Ward Petroleum Ivey Well Pad  
Project Number USR2016-00006

Dear Mr. Simmons:

This letter is in response to the Request for Comments letter and the Ward Petroleum Ivey Well Pad, I respectfully request a response to all comments.

My family and I have lived in The Haven for 13 years. My children attended Silver Creek Elementary, Rocky Top Middle and Mountain Range High schools. I am distressed at the many fracking sites appearing in our state, and scared as those sites are now proposed within a mile of my home. As a citizen of Colorado, the county of Adams and the City of Thornton, I am angry that I don't have a voice in what happens in my community and that the oil and gas industry is encouraged by state law and able to act without regard to the health of my family and my neighbors, and can conduct business that directly affects my property values.

I would like to specify address the bullet points contained in the "Compliance Statement" of the letter:

- **The location does not fall within a floodplain and wetlands.** The proposed Ivey site is not in compliance with FEMA's 500 year floodplain. This puts the immediate environment, Big Dry Creek, and the community at significant risk due to historical flooding of the area. Oil and gas fracking operations bring an inherent risk of spills and releases. Thornton has had eight historical spills in the last fifteen months. I am asking that a floodplain evaluation assessment be conducted before the site moves forward.
- **The proximity to the E-470 will assist in mitigating noise during drilling and completions.** The Haven, Quail Valley, and the new neighborhood of Fairfield and Little Lights Daycare Center are all located south of E-470. We are directly across the street from this proposed large-scale site. How will this mitigate noise for us? E-470 would not be a buffer for our neighborhoods.
- **The topography is conducive to a multi-well pad.** I wholeheartedly disagree. The site is steps away from open space and Big Dry Creek. It is also situated between 3 large neighborhoods and a daycare center. How is this conducive to a multi-well pad?
- **There are existing oil and gas facilities and access roads adjacent to the site which will be utilized, negating any new road disturbance.** There are existing small, undeveloped gravel paths, I find it hard to believe that new, developed roads won't be needed. I think this statement is untrue and misleading. The site cannot support the trucks and traffic that a large site will bring. A traffic assessment must be conducted before moving forward on the site.
  - **The Ivey site would eliminate the need to utilize the surface of the undeveloped 35 acre Wadley Farms site for drilling and production activities. Ward instead intends to drill and produce (if economically and technically feasible) the minerals beneath the undeveloped 15 acre Wadley Farms site from the Ivey surface location.** This statement is both infuriating and offensive. I have heard that the residents of Wadley Farms,

though the group ACCDAN, have been very vocal and have been successful in getting fracking out of Wadley Farms. Just because the residents in The Haven, Quail Valley, and others outside Wadley Farms have been more quiet and trusting of the government, doesn't mean that our lives are any less important, our property values are any less important and our health and the health of our children is any less important. In The Haven, we also have a school within our neighborhood, Silver Creek Elementary. Using this statement as a reason to move on the Ivey site is ignoring the hundreds of houses comprised of The Haven Quail Valley, Trailside and the new neighborhood Fairfield, as well as the thousands of students at Silver Creek Elementary. In addition, The Wadley Farms aquifer will still be affected by the site as proposed.

- **The location is outside any city limits.** The location is literally across the street from City of Thornton boundaries. This statement is an exaggeration and inflammatory. While the statement may follow the "letter of the law" it certainly does not follow the "spirit of the law". Literally steps away, across the street there is a new neighborhood being built, Fairfield, and I ask what notification is being given to them? Is information about the large-scale fracking site being shared with them?
- **The location will not affect any current open space.** Designated open space, the Big Dry Creek, is literally steps away from the proposed site. This statement is an exaggeration and inflammatory. While the statement may follow the "letter of the law" it certainly does not follow the "spirit of the law".
- **The wellpad is over 3000 feet from any public gathering area.** What exactly is the marker site for the Ivey site? Criminal law is the physical property line. According to my online measurements, these areas are within 3000 feet of the Ivey site:
  - The playground at Quail Valley is 2100 ft
  - The playground in The Haven filing 2 is 3100 ft
  - The Barn historic site at Quail Valley is 2800 ft from the Ivey Site property line. The Barn historic site has been discussed as a planned public gathering place and possible amphitheater.
  - The Fairfield playground will be directly across the street, within mere feet, of the Ivey site.
  - Little Light Daycare center is within 3000 ft of the property line. Property line to property line is 2300 ft. Their playground is within 2500 ft to the wellsite and the playground is just over 3000 ft from the edge of the building to the well site.

In addition, I've attended several meetings and presentations hosted by Ward Petroleum, the City of Thornton, neighborhood meetings hosted by North Metro Neighbors for Safe Energy, ACCDAN, etc. I have asked Ward representatives point-blank which roads will be used by fracking trucks and if E-470 will be utilized by this traffic. Their responses are very non-committal, and not once did they ever state that E-470 will be used, much less used exclusively, as your letter implies.

Again, I am requesting a response to my comments.

Respectfully,

Abi Gaskins  
2580 E 150 Ave, Thornton CO 80602  
Gatorinco@yahoo.com

**Comment 4**

**From:** [Amy Otsuka](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Petroleum Ivey Well Pad / 152nd & York  
**Date:** Wednesday, February 15, 2017 10:34:34 PM

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Mr. Simmons,

I'm a resident of The Haven community at 148th/York. I'm aware of the application to put 26 wells on the NW lot at 152nd/York. These wells terribly effect our community for many years. The wells will not only effect our community by being any eyesore but they will also effect our environment, air pollution, increase traffic, increase noise, etc. The people of this community moved to this area to live in a quiet community. Therefore, my family respectfully requests that you please deny the application for the Wells at 152nd/York.

Sincerely,

Amy Otsuka  
14715 Columbine Street, Thornton

**Comment 5**

**From:** [Adam Pitchford](#)  
**To:** [Chris Simmons](#)  
**Subject:** Re: Ward Petroleum Ivey Well Pad USR2016-00006 Comments  
**Date:** Monday, March 06, 2017 4:01:35 PM

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March 6, 2017

Adam Pitchford  
2576 E 149th Ave  
Thornton, CO 80602  
505-259-1590

Christopher Simmons  
Adams County Community & Economic Development  
4430 South Adams County Pkwy  
1st Floor, Suite W2000  
Brighton, CO 80601-8204  
720-523-6998

Dear Mr. Simmons,

I am writing to express my personal comments on the request for Use by Special Review Permit related to the Ivey Well Pad by Ward Petroleum. Further to my comments, I would also like to echo and support the letter provided to you by the president of The Haven at York Street HOA dated Feb 20, 2017.

Although I generally support the safe and environmentally sustainable development of the oil and gas industry, I have serious concerns related to the scope and location of this proposed project. The increased demand for energy in Colorado must be addressed, and is an important consideration for Adams County, however I ask that the impact of this specific project be further considered with additional safety and environmental controls required or by the denial of permit use.

My biggest concern is the increased truck traffic during the early phases of project activity and continuing to the production phase if a pipeline is not required. The road infrastructure surrounding the proposed site does not appear to be designed or capable of supporting such extreme weights and volumes. I fear that the safety of local residents will be compromised without road improvements and strict route requirements to prevent truck traffic from interacting with normal community traffic.

Secondly, I feel that the scope and location of this project warrant additional safety and environmental consideration and mitigation. From the information I have reviewed, this is a very large scale drilling operation and it is in very close proximity to current and future residential development as well as Silver Creek Elementary School. The location is in a flood plain and I feel that additional environmental risk management is imperative to protect local residents.

Ultimately, I would like to see this site preserved in a natural state without permitting oil and gas development. I understand, however, that the progress of the project is likely to continue, but I urge the county to consider limiting and controlling the size of such a large project in

close proximity to neighborhoods. Please require additional safety and environmental precautions to mitigate risk and interaction with local residents.

Thank you for the time and consideration to review my comments.

Best Regards,

--

Adam Pitchford

505.259.1590

[adam.pitchford@gmail.com](mailto:adam.pitchford@gmail.com)

March 6<sup>th</sup>, 2017

To Chris Simmons,

Here are some of my concerns regarding the Ward Ivey site.

***Concerns about the size of the facility:***

With 26 wells permitted and a potential of 52 oil tanks and 26 separators (as per COGCC permit), this will be one of the first large scale oil and gas facility within the urban part of Adams County. The site is in close proximity to the I25 corridor where urban development is currently happening at a very fast pace.

At the first Ward community meeting in November, I was told about a possible second phase of the Ivey project that would target the extraction of minerals within the East side of sections 2, 11, 14, 23 and 26. While this 2<sup>nd</sup> phase is not yet being permitted, this could potentially bring the total number of wells on the Ivey pad to 52 wells, potentially the biggest well pad in Colorado.

***Concerns about the proximity to newer developments and the lack of overall planning:***

This site is within 1,500 feet of a Richmond community of 110 single family homes currently being built and within 2,000 feet of a proposed single family development of 260 single family homes (both developments within the City of Thornton). This should be taken in consideration while issuing new permits, long term planning should look into the overall impact on the future of the community.

***Concerns about the lack of transparency:***

I am also quite surprised by the lack of transparency about the project and about other oil and gas developments in the County.

People driving around have no idea of what's coming on this parcel of land. The County should have a requirement to post on a big sign stating clearly the future use of the parcel. Most people do not know where to find information about future oil and gas developments or do not have the time and resources to look into the impressive map database of the COGCC. It would be a good practice to put very big signs (readable from the road) on every planned large scale oil and gas pads with clear details about parcel size, number of wells, tanks and other equipments being permitted on the parcel as well as contact information for potential questions. While driving around, people know of upcoming shops, hospitals, schools... but do not know about this upcoming major industrial facility.

This seems like a deliberate act to hide facts from residents.

The transparency issue needs to be addressed.

That issue is even more pressing in a place like Ivey where people buy new houses without any knowledge of future oil and gas developments within 1,500 feet of their future house. It's in the best interest of every party to disclose known facts.

This concern of transparency is very important and should be addressed for every parcels in Adams County where large scale oil and gas operations are being planned.

***Concerns about visual impact and environmental impact:***

The Ivey site sits is adjacent to the Big Dry Creek Open Space, a site protecting the wildlife of the area. This kind of open space is also designed for residents to enjoy the natural beauty of the area. Locating a massive industrial facility next to an open space seems in contradiction with the mission of protecting the environment and the wildlife in the open space.

The visual impact needs to be addressed. At the Ward meeting in January, I was shown beautiful

photographs of the future projects. The photos were very misleading. One just need to drive North on I25 to see the visual impact of relatively small facilities (6 wells, 20 tanks). The visual impact of a facility with 26 wells, 52 oil tanks, 10 water tanks, 26 separators... cannot be ignored. This will redefine the landscape of our communities. Proper landscaping and fencing need to be provided and maintained properly. A high fence (minimum 6ft) and row of tall trees (minimum 8ft) should be required around the facility.

***Concerns about overall impact on urban Adams County:***

The Ivey site is unfortunately not the only site being proposed in this part of Adams County. With many new permit applications approved by the COGCC or currently pending, the County is seeing an unprecedented boom in oil and gas permit applications. Many of the facilities will be in the suburban part of Adams County.

Is there any study being done about the overall impact of multiple large scale facilities within a few miles radius?

What is the impact on health, safety, traffic... of multiple large scale facilities?

Looking at a the COGCC map database, I see as many as 88 wells being planned in a small 6 square miles area just East of Ivey. All the facilities are approved separately without looking at the bigger picture. We need better long term planning.

***Concerns about health and safety:***

The use of pipeline should be required for oil, gas and produced water. Adams County should make the use of pipelines a condition of approval for the site.

There are so many health and safety concerns, I will just list a few without going in details:

- the site is within a floodplain, close to the Big Dry Creek,
- concerns with possible asthma attacks during air inversions,
- pipelines should be in place before drilling to minimize the on-site storage of hazardous materials,
- air quality concerns,
- emergency response concerns,
- concerns regarding regular monitoring of the facility in order to address potential issues immediately...

Safety and health concerns should be addressed and the County should require best management practices from the operator.

The County need to protect the health and safety of its residents.

***Concerns about traffic:***

The roads around the site are not appropriate for heavy truck traffic.

The company should be required to use pipelines to carry the oil and gas as well as the produced water. The use of pipelines might also help reduce the risk of traffic accidents spills in an urban area, close to schools and neighborhoods.

The local roads are too narrow and not safe for trucks, the use of E470 should be required.

I'm also concerned about the close proximity to several schools (Silver Creek elementary school within half a mile, Stargate and Rocky Top middle school): a study should be required to study the impact of traffic on school bus routes. The safety of children should be a priority.

The traffic on 152<sup>nd</sup> is going to increase with all the new developments happening nearby and additional heavy truck traffic on the road will create unsafe driving conditions.

***Concerns about the lack of long term studies:***

More long term studies need to be done to evaluate the impact of large scale facilities next to heavily populated areas. It is irresponsible to have that many wells close to neighborhoods and in the middle of a growing metro area without studying the long term effects of such facilities.

Looking at the map of current development projects in the city of Thornton, it is clear that, within the near future, most of the land in the sections adjacent to the proposed pad will be developed for residential and commercial purposes.

Large scale facilities do not belong into our suburbs.

A high concentration of oil and gas well operations in the middle of an urban area is unprecedented. As of now, the impacts on public health are not fully understood.

***Concerns about the Ward public meetings:***

I went to Ward public meetings in November 2016 and January 2017.

I think the format of the meetings was not appropriate. While I recognize the importance to be able to ask specific questions one-on-one, I think the meeting should have started with an overall presentation of the project by Ward to all the attendees. I also think that residents would benefit hearing other residents' questions and concerns and Ward's responses. We are all concerned about different issues and the community would benefit from shared understanding and knowledge about the project.

I also want to note that the January meeting was held in a room that was too small to accommodate a large number of people (the capacity of the room was about 40 people). The waiting time might have deter many residents from staying and from expressing their concerns.

The format of the meeting felt more as if it was just another formality that needed to be checked off a list by Ward Petroleum.

***Concerns about lack of public process:***

A public hearing should be required for any large scale facility being planned within 2,000 feet of any existing or planned neighborhood. The County needs to hear and address the concerns of its residents.

Thanks for reviewing my concerns and for addressing Adams County residents' concerns.

Amandine Velamala  
Wadley Farms resident

**From:** [Angela Wilcox](#)  
**To:** [Chris Simmons](#)  
**Subject:** Fracking wells  
**Date:** Thursday, March 02, 2017 4:24:37 PM

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Dear Mr. Simmons,

I am writing this letter as a concerned citizen and frightened homeowner. I have 3 children ranging from 3-14 years old and whom, not only live in the proposed fracking site, but attend schools that would be effected by the fracking pads, as well.

I am actually a fracking supporter. But, would NEVER support this amount of fracking be done in such a small space. This is irresponsible and dangerous. If it was planned in an area that was desolate, I would still describe it the same way, but at least it would be a more appropriate place to experiment with such a large scale of drilling. But, the fact that the proposed sight is so populated and close to where so many children would be effected is shameful.

I have done my research. I know of the potential dangers to our air and water supply. What happens if there is a leak or fire or accident, as there was recently in a fracking pad not far from our area? What would happen to all of our homes? How would we evacuate the schools fast enough and get the children far enough away to keep them safe? What will we do if our kids all start to fall ill? These are rational and thoughtful questions we should all be posing and all should be concerned about. These are the types of situations, very real situations, that are keeping residents up at night hoping our law makers and elected officials are doing what we voted them in to do. I hope you are protecting your constituents. I hope you are not being lured by big companies, dollar signs and promises.

The possibility, and likelihood, of what such an intense and inappropriate fracking site will do to my home's resale value is not good and I'm not happy about it. BUT, it doesn't worry me like the undesirable effects on my water, air and possible danger do. If I didn't have children, I would probably just be appalled and annoyed at the poor judgement and ridiculous nature of this entire situation. The fact is, we live in the suburbs. Kids are everywhere. We have a fantastic, clean, family-friendly neighborhood full of kids, near great schools. That is why we moved here. The fracking needs to be moved elsewhere or the scale needs to be decreased immensley to be safe and appropriate for the human beings that already inhabit the proposed area.

Please do the right thing. Please put people first. Please do your job in a way that will help you hold your head high and help the people you serve take care of their families and sleep peacefully. Please don't force this "mama bear", and all the others living in this area, to go on the defense. I pray that you will prove, by your choices and actions, to be someone I can stand behind again.

Thank you for your time.  
Concerned,  
Angela Wilcox

[angwilcox5@gmail.com](mailto:angwilcox5@gmail.com)  
(559)230-9632

2600 E 147th Ave  
Thornton, CO 80602

**Comment 8**

**From:** [bcottrell@4pcb.com](mailto:bcottrell@4pcb.com)  
**To:** [Chris Simmons](#); [Steve O'Dorisio](#); [Eva Henry](#); [Mary Hodge](#); [Erik Hansen](#); [Chaz Tedesco](#)  
**Subject:** Comments on the new IVEY proposal  
**Date:** Wednesday, March 01, 2017 1:33:53 PM

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I'm not just worried about this being near schools, I rather not even have it anywhere near us. "They" can say that it's not dangerous however news from other towns across the country can't all be wrong. I probably won't be around to see what this fiasco will bring in years to come.

Our officials are supposed to protect us that is why we vote. I don't have too much faith in that these days.

*Thank You,  
Barbara Cottrell  
360 Del Norte St.  
Denver, CO 80221*

**From:** [Brittany Crouch](#)  
**To:** [Chris Simmons](#)  
**Subject:** 152nd & York oils and gas  
**Date:** Wednesday, February 15, 2017 6:45:18 PM

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Christopher Simmons,

I am writing in regards to the special review permit to allow 26 horizontal wells near our home on 152nd Parkway and York in Thornton (parcel #0157311400006).

We do not want to see this near our home. We are concerned with the traffic, noise, lights, and views that this will bring to an already busy neighborhood area. With the elementary school right across the street this seems like a horrible location for an oil and gas site for safety reasons. Our home values will drop and people might want to move away from this area if it is put in. My sister lives near a well site in northern Colorado and they assured their neighbors there would not be traffic, noise, etc and that is not the case. Every time we drive through there late at night there are several trucks coming in and out, noise, smells and bright lights (even though they have the noise reduction walls). I am happy to see development in our area but this is not something we want to see so close to our neighborhood and school. I'm actually shocked this would be allowed so close.

Thanks for your consideration to our concerns. They should move their site to somewhere not so populated.

Brittany Crouch

DATE: 2/24/17

FROM: Ben Galassini

TO: Chris Simmons of Adams County ([csimmons@adcogov.org](mailto:csimmons@adcogov.org))

RE: Request for Public Comments on the Ward Petroleum Ivey Site Proposal on 152nd Parkway

[https://www.adcogov.org/sites/default/files/USR2016-00006\\_Permit\\_Application.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Permit_Application.pdf)

and [https://www.adcogov.org/sites/default/files/USR2016-00006\\_Request\\_for\\_Comments.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Request_for_Comments.pdf)

As a resident of Trailside community located between 156th Ave and 160th Ave, east of York, please find my comments regarding the proposal to develop the Ivey site for oil & gas development on 152nd Parkway below.

1. The proposed well site is one of the largest single pad sites in the Niobrara region with some of the longest proposed lateral wells in this part of the state. The scale of the proposed surface site and quantity of oil that is expected (as per the required onsite storage) is extremely concerning to be located so closely to adjacent medium density neighborhoods. After reviewing all of the original permit information that was originally proposed by Synergy in 2013, I feel that the site and impacts surrounding its location have been severely misrepresented on the original permitting process.
  - a. ***This high impact project should be brought before the Adams County Board of Commissioners for a vote with public hearing, and not approved through the AUSR process***
  - b. ***All original permitting data should be re-reviewed and re-submitted as surrounding area has changed since the original 2013 permit by Synergy.***
2. Ward plans to tie into a Brighton pipeline in the future, thus negating all of the short term risks involved with the proposed surface equipment.
  - a. ***Consideration should be presented to REQUIRE ward petroleum to secure a pipeline tie-in for this site, rather than rely on surface storage & road transportation as it would mitigate nearly ALL of the concerns brought up below.***
3. There is currently NO plan to pave a shoulder for truck traffic pulling off of 152nd st. This street has a 55MPH speed limit and this completely unacceptable.
  - a. ***Ward Petroleum should be responsible for paving shoulder/ turnoff improvements onto the access road for this site.***
4. Surrounding neighborhoods lie within 1/2mi from the planned site, downstream along the Big Dry Creek. Despite planned containment, the site lies marginally outside of the legal FEMA 100-yr flood map, and considering the 2013 100 year flood event, we feel the bare minimum environmental approach for onsite storage is not adequate.
  - a. ***A reduction in onsite storage should be considered. A much more extensive storage berm, or a requirement to secure a pipeline tie-in in lieu of massive onsite storage.***
5. Drilling and oil transportation traffic is planned for York north of 152nd, creating congestion, noise and pollution around the Trailside community, as well as safety concerns for community children that take buses to Silver Creek Elementary, Rocky Top Middle School and Horizon High School, and individual transportation to other schools.
  - a. ***An alternate route should be used for Ivey traffic to minimize conflicts with all surrounding neighborhoods and school traffic, such as north on Washington or over E-470.***
6. No consideration has been made by ward petroleum concerning the NARROW 2-lane bridge on York, just north of E-470. It does not meet regulation width, only has a permanent barrier on 1 side

and is not adequate for routine heavy truck traffic. There have been several accidents and 1 death recently at this site.

- a. All transportation options and routes should be more fully reviewed, or improvements to the bridge should be considered before start of development.**
7. The nearest neighborhood is 1/2 mile away, and Silver creek Elementary lies 3600' away from the proposed project. We are gravely concerned about long-term air quality considering the quantity of VOC (Combustors) that will be onsite. I am not convinced Ward Petroleum has done anything above the bare minimum requirements in terms of air quality mitigation.
  - a. Pollutant-emitting devices should be further minimized and Air quality should be more closely monitored.**
8. The scale and location of the proposed site is very visible from surrounding neighborhoods (I feel the photos provided towards the original permit totally misrepresent it's location). Additionally, the location will run directly adjacent to the planned big dry creek Trail system -an unappealing sight for any planned outdoor use.
  - a. Overall site footprint and surface equipment should be further minimized and a much more extensive landscaping plan should be proposed.**
9. Environmental wall is only planned for the southern half of the site, but light and sound can still be exposed to the north, directed toward Trailside community.
  - a. Sound and light mitigation should be considered to the North**

I work as an Engineer in the O&G industry & do not feel the approach taken by Ward petroleum is appropriate considering many risks noted above & the proximity to residential zoning and the designated waterway. I strongly urge Adams to more closely scrutinize the proposal & permit for this location.

Thank you,  
-Ben Galassini

**Comment 11**

**From:** [Brian McWilliams](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivy Wellpad community comments  
**Date:** Monday, March 06, 2017 3:59:58 PM

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To who it may concern,

Please let the following concerns be added to the development considerations for the Ward Petroleum Ivy Well Pad Site (Project Number USR2016-00006).

My name is Brian McWilliams and I live at 15047 Madison Street, Brighton Co 80602. I am approximately 3,300 feet from the intersection where the project will be undertaken.

I attended the community information sessions presented by Ward Petroleum, and unfortunately their staff was unable to answer some of my concerns. The main area of concern was that the material presented at the second meeting was identical to that at the first. To me, this shows a complete disregard to community concerns and indicates that they will move forward with their plan regardless of what any of my fellow taxpayers say. I am worried that their lack of concern for the general public during the planning phase will translate to the operational phase, and lead to corners being cut with resulting environmental and health impacts.

Knowing that a statement of “I don’t trust Ward Petroleum” doesn’t provide much for you to work with, some specific concerns and remediation ideas are below:

1) My house is on a well. If operations are done properly, I am fine as the drilling happens far below the aquifer I use to live. My concern is that mistakes happen, and under the current operation plan we wouldn’t even know about it. COGA/site development regulations require pre testing of one well, and then post-drilling testing within 6 months. This limited amount of testing is not sufficient to safeguard my family’s health. If a leak does occur, and the plume is not in the path of that single test well, the pollution will only be detected when my family develops health issues and dies. This is the equivalent of starting a campfire, and then standing upwind sniffing for some to tell if it is extinguished. That isn’t sufficient to prevent the forest from burning to the ground.

**Solution: Require multiple wells in a radius to the site to be tested to detect any pollution.**

2) The requirement to post-test the well within 6 months is also inadequate to protect the community’s health. This well pad will be in operation for decades, and as such monitoring needs to continue until it is safely decommissioned. The current plan is the equivalent of dropping a lit match in a field, immediately scanning for a brush fire, and then leaving the site a minute later. This behavior would not be acceptable as an individual, and it should not be acceptable for Ward Petroleum.

**Solution: Require subsurface water monitoring for the life of the project.**

3) The drilling and fracking of the site requires a significant amount of heavy vehicle traffic to the site. Ward claims that this traffic is the same as any general housing development traffic and as such doesn’t require any remediation. This argument does not stand up however - housing construction traffic consisted mainly of wood, with some concrete being brought

onsite. Fracking requires large amount of water, transported in huge boxy structures, something similar to a shipping container. The weight of these transport structures is far greater than going to other activities. Since damage to roads increases exponentially as weight increases, (<https://streets.mn/2016/07/07/chart-of-the-day-vehicle-weight-vs-road-damage-levels/>) the drilling and fracking activities will place an undue burden on not only the local roads, but community and regional arterials.

Disturbances at the drilling site are required by COGA to be remediated at the end of the well life, returning it to it's natural state. I currently live on such a parcel, and one cannot tell from looking at it that there used to be a well head. Road damage should be treated as a surface disturbance that needs to be corrected.

**Solution: Require Ward Petroleum to return the roads to a pre-drilling state, or provide the funds to the county to do so. The City of Thornton did extensive research on this issue recently, and issued a fee structure that accurately reflects the damage. The county can adopt the report and fee structure without extensive study on their own - someone else has already done the legwork. This is achieved through changes in the local traffic code, and should not be challengeable as a violation of COGA scope. The Thornton code change can be found here:**

[https://www.cityofthornton.net/government/citydevelopment/Documents/oil-gas/model\\_traffic\\_code\\_10\\_4\\_16.pdf](https://www.cityofthornton.net/government/citydevelopment/Documents/oil-gas/model_traffic_code_10_4_16.pdf)

**Solution: Earmark those funds received for repairing the damages caused by Ward's activities - do not place them in the general fund to be lost, leaving the impacted area without the resources needed to repair the damage.**

4) Removal of the large quantities of oil and gas produced via surface transportation also greatly impacts the local roads. The risk of an accident and resulting spill is a given certainty with the amount of product they are planning to create. The potential damage can be seen in the taker truck rollover on the southbound ramp to I-25 from Highway 7 a few years ago. Not only did the rollover cause significant traffic impact, but the long term remediation work also did. This surface traffic should be eliminated by the use of pipelines to the site. Ward has proposed this as a potential future development, but no plans are confirmed.

**Solution: Require access pipelines be constructed and in place prior to beginning of drilling.**

5) Nothing in the permit application addresses volatile compound releases as far as I could find ([https://www.adcogov.org/sites/default/files/USR2016-00006\\_Permit\\_Application.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Permit_Application.pdf)). As far as I understand it, there are two models to address this - either to capture the emissions, condense and remove them, or to flare the releases off. Flaring creates many issues starting with the production of noxious fumes. It also generates light pollution in an area where we can still see a good number of stars at night. A glow on the horizon would interfere with that and lower the quality of life in the rural area. Finally, flaring takes valuable resources out of the ground and destroys them, with no measurement and most importantly no payment in taxes to the State and County. The operators need to fully account for all releases and make payments of the required severance taxes associated with them. Excess natural gas and methane, are the two most marketable flare products, but other gases also have value.

**Solution: Require all volatile compounds to be captured, or payments made to account**

**for their value.**

6) The City of Thornton is slated to make a significant investment in remediating the Big Dry Creek at the same intersection as the wellpad. The work is a test project for stream bank remediation to reduce flooding risks and hopefully provide a series of trails. The eventual goal would be to develop the Big Dry Creek into a multimodal corridor similar to the South Platte Trail system. It would tie into the work that Westminster has done, allowing people to bike and walk from this area, all the way out to Cherry Creek Dam or Golden. The quality of life improvements could be huge for the area if the full project goes forward.

Even if the connectors don't happen, the site will be available as a short local walking trail. Ward's site plan mentions screening vegetation, but does not go into detail.

**Solution: Require view screening from the planned open space site, not just the road. It would be a true loss to have a great trail built that overlooks a unappealing industrial site.**

**Solution: Since the stream improvements reduce the flooding risk to Ward's infrastructure most directly, they are getting a free ride. Require that they participate in the trail/park project in a significant way. Require them to upgrade the project from the planned 100 year flood event to a 500 year flood event.**

7) In the site proposal plan, where they get the fluids to frack with is not clearly defined. My residential well is at risk of depletion if they use subsurface water for this project.

**Solution: Require Ward Petroleum to sustainably source their fracking fluid.**

8) If something does go wrong, my home (approximately 3,300 feet from the site) won't be notified, as the notification radius is 1/2 mile. I know that at some point one has to draw a line of notification/planning, but 1/2 mile is extremely short sighted given the potential damage from a mistake or accident

**Solution: Require a emergency plan to address parcels up to at least one mile away.**

I have many other concerns, but these are the most critical to me. Please take them into consideration when addressing the approval. Contrary to what many people say, you as the county commissioners and planning staff DO have power to improve the extraction process. COGA and the oil and gas industry does not dictate everything to you - use the resources (traffic codes, etc.) at your disposal to affect positive modifications to this site plan and operation.

I thank you for your consideration of my concerns in this matter,

Sincerely,

Brian McWilliams

15047 Madison Street

Brighton Colorado 80602

**Comment 12**

**From:** [bemurphy13@gmail.com](mailto:bemurphy13@gmail.com)  
**To:** [Chris Simmons](#)  
**Subject:** Well comments  
**Date:** Tuesday, February 21, 2017 7:47:20 AM  
**Attachments:** [USR2016-00006 Request for Comments.pdf](#)

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Dear Mr. Simmons.

It is my personal opinion that Fracking should not be allowed anywhere near a home, a school or any residential area. I do not believe this permit should be allowed to occur. Thank you for your time.

Sent from my iPhone

**Comment 13**

**From:** [Chase House](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Steve O'Dorisio](#); [Chaz Tedesco](#); [Chaz Tedesco](#); [Mary Hodge](#)  
**Subject:** Oil and gas drilling sights around the Todd Creek area  
**Date:** Wednesday, March 01, 2017 9:19:30 AM

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I live in the Eagle Shadow subdivision. I am voicing my concern with the oil well drilling going on the area. My biggest concern is with the noise, increased truck traffic and the effects on the drilling sights caused by a major storm (flooding). I would ask that the county setup rules to address these issues. This includes the repair of roads, as an example Holly at Hwy 7 is in need of repairs to the road and stop sign. This intersection has seen a dramatic increase in truck traffic over the past couple of years and it is showing that. I would ask that you consider passing this cost onto the drilling companies and not put it on the backs of tax payers.

## **With Citizen's Support, Adams County Commissioners Need To Establish Mitigation Measures For The Ivey Site That Will Protect Critical Urban Area Health, Safety and Quality of Life Needs**

1. Require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks to reduce the very high risks of asthma attacks during air inversions that frequently occur in the Big Dry Creek valley.
2. Require the exclusive use of only E470 during the drilling and

fracking operations to reduce the very dangerous heavy truck safety concerns in close proximity to schools and urban areas.

3. Require a design floodplain level for a 500-year rainfall event to reduce the flooding and environmental risks from more intense, up-slope storms.

4. Require the use of a pipeline to an off-site production pad to eliminate the important “quality of life” concerns and the risks of real estate property value losses (estimated to be \$190 million).

*Charles Chase  
Eagle Shadow*

**From:** [Craig Davidson](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Steve O'Dorisio](#); [Eva Henry](#); [Chaz Tedesco](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Ivey Well Pad - Ward Petroleum - Project Number: USR2016-00006  
**Date:** Monday, March 06, 2017 2:57:43 PM

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Mr. Simmons - I am writing concerning the Ivey site wellpad to be developed by Ward Petroleum. My concern is the proximity to established and developing housing, an elementary school, and flood zone. I respectfully request consideration of the following recommendations regarding the development of the Ivey site:

- Consider relocating the surface site north and west further away from existing and developing neighborhoods - possibly up to a half mile. This could address both the neighborhood and school proximity concern as well as the flood zone concern.
- Consider either establishing a pipeline (or pipelines) to bring in and transport out liquid/gas material or contain vehicle traffic access to the site utilizing E-470. This addresses infrastructure concerns of narrow two lane road access currently in place as well as the neighborhoods in the area and a small failing bridge.
- Finally please consider requiring the usage of low profile tanks and equipment on the site. This would help protect the property values of existing neighborhoods as well as the aesthetics of the general area.

I am not inherently opposed to the development of Colorado's natural gas and oil resources, but want to see us do so in a manner that respects the health and property of Coloradans as well as our beautiful environment. I respectfully request that a public hearing be held for community input and consideration, and/or perhaps a vote or other appropriate procedural review of how the site is developed by Ward.

Thank you very much for your consideration.

Respectfully,  
-- Craig H Davidson

**303.601.9219 cell**  
**303.920.0116 home**  
**303.964.5649 work**

[craig\\_h\\_davidson@yahoo.com](mailto:craig_h_davidson@yahoo.com)

**From:** [Courtney Howard](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Well  
**Date:** Monday, February 27, 2017 9:14:11 PM

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Dear Mr. Simmons,

I am writing to express my extreme concern about the proposed Ivey Well Site at 152nd and York St. in Thornton, Co. As a teacher at Silver Creek Elementary only 500 or so yards away from the site, I am concerned about the safety of my students', my colleagues, and my health should this site be allowed. There are many studies that prove that wells produce many toxins that are dangerous to human health especially the health of people with respiratory illnesses even when they are running "safely". Many of my students suffer from asthma already, and this would contribute to their symptoms. If the site was not running properly, then the health risks would be even higher. There are no evacuation routes that would be safe for my students or staff to take. There is no planned response team to help in the case of a needed evacuation.

While this is my immediate concern, I have other concerns as well. The future of our city, county, and state is a priority as well. I keep wondering why everyone wants the latest form of technology to use for their communication needs, but we are still functioning on century old energy sources to run them. We have the opportunity to attract new business and new residents to our area by being pioneers in sustainable energy. Many people would be jumping at an opportunity to live in a place that is looking towards our future as a human race as opposed to lining the pockets of the oil and gas companies. Long term vs. short term is becoming increasingly necessary.

Please reconsider moving forward with the Ivey Well site. Our city, county, and state cannot survive the long term affects that would occur from drilling at this site.

Courtney Howard

courtney.howard@comcast.net

**Comment 16**

**From:** [Chelsea Iverson](#)  
**To:** [Chris Simmons](#)  
**Subject:** Quail valley fracking response  
**Date:** Wednesday, February 15, 2017 4:56:31 PM

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Hi there :) my name is Chelsea Iverson. My husband Chris and I live in Quail Valley, we received the letter of information regarding the 26 wells projected to go off of 152nd and York. My husband and I moved in not even a year ago, we have a one-year-old daughter and a baby boy on the way- when we found this house we thought our dreams were coming true. Not even a year later we are terrified we made a huge mistake purchasing this home, due to the potential fracking that will run under our home and through our neighborhood and schools.. no matter what I've heard from oil companies I refuse to believe that fracking is anything but a danger to us as humans and our planet. It's not hard to find a list of health effects do the Fracking, along with environmental problems. I'm sure you'll be receiving other emails from friends and family in the area, so I will not waste your time going through every reason and fact I'm opposed to fracking. All I ask is that you do whatever you possibly can to see that it doesn't happen here. It might not seem like much if you're not in our shoes but for us it's our entire lives being compromised.

Thank you,  
The Iversons  
720-338-5807

**Comment 17**

**From:** [Cynthia Martinez](#)  
**To:** [Chris Simmons](#); [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorisio](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Comments on Ivey Site  
**Date:** Monday, March 06, 2017 12:10:39 AM

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March 6, 2017

To Chris Simmons, Adams County Commissioners, and Ward Petroleum.

[csimmons@adcogov.org](mailto:csimmons@adcogov.org)

Submitted by Cynthia Pokorny Martinez, Quail Valley resident, 14667 Race St, Thornton, CO 80602.

Comments on Ward Ivey Site Request for Use By Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas.

I am 100% against any type of oil and gas development projects in Adams County, especially these proposed fracking projects that are way too close to schools, businesses, and homes. Our quality of life, as well as that of wildlife, will be severely impacted. The air we breathe and the water we drink run the risk of being contaminated. Everyone's health who lives and works in this area of Adams County, including surrounding communities, has the potential to be harmed in ways that can never be repaired. None of you can guarantee us that accidents won't happen.

I want to point out the research that has been conducted by Dr. Theo Colborn.

"For nearly 30 years TEDX's founder Dr. Theo Colborn dedicated herself to revealing the dangers of endocrine disrupting chemicals to wildlife, humans and the environment. More recently she alerted us to the threats posed by chemicals associated with oil and gas development."

(PLEASE VISIT THE WEBSITE <http://endocrinedisruption.org/about-tedx/theo-colborn> )

Here is more crucial information that must be shared with residents of Adams County before any more wells are proposed or permitted:

" THE FOSSIL FUEL CONNECTION

Extracting, processing, and burning fossil fuels (natural gas, oil and coal) introduces huge volumes of harmful chemicals into our environment. These chemicals, and the tens of thousands of chemical products synthesized from them, are now present in every environment on earth, including the womb. Extremely low concentrations of many chemicals can damage the endocrine system of our bodies by interfering with the intricate, delicate network of natural chemical interactions critical to healthy development and normal function."

(PLEASE VISIT THE WEBSITE <http://endocrinedisruption.org/endocrine-disruption/the-fossil-fuel-connection>

TAKE THE TIME TO THOROUGHLY READ THE VAST AMOUNTS OF INFORMATION AVAILABLE.)

I also want to express my concerns regarding several topics related to the proposed wells.

1. I am in agreement with ACCDAN that Adams County "require the Ward Ivey permit application to be put to a vote of the Adams County Board of Commissioners including a public hearing."

2. The air should be monitored during ALL PHASES OF PRODUCTION.
3. Furthermore, I would like to request that the air be monitored now prior to any further oil and gas development in Adams County. It is crucial to establish a baseline NOW!
4. Require the use of a pipeline for ALL PRODUCTION FLUIDS AND GASES TO OFF-SITE SEPARATORS, COMBUSTORS, AND STORAGE TANKS to reduce the very high risks of asthma attacks during air inversions that frequently occur in the Big Dry Creek valley.
5. Require the exclusive use of only E-470 during the drilling and fracking operations to reduce the very dangerous heavy truck safety concerns in close proximity to schools and urban areas.
6. Require a design floodplain level for a 500-year rainfall event to reduce the flooding and environmental risks from more intense, up-slope storms.
7. Require the use of a pipeline to an off-site production pad to eliminate the important "quality of life" concerns and the risks of real estate property value losses (estimate to be \$190 million).
8. Where did the 500 foot rule come from? I can't believe that Adams County would allow these fracking operations to occur in residential areas AT ALL!
9. It seems to me that everything about this whole matter is purely money driven and has absolutely nothing to do with the safety and welfare of Adams County citizens. The big and powerful oil and gas companies think they can just railroad through their agenda regardless of the harmful effects on our health and well-being.
10. I want to bring to your attention the following article regarding a recent study connecting a certain type of childhood cancer connected with oil and gas extraction.  
  
<http://www.ibtimes.com/drilling-us-oil-gas-extraction-connected-childhood-cancer-study-finds-2497315>
11. This is not the time for our government to be cutting back on protecting our environment, as I recently learned from Greenpeace.
12. What will Ward and Adams County do if we experience a catastrophic event? What emergency preparedness is being budgeted and planned for?
13. What about Best Management Practices? What's Ward's plans?
14. Adams County should insist on pipelines being used for water and oil. This requirement must be included as a Condition of Approval in Ward's permit. **NO DRILLING SHOULD BE ALLOWED UNTIL THE PIPELINES ARE IN PLACE.**
15. I believe that it is a MYTH that Colorado cities cannot stop drilling. What about the Colorado Home Rule that allows communities to have authority under the State's constitution to restrict industrial activity? Isn't Thornton a Home Rule city? Why do we

have to allow this type of drilling activity in residential areas?

16. What about the ruling below? Doesn't this grant Thornton's citizens the right to regulate what's in the common interest for all of us who live here?  
“But neither property rights nor contract rights are absolute; for government cannot exist if the citizen may at will use his property to the detriment of his fellows, or exercise his freedom of contract to work them harm. Equally fundamental with the private right is that of the public to regulate it in the common interest.” from US Supreme Court NEBBIA v. PEOPLE OF STATE OF NEW YORK, Decided March 5, 1934.

17. What about the increased potential of earthquakes in our area due to fracking?

Please read this article: <https://www.usgs.gov/news/new-usgs-maps-identify-potential-ground-shaking-hazards-2017>

This recently released research from Seismological Research Letters shows new USGS maps identifying potential ground-shaking hazards in 2017.

18. More Commonly asked questions about fracking and earthquakes can be viewed below. <https://www2.usgs.gov/faq/?q=taxonomy/term/9833>

Please see the section about the documented earthquake induced by fluid injection on November 6, 2011 in Oklahoma. Additionally, since there are no methods currently available to assess whether a planned wastewater disposal activity will trigger earthquakes that would be of the magnitude to be a concern, then why risk it?

19. Finally, I attended Broomfield's Oil and Gas Public Forum on February 21, 2017. Matt Lepore, the COGCC Director, stated that he has not denied any permits. It seems to me that Mr. Lepore is just rubber-stamping whatever the oil and gas industry wants to do.

The COGCC website clearly states the following as part of their Mission Statement:  
“Responsible development results in:

- The efficient exploration and production of oil and gas resources in a manner consistent with the protection of public health, safety and welfare.
- The prevention of waste.
- The protection of mineral owners' correlative rights.
- The prevention and mitigation of adverse environmental impacts.”

I would ask that we hold the COGCC accountable for PROTECTING OUR PUBLIC HEALTH, SAFETY AND WELFARE and PREVENTING AND MITIGATING ADVERSE ENVIRONMENTAL IMPACTS by ASKING FOR A BAN ON FRACKING IN OUR COMMUNITY AND IN COLORADO. There has to be a better way.

**Comment 18**

**From:** [Cassie Matz](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Oil/Gas Facility  
**Date:** Wednesday, February 22, 2017 10:32:02 AM

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Dear politician-

I come to you as a concerned citizen regarding the proposal from Ward Energy to use hydraulic fracturing at the Ivey site, which is located near two schools, several high density shopping areas, a hospital, and numerous residential developments (including one that is currently in development). My name is Cassie Matz, and I have been an Adams County resident for 24 years. My family is active in the local community. We have invested much time and energy into serving this community.

Thornton is our home. We have owned two homes in Thornton, the most recent being in the Quail Valley neighborhood of north Thornton. We chose to invest in our "forever" home shortly after the birth of our now four year old daughter, Taylor. Since our move, we have added another daughter, Ellie, who is six months old. We hope to raise our family here. Our decision was based on the fact that we believed that Thornton and the whole of Adams County was a safe, affordable, and healthy community to raise our child in.

I am now highly concerned about the health and safety of my family. Should the permits for fracking be approved, my growing children will be exposed to a variety of unknown toxic pollutants, including known carcinogens, in the air and groundwater. My daughter will attend school at Silver Creek Elementary in the shadow of an industrial oil and gas facility. We will all be exposed to noise pollution and an increase in industrial traffic on our once quiet roads. Our large backyard, which my daughter plays in daily, backs to York Street. I fear she will no longer have a quiet, safe place to play, as there will be hundreds of oil tankers that drive past our home to and from the fracking site every day. Many, many more Adams County citizens will be impacted by the various types of pollution this site will produce by walking to school at Rocky Top, Silver Hills, or Stargate, or playing golf at nearby Thorncreek golf course. The recent studies that have been released prove tentative correlation between childhood cancers and residential proximity to oil and gas facilities. The health of my children and the other children in the community should be the most important issue to AdCo government.

I am not anti-oil and gas; rather, I am pro-responsible and safe drilling. I believe it is absolutely irresponsible to consider allowing any oil and gas drilling, but especially such a large scale production, in the middle of a residential, highly populated, suburban community. These are our homes, our dreams, and our families that will be affected. There is no information that fracking so close to such a robust community is safe in the short or long term. Furthermore, allowing a large oil and gas company to begin work in the middle of a neighborhood where hardworking families reside sets a dangerous precedent for other residents throughout the state and country. Additionally, I believe that the profits of the retail establishments at

Larkspur, the Orchard shopping mall, and the Grove will be affected, as residents outside of our community may be hesitant to travel regularly to the industrial area that this site will create.

As a long-term, invested resident of Adams County, I expect to have a voice in the decisions made that affect my family and the families in the community. I ask that you require Ward to complete an alternative location analysis to find other, less impactful sites to drill. My ultimate request is that you eventually deny them the ability to drill in the middle of our beautiful community. Your purpose, as a local representative, is to serve the best interest of the residents of Adams County. Please protect the residents of Adams County by proceeding forward to the permit requests with caution and a critical eye.

Thank you, Cassie Matz, Quail Valley resident

Adams County  
Community & Economic Development Department

Attn: Christopher Simmons, Case Manager

Case Name: Ward Petroleum Ivy Well Pad

Project Number: USR2016-00006

RECEIPT ACKNOWLEDGEMENT REQUESTED

March 5, 2017

As a current resident in Northern Thornton and Adams County, I am enclosing my concerns on the Ward Petroleum Ivey Well Pad.

First and foremost, my family and I just moved into a new home a little over a year ago off 156<sup>th</sup> and York. We chose this area because it is quiet and beautiful with easy access to all the main highways, but we are removed from the "city."

Now, we feel that the choice we made might change with the Ivy well pad plans to come so close to our home and school that our son attends. This well pad will have an impact to my home values and could increase the potential for flood insurance. In addition, there are several health concerns that I now have to think about. I currently suffer from Asthma and this will have a direct impact to my health, but I am also keeping in mind the health of my husband and son. I anticipated none of this when I purchased a new home. It is unfair and unacceptable that Ward petroleum thinks there is no problem with placing one of the largest fracking sites in Colorado, right next to my home. This is unacceptable and I hope you read all the comments and understand people, families, are going to be directly impacted in so many ways.

I have been following the information received and attended a meeting at the Westminster Marriot where I had the opportunity to speak with Ward Petroleum. The room was small and there were random tables setup where we were told we could leave our questions so they could be addressed. No form was easily available to document questions, the room was only for 30 or 40 people so we had to finish our questions and leave as per directed by Westminster PD. One would think the forum would be different if the company was transparent in their plans and really wanted to hear our concerns. The representatives had little information on the community and events that occurred.

The week of this meeting happened to be the week where a Father died on the bridge just passed 156<sup>th</sup> and York. The back of our houses faces that direction so we saw the whole thing. The bridge is so narrow and hard to navigate with barricades sticking out. Now, Ward petroleum is suggesting this as a route to carry out the millions of gallons of hazardous material to and fro, while other trucks, busses (carrying our children to and from school on that bridge) and cars go through there at the same time. This is another catastrophe waiting to happen and needs to be addressed. There have been 3 accidents in the year we have been here, on that same bridge. 1 of them was fatal and I anticipate that number going up if it is not corrected and Ward Petroleum is approved for the Ivy well pad.

Another major concern is that this will be between 300-500 feet away from the school my son attends, Silvercreek elementary. There are approximately 620 students that currently attend this school, plus staff and administration you are looking at 700 people in this school at any given time. That means, these 700 people can be in danger throughout their school day. At the meeting that I attended, Ward petroleum explained that the City of Thornton or North Metro Fire District would need to respond to spills, explosions, or emergencies with the well pad. Gathering info from other community members that attended prior meetings, It is my understanding that North Metro FD is not equipped nor prepared to handle such emergencies which means any emergency could turn into a mass-causality situation. Who else would be able to assist or respond and help prevent these situations since Ward Petroleum will not be onsite 100% of the time?

A recent article from CU Health centers appropriate to my concern, I have attached the link:

<http://www.cuanschutztoday.org/health-impacts-of-fracking-emissions/>

My last major concern is that placing this well pad so close to the Big Dry Creek will have impacts to the 100 year flood plain. It is my understanding with current weather conditions it is already unsafe and we are at risk of flooding. With the Ivy well pad going into this area, this can lead to disastrous events. Homes in my neighborhood will probably have to purchase flood insurance to be protected. Big Dry Creek is a beautiful pathway and I would be saddened for it to be destroyed, in addition to now having the concern of flooding right next to my home.

Thank you for allowing us this opportunity to express our concerns.

Sincerely,

Crystal Rodriguez-Lobato

720-934-4724

Trailside, 156<sup>th</sup> and York

**Comment 20**

**From:** [csmyder@gmail.com](mailto:csmyder@gmail.com)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Chaz Tedesco](#); [Erik Hansen](#); [Steve O'Dorisio](#); [Mary Hodge](#)  
**Subject:** Comments on Ivey Site  
**Date:** Sunday, February 26, 2017 3:30:07 PM

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## Comments on Ward Ivey Site 26-well oil and gas development

First of all, this is the second "submission of comments" we have filed with Adams County in less than 6 months (RCU2016-00027 -Cell Tower 16515 York St). In regards to the Ward Ivey site, other submitters (including ACCDAN) have submitted in-depth concerns for this large-scale operation including: potential health hazards, traffic hazards, increased noise production, a decline in quality of life and home values.

We have several concerns-some based on personal experience living here for the past four years.

- Just recently on November 17<sup>th</sup> 2016, we were stuck in traffic due to an oil tanker spill on CO Rd 7. This required a HAZMAT level 3 response from Adams County (a single truck). This spill was just down the street from our home and there was nowhere to re-route traffic. Adams County infrastructure improvement is not in line with the rapid population growth. What would prevent tanker spills like the one on CO 7 from occurring time and again when the truck traffic is only going to be multiplied by the Ward Ivey operation? Not to mention the potential health fallout from such spills.
- We have had experience with two active fracking sites near 168<sup>th</sup> and Colorado. Every morning when we looked out our windows we had to look at the towers. On any given day, the noise and vibrations caused by drilling could be heard and felt throughout our home (windows and doors closed). This made it near impossible to work from home and this alone is a concern for declining quality of life and home values.
- What 24/7 security will be put in place for all these nearby sites (not only the proposed site but many preexisting ones)? What prevents us from becoming a potential terror target? This is an unprecedented number of wells and tanks in a highly-populated area. This combination of oil facilities and population make it an attractive target.
- The infrastructure in the proposed area is inadequate, the roads (specifically York St where it passes under 470) are already deteriorating and cannot handle more traffic from heavy vehicles. Our backyard faces the unpaved portion of York St. For the past two years, we have put up with construction traffic for the nearby new neighborhoods which is very noisy, causes vibration, and kicks up a large amount of dust. What prevents oil trucks from using this street? And what prevents an oil spill in our backyard?

As residents of Adams County for four years we have dealt with multiple high-impact and ongoing issues including the proposed Ward Ivey drill site, the proposed York St cell tower, issues with the unpaved portion of York St, the Weld County Water treatment facility odors (including submitting entries for an odor log), an extremely high iron content in our drinking water, tanker spills, and oil personnel soliciting use of our yard as a site for underground seismic survey. We have yet to have a peaceful year in our home. Our time has been spent in worry and fear: health and safety concerns, property hazards, and declining property values. We have spent countless hours researching, attending meetings, and submitting comments for these issues (most unresolved).

If plans were approved in the early 90s for high volume drilling operations in this section of Adams County, why were developers allowed to build homes right on top of those plans before the wells were ever drilled? When we purchased our home, there were mandatory disclosures for "expanding soil". However, we received no notice that drilling operations could happen directly below our home. We received no notice we would be surrounded by high volume drilling facilities.

As far as we see it, we are up against a conflict of interest; Adams County receives tax revenue from both residents and oil companies. In the end, what good are our comments or protests? We have little recourse or support other than from organizations like ACCDAN. How do the residents of the Ward Ivey area benefit as citizens of Adams County? Living here has been a constant fight. Our only hope at this point, is to relocate and sell our home before dropping home prices leave us upside down in it.

Chris and Jennifer Smyder  
16636 Gaylord St  
Thornton, Co 80602

**Comment 21**

**From:** [Cheryl Tadlock](#)  
**To:** [Chris Simmons](#); [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorasio](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Comments on Ward Petroleum's application for the Ivey Site  
**Date:** Saturday, March 04, 2017 2:45:43 PM

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## RECEIPT ACKNOWLEDGEMENT REQUESTED

Dear Mr. Simmons and Adams County Commissioners,

We are writing to express concerns about the application submitted by Ward Petroleum for the Ivey Site Permit. Further, we support comments submitted by the ACCDAN organization on February 22, 2017.

### **Residents Demand a Public Hearing**

First and most importantly, the Ivey Site application should be referred to the Board of County Commissioners for a public hearing so that Adams County **residents can hear a full and complete discussion of the project**. We have been provided only the (incomplete) application and the 11/15/16 and 1/19/17 public information-sharing meetings, which were ineffective due to insufficient space, inconsistent/incomplete/"unavailable" information.

- **Please require a public hearing for this site.**
- **Please respond to the 1000+ signatures submitted by ACCDAN and LOGIC on the petition supporting this requirement.**

### **Pipelines, Traffic**

Ward's application does not commit that pipelines will be used to bring and remove fracking water or to pipe production off site. The site map shows 44 oil and water storage tanks on site and the pictures show large numbers of storage tanks which would imply no pipelines for production. However, the traffic impact study engineers **DID** assume pipelines when determining numbers of truck trips. **Please require:**

- **Ward must specify clearly whether trucks will be used to transport required water, wastewater and produced oil.**
- **Pipelines should be a mandatory requirement in the AUSR permit AND a prerequisite for drilling a large scale site located so close to neighborhoods, schools, Big Dry Creek and open space for public use and wildlife including eagles, hawks, coyotes, foxes, etc.**

The traffic impact study for this site was conducted from 7-9 am and 4-6 pm on a Wednesday. Wednesdays are early release days in Adams12. The access route identified in the application has trucks coming off of I-25 at Highway 7 and continuing east on either 168th or Highway 7 to York and then south on York to the site. This means thousands of industrial trucks traveling next to 3 new neighborhoods which are not even on the map in the application. These neighborhoods will be highly impacted by noise, diesel exhaust, road safety issues and property value concerns. Further, the planned truck route to the NE is on York Street, under E470 and across a narrow bridge over Big Dry Creek just south of 156th Avenue, with no posted weight limit for the underwhelming structure. This bridge has been the site of several major accidents resulting from **existing** traffic. Can it safely withstand such an increase? **Please require:**

- **A traffic impact study to be conducted by a third party to address school bus route considerations**
- **Will truck traffic be required to use E470 exclusively, exiting and entering at York?**
- **How will trucks be monitored to ensure they use the required route and adhere to safety standards established by the county?**

### **BMPs, Schedule**

Neither a drilling schedule nor Best Management Practices (BMPs) were included in the application. **Please require:**

- **Ward must document both, along with additional site specifics, such as sound mitigation techniques, to be used at the Ivey site to minimize impact to local residents, Big Dry Creek and wildlife.**
- **Ward must document an emergency response plan including a minimum of one public meeting and an**

**educational pamphlet to be distributed to the ½ mile radius on the emergency response plan and safety mitigation measures.**

- **Floodplain level for a 500-year rainfall event to reduce flooding and environmental risks from increasingly intense, up-slope storms.**

Citizens of Adams County respectfully ask you to faithfully perform your duties as elected officials to protect our safety, way of life and natural resources.

Regards,

The Tadlock Family  
Wadley Farms

**Comment 22**

**From:** [DEBBIE](#)  
**To:** [Chris Simmons](#)  
**Subject:** ivey well site  
**Date:** Sunday, March 05, 2017 9:27:12 AM

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My name is Debra Avants-King, a resident of Thornton Co, Adams County in the Eastlake area.

I strongly oppose fracking in Colorado, and especially near homes and schools. The Ivey well site is too close to neighborhoods, endangering families health and well being.

The next ones coming up are proposed to go right through the Hunters Glen neighborhood. We here in Adams County feel we are being treated no different then the

quake victims in Oklahoma and the Flint residents in a water crisis and the residents in Wyoming who have had fracking affect their water.

Stop it now before you destroy the residents in Adams county, along with Broomfield and Boulder, Longmont and all the way up the northern corridor to Ft Collins.

You try to tell us there is not sufficient data and no harm will come to these residents. But there is sufficient data to tell us the risk and health hazards that fracking has had on other communities along with the affects it will have on the land.

No more fracking in the Northern Corridor, and stay out of the neighborhoods. People live there.

Thank you,  
Debra Avants-King  
80241

**Comment 23**

**From:** [CenturyLink Customer](#)  
**To:** [Chris Simmons](#)  
**Subject:** Request for Comments, Ward Petroleum Ivey Well Pad  
**Date:** Tuesday, February 21, 2017 9:07:24 AM

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Mr. Simmons,

I'm writing in response to the Request for Comments received in the mail regarding the Ward Petroleum Ivey Well Pad project and the Request for a Use by Special Review Permit. Prior to receiving this request, I attended a community meeting hosted by Ward Petroleum. While there seems to be steps being taken to mitigate noise, light pollution, and other construction nuisances, I have many longer-term concerns about this project due to its proximity near to (and underneath of), so many homes, neighborhoods, new housing projects, natural flood plains, and of course, the elementary school attended by my kids and so many others from this area.

I've worked in the oil and gas industry for over 20 years as an Engineer, and in that time I have become very familiar with the hazards of handling high pressure, flammable and toxic hydrocarbon mixtures that come out of the ground (in both liquid and gaseous forms). In my experience, most all of the processing equipment that handle these types of oil and gas mixtures are installed in plants and refineries far removed from populated areas. Even with strict adherence to industry design and safety standards, mistakes will happen, machinery will fail, and sometimes procedures will not be followed, possibly ending with disastrous results.

With the booming growth in population and construction in this region of Adams county I'm concerned that the zoning of an operation like this is completely misguided potentially creating a dangerous situation for the thousands that cohabitate with the well pad installation.

Finally, there appears to be many unknowns with the practice of hydraulic fracturing an waste water injection and the subsequent increase in seismic active in these areas. Regions of Oklahoma for example, where these methods of extraction have been practiced for years, have experienced earthquake activity jump from just a few per year, to several hundred, with a corresponding increase in seismic magnitude. With observations like this along with the lack of scientific studies that prove or refute that fracking is the cause of the increase in seismic activity, I cannot agree to risking the stability of the ground my house an surrounding neighborhood rests on.

Based on these reasons, I respectfully request that the Special review Permit be denied. Thank you for your time,

Dan Bucher  
14845 Columbine Ct  
Thornton, CO 80602

**Comment 24**

Christopher Simmons, Oil & Gas Liaison  
Community & Economic Development Department  
4430 S. Adams County Parkway, 1<sup>st</sup> Floor, Suite W2000A  
Brighton, CO 80601

February 16, 2017

Dear Chris and Staff,

I would like to express my concerns regarding the proposed oil and gas drilling at the Ivey and Todd Creek sites. My family and I have been residents of Quail Valley for 13 years, it is located less than 2,000 feet from the Ivey site. For your information, the drilling site is in a designed flood plain. During our 13 years in Quail Valley, we have experienced on several occasions severe flooding forcing the closure of 144<sup>th</sup> Ave and 152<sup>nd</sup> Parkway between York and Washington Street. This is very troubling that a large-scale drilling operation will be in operation in this flood plain. We love the area, especially the open space surrounding our subdivision. I'm deeply concerned how this project will impact the quality of life of my family, my neighbors, the environment, and wildlife. As property owners on the coast of Florida as well, I was personally and financially affected by the BP spill in 2010 and would never ever want to see anything like that happen again!

My husband and I have worked very hard to achieve the American Dream to own a home, raise two daughters, and to give back to our Thornton community by volunteering our time. All of that can be gone in a blink of an eye. I'm not going to reiterate all the details of why a large-scale oil and gas drilling so close to 1,900 homes and two schools is a bad idea. Drilling so close to urban developments is a no win for property owners. We can't just sell our home and move away to a new community where we have no fear of drilling. Our way of life, health and property values are at stake. We depend on our nest egg to retire. So, what has happened to our rights as an average citizen? Why does corporate profits have to dictate how decisions are determined?

What we ask is you consider us, not the oil revenues. Please no large-scale oil and drilling in large urban neighborhoods!

Thank you for considering my views.

*Signed by Donna Dethouars*

Donna Dethouars  
14576 Williams Street  
Thornton, CO 80602

**Comment 25**

**From:** [Dan Eddings](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site  
**Date:** Monday, March 06, 2017 12:22:14 PM

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I was writing in regards to the planned Ivey Site well pad location. I have attended a couple of the preliminary meetings with regards to this location. I have also read through most of the posts around. I work for a service company so I know some of the basic items and procedures when companies decide to drill and produce a well. For the most part I am not too concerned with the idea of the well in general.

What has brought some concern in my view is the need for such a large footprint involving the separators, storage tanks, and general upstream equipment. Wells in these formations typically have large initial production profiles which diminish quite quickly in some cases. While there may be need for a large number of storage tanks initially, there will not be a need for this type of capacity in the future. In no place have I seen where the company has given any theories of what the production may actually be. It might give someone such as myself an idea of the extent of the storage. Overall, I think that these storage solutions are a large problem. It creates an huge footprint near this residential, commercial, green space, and up and coming business development. Once this has been established, it cant be taken back. I agree with some others in this topic in that the company should look at moving the production facility elsewhere. Here are my concerns.

1) If they are not planning on putting in a pipeline to some area outside of this residential area there is going to be a ton of truck traffic when they produce this well. This will be a burden on the roads and infrastructure of the Adams county residents. This brings in another variable of danger in the transportation of these hydrocarbon products and byproducts. I feel that this far outweighs the initial dangers associated with well drilling and production. Typically most companies are environmentally sound when it comes to this industry. However, driving large trucks are out of control of most companies. In other words, the unknown variable of someone getting into an accident could cause a huge environmental disaster which is probably not thought of or accounted for in most risk assessment plans.

2) Some residents have suggested using 470 exclusively. I highly recommend this thought and agree with this. This road is not paid for by public funds and would be a perfect solution to keeping truck traffic off the smaller side roads. I don't know what the extent of the law and policies governing this thought might be but I have a recommendation. I know that as a city/county one can restrict truck traffic on certain residential roads and bridges. You see the signs all the time. So a simple solution to force the company to use the 470 would be to implement restrictions as to the weight, vehicle type, etc on said roads that lead to the pad. We see similar cases all the time in the industry where a farmer will absolutely refuse access to a well site (or rather refuse the most convenient route). In these cases sometimes a farmer might push the access road miles out of the way and restrict the speed to say 5 mph. This forces the operators and services companies away from say their homes. While this is a huge problem for time it does show that there are rights of the residents over the oil companies. I might recommend something similar to prevent trucks from going through neighborhoods. You can then put police officers on said restricted roads and write tickets to anyone that is not abiding by the 470 only restriction. So basically, if you cant force the company to use 470, you can prevent them from using the small side roads making 470 the only option. If every sand truck and water hauler had to stop for a check/inspection, it would slow the site to a point where profitability would begin to cause the operator problems.

3) I feel that my third issue gets overlooked and pushed to the bottom of most peoples issues. These operators are after the initial production. This is what pays for the high cost associated with a well project. Once an operator has realized the profits from the initial production, sometimes they will sell the location/mineral rights. This creates a problem going forward into the future. A lot of these stripper type wells just put out enough money to stay afloat. In other words, the initial producer is out of the mix and has sold this asset to a smaller company. This creates future problems considering the stability of some of these small companies. Who is going to take care of the plugging and abandonment of the well once its life cycle is complete. Who is going to remove the tanks and equipment. No one. I have seen this many times and its a building problem caused by the shale revolution. The future is going to be difficult when this situation occurs. So basically, a company realizes the last little amount of profits and essentially goes bankrupt. Then no one is responsible for the removal or cleanup of the location. In the end it goes to the city/state. They are already having some of these issues arise in North Dakota and Texas. When no money is set aside or budgeted for cleanup there is a huge problem just waiting to blow up in local governments faces. It does not really become a problem for the wells outside of town on huge farms. They could care less about a few acres of missing land or rusting equipment. This is completely different in this Ivey development which is so close to residential and commercial developments. Its simply the aesthetics of how the land is going to look 10, 15, 20 years down the road. I can almost guarantee these locations will go dry or unprofitable in a short amount of time. That's the nature of the tight shale plays. So, basically we are drilling like crazy and creating a ton of wasted space for a well that will only be in production for a few years. Its just the nature of the shale plays.

I personally have no issues with the well itself, the drilling implications, the fracturing treatments, etc. However, the logistics of such a large well in an up and coming residential/commercial area is disturbing. I would highly recommend taking some time to review all options on this site and trying to minimize the footprint and truck traffic. A well head itself is small and somewhat unnoticed by the casual observer. However, the pump jacks, storage tanks, separators, upstream chemical tanks, flare systems, etc all have a huge footprint and take away from the beauty of this state.

Thanks you for your time and I hope the community and its leaders review this project thoroughly. Once the box is open, it cant be closed (or will be very difficult). Feel free to contact me with any questions regarding my opinions and expertise on this industry. I would be more than happy to assist with this and future O&G development projects.

Sincerely,

Daniel Eddings, Ph. D (Research and Development Scientist - Oilfield Service Company)

1905 E. 166th Ave  
Thornton, CO 80602  
[daneddings8@gmail.com](mailto:daneddings8@gmail.com)  
(479) 879-3935

**Comment 26**

**From:** [Dave Ellison](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments Regarding Ward Petroleum Ivey Well Pad - USR2016-00006  
**Date:** Friday, February 17, 2017 7:01:16 AM  
**Attachments:** [Ivey Site Mitigation Summary 16FEB17.pdf](#)  
[Ivey Site Mitigation Needs 16FEB17.pdf](#)  
[Rasmussen-et-al\\_JAMA\\_InternalMedicine.pdf](#)

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As a follow-up to your February 16, 2017 Request for Comments, I have attached the following:

1. A PDF file summarizing requested mitigation actions to be taken by the Adams County Board of County Commissioners regarding the Ivey Site
2. A PDF file of 16 slides I prepared to support the requested mitigations actions
3. A PDF file of Asthma Attacks & Fracking by Environmental Health Sciences Johns Hopkins Bloomberg School of Public Health

I respectfully request the following mitigation actions:

Here are the supportive slides and referred paper by Dr. Brian S. Schwartz et. al. regarding asthma attacks and fracking/production pads.

Should you have any questions, please do let me know.

Samuel David Ellison  
15073 Saint Paul St  
Thornton, CO 80602

**Dave Ellison** P.E., ENV-SP  
*Infrastructure Sustainability Professional & Leadership Coach*  
**Synergy Connects, LLC™**  
*Equipping people toward a sustainable planet.*  
C 303.885.1202  
<http://www.synergyconnects.com>

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<http://www.keystonepdi.com>

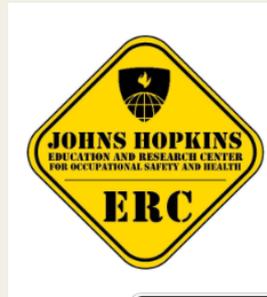
**Comment 27**

## **With Citizen's Support, Adams County Commissioners Need To Establish Mitigation Measures For The Ivey Site That Will Protect Critical Urban Area Health, Safety and Quality of Life Needs**

1. Require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks to reduce the very high risks of asthma attacks during air inversions that frequently occur in the Big Dry Creek valley.
2. Require the exclusive use of only E470 during the drilling and fracking operations to reduce the very dangerous heavy truck safety concerns in close proximity to schools and urban areas.
3. Require a design floodplain level for a 500-year rainfall event to reduce the flooding and environmental risks from more intense, up-slope storms.
4. Require the use of a pipeline to an off-site production pad to eliminate the important "quality of life" concerns and the risks of real estate property value losses (estimated to be \$190 million).

# The Ivey Wellpad Demands Adams County Mitigation Measures Required To Protect Critical Urban Area Health, Safety, And Quality Of Life Needs

## Overview



*Health*



*Safety*



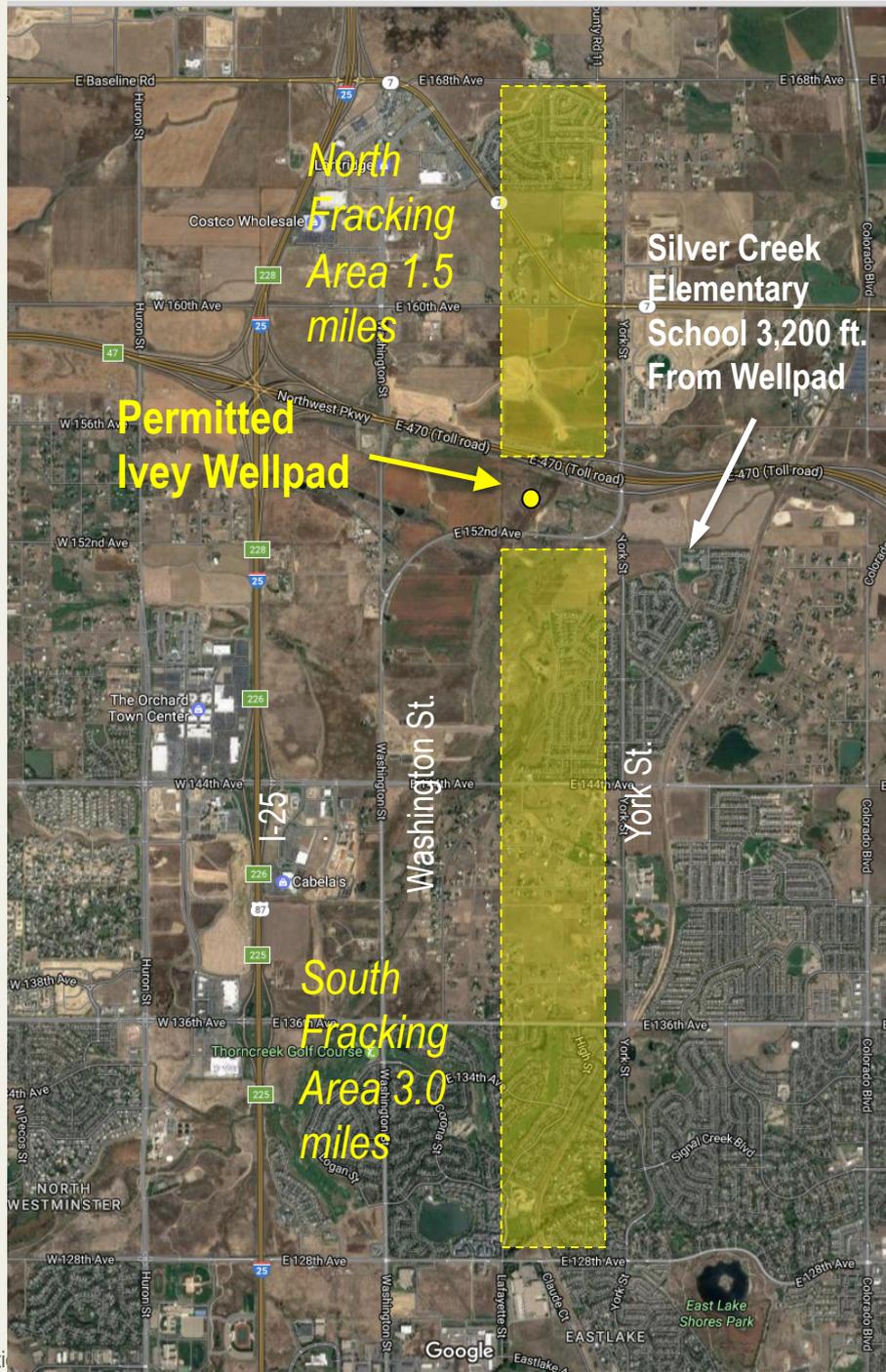
*Quality of Live*

***Citizens Support For  
Mitigation Requirements By  
Adams County Commissioners***

# Ivey Wellpad Information From COGCC, Ward Petroleum & Adams Co.

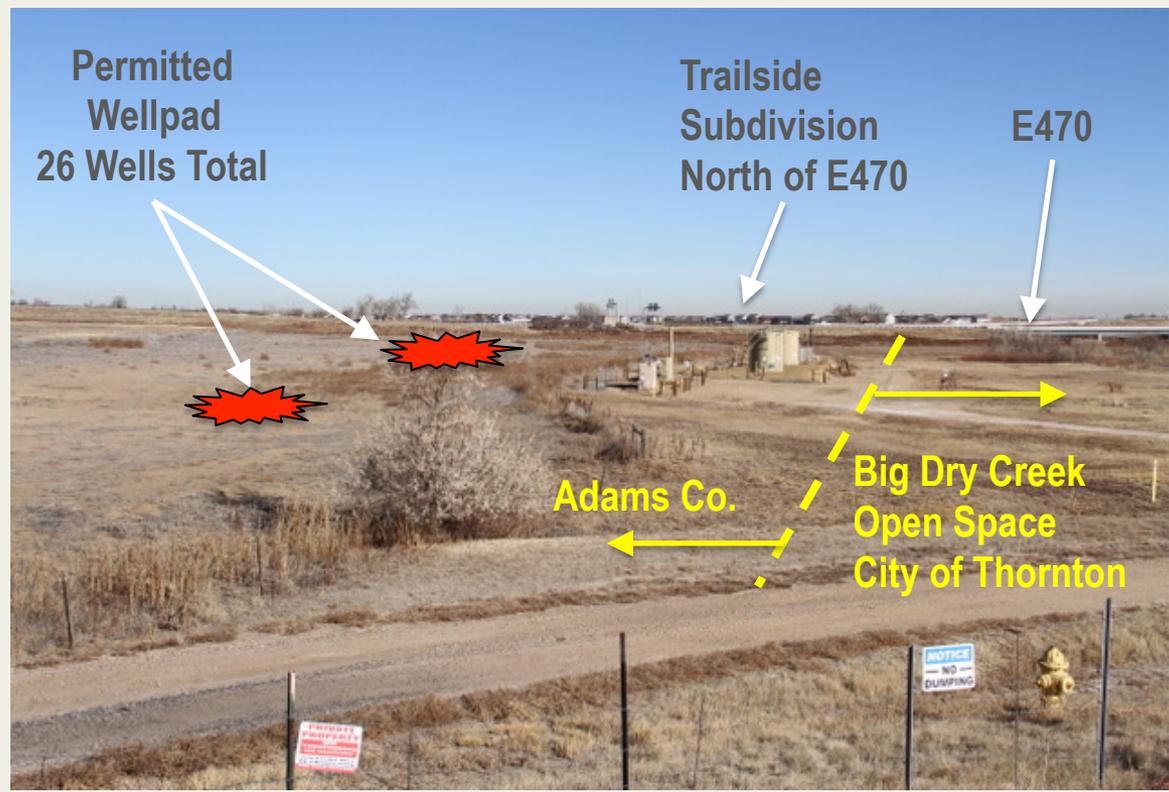
- COGCC Wellpad I.D. 442411 July 2015 Permitted includes 26 wells
- Horizontal well length is 3 miles to the south and 1.5 miles to the north
- Production pad will have 52 crude oil tanks
- 10 water tanks (water tanks for produced fracking fluids)
- 26 separators (crude oil, gas, water/ fracking fluids)
- 10 volatile organic compound (VOC) combustors
- A second potential wellpad to the west includes an additional 26 wells (may or may not be Ward Petroleum ownership)

Rt. 7  
E470  
144<sup>th</sup> Ave  
136<sup>th</sup> Ave  
128<sup>th</sup> Ave



# The Permitted Ivey Wellpad Is Located On The Valley Floor Of Big Dry Creek Adjacent To A Designated Open Space

There are no homes located within 1,000 ft. of the permitted Ivey Wellpad. Approximately half of the area within the 1,000 ft. radius is either Open Space or E470 Right of Way. The rest of the 1,000 ft. radius space is agricultural land.



# The Permitted And Potential Future Wellpads Are Massive “Industrial Sized” Facilities

(Note: The COGCC Permit Has Different Numbers Than The AdCo Permit)



## **Permitted Ivey Wellpad – 26 Wells**

52 crude tanks, 10 water tanks, 26 separators, 10 VOC combustors



## **Potential Future Wellpad – 26 Wells**

52 crude tanks, 10 water tanks, 26 separators, 10 VOC combustors

## **Total Infrastructure At Full Build Out**

**104 crude tanks, 20 water tanks, 52 separators, 20 VOC combustors**

*Total On-Site Crude Oil Storage = 2,300,000 Gallons*

*Total On-Site Water Storage = 200,000 Gallons (Recovered Fracking Fluids)*

Overview

# Urban Area Notification Processes & Agreements Vary

COGCC considers residences within 1,000 feet of well pad.

Adams County considers residences within 0.5 miles of the well pad. The county will accept input from anyone.

COGCC approved the Ivey Wellpad Permit in July 2015 without any public notice or input since no one lives within a 1,000 foot radius from the well pad.



**Permitted Ivey Wellpad**

**North Fracking Area**

Silver Creek Elementary School

**South Fracking Area**

1,906 homes within the Adams Co. contact area. Silver Creek Elementary is 3,200 feet east of the wellpad.

1,322 homes are directly over the South Fracking Area.

# Urban Neighborhoods Impacted By The Ivey Site<sup>1</sup>

## Urban Areas Within The Adams County Contact Area (0.5 miles)

- ✓ Orchard Farms (308 Homes)
- ✓ Trailside (280 Homes)
- ✓ Eastcreek Farm (276 Homes)
- ✓ Haven at York St. (522 Homes)
- ✓ Fairfield (108 Homes)
- ✓ Quail Valley (412 Homes)

Total Homes Within Adams Co Contact Area = **1,906**

Estimated Current Real Estate Value = \$760 million

## Urban Areas Directly Over The Permitted Fracking Area

- ✓ North Creek Farms (432 Homes)
- ✓ Fairfield (108 Homes)
- ✓ Quail Valley (412 Homes)
- ✓ Wadley Farms (60 Homes)
- ✓ Hunters Glen (416 Homes)
- ✓ York Crossing (114 Homes)
- ✓ Lake Avery Estates (70 Homes)
- ✓ Peach Tree at the Lake (142 Homes)

Total Homes Over Permitted Fracking Area = **1,754**

Estimated Current Real Estate Value = \$700 million

## Urban Areas Within Sight Of The Proposed Production Pad

(i.e. Primary Entry = York Street North Of 144<sup>th</sup> Ave to Route 7)

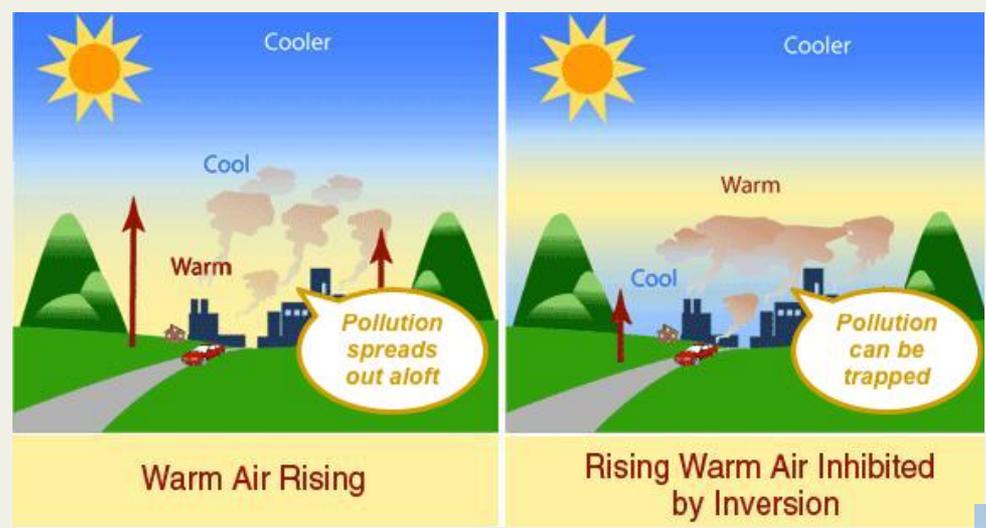
- ✓ Orchard Farms (308 Homes)
- ✓ Trailside (280 Homes)
- ✓ Eastcreek Farm (276 Homes)
- ✓ Haven at York St. (522 Homes)
- ✓ Fairfield (108 Homes)
- ✓ Quail Valley (412 Homes)

Total Homes Within Sight Of The Proposed Production Pad = **1,906**

Estimated Current Real Estate Value = \$760 million

<sup>1</sup> Existing Homes In Existing Subdivision, Subdivisions Under Construction, + Planned & Permitted Subdivisions

# Air Inversions Over The Big Dry Creek Valley Occur Frequently, Increasing The Risks of Trapping Hazardous Emissions From The Ivey Wellpad



Air inversions are caused when calm winds are experienced and warm air aloft traps cold air near the ground. Pollution can be trapped by air inversions.

Emissions from the massive Ivey Wellpad will act as a significant point source discharge of hazardous off-gases & VOCs from the 20 combustors and 52 separators.



# Air Inversions Over The Big Dry Creek Valley Are Very Noticeable Because Of The Fog Bank Trapped In The Valley Floor During Calm, Cool Weather Conditions

During air inversions, hazardous off-gases from the Ivey Wellpad will mix with the inverted air envelop causing the concentration of hazardous pollutants to significantly increase. **This is a real worry for increased Asthma Attacks requiring hospitalization (reference next slides).**

Existing air inversion envelope in the Big Dry Creek Valley (Over 2,600 homes and three schools within air inversion envelope = 8,500 people) + St. Anthony North Health Center

CDOT's limited visibility area warning system on I-25 from 120th Avenue north to E470 to warn of fog due to air inversions in the Big Dry Creek Valley.





# A Team Of Seven Medical Researchers Have Recently Documented Long-term Evidence That Individuals Living Close To Fracking Wellpads Have Significantly Higher Occurrences Of Asthma Attacks<sup>1</sup>

July 18, 2016

From Johns Hopkins School of Public Health – Baltimore Md.

Brian S. Schwartz, a medical doctor and a professor in the Department of Environmental Health Services at the Bloomberg School was the senior author of this study and states: “We are concerned with the growing number of studies that have observed health effects associated with this industry, We believe it’s time to take a more cautions approach to fracking well development with an eye on environmental and public health impacts.”

This comprehensive study of 400,000 people (2005 to 2012) involved more than 35,000 asthma patients between the ages of 5 and 90. Patients that reported attacks were mapped and studied in relation to the fracking well locations. The researchers discovered that those that lived in close proximity to multiple or large active natural gas wells were 1.5 to 4 times more likely to experience asthma attacks that required hospitalization.

<sup>1</sup>JAMA Intern Med. doi:10.1001/jamaintermmed.2016.2436  
Published online July 18, 2016

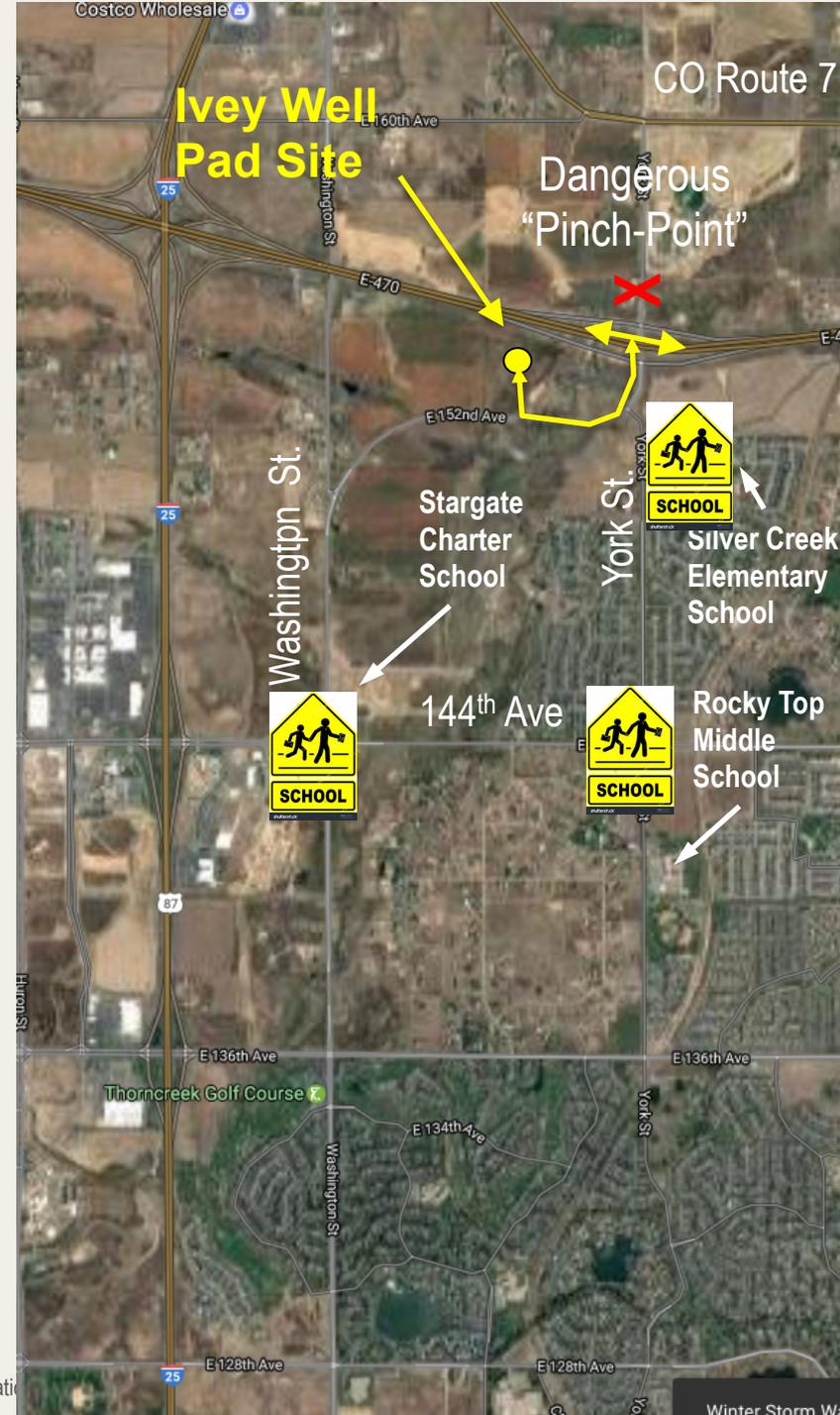
## Use Of A Pipeline For All Production Fluids And Gases To Off-site Separators, Combustors, And Storage Tanks Is Required To Reduce The Risks Of Asthma Attacks

1. Air inversions do occur frequently in the Big Dry Creek valley (several per month).
2. The air inversion envelope of the Big Dry Creek covers an urban area containing over 2,600 homes and three major schools with a total population of approximately 8,500 people.
3. The point source discharges from the Ivey Wellpad are very significant and have proven hazardous emissions that cause asthma attacks.
4. Using U.S. averages, a single air inversion in Big Dry Creek that includes emissions from the permitted Ivey Site could trigger over 400 asthma attacks requiring hospitalization.<sup>2</sup>
5. The combination of hazardous emissions and air inversions require a pipeline mitigation by Adams County Commissioners that transfers all production fluids and gases to an off-site facility (i.e. out of the Big Dry Creek valley) including separators, combustors, crude oil storage tanks and water storage tanks.

<sup>2</sup> American Academy of Allergy Asthma & Immunology

# Safe Truck Transportation At The Ivey Wellpad is Very Limited To **Using E470 Only**

- During the drilling and fracking phase, a total of more than 100,000 truck trips will be completed using CDOT estimates.
- When the production phase begins, heavy truck traffic will occur daily . . . and forever with out the pipeline mitigation.
- **E470 offers the only safe transportation avenue to and from the Ivey Wellpad because there are three school pedestrian crossing points south of the site and a dangerous, pinch-point to the north caused by the damaged, York St. Bridge over Big Dry Creek.**



# York Street Bridge At Big Dry Creek Is A Dangerous Pinch-Point For Truck Traffic<sup>1</sup>



**A Truck & A School Bus?**  
**Very Dangerous**

**Mitigation Requirements**  
All truck traffic must use exclusively E470 for access to and from the Ivey Wellpad.

<sup>1</sup> On January 8, 2017 a two car, head-on collision happened on this bridge resulting in one fatality.

# Storm Frequencies And Intensities Are Increasing Exponentially Rendering FEMA's Long-standing 100-Year Safe Design Flood Level **NOT SAFE**

High intensity storms like the 2013 1,000-year rainfall event in Lyons, CO have made FEMA's 100-year floodplain UNSAFE. This storm event caused \$2 billion in infrastructure damage and the loss of 22,000 gallons of crude oil from petroleum tanks in the flood area.



Many organizations are working on the impacts of Climate Change including:

- Colorado Water Conservation Board
- Colorado Department of Transportation
- Colorado Department of Public Health and Environment
- Federal Emergency Management Agency
- President Obama's Executive Order 13690 – **Establishing a 500-Year Safe Design Flood Level For Major Federal Facilities.**

# Establishing A Design Floodplain Level For A 500-year Rainfall Event Reduces Ivey Wellpad Risks From Intense, Up-slope Storms And Resulting Floodwaters

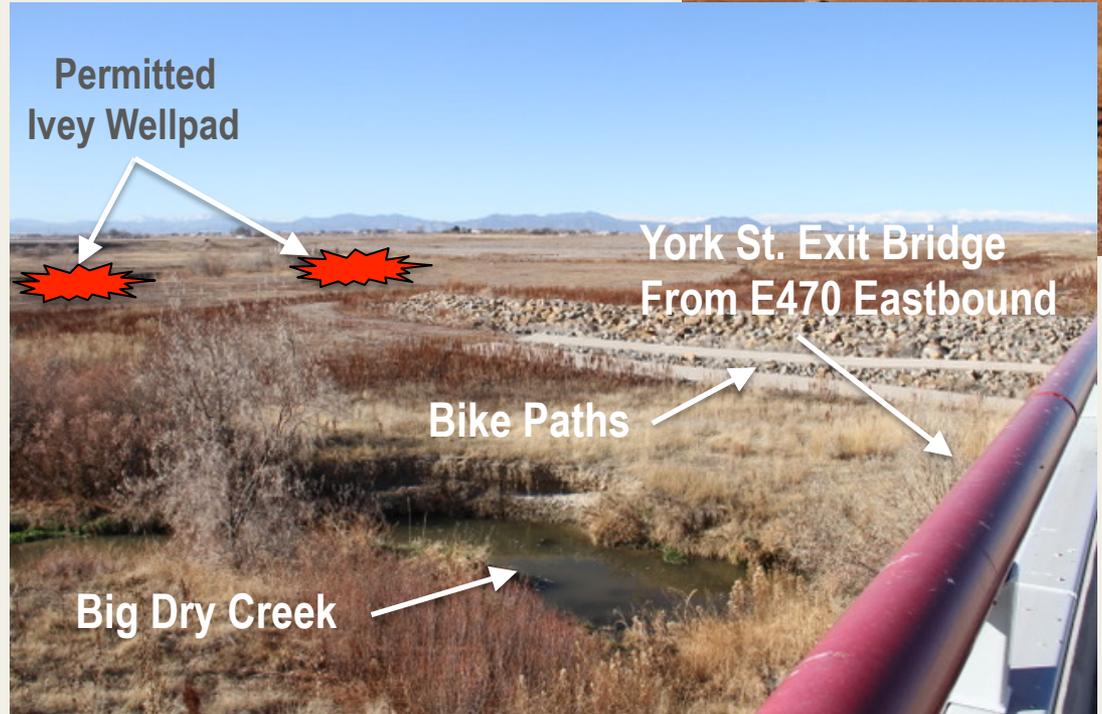
All major structures at the Ivey Wellpad should be placed at or above FEMA's 500-year floodplain to reduce the risks of damage (i.e. separators, combustors, crude oil storage tanks and contaminated water storage tanks).

This is particularly important since over 1 million gallons of crude oil capacity is provided at the COGCC permitted Ivey Wellpad and this represents a serious environmental threat downstream (i.e. Big Dry Creek and the Platt River).



# The Ivey Wellpad “Industrial Facility” Adjacent to Big Dry Creek Open Space Does Not Work For Urban Areas

- Open space with bike and walking pathway is a critical component of sustainable communities.
- 1,906 Homes will have visibility to the Ivey Wellpad. **Property values will likely be reduced by 25%.**



**Mitigation Requirements**  
 Use a pipeline alternative to move produced petroleum liquids and gases to a rural area for processing. Eliminate both the massive oil pad look and production trucking.

## **With Citizen's Support, Adams County Commissioners Need To Establish Mitigation Measures For The Ivey Site That Will Protect Critical Urban Area Health, Safety and Quality of Life Needs**

1. Require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks to reduce the very high risks of asthma attacks during air inversions that frequently occur in the Big Dry Creek valley.
2. Require the exclusive use of only E470 during the drilling and fracking operations to reduce the very dangerous heavy truck safety concerns in close proximity to schools and urban areas.
3. Require a design floodplain level for a 500-year rainfall event to reduce the flooding and environmental risks from more intense, up-slope storms.
4. Require the use of a pipeline to an off-site production pad to eliminate the important "quality of life" concerns and the risks of real estate property value losses (estimated to be \$190 million).

**From:** [Deb Jenkins](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments re: Ivey Well Pad  
**Date:** Wednesday, February 22, 2017 11:29:06 AM

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February 21, 2017

Department of Community and Economic Development, Adams County

We bought our brand new home in Quail Valley in 2004. It was on the edge of Thornton, no amenities but lots of wildlife. We knew it would eventually fill in with stores, gas stations, restaurants and hospitals and the wildlife would sadly be displaced. The one thing we did not anticipate was the drilling and fracking in and around our neighborhood. Honestly, I would have stayed in Arvada had I known. We planned to retire in this home and stay as long as possible. Now we feel pressured to move away from the health hazards of all the wells in such close proximity to our home. Quite frankly, it upsets me very much.

My first concern is that this proposal calls for a large INDUSTRIAL site so near our homes. This site will have 26 wells that also consist of crude oil tanks, separators, VOC combustors in a 6 acre area. Almost a million gallons of hazardous waste will be produced by this site. I am very concerned about this being so close to our open space and Big Dry Creek. Big Dry Creek flows into the S. Platte River which flows northeast thru Colorado and is used for drinking water, livestock and farmland. A spill of the hazardous material from this well could be disastrous for many people downstream. The application indicates this site is not in a floodplain but is dangerously close. In 2013 when we had the floods, that entire area was full of water and there was no access to 152<sup>nd</sup> Avenue or York Street until the water levels went down. This in itself sounds like a pretty risky situation.

My second concern is our air quality. With 26 wells in such close proximity to Big Dry Creek, we have air inversions frequently in the winter. These inversions will trap the emissions all around our homes and schools. Preliminary studies show that asthma is higher in areas with gas and oil development near residential areas. The Colorado School of Public Health at CU Anschutz researchers have found that children and young adults were 4.3 times more likely to have acute lymphocytic leukemia when they lived in areas of these active oil and gas wells. Is this a risk we want to take with our children, our future? The study indicates that everyone is at risk of health issues including cancer when living within a mile of this industrial exposure. This industrial activity has the potential to emit toxic substances into the air and water including carcinogens such as benzene. The school is approximately 3,600 feet from the well pad. The new subdivision that is currently under construction is right across 152<sup>nd</sup> Avenue from the proposed well site, a mere 1,400' away.

My third concern is the possibility of well failure. It is not a question of IF a well will fail but when. On January 23<sup>rd</sup> of this year, Anadarko had a well blow out in Weld County. The well spewed toxic waste and it took several days for the issue to be under control. The area that was affected was 2,900' long x 1400' wide area requiring the evacuation of a few homes. A windy day could make that area much larger. If the proposed well site had a similar failure that encompassed 2,900' there would have to be many evacuations and it would have spewed toxic and hazardous waste into Big Dry Creek and toxic fumes into the air. In the latest well failure there were 11,634 gallons of oil released with 4,788 gallons that have not been recovered. There were 69,216 gallons of "produced water" released and 28,392 gallons have not been recovered. I have grave concerns regarding the hazardous materials that were not recovered. What about fires or explosions? How

quickly would someone be able to take care of that problem? Is our fire department qualified to handle an emergency of that kind? Possibly hundreds of people would have to be evacuated due to fire, smoke and toxic fumes. Is there a possibility that an explosion could travel along the fracking lines under our homes?

My fourth concern is the truck traffic, noise and vibrations. With all the trucks going in and out of the site, an accident with the trucks hauling the hazardous waste is concerning. 152<sup>nd</sup> Ave is a narrow road with fast speeds. The road is not equipped to handle such large trucks, especially the bridge at York just north of E-470. If I have done my math correctly, the drilling of 26 wells will be a minimum of 468 days of noise, light and vibrations. This does not include when they drill under our homes. In Erie, homeowners have horrible vibrations and noise in their homes for weeks on end. When they do drill under our homes, is there data showing that it will not damage our homes or cause more radon issues? Why do they have to go under our homes when there is open farmland just to the west of our subdivision? I am also concerned about our property values. I don't want to live in an industrial area and I am sure most people don't either.

I am also concerned about the wildlife in the area. We have a lot of hawks, owls and eagles in the area. The heat that is generated from the combustor is invisible to the birds. When they fly over it, it singes all their feathers. They are unable to fly. This happens quite frequently to a lot of birds around these industrial sites.

The community meetings that Ward Petroleum had were inadequate. The room size of the second meeting was too small and we were hurried through so others could get in. It seemed that they told us what they were allowed to say and they didn't really answer our questions and concerns. I felt that these meetings were more "feel good" meetings to make us feel that we had a chance to voice our concerns.

On a side note, I don't think for a second that these oil and gas companies are interested in the citizens' concerns. They do not seem to have any responsibility to take care of any hardship they cause. They are only interested in money. CNOOC (Chinese Government owned company) paid 1.27 billion dollars for a 1/3 stake in 800,000 acres of land in NE Colorado (including Adams County) and SE Wyoming to Chesapeake Energy Corp. The CFO of Chesapeake Energy Corp was Michael Hodges who is now the CFO of Ward Petroleum. While I do not know if Ward Petroleum is in partnership with the Chinese communist country, the bottom line is that this is not for our national security. It is purely about the money. We are ruining our health, our land and our neighborhoods for someone else's profit. They are putting these industrial sites in and around neighborhoods because it is less expensive for them and that equals more profit.

I would like to see a moratorium on drilling so close to neighborhoods and schools at least until more research has been done to ensure the safety of the citizens.

Thank you,

Deb & Walt Jenkins  
2079 E 148<sup>th</sup> Place  
Thornton, CO 80602  
303-940-6963

**Comment 28**

**From:** [Dan Lyman](#)  
**To:** [Chris Simmons](#)  
**Subject:** Please Stop The Ivey Site Project  
**Date:** Thursday, February 16, 2017 8:48:15 PM

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Good day,

I'm writing about the proposed ively fracking site and wanted to convey how strongly I oppose the project. I'm not opposed to fracking in general, but am against placing facilities very close to neighborhoods and schools like this site would be. Especially when it is going to be such a massive facility. It's just not the right thing to do to upstanding members of the community that chose to live in this town and this county. The sheer number of existing and proposed sites in this small area, just a few miles wide, embedded in and around so many neighborhoods.

There are many negative aspects that come along with this type of operation and I'm sure you're well aware of them. Lights, noise, traffic, emissions, seismic activity, fires, environmental risks, property values and so on. I think what makes this project that much worse is that it will sit in a very low area right next to the Big Dry Creek which makes it susceptible to contamination of the creek in the case of a spill and potentially much worse if the site were to flood, which is a real possibility. I've seen the high water there often during heavy rains.

Also, the site will be right in the middle of a well known inversion zone which will certainly cause long periods of significant air pollution due to the burners. Add to that other sites in the inversion zone and it isn't a place very many folks would choose to live but it would be a place that causes significant health issues.

I ask that this project not be approved!

For the safety and well being of the many neighborhoods effected I ask that this not be allowed to happen. I know big business has a lot of influence but I ask you to think about the thousands of families directly affected by this. Fracking has no place next to residential areas.

Sincerely,

Dan Lyman  
Concerned Resident  
303-489-1162

**Comment 29**

**From:** [Eileen Birk](#)  
**To:** [Chris Simmons](#)  
**Cc:** [efbirk@yahoo.com](mailto:efbirk@yahoo.com)  
**Subject:** Comments on Application for Ward Petroleum Ivy Well Pad Fracking Site at East 152nd Parkway and York Street  
**Date:** Sunday, March 05, 2017 9:32:17 PM

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My husband and I, as homeowners impacted by the Ward Petroleum application for the Ivey Well Pad fracking Site at East 152nd Parkway and York Street, hereby submit our comments on this application.

The proposed Ivey Well Pad fracking site unnecessarily exposes the residents - including the many children - of Quail Valley, The Haven, and Trailside subdivisions to the byproducts of the fracking process, many of which are known carcinogens. Toluene, xylene, and benzene are all common byproducts of fracking and cause a multitude of serious illnesses and diseases, including cancer. Benzene is a carcinogen, according to the International Agency for Research on Cancer (IARC) and the Environmental Protection Agency (EPA). According to the Center for Disease Control (CDC), benzene exposure is known to have harmful effects on bone marrow and the blood. The CDC states that long term exposure to benzene in the air, as is the case in fracking operations, can cause leukemia and cancer in the blood-forming organs. Toluene is known to cause reproductive abnormalities and central nervous system disorders, while studies have demonstrated that xylene exposure has harmful effects on the kidneys, lungs, heart, and nervous system.

According to a John Hopkins Bloomberg School of Public Health study published in July 18, 2016 in JAMA Internal Medicine, people who live near fracking wells are 1.5 to 4 times more likely to suffer asthma attacks. (<http://www.jhsph.edu/news/news-releases/2016/study-fracking-industry-wells-associated-with-increased-risk-of-asthma-attacks.html>). An additional study by the John Hopkins Bloomberg School of Public Health found an increased risk of adverse pregnancy outcomes for expectant mothers living near fracking industry wells. (<https://hub.jhu.edu/2015/10/12/fracking-pregnancy-risks/>)

The following is an excerpt from an article appearing in the Pittsburgh Post-Gazette on August 24, 2015. (<http://www.post-gazette.com/opinion/Op-Ed/2015/08/24/Fracking-near-schools-DEP-fails-to-keep-drillers-a-healthy-distance-from-children.html>)

. . . a growing body of peer-reviewed science provides significant evidence of the public health risks of shale oil and gas development. Unhealthy levels of benzene and formaldehyde have been found near compressor stations. Research has shown that some women in high-density drilling areas with greater than 125 wells per mile had an elevated risk of births with congenital heart disease and neural tube defects.

Researchers found in a recent study that in areas closest to active wells, levels of polycyclic aromatic hydrocarbons, or PAHs, which are linked with lung and skin cancer as well as respiratory effects, exceeded the Environmental Protection Agency's acceptable risk level. The risk level decreased only by 30 percent 3.2 miles away from

an active well. A survey in Pennsylvania showed that the closer residents live to gas wells and facilities, the more they reported specific health symptoms like headaches and sore throats.

Research in Colorado showed that residents living less than or equal to one-half mile away from gas wells are at higher risk of respiratory, neurological and other health impacts and have a higher lifetime risk for cancer than those who live at farther distances. Two times as many residents in Pennsylvania living less than 1 kilometer (0.6 of a mile) from gas wells have reported more respiratory symptoms per person than those living 1 to 2 km or more than 2 km away.

Air pollution occurs during every stage of unconventional gas development. In an analysis of all chemicals used in unconventional gas extraction processes (such as fracking), 37 percent were found to evaporate easily and get into the air that people breathe. Of these volatile chemicals, 81 percent were found to have adverse effects on the brain and central nervous system. Chemicals in the air have the ability to be inhaled and be absorbed directly into the bloodstream, bypassing the body's detoxifying mechanisms of the liver.

Children are especially vulnerable to environmental hazards and can have very different health outcomes than adults who are similarly exposed in the same locations. Children breathe more air and drink more water per unit of body weight than adults do and often put objects and their hands into their mouths more frequently than adults. If the air or water is contaminated, children will receive a higher dose than adults and are more vulnerable to exposures. Additionally, children are less able to process environmental chemicals and their young ages provide longer durations for diseases with long latency periods, such as leukemia, to develop.

Additional studies are underway and the scientific community is now playing catch-up with the rapid growth of this industry. We are only now just beginning to understand the implications of the shale gas industry for the environment and human health. Until better data emerge on the potential risks, precautionary measures are warranted with regard to the permitting of new wells close to schools.

Given the accidents like explosions and fires that have occurred, and documented water and air pollution from oil and gas infrastructure, policymakers, such as DEP, should exercise the utmost caution when making decisions that could impact children

and other vulnerable populations.

\* \* \*

**Silver Creek Elementary School is only half a mile away from this site.** In addition to the environmental hazards, there exists the very real possibility, as mentioned in the excerpt above, of fire and explosions at the drilling sites. It is our understanding, straight from the mouth of an Adams County commissioner, that there is no reliable data concerning a safe “buffer zone” that should separate these facilities from nearby homes and schools in the event of a fire or explosion. It is terrifying to us that, should such an event occur, children at the school and/or residents of our community could be killed. **WITHOUT SPECIFIC SAFETY BUFFER ZONE DATA**, such a site should not be located in such close proximity – less than half a mile - to a school and homes!!!

There would also be a significant danger posed by numerous vehicles transporting hazardous materials so close to the school, not to mention increased danger simply from the higher traffic volume itself. To knowingly allow such dangerous activities to be taking place near a school, where there should be an even higher standard of caution and care to protect our children, is absolutely outrageous.

A less critical but not unimportant concern is the impact of fracking sites on property values. It is indisputable that fracking sites in close proximity to homes CAN AND DO create highly negative perceptions, perceptions that bring down homes values and reduce the desire to live in affected neighborhoods. I wonder how many people will buy a new Richmond Home in the Fairfield Subdivision once they find out a monstrous fracking site will be literally right across the street from them? And if Richmond Home reps are not disclosing this information to purchasers, I have no doubt litigation will result once purchasers receive that nasty surprise, and begin to fear for their safety, as well.

My husband and I love our neighborhood, our community, and our children’s school, and have never given a second thought to moving. Our neighborhood has always felt like “The Haven” to us that it is so aptly named. Yet with the terrifying prospect of our health and safety being endangered by a giant fracking site polluting our air, creating the risk of fires and explosions, endangering our roads, and putting a black cloud of fear over our entire community, the prospect has occurred to us for the first time that we may need to find somewhere else to live – assuming we could even sell our home if our property values plummet.

If Adams County is unable to deny the application, we ask that the commissioners impose every single restriction and regulation within its authority that would make it impractical or undesirable for Ward Petroleum to locate its fracking site here, or at least lessen any potential health and safety impacts to our residents and our children. Such restrictions and conditions would hopefully include enforcing as much of a setback from the school and nearby homes as possible, requiring that the truck traffic be restricted to E-470, and requiring

that by-products be piped away from our community.

Most of all, please do your due diligence in researching any health and safety risks posed to humans by fracking activities, and do everything in your power to protect our residents and our children. As the linked article states, “Decision-making around gas extraction should not hinge on demonstrating harm after the fact. It should hinge on demonstrating no risk of harm before the fact.” (*Fracking Near Schools*, [post-gazette.com](http://post-gazette.com), by Jerome Paulson, 8/12/15.)

Thank you for the opportunity to be heard on this important issue.

Eileen and Erik Birk

15062 Elizabeth Court

Thornton, CO 80602

[efbirk@gmail.com](mailto:efbirk@gmail.com)

**Comment 30**

**From:** [Crouch](#)  
**To:** [Chris Simmons](#)  
**Subject:** Oil projects on York  
**Date:** Sunday, March 05, 2017 1:32:30 PM

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Christopher Simmons,

I am writing in regards to the special review permit to allow 26 horizontal wells near our home on 152nd Parkway and York in Thornton (parcel [#0157311400006](#)).

We do not want to see this near our home. We are concerned with the traffic, noise, lights, and views that this will bring to an already busy neighborhood area. With the elementary school right across the street this seems like a horrible location for an oil and gas site for safety reasons. Our home values will drop and people might want to move away from this area if constructed. My sister-in-law lives near a well site in northern Colorado and they assured there neighbors there would not be traffic, noise, etc and that is not the case. Every time we drive through there late at night there are several trucks coming in and out, noise, smells and bright lights (even though they have the noise reduction walls). I am happy to see development in our area but this is not something we want to see so close to our neighborhood and schools.

Thanks for your consideration of our concerns.

Eric Crouch

Sent from my iPhone

**Comment 31**

**From:** [ericditzler@comcast.net](mailto:ericditzler@comcast.net)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey well comments  
**Date:** Thursday, March 02, 2017 7:26:53 PM

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Hello Mr Simmons,

My name is Eric Ditzler, I actually sent in an earlier email with comments on the Ivey well. That earlier email was mainly asking you to make Ward construct a pipeline for the Ivey site. I'd like to add on some other thoughts. If the pipeline is not mandated, I have a few alternate suggestions for you.

Since there will be a lot of truck traffic, you should make Ward construct a turn out lane to turn into the site, and an acceleration lane for the trucks to use when turning out of the site. A fully loaded semi truck takes a long time to slow down and to speed up from a stop, when turning off or out onto the main road with the 55mph speed limit it seems dangerous. Also if the trucks will be coming and going 24 hours a day, they should put in street lights by the turn out for added safety. When approaching a truck that has just turned out at 55mph, if there were an accident it would basically be like hitting something completely stopped, and potentially fatal, street lights might help prevent that.

Also regarding truck traffic, if you could mandate they use E470 that would be greatly appreciated. If that is not possible, then redoing the narrow bridge is a must. Also the traffic light at Highway 7 and York needs to have a left turn arrow, currently there are lights installed for this, but they're covered in black plastic. Also a double left turn lane would be welcomed, there are 5 lanes pointing North there and only one small left turn lane. If trucks are turning left there, this needs to be fixed.

Back to the site itself, it's going to be such an eye sore with all those tanks. Could you please ask them to put in lots of mature landscaping. There's a site along I-25 up north that's completely surrounded by mature pine trees, so year round you can't hardly see in. Mature landscaping and a watering system is a must. Or here's another idea. They could make a fake barn to cover the entire site, if they made it look like a horse barn it would fit right into the surrounding landscape. They could even have trucks drive right into the barn. Arena sized barns are not uncommon in the area and would cover up all the unsightliness.

Listen I'm not an anti oil person, however if they're going to come so close to houses, their site should be safe and shouldn't be a terrible eye sore for everyone who has to live by it and drive by it everyday. They're going to make a lot of money from this well. Asking them to make some accommodations up front is not too much to ask.

Again the pipeline away from the site would be preferred, but if not then please consider my suggestions.

Thanks for your time

Eric Ditzler  
Haven at York Street

**From:** [ericditzler@comcast.net](mailto:ericditzler@comcast.net)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Well Comments  
**Date:** Tuesday, February 28, 2017 6:52:08 PM

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Mr Simmons,

I'm writing to express my concerns about the Ivey gas well. My family lives near by the proposed site in the Haven neighborhood. Three of our family members have asthma and we are very concerned about the potential air pollution. We're also concerned about the light and noise pollution, as well as the truck traffic in relation to Silver Creek Elementary school, which is very close to the site and my children attend. I recently learned that if the county requested a pipeline from the site to a location further away from any people that all my concerns would be taken care.

I'm asking for a pipeline to be added to the county's special application guidelines for the Ivey well. There is much farm land for sale close to the site that is zoned industrial and it could easily provide an alternate spot to build the separation, combustion and storage tank facility. The pipeline wouldn't have to go far, even a mile away would be an enormous help, just get it out of the air inversion area caused by Big Dry Creek and away from the dense residential area. I think the best choice would be to take the pipeline west towards I-25, no homes are that direction and there's already the Electrical substation over that way.

We love living in Adams county, we've been here for 10 years, we had always planned to live out the rest of our days here. However if Ivey is permitted to operate without a pipeline, we'll be moving.

Thank you for your time and consideration.

Eric Ditzler  
Nicole Ditzler  
Ryder Ditzler  
Lillian Ditzler  
14838 Clayton Street  
Thornton CO 80602

**From:** [Frederica Acora](#)  
**To:** [Chris Simmons](#); [Steve O'Dorisio](#); [Eva Henry](#); [Mary Hodge](#); [Erik Hansen](#); [Chaz Tedesco](#)  
**Subject:** Comments on the new IVEY proposal  
**Date:** Thursday, March 02, 2017 7:04:12 AM

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Hello, Really? This is what you want to agree too? I say NO. Sincerely, Frederica Acora Boulder, CO

Ward Petroleum has changed their initial proposal from 1.5 mile lateral wells to 3 mile lateral wells. This 26-well site (with up to 26 additional wells) is to be located approximately 3,200 feet from Silver Creek Elementary School. It will bring an additional 55,000 industrial truck trips to Highway 7.

**Comment 34**

**From:** [Ishwar Goyal](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Comments  
**Date:** Sunday, February 26, 2017 6:39:35 PM

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Hello Simmons,

I got mail from Adams County for Ivey Project and I would like to provide the following comments

**My Information**

Name: Ishwar Lal Goyal

Phone: 720-917-6045

Address: 15055 Elizabeth Street , Thornton 80602

**Comments:**

1. This size of commercial project should not be allowed that close to the residential area. I understand, Colorado Oil & Gas Association trying best to enforce rules and policies for the commercial project but it's really hard/impossible to maintain the continuity of enforcement for long run because fines are so low so Gas companies usually prefer to pay fines than doing to the right thing.

2. Pipelines for transfer of raw material: There are three schools with one mile radius from the site. It's very mandatory to maintain the Safety of our kids. If thousands of trucks are on the roads that will be very dangerous for our kids and infrastructure. Gas Company should transfer the raw material using pipeline and County should consider as base requirement for approval of this project.

Thanks,  
Ishwar Goyal  
720-917-6045

**From:** [Josh Bastian](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site comment  
**Date:** Sunday, March 05, 2017 2:57:11 PM

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Adams County Commissioners,

Adams County has become a flash point for special interests advocating the banning of oil and gas extraction by any means, and their attempts to illegally limit access to the property owned by mineral rights owners. They have requested cities and counties illegally ban extraction or grant moratoriums against extraction in violation of state law to prevent legal development of mineral property rights.

Commissioners should politely but firmly tell these activists that they are attempting to make change at the wrong place. The only place that they should be focusing their efforts is at the one place where they can actually make a difference. They should focus their efforts at the state level and quit tying up the valuable time of the county commissioners. They should be told time is better spent on issues that the county can actually address and legally make a difference.

Sincerely,

Josh Bastian

**Comment 36**

**From:** [Jen Bone](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Proposal  
**Date:** Saturday, February 18, 2017 9:21:54 PM

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Dear Mr. Chris Simmons,

We are writing to express our concern regarding the proposed Ivey site oil well. We are concerned about the harmful health effects associated with drilling, the truck traffic on narrow roadways and by our schools, and the risks associated with potential spills.

Thousands of Adams County residents are at risk due to the proximity of the proposed well pad. A recent study conducted in Garfield County, Colorado reported **61 airborne chemicals** were released into the air within a one mile radius of the 130 gas wells. *More concerning is the level of Methylene Chloride, a potential carcinogen, being one of the chemicals released.* We simply cannot knowingly allow such harmful chemicals to be released within one-mile of residential neighborhoods and schools!

The Colorado School of Public Health (with no conflicts of interest, financial or otherwise) used a scientifically based study to understand the wide-ranging impacts of drilling. They also concluded that air emissions are likely to occur at levels that can cause human health impacts. In addition, truck traffic poses a serious “safety risk.”<sup>[i]</sup> As you are already aware, a tanker overturned in Adams County causing unnecessary oil spillage. And, oil and gas accidents are not uncommon. *According to the Adams County Government website, 10 incidents leading to various types of spills occurred within a five month time period from August-December 2016.*

In addition to the harmful health impacts and dangers of truck traffic, we also need to be concerned about potential flooding in the area. *The floods of 2013 caused 14 oil spills totaling 48,000 gallons of oil spilling into the Colorado Front Range.* The proposed Ivey Site is located only a few feet away from Big Dry Creek—a location considered inclusive of the western side of the floodplain. We cannot risk another oil spill of this magnitude. These facts cannot be disputed. They happened. They can all happen again in Thornton, Colorado.

We respectfully ask that you reconsider the location of the proposed wells. The Ivey Site is too close to homes and schools. At minimum, we believe you can 1) require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks, 2) force trucks to use E470 and not narrow roads like York Street, and 3) demand a design floodplain level for 500-year rainfall event.

Cordially,

Ryan and Jennifer Bone – Trailside Residents

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[i] “Health Impact Assessment for Battlement Mesa, Garfield County Colorado.” PDF. Retrieved February 18, 2017 from [Garfield-county.com](http://Garfield-county.com).

**From:** [CenturyLink Customer](#)  
**To:** [Chris Simmons](#)  
**Subject:** Drilling-Ward Ivey Site  
**Date:** Tuesday, February 28, 2017 5:20:22 AM

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To whom it may concern,

The proposal includes for onsite storage of 36 crude oil and 8 waste water tanks holding approximately 20,000 gallons each, or almost a MILLION GALLONS of hazardous material, in a floodplain, feet from the Big Dry Creek. Such a large industrial operation puts thousands of residents and wildlife, including eagles (located a few hundred feet to the north), foxes, and prairie dogs in unacceptable risk. At the community meeting on January 11th, 2017, the operator was not aware the facility is going to be in such a risky area, leading me to question what other details were uncertain. The application still indicates it is not in a floodplain, but it is hard to imagine as the site is only a few feet above and next to the Big Dry Creek.

Comments from the Engineering Review in the application on October 7th, 2016 agree with what the FEMA maps show, that the site is inclusive of the western side of the floodplain. If Ward is trying to argue their way out of this, it is a technicality putting public and environmental safety at unacceptable risk, particularly as storms are becoming more and more severe; large scale storage must be avoided. Not to mention its proximity to our children and our schools. We chose this neighborhood because it was away from the city and noise.

Now it could all be taken away!!

Sincerely,  
Julie Bucher

**Comment 38**

**From:** [Juliet Diana](#)  
**To:** [Chris Simmons](#)  
**Subject:** 26 wells on one well pad  
**Date:** Thursday, March 02, 2017 3:47:27 PM

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Dear Chris,

I live in the Havens at York neighborhood, and am writing to tell you, I, nor my husband, want 26 wells on one well pad near where we live. It's unsightly, probably loud, and hurts the Earth.

Please don't build that.

Juliet Diana

**Comment 39**

**From:** [John Lewis](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Ivey Site Comments  
**Date:** Friday, February 24, 2017 3:46:38 PM  
**Attachments:** [Comments on Ward Ivey Site Permit Application 2-24-2017.docx](#)

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To whom it may concern,

We are residents of Hunters Glen.

Pls find attached our comments and concerns on the Ward Ivey Site permit. We request public hearings be held to review.

Sincerely

John Lewis & Catherine Haluszczak

303-355-8054

E 132<sup>nd</sup> Way

Thornton

**Comment 40**

02/24/2017

Comments on Ward Ivey Site Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas  
Northwest of Intersection of 152nd and York Street, Brighton

Dear Chris Simmons, Adams County Staff and Adams County Commissioners,

We would like to add our voices to those expressing serious concerns with the approval of drilling projects such as Ivey - and Todd Creek - being applied for in or near our neighborhood (Hunters Glen for us personally). While we understand the need for energy development in general, we do not agree that it should be permitted in densely populated areas at the expense of the public health and safety or lowered quality of life and property values. We count on you to exercise the power of county government on our behalf, as the development permit process, and in fact Adams policies on this topic in general, move forward.

In our opinion – and of the few dozen other residents we have spoken to in the process of attending meetings - without exception – no dissent - is that it is quite clear that these noisy, dangerous, unsightly, and polluting industrial facilities / operations should not be permitted near this type of densely populated residential areas at all. We feel the very idea of considering permitting a ‘LUMA’ class site is an extremely poor one on the face of it. When you add to the residential density 1. the floodplain/inversion location, 2. the public open space site it is next to, and 3. the three public schools impacted by traffic, that conclusion requires no formal study to determine; it is self-evident to any thoughtful, informed individual.

Yet we are going down the permit road already – since the state is not allowing the outright banning of drilling –so these companies must be held to the highest possible standards by local government when generating risks to our public safety and health, degrading our quality of life, and lowering our property values and tax basis.

If the applicants are required to recognize and plan on bearing the true lifecycle costs of their operations to residents, local government, infrastructure, and environment in their profit calculations, our outcomes will be greatly improved.

We ask you to require the Ward Ivey permit application to be put to a vote of the Adams County Board of Commissioners including a public hearing. With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado. On February 14, ACCDAN submitted 1,008 petition signatures to the county stating -- As residents of Adams County in Colorado, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county’s Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (4- 10-02-05-07).

We ask further that:

- A) Ward be compelled to properly complete their application materials and associated plans prior to the hearings

- B) Actions be taken and policies be set by Adams County government to address the many remaining concerns and associated costs

Each of those requests are detailed further in the sections below.

## Missing items and ambiguities in Ward Ivey Permit Application to be responded to by Ward in writing prior to hearings

1) The **will serve letter** is a requirement of the permit application and has not been submitted. The application should not be processed until the will serve letter is provided.

**2) Access road and pipeline easements:** In the **cover letter**, Ward seems to indicate that it has all of the **easements** for access and pipelines to support the project, but the easement documentation is not provided. The requested easement documentation should be provided for pipelines, since the application details are based on the presupposition that Ward will use a pipeline for the site. ACCDAN supports the use of pipelines for the Ivey Site and encourages Adams County to make pipelines a condition for approval.

**3) Site-Specific Drilling Schedule** - The county regulations require a **drilling schedule** to be provided. By definition, a schedule includes the start and end dates for the various activities to complete the project. Ward has not provided a drilling schedule and therefore the current application is incomplete. The information provided is generic information on how long it takes to drill any well, how long it takes to complete any well and is not a schedule for the proposed Ward Ivey project that Ward is asking the county to approve. Schedule details are provided in the traffic impact study section? Is that the planned schedule? If so, it means that you will be drilling and fracking at the Ivey site for two straight years – from August 2018 to August 2020. This is an unacceptably long period of time to impact the surrounding area.

**4) Sound Mitigation Plan** - The **sound mitigation fencing** diagram on page 15 of the pdf only shows it for location 2, what about the sound wall for location 1? On pdf page 38, the drilling operations plan site layout shows a sound wall around the entire site. Please consistently and clearly depict the plans for the sound wall.

**5) Site Security** - Please include a description of the security fencing to be installed to keep children out of site and all equipment areas – wells, tank batteries, etc.

**6) On-Site Production Facilities Unclear** - The **Site Plan** shows no separators, no ECD (combustion units) and no tanks, does this mean you do not intend to build any ancillary equipment? However, the renderings on pdf pages 22 and 23 show a couple of VCUs and a couple of tanks. It is unclear what the project will entail.

**7) Fracking waste fluids plan** - There is no discussion of what will be done with fracking waste water in terms of whether will it be piped or trucked out?

### **Stormwater Management Plan**

**A) . Floodplain** - The application still indicates it is not in a **floodplain**, but it is in fact only a few feet above and next to the Big Dry Creek. Comments from the Engineering Review in the application on October 7th, 2016 agree with what the FEMA maps show, that the site is inclusive of the western side of the floodplain. Ward is putting public and environmental safety at unacceptable risk, particularly as storms are becoming more and more severe; large-scale storage must be avoided at a this site.

B) The **Stormwater Management Plan** information provided does not specifically tell how you will protect Big Dry Creek? The stormwater information is all generic but it needs to be made

explicitly site-specific for the Ivey project, which has special requirements due to its location in the Dry Creek Basin floodplain.

**9) Containment Plan:** What will the **capacity of the steel berms** be? 1.5 times the capacity of the largest tank? Or all tanks combined?

#### **8) Traffic Impact Study**

A) The **traffic impact study** assumes a pipeline is used for all product, water, etc. and yet the diagram on pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. Most of this equipment is not needed since Ward will be using a pipeline. The application needs to depict what Ward's actual plan is consistently in the permit application. You can't have a traffic study that says pipeline and then not use a pipeline.

B) There is no discussion in the **traffic impact study** of the damaged bridge on York Street north of the E-470 interchange where a fatality occurred last month because the bridge is too narrow and unsafe.

C) Page 12 of the traffic impact study says there will be 19,263 trucks during drilling and completion (is this with or without pipelines?). The traffic estimates are unrealistic in any case; if a pipeline is in place they are high, if not, they are low.

D) On page 13 of the **traffic impact study** it references 144 one-way truck trips per ye (which we assume is per year?) during production/operations? Is this with or without pipelines? This does not seem to make sense with the statement below that indicates 21 daily trips in weekdays which would be 5,460 trips per year. Please provide a better description/explanation of the "production phase truck trips". Also, why are truck trips required if a pipeline is in use?

At the Community Meeting on January 11th, 2017, the operators declared they were not required to disclose the planned oil production of the site. This has a direct impact on the number / frequency of truck trips required, assuming they are not using a pipeline to haul the separated crude oil and wastewater off-site. It's not unreasonable to say it will be immensely significant, but exactly how much?? The application lists 1-2 light truck trips per day and a tanker every 1-30 days. Given a million gallons of on-site storage, that claim is not credible.

E) The **traffic impact study** DID NOT LOOK AT SCHOOL BUS ROUTES and times. This is a big omission as protecting our children as they travel to and from school is a key concern. Please add an analysis of this and describe what you will do to minimize impacts. For example, what if a school bus and an oil tanker both have to use the narrow bridge on York Street at the same time? Would the bridge hold the weight? Would it be safe? Furthermore, the traffic data was gathered on Wednesday afternoon which is an early release day for Adams County schools so the traffic study is not reflective of school day traffic.

F) **All 3 schools directly impacted not considered in plan** - The **traffic plan** avoids Stargate school but sends the traffic right past the Silver Creek Elementary School and Rocky Top?

#### **9) Missing Neighborhood and Environmental Impacts:**

A) New homes by Richmond Builders not considered – new homes are being permitted and built directly across the street, likely within 1000' of the drill site. Despite having approved housing permits prior to Ivey application receipt, the application does not address this

B) The application states it "will not affect any open space" and that there is not anywhere considered a "public gathering area" closer than 3000 ft, when it clearly impairs the conservation values of the Big Dry Creek open space of the City of Thornton directly next door to it. The space was purchased by the City of Thornton for the residents to enjoy the natural beauty of the area. The City is planning improvements to the open space to allow for more

recreation opportunities. Locating 44 large tanks that are 16'H and 16'W and 12 VOCs that are THIRTY FEET HIGH as part of an industrial well site directly adjacent to the open space is incompatible with the use of that space and use of resident's tax dollars.

## Requested actions to be taken and policies to be implemented by Adams for Ivey and other sites:

1. **Remote production facilities and pipeline transmission be required, including separate pipeline for waste fluids:** The applicant shall transport all oil, water and gas via pipelines in order to minimize traffic impacts on local roadways and emissions impacts from the Ivey site. The applicant's transportation impacts and other aspects of its permit application are predicated on a pipeline being in place and therefore, pipelines for water, waste water and all product transport should be a condition of permit approval. Prior to initiation of construction, the applicant shall provide the applicable title and easement commitments required to construct the oil, water and gas pipelines for the facility. The pipelines must be in place prior to drilling.
  - a. Ivey, and any low-lying site, especially those in urban areas, must locate holding tanks, separators, etc. outside the Dry Creek Basin or other low-lying basin where they are subject to flooding and / or the atmospheric effects of temperature inversions - by the **construction of a pipeline** from the well head. A pipeline also avoids road usage problems below. Ward have made conflicting comments on whether a pipeline will be used, nor provided any details of its route, construction, or destination. The pipelines themselves must meet zoning requirements and pass environmental impact studies. Ward has thus far made conflicting statements about the use of pipelines and trucks; they **MUST** be required to have production and waste pipelines in place to a remote facility at least 1 mile outside any densely populated area and on higher ground, and not within the Dry Creek Basin or any other 500 yr, floodplain.
  - b. The applicant agrees to pipe in water for fracking operations and not to use truck transport for water and the applicant agrees to no use of local wells unless the well is owned by the operator and is permitted by the state for industrial use (versus residential use).
2. **Road usage restrictions and fees be imposed:** Truck traffic for both production oil and waste fluids must be prohibited altogether in dense residential neighborhoods. The problem in the case of Ivey is exacerbated by its proximity to schools and school bus routes. There is simply no good way for that to be allowed. Any heavy truck traffic generated by the facility should be prohibited on local roads except as required to get to and from E470; if necessary, they must pay to build addition entry/exit to E470! All operators must also be charged for their use of those roads they must use to get to and from E470. The charges must truly offset the significantly increased wear and tear and maintenance costs resulting. Adams County must not bear the cost of this increased traffic.
  - a. For any activities that may occur prior to a pipeline being in place, Adams County should require the use of E-470 for all Ward Ivey traffic rather than relying on local roadways.
  - b. A long-term study to learn the true infrastructure costs and maintenance required must be performed for Adams as a whole, including all present and proposed permitted sites in the County.
  - c. Address the pinch point bridge on York Street north of the E-470 interchange. This bridge is planned by Ward to be used for tanker traffic. It is too narrow. Barely wide enough for two cars and a fatality occurred at this location from a traffic accident in

January 2017. This bridge needs to be repaired, widened and upgraded if it is going to be used for heavy trucks/oil tanker traffic. Please carefully evaluate and mitigate the safety of this proposed route. Preference would be to use E-470 and avoid this stretch of York Street entirely and keep traffic away from neighborhoods.

- d. Require traffic impact study to address school bus route considerations.
- e. Restrictions on well drilling traffic for safety considerations and to avoid school schedule times, rush hour and evening sleeping hours.

### **3. Disaster and Emergency, Bonds and Insurance**

- a. **Emergency Response Plans:** The operator must provide a credible emergency response plan. If the plan relies on local public agencies as primary responders, those agencies must also approve the plan. The plan must include the contingency that Ward may not be a viable business concern any longer at some point, and could not respond.
- b. Applicant shall verify prior to commencement of drilling operations that the designated emergency responders have appropriate fire suppressant foam on hand and that they are trained and capable of responding to oil and gas fires. Applicant shall secure a signed letter of preparedness from the designated emergency response agency attesting to these facts.
- c. **Emergency clean-up bond requirements:** The financial impact of a catastrophic event such as spillage of 2 million gallons of crude into Dry Creek due to a catastrophic event, e.g. flooding (such as have occurred in recent years) would be very large, potentially in the billions. We cannot rely on operators to voluntarily set aside sufficient funds for clean-up and re-build. Past experience teaches we cannot rely on operators even being in existence for the full duration of the risks they have created. These funds must also be sufficient to equip and train local government agencies who respond. We suggest a \$50 million dollar fund in the case of Ivey (in addition to insurance below).
- d. **Insurance Requirements:** Applicant agrees to increased liability insurance for operators at a minimum of \$50 million per incident to cover the increased risk of drilling in or near neighborhoods.

### **4. Independent Environmental and Safety Monitoring requirements: Operators must pay cost for Adams County to employ independent, licensed agencies to monitor, test, and publish for public consumption:**

- a. Conduct a study of both the flooding and atmospheric inversion concerns raised by a resident engineer, including consideration for application of 500-year flood design standards and/or relocating the pad to higher ground, and impacts/frequencies of atmospheric inversions on residents, especially those with respiratory problems, and create credible plans to mitigate the risks from each.
- b. **Environmental Impact Study should be performed on impacts to wildlife, water quality, air quality, geostability**
- c. **CDPHE Recommendation Compliance** - Prior to initiating construction, the applicant shall request of COGCC and CDPHE that a CDPHE evaluation of the site be conducted and shall subsequently then agree to comply with the resulting CDPHE recommendations. If CDPHE will not conduct said evaluation, the applicant shall secure the services of an independent company to conduct a similar evaluation and shall agree to comply with its recommendations.
- d. Applicant agrees to provide Adams County access for inspections with notification, but without advance notification.
- e. **Pre-Operations Baseline Measurements must be taken of all ongoing factors below**

- f. **Ongoing Air pollution levels monitoring** – Air plumes from well head site must be monitored and must remain within established limits. Violations must result in heavy financial penalties, and repeated violations must result in termination of permit and operations altogether.
  - g. **Ongoing Water pollution levels monitoring** – surface and aquifer levels of drilling by-products and wastes. Violations must result in heavy financial penalties, and repeated violations must result in termination of permit and operations altogether. The applicant agrees to conduct a baseline drinking water test for any drinking water well owner within 1 mile both prior to drilling and following six months, one year and five years of operation upon the request of the owner.
  - h. **Ongoing Noise pollution levels monitoring** - Noise levels must be regulated, monitored, and enforced both at operations site and along roadways used to/from E470. 95 db max.
  - i. **Ongoing Epidemiological monitoring** – Incidence of diseases such as cancer and asthma associated with drilling operations must be monitored long-term in local population near operations.
  - j. **Ongoing Seismological monitoring** – Seismic activity must be monitored.
  - k. Applicant agrees to provide Adams County with the use of FLIR camera three days per month for the county's independent inspection use for monthly inspections of facilities proximate to neighborhoods.
5. **Site Berming, Fencing, Sound Abatement and Security Requirements:** Ward states there may be 30ft tall equipment on site; there will be unacceptable levels of noise pollution during drilling operations, requiring 360 perimeter berming; and the site remains an ongoing security risk that must be properly fenced and securely monitored.
- a. Prior to initiation of construction, applicant shall submit a **fencing plan** addressing BOTH fencing during construction and permanent fencing during operations. The permanent fencing shall be a security fencing a minimum of 6 feet tall and shall fully surround all oil and gas wells, tanks, ECDs and other ancillary oil and gas equipment. The access gate shall be locked. Fencing is not optional and not left up to the surface owner to decide. It is a public safety issue when you are within walking distance of neighborhoods and schools.
  - b. Prior to initiative of construction, applicant shall submit a **landscaping plan** which includes a combination of berm(s), mature trees (8-plus feet in height), bushes and groundcover to adequately serve as a visual barrier between the site and surrounding neighborhoods and roadways. The landscaping plan shall be compatible with the surrounding area and is subject to county approval prior to construction initiation. The landscaping plan shall include a means and schedule for watering during establishment of vegetation and then thereafter for maintenance. Vegetation must be watered/irrigated to ensure its survival.
  - c. The **sound mitigation plan** shall include a sound wall during drilling and completion operations regardless of the results of the sound study. In addition, any additional controls recommended by the required sound study will be implemented.
6. **Green Practices Requirements:**
- a. Requirement for no flaring except in the case of an emergency/repair after completion. Applicant agrees to requirements of Green Completion.
  - b. Strengthened requirements for dust control during operations, requiring that "no visible dust" is created which impacts neighboring properties or dust on roads impacting children.

- c. Requirement for all lighting used to be directed downwards and shielded upwards to minimize light pollution during nighttime operations.

#### **7. Guaranteed Use of Industry Best Practices**

- a. The applicant shall agree to perform Bradenhead Annulus Pressure Monitoring (Rule 341), regardless of whether directed by COGCC or not. Operator shall monitor and record bradenhead annulus pressure during hydraulic fracturing operations, and to promptly report to Adams County and COGCC increases in pressure greater than 200 psig. These requirements help to ensure that groundwater is protected and that prompt action is taken if conditions arise that could lead to the subsurface release of hydraulic fracturing fluids.
- b. The applicant agrees to use electric drill rigs or best available clean and quiet drilling technology to achieve sound levels of less than 45 dBa measured 200 feet from the drill rig.
- c. The applicant agrees to use of closed loop system and to not use any open pits.
- d. Applicant agrees to use only low-profile tanks (12-foot tall maximum during for operations) for operations. Larger temporary tanks may be used during drilling and completion. Applicant further agrees to comply with a maximum equipment height for any equipment to remain on the site for operations (such as VCUs, shafts, etc.) of 25 feet or less (Note this is in addition to the height restriction of 12 feet for all product storage tanks to be used at the site).
- e. 12) Applicant agrees to install steel-rimmed berms and synthetic liners everywhere and in all cases. Applicant further agrees to install berm capacity capable of containing 1.5 times the amount of liquids in the single largest tank to be present on the site at any given time.

#### **10. Operating Schedule Restrictions**

- f. Requirement that once drilling starts on the first well that all planned wells for that phase must be completed within 9 months or they lose the right to drill and must repeat the permit process for remaining wells. Applicant agrees to complete all permitted wells in two phases or less to minimize disturbance on surrounding area.
- g. If well operations are stopped for a period of 12 months, the operator must initiate removal of all well structures within 6 months of the 12th month that operations are ceased and complete full removal within 24 months of the last operations day and re-vegetate the site.

While they may be late for presently permitted projects, we would also like to suggest additional zoning restrictions be considered to prevent future plans and applications such as these from occurring in the first place:

- 8. **Floodplain zone building and water pollution restrictions:** For future, all building should be prohibited in zoned 500 year floodplain areas. The Dry Creek basin, e.g., should remain undeveloped open space.
- 9. **Inversion zone air pollution restrictions:** For future, any commercial operation generating air pollutants should be prohibited from locating in these zoned areas.
- 10. **Additional residential zoning policies:** For future, any non-delivery commercial vehicle traffic should be prohibited in/through residential zones. Residential noise pollution standards should be set/increased and enforced.

A final concern is the measures above do not directly address concerns regarding loss of property values in surrounding neighborhoods (which of course impact not only the homeowners but county tax

revenue basis) these measures will significantly ameliorate the impacts of the wellhead sites and traffic they generate in surrounding neighborhoods. These costs should be borne by the operators, not by the nearby homeowners or by Adams County residents in general.

We do not claim to have expertise in the practical county government considerations involved in getting these policies implemented; however, we hope you will find some of these suggestions feasible for you to act upon in some form to protect the rights and well-being of your constituency.

Thank you for your consideration and your attention to this very important issue.

Sincerely,  
John Lewis and Catherine Haluszczak  
Hunters Glen  
Thornton, CO 80241

**From:** [Jeffrey Merrell](#)  
**To:** [Chris Simmons](#); [taralmerrell@gmail.com](mailto:taralmerrell@gmail.com)  
**Subject:** Ward Ivey Site  
**Date:** Wednesday, February 22, 2017 8:03:15 PM

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Mr. Simmons,

I'm writing you to summarize the numerous concerns I have with the proposed Ivey site. My family lives in the Haven @ York Street subdivision which is within eyesight of the proposed site. We moved to this neighborhood about 2.5 years ago and have enjoyed the neighborhood.

I have outlined my concerns below:

1) My up most concern is the health and well being of my family whom I've been charged with to care and provide a quality life for. Numerous studies have shown the health concerns tied to not only fracturing, but oil and gas activity as a whole. The study out of John Hopkins ties fracturing sites to increased asthma attacks. Studies have also shown correlation between stress, restlessness, fatigue, depression, and mood swings in the areas of oil and gas production. This includes worsening symptoms for those who may already be ill or suffering from long-term illness. This scenario would fit my family since my daughter Alice suffers from asthma and my wife Tara suffers from a progressive form of multiple sclerosis, an auto-immune disease that affects the central nervous system. Tara already exhibits the aforementioned symptoms, so any of the proposed activities would only increase the affects of her symptoms.

2) Other credible studies have shown the drastic decrease in home values for those homes within line of sight of the production facility, some upwards of a 25% loss. I didn't sign up for that when I moved into the Haven. Home prices are already inflated in the area and none of the area homeowners can afford to risk losing any amount of equity in their homes at the expense of the County and Ward increasing their revenues. Even outside of the aesthetic sense the Ivey site brings, I'm looking bigger picture at all of the surrounding proposed (and COGCC approved) wells along E-470. It covers many square miles, some of which are undeveloped, but nonetheless, if all drilling and production goes as planned, I would imagine north Thornton to easily become a less desirable and less valuable area to raise a family.

3) I don't feel like Ward's proposed project summary addresses traffic at all. It's great they talked about traffic on their private road, but how about truck traffic during drilling? They haven't addressed all the water truck traffic that will be needed to complete hydraulic fracturing. If you've ever dropped kids off @ Silver Creek Elementary in the morning, then you're aware of the already present congestion at the intersection of York and 152nd. Numerous water truck traffic will only further congest this, significantly if trucks are routed down 144th to York. Neither Ward, nor Adams County has addressed these concerns to my knowledge.

I truly believe these wells should be pushed further outward to rural areas where the environmental, health, and safety concerns are less, due to little or no population.

I strongly believe that the only way the County should approve these wells is if there is not a production pad to include all of the tanks and equipment. All fluids should again be pipelined

to a more remote location.

This facility and the Todd Creek facility will set precedence for future O&G activity, so now is the time to put this in the Commissioner's hands for a vote. I vote no. I like Adams County as it is. If it's going to look like Weld County in the years to come, then Adams County is not where I want my family to be.

Thank you for understanding my concerns,

Sincerely,

Jeff Merrell, CSP

**From:** [Jennifer Monk](#)  
**To:** [Chris Simmons](#); [Steve O'Doriso](#); [Eva Henry](#); [Mary Hodge](#); [Erik Hansen](#); [Chaz Tedesco](#)  
**Subject:** Comments on the new IVEY proposal  
**Date:** Wednesday, March 01, 2017 12:32:34 PM

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Dear Representatives,

Ward Petroleum has changed their initial proposal from 1.5 mile lateral wells to 3 mile lateral wells. This 26-well site (with up to 26 additional wells) is to be located approximately 3,200 feet from Silver Creek Elementary School. It will bring an additional 55,000 industrial truck trips to Highway 7. I am not at all happy with this because it will make it more dangerous for kids. I also do not want to have to pay for the extra wear and tear on the roads which will come from taxpayer dollars. I also do not like that that many trucks will make the road more dangerous to travel. Those truckers pull out in front of people and take unnecessary chances all the time when entering traffic. This is a terrible thing to have happen and I ask that you say no to Ward Petroleums proposal. Thank you, Jennifer Monk Loveland, Colorado

**Comment 42**

**From:** [J. P.](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comment for Ivey/Wadley permit application  
**Date:** Monday, March 06, 2017 2:25:17 PM

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Dear Adams County Commissioners:

I am submitting the following article for official record and also to be included as comments for the Ivey/ Wadley permit application. The community will hold each of you and the county liable for any damages and/or suffering caused by large frack sites within our neighborhoods. The following article illustrates how pollution (air, water, environmental) can affect the health and well-being of children. The community is urging you to reject these sites.

"A quarter of all global deaths of children under five are due to unhealthy or polluted environments including dirty water and air, second-hand smoke and a lack of adequate hygiene, the World Health Organization (WHO) said on Monday.

Such unsanitary and polluted environments can lead to fatal cases of diarrhea, malaria and pneumonia, the WHO said in a report, and kill 1.7 million children a year.

"A polluted environment is a deadly one -- particularly for young children," WHO Director-General Margaret Chan said in a statement. "Their developing organs and immune systems, and smaller bodies and airways, make them especially vulnerable to dirty air and water."

In the report -- "Inheriting a sustainable world: Atlas on children's health and the environment" -- the WHO said harmful exposure can start in the womb, and then continue if infants and toddlers are exposed to indoor and outdoor air pollution and second-hand smoke.

This increases their childhood risk of pneumonia as well as their lifelong risk of chronic respiratory diseases such as asthma. Air pollution also increases the lifelong risk of heart disease, stroke and cancer, the report said.

The report also noted that in households without access to safe water and sanitation, or that are polluted with smoke from unclean fuels such as coal or dung for cooking and heating, children are at higher risk of diarrhea and pneumonia.

Children are also exposed to harmful chemicals through food, water, air and products around them, it said.

Maria Neira, a WHO expert on public health, said this was a heavy toll, both in terms of deaths and long-term illness and disease rates. She urged governments to do more to make all places safe for children.

"Investing in the removal of environmental risks to health, such as improving water quality or using cleaner fuels, will result in massive health benefits," she said.

Reporting by Kate Kelland, editing by Jeremy Gaunt

<http://www.reuters.com/article/us-health-pollution-who-idUSKBN16D00H>

**From:** [J. P.](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comment on Ward Ivey/Wadley Permit Application  
**Date:** Sunday, March 05, 2017 9:45:01 PM

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"Courage is rightly esteemed the first of human qualities . . . because it is the quality which guarantees all others." -Churchill

Have courage and stop the Ivey and Wadley sites. You know deep in your heart that drilling within neighborhoods so close to where we live and raise our children is abnormal and unethical.

As gatekeepers to this community you cannot bow down as they try to steal our freedom to protect our families and neighbors, our peace of mind, our quality of life and our human right to live in safety. Have courage and keep this ruthless industry from our communities.

Have courage to stand for the vulnerable- all of the children who are the voiceless and are counting on you to act with compassion, love and understanding. You know what they will be exposed to. Is the image of a child gasping for air from asthma not enough? Is the image of a child fighting for their life from benzene-induced leukemia not enough for you to act?

What is enough? What can't your heart take?

Even if we lose one life from this toxic environment, do they not matter? Why?

Is the risk worth a persons life and money?

How did you get to this place in life where you cannot stand up for a child?

Thousands of people are counting on you to stop these sites.

Have courage.

Have humanity.

Regards,  
Jeanette Pidanick

**From:** [jonimsale@gmail.com](mailto:jonimsale@gmail.com)  
**To:** [Chris Simmons](#)  
**Subject:** Stop Fracking!  
**Date:** Sunday, March 05, 2017 10:43:37 PM

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Fracking near Silver Creek Elementary is careless and negligent! Please stop fracking near our children!!! Traffic and Noise and Air Pollution CANT BE GOOD for our CHILDREN!

Please relocate and frack somewhere down the road... pipe it in if you need!?!? Just don't put our community and AWESOME school, SILVER CREEK ELEMENTARY, at risk for accidents, trucking, pollution! FIND another place for your Fracking!!! Please!!

Joni Sale

Haven At York Street!

Sent from my iPhone

**From:** [katerina chamot](#)  
**To:** [Chris Simmons](#)  
**Subject:** Don't allow Ward to frack  
**Date:** Thursday, March 02, 2017 2:25:52 PM

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Katerina Chamot  
2469 E. 148<sup>th</sup> Place  
Thornton, Colorado 80602

Department of Community and Economic Development  
4430 South Adams County Parkway  
Suite W2000A  
Brighton, CO 80601-8216

March 2, 2017

Dear Committee for Community and Economic Development,

I am a homeowner living in the Haven community less than ½ mile from the proposed Ward Petroleum Ivey Well Pad site that will allow 26 wells to be drilled. The site is too close to our schools and homes and we, as the community, **do not want fracking** in our neighborhood.

I urge you to **not** allow Ward to come into our neighborhoods. I am concerned about our health, earthquakes, water quality and decreased house values.

I have attended the Ward Petroleum meetings and I am gravely concerned. Recent news suggests that fracking is not safe. Fracking has been linked to earthquakes and health issues for adults and children living close to the fracking sites.

On September 3, 2016 the state of **Oklahoma had to shut down 37 wells that were responsible for earthquakes**. I do not want the same thing to happen in my community.

John Hopkins University, on August 24, 2016, reported that fracking caused an increase in severe headaches, severe fatigue and chronic nasal and sinus symptoms. Other research showed an increase in premature births, asthma attacks and indoor radon concentrations. The Ivey site is less than ½ mile to Silver Creek Elementary where children spend a majority of their lives.

I am afraid for my health and the welfare of my community. Please do not allow Ward Petroleum to frack in our neighborhood destroying our health and our community.

Thank you,

Katerina Chamot

**Comment 46**

**From:** [Kathy Frank](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Erik Frank \(erik.frank@mizunousa.com\)](mailto:erik.frank@mizunousa.com)  
**Subject:** Ivey Site  
**Date:** Thursday, February 16, 2017 11:15:17 AM

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Chris,

I received your contact information to write to about any concerns or comments in relation to the proposed Ivey site. We live in the Haven at York Street, right in front of Silver Creek Elementary School. I have overall concerns with the size of the site, additional traffic impact to the area and overall health concerns – a lot of which are unknown. Recently KDVR had an article on a study conducted that claims children and young adults with acute lymphocytic leukemia were 4.3 times more likely to live in areas of high-density oil and gas (see link below). I personally feel that until we can better understand the impact this type of a site would have to the local area, especially any health concerns, we really need to pause and better understand the long-term impact to the local community. An elementary school is very near the site and it would be very sad to see any of those children impacted negatively by a decision like this.

<http://kdvr.com/2017/02/15/more-cases-of-childhood-leukemia-found-in-areas-of-high-density-oil-and-gas-development/>

I appreciated your consideration and time in listening to the local concerns.

Regards,  
Kathy & Erik Frank

**From:** [kymand@aol.com](mailto:kymand@aol.com)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Petroleum Ivey Well Pad  
**Date:** Monday, March 06, 2017 4:31:55 PM

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Dear Mr. Christopher Simmons or to Whom it May Concern,

I am writing to you as a voter, Adams county tax payer and resident of the York Street community. I would like you to take into consideration my concerns and disapproval for allowing 26 wells and 1 well pad to be active on site in our neighborhood. I have many concerns and issues with this development occurring mostly from an environmental impact standpoint. Colorado should be on the forefront of developing and promoting clean energy and not allowing money or persuasion from these companies to compromise what is best for its citizens.

Please take into consideration my message from a concerned resident,

Thank you for your time, Kim Harmon

**From:** [Leslie Coon](#)  
**To:** [Steve O'Dorisio](#); [Chaz Tedesco](#); [Eva Henry](#); [Mary Hodge](#); [chansen@adcogov.org](mailto:chansen@adcogov.org); [Chris Simmons](#)  
**Subject:** Comments regarding the Ward IVEY pad  
**Date:** Tuesday, February 21, 2017 1:34:39 PM

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I was in Silt Colorado when they added numerous wells. People's drinking water turned poisonous from wells 100 yards from their home. They had to buy filtered water, and that water ran out.

**From:** [Laura Harris](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorisio](#); [Mary Hodge](#); [Erik Hansen](#); [Norman Wright](#)  
**Subject:** Ward Petroleum Ivey Well Pad USR2016-0006 Comments - Laura & Dave Harris  
**Date:** Monday, February 27, 2017 5:12:46 PM  
**Attachments:** [image002.png](#)  
[USR2016-00006 Comments - Laura & Dave Harris.pdf](#)

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Dear Mr. Simmons –

Please find the attached comments regarding the subject permit application. Our comments are also provided below. Thank you for your consideration.

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February 26, 2016

Christopher Simmons  
Adams County Community and Economic Development  
4430 South Adams County Parkway, 1<sup>st</sup> Floor, Suite W2000  
Brighton, CO 80601-8204

Re: Ward Petroleum Ivey Well Pad USR2016-00006 Comments

Dear Mr. Simmons:

We are strongly opposed to approving the subject permit application. Our concerns about the subject application and proposed mitigations are summarized below.

1. **Due to the project scale, duration, and proximity to existing and planned neighborhoods and schools, the application should be referred to the Adams County Commissioners for a vote. A public hearing should be held to allow ample opportunity for public education, involvement, and formal public comment.** Although the Ivey project will affect nearly 2,000 residences, the COGCC approved the Ivey well pad permit without any public notice or input as there are no residences within a 1,000-foot radius of the well pad. The notification area for Ward Petroleum's informational meeting left many affected residences out of the process. Further, some of the information presented in the informational meeting conflicts with the information in Ward Petroleum's application. Phase 2 of this project is 20 – 40 years; the longevity of the project warrants a public hearing. My family and nearly 2,000 others will be directly impacted by the proposed project. We deserve to have a voice in the permit approval process.

Permitting an industrial project in an area that is zoned for agricultural use and lies in the midst of several schools and neighborhoods is a non-starter. The project should incorporate the highest level of safeguards to protect community health, safety, and property values.

2. **Require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks.** A pipeline is required to reduce health and safety issues related to the project, preserve the quality of life in our community, minimize the visual impact of the industrial project, and reduce the

risk of real estate property value losses. Use of pipeline would minimize the impact of dangerous heavy truck traffic in an area frequently travelled by young children and families travelling to and from local schools. In addition, inversions frequently occur in the Big Dry Creek valley where the production pad will be located. During an inversion event, a heavy concentration of hazardous emissions will be trapped in the extent of the inversion area which encompasses multiple neighborhoods and schools and increases the risk of asthma attacks and other medical issues.

3. **Require the exclusive use of E-470 during the drilling and fracking operations.** The access plan presented in Ward Petroleum's information meeting overlaps with primary routes used by school buses, young drivers, and families travelling to and from area schools. Use of E-470 would significantly reduce the dangerous heavy truck traffic near schools and neighborhoods.
4. **Restrict truck traffic to protect community safety and quality of life.** Truck traffic associated with drilling operations should be restricted to avoid school start and release times, rush hour and evening sleeping hours.
5. **Require a fence with locked gate around the full perimeter of the production area.** Installation of a perimeter fence should be a requirement to safeguard against children entering the production site and mask the production area. A perimeter fence should be a requirement rather than an option at the discretion of the surface owner.
6. **Require a detailed emergency response plan.** As the production facility is close to existing and planned neighborhoods and schools, a detailed emergency response plan including safety mitigation measures should be prepared and communicated to area schools and residences within a ½ mile radius of the site. In addition, the applicant should be required to verify that first responders have the appropriate material and training required to handle an oil and gas fire prior to drilling operations.
7. **Require a 500-year flood safe design to reduce the flooding and environmental risks associated with intense storms.** The production pad location is in an area known to be subject to flooding during intense storms. The proximity to schools and planned and existing neighborhoods warrants additional safety precautions to protect the community from spills, runoff, and other hazards.

Thank you for your consideration.

Sincerely,

Laura & Dave Harris  
15097 St Paul St  
Thornton, CO 80602

**From:** [Laura Ruch](#)  
**To:** [Chris Simmons](#)  
**Subject:** Public Comments for Ward Petroleum Ivey Well Pad  
**Date:** Tuesday, February 28, 2017 8:26:15 PM  
**Attachments:** [9ED6683B-1AA4-4760-95F6-4F7BA965CE2E\[26\].png](#)  
**Importance:** High

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Christopher Simmons

Hello, I hope this email finds you well. I am writing you today as a concerned citizen, neighbor, business owner and most importantly a mother. I am increasingly concerned about the use permit being considered for the Ward Petroleum Ivey Well Pad. I understand that our current laws favor oil production, fracking and business, while I am not altogether against oil exploration I am deeply concerned that this site in particular has been considered at all, especially for this massive scope of a project. I am sure you are aware but there are several factors that should prevent this use permit from being approved. As I see it there are 3-5 major issues and I would appreciate your thoughtfully reflection on these.

1. Less than 1/2 mile from this site is an elementary school where over 600 K-5 graders attend on a weekly basis from August til June. The burn of from these sites is known to contain chemicals that can be extremely harmful especially to the young. It is also important to think about what could happen should an accident occur at the site and the harm that could come due to the close proximity to a substantial amount of children. If for no other reason I implore you on this basis alone to deny this permit.
2. The massive scope of an almost 3 miles horizontal fracking run has not been done in Colorado and to have the 1st project of this kind being done under almost 1300 residential homes, seems at the very least irresponsible. This has potential unforeseen consequences such as devaluation of property, potential earthquakes (the earthquakes in TX and OK are those that are located near these longer horizontal fracking runs).
3. The roads accessing these sites are mainly residential and the infrastructure is not adequate to allow for the type of traffic expected; we are looking at a public safety hazard.
4. This site is located very close to a 100 year flood plane and areas around here flooded within the last 5 years...the environmental impact and danger to the waterway is a real threat.
5. The area surrounding this site is protected open space mainly due to nesting owls and hawks. I think it's important that we look at smart growth and that includes allowing for the protections of wild life and planned open space.

Again, I thank you for your time and consideration.

Laura Ruch  
Degree/Designations BS, CRS, GRI , TRC, SFR, QSC Broker Associate  
2015-2016 Chairwoman & Director, Denver Metro Association of Realtors®  
Past Chair, Colorado Assoc. of Realtors®-Young Professionals Network



The Ruch Group at Keller Williams Preferred Realty

Cell: 720.289.7653

Office:303.452.3300

E-Fax:720.223.6082

Lauraruch@ruchgroup.com

[lauraruch@KW.com](mailto:lauraruch@KW.com)

11859 Pecos St., #200

Westminster, CO 80234

**Comment 51**

RECEIPT ACKNOWLEDGEMENT REQUESTED

DATE: March 6, 2017

TO: Chris Simmons of Adams County (csimmons@adcogov.org)

RE: Comments on Ward Ivey site

FROM: Michelle Dupree, resident of The Haven, walking distance adjacent to proposed well pad site.

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

The following are my comments as an **adversely impacted resident** of the Ward Ivey Permit Application in accordance with the comment period which closes March 6, 2017. I respectfully request a response in writing to each of my concerns.

**1. Comment #1- Request for the Ivey application to be put to a vote including a public hearing.**

There was over 1,000 petition signatures requesting a vote/ hearing from residents who happen to be aware of the situation. There are many more residents who will be impacted who are still unaware of the situation. 3200 feet from an elementary school and a large scale housing development is simply not ethically responsible and the impacted public deserves a right to have a say in the matter. This issue needs to be put to a vote and a public hearing held.

**2. Comment #2-Gather more information on the potential for harm to residents before proceeding including:**

- Implement a study on the impact of temperature inversions on trapping of airborne emissions from the Ivey site. Adams County should work with CDPHE, TriCounty Health, City and County of Broomfield, the University of Colorado and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality both before substantial drilling occurs.
- Impact on property values relative to the size and scope of this particular large scale development, not general studies repurposed. This has the potential to be the largest site in the county and potentially the state. What is the financial harm to come to the surrounding residents?
- Conduct a review of the flooding concerns that have been raised
- Require a more detailed traffic impact study held during school release hours to address school bus route considerations and high risk areas such as the pinch point bridge on York Street north of the E-470 interchange.

**3. Comment #3-Enforce important conditions for application consideration**

- Enforce the use of pipelines and require documentation of such plans in the application as condition for application approval
- Require the use of E-470 for all Ward Ivey traffic rather than relying on local roadways which will impact traffic and safety.
- Require more detail in the application documentation relating to the impact on residents-missing detail outlined below.

#### **4. Comment #4- Lack of application disclosure detail relating to relevant details**

- There is ambiguity and missing relevant information in the Ward application including:
  - Is Ward using pipelines or not?- the application does not specifically say yet the traffic study was based on this assumption
  - The site map shows 44 tanks yet why are tanks needed if pipelines will be used? What specifically is the development going to look like?
  - There are no actual dates for each phase as well as completion date. A Ward representative told me at one of the meetings this would go on for years and years. What are the dates of all phases including final end date?
  - There is no information on sound mitigation for location 1, only location 2
  - It does not appear to me the renderings are to scale, The two small existing tanks directly to the east appear close to the same size as most of the tanks. Is this misleading? What will the visual impact be during each of the phases including the maximum tank usage phase?

As one final point, this is an unbelievable injustice towards residents who will certainly suffer financial harm and can only hope they do not suffer permanent health problems. The fact that all elected officials point to the state and the state does not care is something I never thought I would experience. The process, incumbent upon the impacted citizens to become “speed schooled” on the nuances of the oil and gas industry is also heavily unjust in that the only action possible is to read a 155 page application that is specific in details that only a professional of the oil and gas industry or a long studied individual citizen would be able to read through with an eye towards checking for proper checks and balances to protect residents. Therefore, the details outlined in the ACCDAN and the North Metro Neighbors for Safe Energy are echoed by me as well and I would also like responses to their comments sent to me as well. These volunteers, sadly, are the only people looking out for the interests of the citizens.

Sincerely

Michelle Dupree

**From:** [Mike McClymonds](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments regarding Ward Petroleum Ivey Well Pad, Project: USR2016-00006  
**Date:** Thursday, March 02, 2017 12:28:08 PM  
**Attachments:** [USR2016-00006 Haven HOA Comments R1.docx](#)

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Dear Mr Simmons,

Please find attached the subject comments.

Please respond back your receipt of this email.

--

Respectfully,

Mike McClymonds  
[mike.mccclymonds@gmail.com](mailto:mike.mccclymonds@gmail.com)  
720-917-8605 cell

February 20, 2016

Christopher Simmons  
Adams County Community and Economic Development  
4430 South Adams County Parkway, 1<sup>st</sup> Floor, Suite W2000  
Brighton, CO 80601-8204

Re: Ward Petroleum Ivey Well Pad USR2016-00006 Comments

**This document is being emailed as directed to: csimmons@adco.gov**

Dear Mr. Simmons:

The Haven at York Street Homeowners Association, representing 519 homeowners, is strongly opposed to approving the subject permit application. Our concerns with Ward Petroleum's application are summarized and proposed mitigations are summarized below.

- 1. Due to the project scale, duration, and proximity to existing and planned neighborhoods and schools, we respectfully request that the application be referred to the Adams County Commissioners for a vote and that a public hearing be held to allow ample opportunity for public education, involvement, and formal public comment.** The COGCC approved the Ivey well pad permit without any public notice or input as there are no residences within a 1,000-foot radius of the well pad. The notification area for Ward Petroleum's informational meeting left many affected residences out of the process and it appears that some of the information presented in the informational meeting conflicts with the information in Ward Petroleum's application. Our community will be directly impacted by the proposed project and deserves to have a voice in the permit approval process.
- 2. Require the use of a pipeline for all production fluids and gases to off-site separators, combustors, and storage tanks.** A pipeline is required to reduce health and safety issues related to the project. Inversions frequently occur in the Big Dry Creek valley where the production pad will be located. During an inversion event, a heavy concentration of hazardous emissions will be trapped in the extent of the inversion area increasing the risk of asthma attacks and other medical issues. Incorporating a pipeline into the project would also help preserve the quality of life in our community, minimize the visual impact of the industrial project, and reduce the risk of real estate property value losses.
- 3. Require the exclusive use of E-470 during the drilling and fracking operations.** The access plan presented in Ward Petroleum's information meeting overlaps with primary routes used by school buses, young drivers, and families travelling to and from area schools. Use of E-470 would significantly reduce the dangerous heavy truck traffic near schools and neighborhoods. Per Wards representative they will require a minimum of 5,000,000 gallons of fracking fluid per well which equates to 833 truck loads per well or a total of 21,667 truck loads.
- 4. Require a 500-year flood safe design to reduce the flooding and environmental risks associated with intense storms.** The production pad location is subject to flooding during intense storms. The proximity to schools and planned and existing neighborhoods warrants additional safety precautions to avoid spills, runoff, and other hazards. During the 12 years I have lived in the neighborhood, this area has been under water on numerous occasions.

5. **Require a fence with locked gate around the full perimeter of the production area.** Installation of a perimeter fence should be a requirement to safeguard against children entering the production site and to reduce negative aesthetic impacts. The permit application stated that a perimeter fence would only be installed at the request of the surface owner.
6. **Restrict well drilling traffic to protect community safety and quality of life.** Truck traffic associated with drilling operations should be restricted to avoid school schedule times, rush hour and evening sleeping hours.
7. **Require a detailed emergency response plan.** Due to the proximity to existing and planned neighborhoods and schools, a detailed emergency response plan including safety mitigation measures should be prepared and communicated to area schools and residences within a ½ mile radius of the site. In addition, the applicant should be required to verify that first responders have the appropriate fire suppressant material and training required to handle an oil and gas fire prior to drilling operations.

Thank you for your consideration.

Sincerely,

Mike McClymonds  
President, Haven at York Street HOA

**From:** [Mikayla Norcross](#)  
**To:** [Chris Simmons](#)  
**Subject:** Fwd: Ivey Fracking site Comments  
**Date:** Monday, March 06, 2017 3:53:30 PM

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My Apologies. I forgot to further request a public hearing and a vote by the Adams County Board of Commissioners for the Ivey Site.

Thank you again for your time,

Mikayla Norcross

----- Forwarded message -----

**From:** **Mikayla Norcross** <[mladwig20@gmail.com](mailto:mladwig20@gmail.com)>

**Date:** Mon, Mar 6, 2017 at 3:49 PM

**Subject:** Ivey Fracking site Comments

**To:** [csimmons@adcogov.org](mailto:csimmons@adcogov.org)

Receipt Acknowledgement Requested

To: Chris Simmons of Adams County

Re: Ivey oil well site request for comments

As residents of Adams County and the City of Thornton, we are outraged that such a largescale fracking operation is likely to be allowed right in our backyards. First and foremost on our list of major concerns are the negative health and safety implications on our residents and community. While immediate health issues have not been substantial, long-term effects on health are largely unknown which makes this project irresponsible. Long-term exposure to gasses and chemicals could possibly be linked to chronic and deadly diseases-long after exposure to such chemicals has ended. There is simply not enough data to allow so many of our residents to be exposed in such a way.

However, as frustrated as we are with Colorado's decision to ignore our pertinent health concerns, we do not feel we will be able to overturn the decision to allow fracking in this community and others like it. We therefore have a list of questions and requests which we feel must be addressed before the Ivey well site application is approved. We would like to request that air studies be conducted before and during drilling operations and that proper mitigation be taken to ensure emissions are not being trapped in our area. We also request that Ward Petroleum agrees to building a pipeline for product transmission before any drilling occurs. We would like any oil and gas traffic to be mandated to use E-470 instead of roads in local communities to protect our residents and our infrastructure.

Furthermore, we believe it is in our best interest for the following questions to be addressed before approval of Ward Petroleum's application:

- Are these wells only hold by production (HBP) and will be single well facilities, or will there be future expansions?
- How many wells will be fed into a facility?
- Will there be central processing sites for oil?
- Will there be central processing sites for gas? Compressor stations?
- Where will the compressors be located - concerned about noise?
- Who owns the mineral rights?
- Do we receive monetary compensation for the production of wells in our area due to the fact that we own the surface rights?
- Is the gas sweet or sour? H2S?
- What is the safety record of Ward Petroleum?
- What will be done with the produced water? Injected into the ground? Will it affect our water source?
- What are the traffic routes planned for the trucks?
- Will there be an oil and water pipeline verses trucking?
- How are process safety events handled? What is Ward's record on process safety events?
- How will we be notified of oil spills or gas releases? What is the numerical value at which this needs to be reported?
- What is the 10 year plan for the field?

Thank you for taking the time to review and address the concerns of our community. We look to Adams County to protect us and our children now and in the future.

The Norcross Family

North Creek Farms, 166<sup>th</sup> & Highway 7

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**Mikayla Norcross**  
[mladwig20@gmail.com](mailto:mladwig20@gmail.com)

**Comment 54**

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**Mikayla Norcross**

**From:** [Mike Pidanic](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments on Ward Ivey Permit Application  
**Date:** Sunday, March 05, 2017 9:33:17 PM

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It is ludicrous to say that large industrial oil and gas drill sites where industrial toxic chemicals are used, and where there are round the clock emissions which contain known carcinogens like benzene and other BTEX compounds, will cause no harm to the communities where they are building these. At the Ivey site there are new houses being built right across the street a few hundred feet away and just down the road from Silver Creek Elementary school, one of the best schools in Adams 12 district. Yet when these frack sites have had blow outs the spray of toxic hydrocarbons and waste water has been know to go as far as 2000 feet. Any elementary school child can do the math to know that the Ivey site is recklessly close to our neighborhoods and schools.

To pretend that this is respectful to the citizens of our community who have been robbed of their mineral rights and their basic human right to live in peace and safety is a farce. It is disgusting that our city and county representatives have so little regard for their citizens, knowingly putting them in harms way, and for what? To make a buck? Show some moral fortitude and oppose drilling in residential neighborhoods! Please stop the Ivey and Wadley drill sites!

Michael Pidanic

DATE: February 20th, 2017

TO: Chris Simmons of Adams County ([csimmons@adcogov.org](mailto:csimmons@adcogov.org))

RE: [https://www.adcogov.org/sites/default/files/USR2016-00006\\_Request\\_for\\_Comments.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Request_for_Comments.pdf)  
and [https://www.adcogov.org/sites/default/files/USR2016-00006\\_Permit\\_Application.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Permit_Application.pdf)

Dear Mr. Simmons,

My wife & I are residents in Adams County and the City of Thornton, living in the Trailside Community. We are extremely concerned about the proposed Ivey oil well site planned for 152nd Parkway. Not only is there environmental danger and risk, but health and safety risk as well. We live next to the Big Dry Creek, and purchased our home here largely because of the natural beauty and quality of life. We have Eagles, Foxes, and other wildlife in here that must be protected.

We are strongly opposed to this project or others like it anywhere near the Big Dry Creek Dedicated Open Space.

Sincerely,

Martin & Debi Warner  
15645 Columbine Street  
Thornton, CO 80602  
[martin@quietcrossing.com](mailto:martin@quietcrossing.com)  
303-505-3174

The image shows two handwritten signatures in black ink. The top signature is a cursive name, likely 'Martin', and the bottom signature is another cursive name, likely 'Debi'. Both signatures are written in a fluid, connected style.

**From:** [Paul Cully](#)  
**To:** [Chris Simmons](#); [Steve O'Dorisio](#); [Eva Henry](#); [Mary Hodge](#); [Erik Hansen](#); [Chaz Tedesco](#)  
**Subject:** Comments on the new IVEY proposal  
**Date:** Thursday, March 02, 2017 8:41:37 AM  
**Importance:** High

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To all:

To permit drilling for oil & gas a thousand feet away from an Elementary School is to endanger innocent children and exposes them to toxic well hole emissions. This is flat out just plain wrong. Oppose the new IVEY proposal and protect the children.

Paul Cully  
5 Ezras Way  
Dover, NH 03820  
978-692-2498  
[pac4patriot@comcast.net](mailto:pac4patriot@comcast.net)

**Comment 57**

**From:** [Phillip Doe](#)  
**To:** [Chris Simmons](#); [Steve O'Dorisio](#); [Eva Henry](#); [Mary Hodge](#); [Erik Hansen](#); [Chaz Tedesco](#)  
**Subject:** Comments by Be the Change on the new IVEY proposal  
**Date:** Monday, March 06, 2017 3:37:04 PM

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Dear Commissioners:

We strongly support the position of citizen groups, the ACCDEN and NMNSE, concerning Ward Petroleum's proposed Ivey drilling site where 26 wells are planned for one pad, with more purportedly on the drawing board. A full public hearing is required, for this proposal constitutes a massive invasion of heavy industry into homes and neighborhoods. The scientific evidence concerning the many health and safety dangers associated with fracking, particularly in urban areas is overwhelming. It is what caused the chief medical officer of New York state, Dr. Howard Zucker, to recommend banning the practice in that state. He recently finished his review of all scientific literature published since the first ban in 2014 and recommended to the governor that the ban stay in full force and effect. Surely, the people of Adams County are no less deserving of government protection from harm than those of New York?

Thus, may we suggest that at the very least the county commissioners have a constitutional obligation to hear the citizens on this issue? Indeed, no issue looms larger for citizens confronted with the fearsome prospect of a forest of oil wells near their back yards and schools and the certain impacts these belching industrial facilities will have on their health and that of their children. The basic principles of democratic government make it imperative you hear directly from the people in open forum on this issue. It is a denial of the will of the people and their sovereignty to do otherwise. We are sure you can and will agree.

Phil Doe  
Environmental Director  
Be the Change

**From:** [Rebecca Acevedo](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Ric Aparicio](#)  
**Subject:** Concerned Parents Writing About Proposed Ivey Fracking Site Near Our Home  
**Date:** Sunday, March 05, 2017 4:19:02 PM

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Dear Chris Simmons, Adams County Staff and Adams County Commissioners:

My husband, Ric Aparicio, and I are residents of The Haven neighborhood in Thornton and are concerned about Ward Petroleum's proposed drilling for fracking operations near our home. As parents of a disabled, medically fragile child who attends Silver Creek Elementary, it is quite concerning that Ward Petroleum appears to be negligent in addressing environmental concerns stemming from their proposed fracking operation. We believe that transparency and accountability to Adams County residents who will be impacted by these proposed operations is critical to ensuring that the community's interests are taken into account and that our concerns are addressed. Thus, we are requesting that there be a public hearing to review Ward Petroleum's application and that this application be put to a vote by the Adams County Board of Commissioners in keeping with the board's fiduciary duties to safeguard the interests of its constituents. Given our daughter's already compromised health, we are quite concerned that Ward Petroleum is seeking to push through their drilling application without adequately addressing the concerns raised by citizens like ourselves regarding the health and environmental impacts of their proposed activities.

We trust that you will represent the interests of our community by ensuring that there is a public hearing on this issue and that the Adams County Board of Commissioners will put Ward Petroleum's application to a vote.

Thanks in advance.

Respectfully Yours,

Rebecca Alstrum-Acevedo &  
Ric Aparicio

**From:** [Raegen Alvarado](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Petroleum Ivey well pad  
**Date:** Thursday, February 16, 2017 3:40:37 PM

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Dear Mr. Simmons. We are strongly against the proposed Ward Ivey well pad going in at 152nd and York. This poses a threat to the value of our properties and our land. We have lived in this area for 16 years and do not want it disturbed by Fracking. In addition it will have negative effects on our ground water, soil, and the natural tectonic plates structure. We have a well behind our house and it's spilled 4 years ago which caused a lot of damage. Most of the underground pipes at this site were completely rotted out and had been leaking for several years. The cleanup of this took a very long time. We had been assured that fracking is never an issue and would never leak, but in this case, that information was false. The effects of this is yet to be known but there should be no more room for error. This simply should not pass and these wells should not be placed at the proposed site or anywhere near our area. We strongly oppose this action.

Raegen Alvarado  
16522 Gilpin Street  
Thornton, CO 80602

**Comment 60**

**From:** [Ruth Ellison](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site  
**Date:** Wednesday, February 22, 2017 8:09:55 AM

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Dear Mr Simmons,

I attended the Broomfield Community Meeting last night with presenters from the Dept of Health, Mr Lapore, Extraction Oil and Neighborhood groups. Four pads with 139 horizontal wells are being considered along the Northwest Parkway, sites not yet permitted. The entire meeting can be seen on the Broomfield City website and I suggest you watch it.

I learned some things that may help the Ivey site and hope you will consider these suggestions when reviewing the permit by Ward. These two situations are very different in that Extraction does not have a permit yet but they have taken the approach of working with the city and the community first, a very novel and much appreciated way to do the drilling. Extraction is planning to:

1. Install the pipeline and do a one million landscaping project before they ever start drilling.
2. They are using a closed system with no tanks. Tanks are the greatest source of VOC's they said so they are piping the oil off site.
3. The pipeline also means no trucks on the roads designed for cars.
4. They are using electric drills to reduce noise. IN fact, Extraction said that when they are in the production stage you should only hear noise equal to a vacuum cleaner from 500 feet.
5. There are no flowbacks with their system so it is much safer.
6. And they mentioned "alternative site perspectives"...something my husband and I have suggested for Ivey because of the issues involving Big Dry Creek...specifically air inversion and flood plain. Along with that thought Mr Lapore said in the permitting process the COGCC looks at rule 604.c(2)E that says " the site should be as far as possible from homes" and I don't believe the Ivey site meets that criteria.

So I am asking for the closed system with pipeline and no caveats for economic feasibility. It would eliminate truck traffic, VOC emissions, and improve the visual presentation of the site thus helping to maintain our property values (and hence Adams County property tax base). I am asking that an alternative site be considered for air inversion and flooding issues (moving it slightly west would put it on higher ground). I am asking that Adams County "do the right thing" for the citizens of the county.

Ruth Ellison

**Comment 61**

**From:** [Ruth Ellison](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Well Site Drilling Input  
**Date:** Friday, February 17, 2017 8:53:30 AM

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Dear Mr Simmons,

I am writing in response to the recent letter I received asking for comments on the Ivey Drill Pad number 0157311400006.

I hope my comments will be read and considered and then not written off as simply a homeowner who is caught up in the "NIMBY" syndrome. I recognize the need and importance of drilling for oil but I want it done safely with the impact on neighboring communities as the first priority. I would like politics to be put aside and health/safety issues to come first. When we know so little of the long term impacts of fracking it frightens me that studies are dismissed. Just this week a CU professor found a link with cancer near fracking sites and our Colorado Health Dept (along with the Colorado Oil and Gas Commission) had that report squashed! I am counting on my local Adams County employees to rise above the politics.

So when we talk health/safety please consider the location of the Ivey Pad. It is above the 100 year flood plan but just barely. When we get those wonderful Colorado rains Big Dry Creek rises quickly and often floods York St just south of E470. We know what happened a few years ago in Lyons and we should be prepared for future floods. The Ivey should be moved to higher ground and further from Big Dry Creek. And speaking of Big Dry Creek...the air inversion around the creek is another health issue. CDOT has put a sign on I-25 near the creek crossing and east of the Westminster Plant that dumps into the creek reminding drivers of fog in that area. Big Dry Creek snakes east and north past neighborhoods and the projected site. Air inversion follows that creek and traps emissions... Regulation #7 is not strong enough...it doesn't deal with air inversion.

I have read the info about fencing, reclamation, erosion, traffic , general housekeeping, etc. (all issues that Ward can later say they addressed) but they are just window dressing answers, They have not looked at the over 2,500 homes impacted by trucks, noise and safety. They simply say they are within their rights because no buildings are within 1,000 feet of the site. But is that enough? When do we as citizens and county officials stand up for our homes and county? When do we expect better from each other?

Please review their petition for more than "i's" dotted and "T's" crossed. Perhaps allowing a public hearing before our county commissioners is something to consider. Our future health and the value of our homes is riding on the decision,

Ruth Ellison

**From:** [Rob Migliore](#)  
**To:** [Chris Simmons](#)  
**Cc:** [house@themigliores.com](mailto:house@themigliores.com)  
**Subject:** Re: Ivey site comments  
**Date:** Friday, February 24, 2017 6:58:50 PM

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Chris, another comment related to the noise. As this site borders the City of Thornton, we are assuming that noise levels of 50db 7p-7a and 55db 7a-7p will not be violated within city limits as a result of drilling / operations.

Rob

On Feb 18, 2017, at 10:47 PM, Rob Migliore <[robmigliore@gmail.com](mailto:robmigliore@gmail.com)> wrote:

Hello Chris, please find our comments enclosed and confirm receipt.

Thanks,

The Migliores

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DATE: February 18th, 2017

TO: Chris Simmons of Adams County ([csimmons@adcogov.org](mailto:csimmons@adcogov.org))

RE: [https://www.adcogov.org/sites/default/files/USR2016-00006\\_Request\\_for\\_Comments.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Request_for_Comments.pdf) and  
[https://www.adcogov.org/sites/default/files/USR2016-00006\\_Permit\\_Application.pdf](https://www.adcogov.org/sites/default/files/USR2016-00006_Permit_Application.pdf)

As a nearby resident in Adams County and the City of Thornton, please find enclosed my concerns about the proposed Ivey oil well site planned for 152nd Parkway.

### **Pubic Health & Environmental Safety Concerns**

The proposal includes for onsite storage of 36 crude oil and 8 waste water tanks holding approximately 20,000 gallons each, or almost a **MILLION GALLONS** of

hazardous material, in a floodplain, feet from the Big Dry Creek. Such a large industrial operation puts thousands of residents and wildlife, including eagles (located a few hundred feet to the north), foxes, and prairie dogs in unacceptable risk. At the community meeting on January 11th, 2017, the operator was not aware the facility is going to be in such a risky area, leading me to question what other details were uncertain. The application still indicates it is not in a floodplain, but it is hard to imagine as the site is only a few feet above and next to the Big Dry Creek. Comments from the Engineering Review in the application on October 7th, 2016 agree with what the FEMA maps show, that the site is inclusive of the western side of the floodplain. If Ward is trying to argue their way out of this, it is a technicality putting public and environmental safety at unacceptable risk, particularly as storms are becoming more and more severe; large-scale storage must be avoided.

Screen Shot 2017-02-18 at 4.29.17 PM.png

The thought of a million gallons of crude oil washing down and out of the Big Dry Creek toward our community and into local water sources is of grave concern. The County or City of Thornton would never intentionally zone this farm land for such a risky industrial operation; it must not receive approval without addressing the concerns of those whose lives are at stake.

At the community meeting, the operator did not know where their emergency response

team is located or what response time should be expected, nor does the application address this. Ward Petroleum is based out of Fort Collins, an hour away. I can't imagine having an emergency at the Ivey site, such as a large explosion or fire continue for an hour or more before an emergency response team arrives. Where will the needed equipment be stored to address such an emergency? The local Thornton Fire Department is ill equipped to handle such an emergency in proxy, lacking the proper equipment and training, so it cannot rest on their shoulders. From the notes in application, it is clear that the emergency preparedness plan is not complete and the project should not continue until the plan is well understood and documented. Additionally, as a parent of two children, I find it concerning that there is not necessarily (pending landowner requirements) a perimeter fence being installed; this should be required for safety reasons as part of the permit process. Adams County must ensure the safety of its tax paying residents and not permit such high risk on-site large-scale storage.

As drilling has been shown to dramatically increase local earthquake activity, the residents require that the operator reimburse homeowners establishing new earthquake coverage in response as a result of drilling operations.

Finally, a high concentration of oil well operations in the middle of an urban area is unprecedented, and as such, the impacts on public health, especially those with respiratory illnesses, due to air pollution and the output of the planned 12 VOCs are not fully understood. Furthermore, an air inversion occurs in the area quite frequently as evidenced by low lying fog. With such an operation, the pollution released into the air from the operation will literally be trapped and blanket the area. Near so many schools and homes, this is an incredibly poor location for such emissions to remain trapped. A CDPHE study should be conducted before the permit application is approved.

The large, industrial onsite storage in the middle of the NW Adams County urban area cannot be allowed due to Public Health & Environmental Safety concerns, and raw material must be pipelined out for processing to minimize these concerns should the project proceed or denied altogether.

### **Traffic & Safety Concerns**

The setup of the site and drilling of 26 wells will require 20,000 truck trips across two-lane city roads and bridges not designed for such industrial traffic, maintained by tax paying citizens of Adams County and Thornton. Further, the intersections in the area

were not designed for heavy, slow moving industrial truck traffic and will lead to congestion and additional pollution as the trucks idle at intersections, as well as frustration for those of us who live in the area.

At the Community Meeting on January 11th, 2017, the operators declared they were not required to disclose the planned oil production of the site. This has a direct impact on the number / frequency of truck trips required to haul the separated crude oil and wastewater off-site. It's not unreasonable to say it will be immensely significant, but exactly how much?? The application lists 1-2 light truck trips per day and a tanker every 1-30 days. Given a million gallons of on-site storage, I find the claim flat out incredulous.

The proposed site sits in close proximity to three major schools and is on the bus route to two of them. Our children will pass by the site and through the traffic areas twice a day. Besides the additional risk our children are placed in **WHILE** at school due to an industrial accident, their risk while **GETTING** to school will be elevated due to the constant truck traffic, carrying heavy, often hazardous material. They intend to direct the traffic to the NE to avoid Stargate School, but ignore the impact to Silver Creek Elementary School and Rocky Top Middle School, plus alternate school traffic from Trailside and adjacent neighborhoods. Peak trips are planned in the morning when children are on their way to school and parents are on their way to work, which is at its most impactful.

The site is located just to the west of a bridge along 152nd Parkway, on the north side. No auxiliary turn lane is planned (headed westbound into the site), but given the road speed of 55MPH, I do not understand how a heavy truck will decelerate that quickly, after the bridge, onto a dirt access road, with other traffic moving at such a high rate. This will create unsafe conditions, as well as congestion, as heavy trucks file in AND out of the site. This section of road suffers high winds and ice, making it more dangerous than most other roads in the area during bad weather, which will be compounded by the frequent and slow moving truck traffic.

The actual planned truck route to the NE has **MAJOR** problems with its plan to go on York under E-470 and through a narrow bridge over the Big Dry Creek just south of 156th Avenue, with no posted weight limit for the underwhelming structure. This bridge has been the site of several major accidents, including one last year damaging the bridge (yet to be repaired), and another **last month** where someone **DIED** and his son was injured due to a head-on collision between two cars. It is quite nerve wracking when you have to "thread the needle" at 55 MPH at the same time as another car - it happens about once per day for me. I can't imagine fighting with a fully loaded tanker to get over the bridge at the same time, or if two tankers are trying to cross at the same time, or our worst fears.. a tanker and a school bus full of children,

in bad weather conditions. The included traffic study **COMPLETELY MISSED** the issues associated with this bridge, noted as "Bridge 2". I cannot stress enough how much of a catastrophic oversight this is.

The photos and videos included show what appears to be construction cones, but these were placed there by the local residents to warn travellers of the dangers ahead. We have been in contact with the City of Thornton, who is responsible for the bridge, and should be consulted. The City is going to conduct a study on the speed limit, but currently has no plans to replace the bridge, so no plan is in place to rectify the situation.

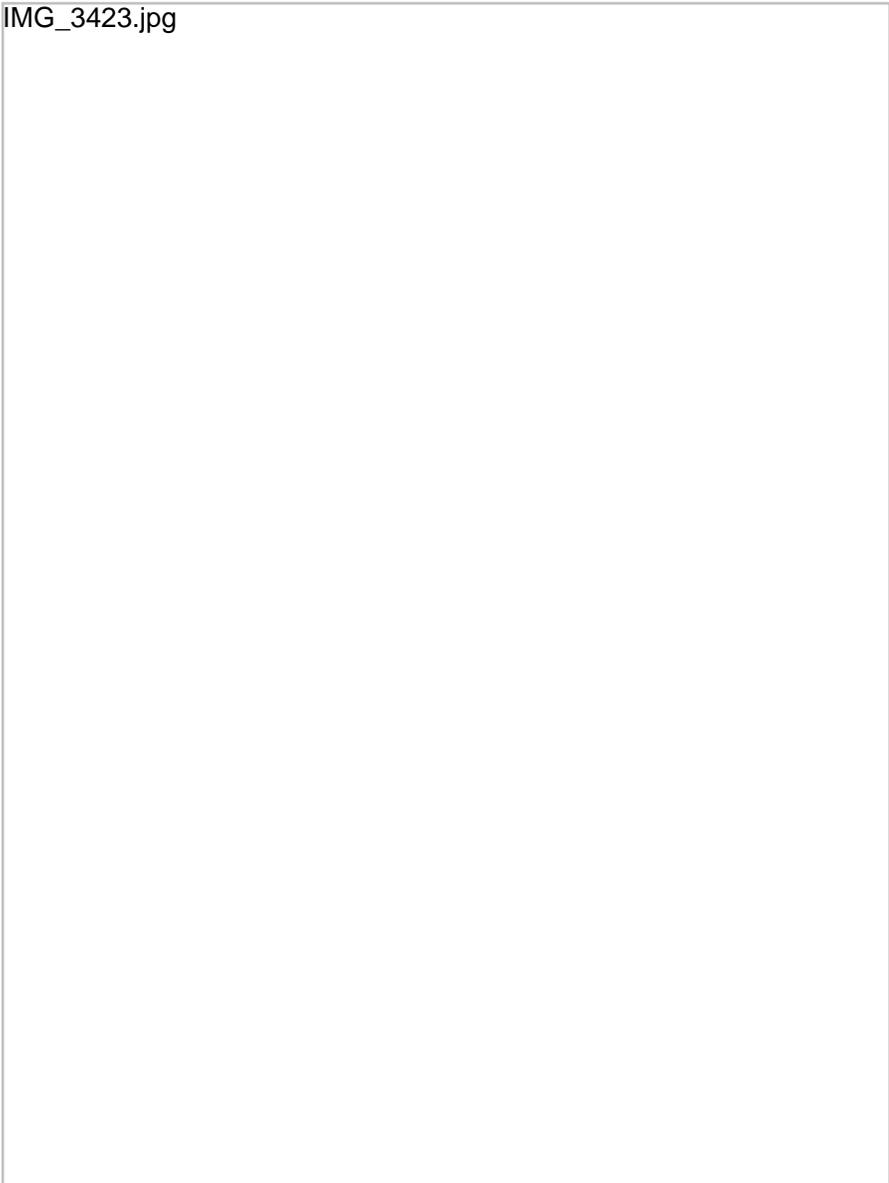
IMG\_3421.jpg



IMG\_3422.jpg



IMG\_3423.jpg



[Video of Traffic Passing over the narrow York Bridge](#)

The heavy truck traffic **CANNOT** be allowed to go on York. The Ward staff at the community meeting was completely unaware of this impediment and did not express any concern when it was raised by multiple attendees; people's lives are at stake.

There are similar concerns with other routes to the west and south. Simply put, the large industrial onsite storage and trucking off-site in the middle of the NW Adams County urban area cannot be allowed due to Traffic & Safety concerns, and raw material must be pipelined out for processing to minimize these concerns should the

project proceed or denied altogether. Pre-production road traffic must be routed via an alternate route, such as 152nd Parkway to Washington or on E-470.

Furthermore, with all of the HUNDREDS of other planned well sites in the area of NW Adams County, a holistic traffic study and plan must be conducted to account for the cumulative effects, such as premature wear of public infrastructure and truck-induced traffic..

### **Aesthetic Concerns**

The Ivey site sits across the street from the several housing developments and adjacent to the Big Dry Creek Open Space purchased by the City of Thornton for the residents to enjoy the natural beauty of the area. The City is planning improvements to the open space to allow for more recreation opportunities. Locating 44 large tanks that are 16'H and 16'W and 12 VOCs that are **THIRTY FEET HIGH** as part of an industrial well site adjacent to the open space goes in vehement opposition with the use of the resident's space preservation and use of tax dollars. It is ironic that the application states it "will not affect any open space" and that it is not considered a "public gathering area" closer than 3000', when it clearly impairs the conservation values of the open space.

This new well site is located next to an existing well with three tanks that are of such disrepair that much of the paint is missing from one of the tanks, and likely rusting. Can we expect such poor maintenance and oversight of the Ivey site? How will the county ensure funds availability to properly reclaim the large operation when it ceases - what if the operator is no longer a functioning business?

Acoustical abatement wall is only included for the south end of the operation. While the operator expects that E-470 will provide some sound barrier, it will not block work lights as seen to the north. The operator needs to include a full perimeter wall during drilling operations.

Furthermore, by locating this unappealing and undesirable industrial site with its large components, noise, dirt and dust, and traffic nearby, and many cases, plain view of, many homes, will have a severe negative impact on property values and lower tax revenues for Adams County. New homes by Richmond Builders are being permitted and built directly across the street, likely within 1000' of the drill site. Despite having approved housing permits prior to Ivey, the application does not address this, despite

inclusion of the development plans in the adjacent owners map to the SE (although NEGLECTS the inclusion of the Big Dry Creek open space to the east). At what point does LUMA need to be considered? As part of the application, there is no definite landscaping planned to mitigate. A picture shows what it could look like, but the operator will have no incentive to landscape after receiving approvals on their permit. A plan must be included for the approval of the permit and the operator held accountable to it. Additionally, the drilling plans indicate the impacts could drag on for two years, painfully. The County has a duty to address these concerns in this growing residential area.

The large industrial onsite storage and trucking off-site in the middle of the NW Adams County urban area cannot be allowed due to Aesthetic concerns, and raw material must be pipelined out for processing to minimize these concerns should the project proceed or denied altogether.

### **Community Information Meeting**

Lastly, I attended the Community "Information" Meeting held by Ward Petroleum on January 11th, 2017 at the Courtyard Marriott on 144th Avenue after the first information meeting did not meet regulations and had to be redone. I do not know the nature of the issues of the first meeting, but the second meeting was not without great concern either. As mentioned above, the staff was unprepared or unwilling to share critical project details in several areas.

Of additional concern was that the meeting was held in an **INADEQUATE** conference room of approximately 15' x 25' with a capacity limit of 41 persons (see photos). Given the approximate staffing of 10 persons, this left only about space 30 people able to access the session, despite the project being located near thousands of residents, many wishing to learn and express their concerns. At the prompting of Westminster City Police, Ward had to turn away guests and were asking those of us in the room to hurry up to make room for others. Many left in frustration. This is not an acceptable community information meeting, excluding many concerned citizens, and lacking details.

IMG\_3363.jpg



IMG\_3361.jpg



## **Conclusion**

In conclusion, this large of a site is unprecedented in its proximity to more than 2,600 homes and thousands of residents, as well as three schools. It creates many health, safety, traffic and aesthetic concerns that should be avoided rather than band-aided. This high impact project should be brought before the Adams County Board of Commissioners for a vote with public hearing via a Special Use Permit, rather than approved by a single individual per the brief AUSR process.

Should the project be approved, the residents request that a permanent sign be posted at the entrance to the site with a phone number to raise concerns with the operator.

Thanks for reviewing and addressing our concerns that affect so many Adams County and City of Thornton residents who have built their lives here and wish for the safe upbringing of their children. We ask that you verify all claims of the operator through the course of this process.

The Migliore Family

Trailside, 156th & York

**Comment 63**

3/2/2017

Mr. Christopher Simmons  
Adams County Community and Economic Development Department  
4430 So Adams County Parkway  
1<sup>st</sup> Floor Suite W200  
Brighton, CO 80601-6998

RE: Ward Ivey Well Pad USR216-00006

This is being emailed at the request for comments from Mr. Simmons

Dear Mr. Simmons

I am a homeowner in the 4<sup>th</sup> filing of The Haven On York St. We had our home built here in 2006 and have lived here since. This project is huge in scale and will have a major impact on the neighborhood both during the initial drilling operation and the later normal operation. I have some concerns about this project relative to safety for not only our neighborhood right here but those that were built after ours, those building right now, and those planned and approved in the near future.

1. **This project should be referred to the Adams County Commissioners for a public meeting and for a vote.** Only those living in a short distance from the site were notified of the original meeting. I think Ward Petroleum hoped that is all they would have to do. There is a lot of interest for this project and I think the public hearing is necessary before the project is approved.
2. **I have concern for the current plan of using tanks for storage.** There are several issues with this. First this is in a flood plain even though the Ward states it does not. Since we have lived here, Dry Creek has had flooded twice from heavy rains. And ongoing work proposed by a current project to improve Dry Creek will allow water to expand more into the flood plain in the future. A major rain storm would send these tanks down the creek and cause major damage to structures and the environment.
3. **I believe that Ward should be required to transport the fluids and gasses via pipeline instead of using tanks.** The concern about flooding is one reason. The other is that the area has inversions, quite regular when conditions are right. These will cause fumes to be trapped during those times. This is also when we usually have fog in the area. Using a pipeline would also reduce the truck traffic that would otherwise be required.
4. **Ward should be required to use E470 for a majority of the truck traffic.** There will be many loads required during the drilling especially.
5. **There should be a review of emergency response plans** for this project and it not be approved until the organizations responsible for that response are trained and have sufficient capacity to handle an emergency at the site and have signed off on the project.

Thanks for including these comments.

Raymond Pelster  
15063 St. Paul St.  
Thornton, CO 80600-7951

**Comment 64**

**From:** [Robert Quabeck](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Petroleum Ivey Well Pad  
**Date:** Friday, March 03, 2017 12:07:53 PM

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To: Christopher Simmons  
From: Robert Quabeck  
Date: March 3, 2017  
Subject: Ward Petroleum Ivey Well Pad  
Project Number: USR2016-00006

This is in response to the Request for Comments on the above project.

I live at 15663 Elizabeth St., very close to this project. I am totally against it for several reasons as follows:

1. There are health issues concerning these projects. Yes, they're always presented by the industry and often government entities as being perfectly safe. Yet there is growing evidence that they are detrimental to the health of those living close to the facilities.
2. There can be shifts in the geologic structure of the ground causing structural, and sometimes catastrophic damage to property. Oklahoma is an excellent example.
3. In spite of regulations and laws, governmental watchdogs often turn their back on violations. North Dakota is an example, and there are others.
4. Property values decrease when homes are in the vicinity of such operations, again, not good.
5. Such a project serves the interests of the few profiting from it, not the local population, not the country in general. A few years ago we were told oil was the security of the nation. Now the security of the nation is being sold to foreign interests so that the few will profit.

For all the above considerations, I am opposed to the above project and am aware of many who feel the same. It is still my hope that local government in a position to influence this decision will put first the interests of the people.

Thank you,

Robert Quabeck  
[qberth@comcast.net](mailto:qberth@comcast.net)  
303-668-5892

**Comment 65**

**From:** [Suzanne Brundage](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Comments  
**Date:** Monday, March 06, 2017 10:36:12 AM

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To Whom It May Concern,

I am writing you in regards to the proposed Ward Ivey site, located on 152nd Pkwy and York St in unincorporated Adams County. As a longtime citizen of Thornton, Colorado and a mother, I do not believe oil and gas development belongs in neighborhoods or residential areas. Research has shown that fracking has numerous health, emotional, environmental, home values, and quality of life impacts on citizens living near oil and gas development. I believe in clean water and air, which is threatened by oil and gas development. I chose to move back to Thornton after attending college out of state because I believed it was a safe, clean place to make my home and raise my family. I grew up here and have always felt the community was safe and clean. I wanted my 2 year old daughter to have the ability to have the same opportunities I had growing up. Oil and gas development threatens these hopes and dreams. It does not belong here.

Not only do I not believe in large scale oil and gas development in neighborhoods, I also do not trust Ward specifically to prevent negative outcomes and promote health and safety. During their community meeting, I spoke at length with a Ward employee, who continually dodged responsibility and did not have specific plans to safeguard my family. For instance, they did not have a specific plan regarding their operations for transporting products. The employee said on multiple occasions that they would like to use a pipeline, but didn't have any plans in place to do so. At one point, when I asked what their plan would be to ensure a spill does not occur during transport (like the Riverdale accident in November), a Ward employee actually said that it would not be their fault and thus they would not be responsible for clean up. I disagree whole heartedly. The spill would not have occurred if the oil company had not been drilling. It was their work products that ended up all over the road and in the ditch. Above and beyond that, as a resident and mother, I do not particularly care about who is at fault for a spill, fire, explosion, equipment failure, etc. I want to know that the oil company has a plan in place, including how to react, how to pay for it, and how to safeguard the community. I also want to know that I am not going to pay for their mistakes when a disaster happens (as I did with the Riverdale spill, since my tax dollars went towards clean up). Ward appears to have no interest in this. I am expected to do my due diligence before I do anything at work, or even before I wrote this letter to you. How is it that Ward is able to bypass this requirement, even though they are proposing a venture that would directly impact thousands of individuals? Ward's lack of appropriate plans and lack of desire to partner with the community is appalling. As such, I do not believe that Ward should be allowed to drill in Adams County.

Can I count on you to prioritize the health and safety of my child, my family, and my neighbors above oil and gas interests? Can I also count on you hold a public hearing so that residents can publicly weigh in on their desires for their community?

Thank you for your time,

Suzanne Brundage  
2415 E. 137th Ave  
Thornton, CO 80602

**Comment 66**

**From:** [Suzanne Cabral](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Steve O'Dorisio](#); [Chaz Tedesco](#); [Eva Henry](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Ivey Site Comments submitted by NMNSE  
**Date:** Sunday, March 05, 2017 7:02:29 AM  
**Attachments:** [IVVEY Site Comments, sbumitted March 5, 1017.docx](#)

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Dear Mr. Simmons and Adams County Commissioners,

Attached is North Metro Neighbors for Safe Energy comments on the proposed Ivey site. I look forward to hearing your responses regarding the comments and questions submitted. If additional information is needed or if you have any questions, please contact me.

Thank you,  
Suzanne Cabral  
303-909-3450  
[cabralsuzanne@msn.com](mailto:cabralsuzanne@msn.com)

March 5, 2017  
To Chris Simmons  
[csimmons@adcogov.org](mailto:csimmons@adcogov.org)

**Comments on Ward Ivey Site SEC. 11 TIS R68W (SW/4 SE/4) NW of E 152nd PKWY and York ST. Adams County, Colorado Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas Northwest of Intersection of 152nd and York Street, Brighton**

Submitted by Suzanne Cabral, representative of **North Metro Neighbors for Safe Energy** (NMNSE) regarding the proposed Ivey Site. I respectfully request a response to all comments.

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

Given the information we are providing below, NMNSE finds that Adams County must reject Ward Petroleum's application for drilling at the Ivey site due to the deficiencies in the application and the unacceptable risks and impacts that Ward Petroleum's project would have on our communities.

NMNSE and Adams County Citizens for Drilling Accountability Now (ACCDAN) worked collaboratively to circulate the petition submitted by ACCDAN to the county on February 14, with 1,008 signatures supporting this statement:

“As residents of Adams County in Colorado, by signing this petition, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county's Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (410-02-05-07). The reason for this petitioned request is that we, the undersigned, believe that all large-scale oil and gas developments within 2,000 feet of an existing or planned neighborhood should require a vote of the Adams County Commissioners and a public hearing allowing ample opportunity for public education, involvement and formal public comment.”

**1) Public hearing requested:** NMNSE and ACCDAN strongly believe that “With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado.” Therefore, NMNSE requires the Ward Ivey permit include a public hearing and the application be put to a vote of the Adams County Board of Commissioners for the following reasons:

**2) Health assessments:** Dave Ellison, a civil engineer residing in Adams County, has submitted an assessment of the proposed Ivey Site, including access to the proposed site and exposure impacts caused by air inversion. St. Anthony North Hospital, Silver Creek Elementary School, Rocky Top Middle School, a childcare facility, Stargate Charter School, along with 2,600 homes are all located within the air inversion envelope.

The Big Dry Creek Valley experiences several air inversions a month, exposing 2,600 homes (for a total of 8,500 residents), to dangerous VOC's and other hazardous industry pollutants. This greatly increases the potential risk of developing and experiencing hospitalization due to asthma attacks.

*JAMA Intern Med.* doi:10.1001/jamaintermmed.2016.2436

The Colorado Department of Health and Environment (CDPHE) reports “health effects of people living near oil and gas operations include irritation of the eyes, nose, throat, lungs or skin, or other symptoms like headache, dizziness, or nausea, and vomiting. Some people living near oil and gas operations also report sleep disturbances or anxiety.”

Due to the many acute and chronic health concerns regarding the effects of living in proximity and/or exposure to concentrated emissions caused by the air inversion envelope near the Ivey site, NMNSE requests that Adams County work with the CDPHE, Tri County Health, the City and County of Broomfield, the University of Colorado, and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality **before any oil and gas development or drilling occurs.**

### **3) As suggested by the CDPHE, studies must include:**

- *Continued evaluation of health risk using more comprehensive exposure data such as data from the Colorado State University studies directly measuring oil and gas emissions in Garfield County and the north Front Range and data collected by the Colorado Air Mobile Monitoring Laboratory.*
- *Continued monitoring of health effects in areas with substantial oil and gas operations including:*
- *High-quality epidemiological studies with improved characterization of exposures to directly assess the possibility of health effects in communities with substantial oil and gas operations.*
- ***Exposure assessment:***
  - *The maximum air concentration of a substance represents an estimate of an acute (short-term) exposure. An acute exposure is an intermittent, infrequent exposure that could occur for a few hours to a few days. This is what the air might be like from an unanticipated release of emissions during oil and gas activities.*
  - *The highest average air concentration for a substance across all datasets is used to represent an estimate of a chronic (long-term) exposure. A chronic exposure is a prolonged continuous exposure, generally over the lifetime of an individual. The air data likely indicates what the average outdoor air is like near residences over the life of a normal operating well or wells.*
- ***Health effects assessment: What are the “safe” levels of exposure for these substances?***
- ***Risk Characterization: Are the exposures to people living near oil and gas operations above or below “safe” levels?***

- **Combined substances**

- *Evaluating the combined risks to human health from multiple substances is an important component to understanding the potential for health effects to occur from oil and gas emissions.*
- *Assessment of Potential Public Health Effects from Oil and Gas Operations in Colorado February 21, 2017 <https://www.colorado.gov/pacific/cdphe/oil-and-gas-health-assessment>*

**4) Conduct a human health risk assessment:** Given the CDPHE recommendations listed above, NMNSE believes that the medical community needs to be informed and engaged in order to collect and document objective data, and that to adequately study and review standards of acceptable exposure risk, any assessment must consider impacts on the most vulnerable in our community— pregnant women and their embryos and fetuses; children; the immunocompromised; and the elderly. Potential risk assessment must include, but is not limited to, effects on the cardiovascular, pulmonary, respiratory, endocrine, immune, neurological, integumentary, hematologic, gastrointestinal, genitourinary, reproductive, musculoskeletal systems and psychological effects.

**5) Conduct a property value impact assessment:** NMNSE requires that an independent property value and tax impact assessment be performed before a permit is issued.

Dave Ellison's analysis:

1,322 homes are directly over the proposed south horizontal drilling and fracking area. Total number of homes over the proposed fracking area is 1,754. The homes within sight of the proposed Ivey site have an estimated value of \$760 million. For these homes, it has been estimated that their property values will be impacted by 25%. As a homeowner, I cannot afford to lose 25% of my property value. As a County, can you afford to lose the income with the decreased value?

**6) Conduct a floodplain evaluation assessment:** Approval of the Ivey permit application should be subject to a full review of probable impacts on the floodplain. As shown in Dave Ellison's presentation, the proposed Ivey site is not in compliance with FEMA's 500-year floodplain. This puts the immediate environment, Big Dry Creek, and the community at significant risk due to historical flooding of the area.

The COGCC Spill analysis by year 2010-2016 reports 3,980 spills.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

On January 23, 2017, Anadarko in Weld County had a release from one well that affected an area approximately 2,900 x 1,400 ft. <http://cogcc.state.co.us/weblink/results.aspx?id=449004>

A design floodplain level for a 500-year rainfall implemented with construction of proposed culvert(s) for drainage to prevent washout, a silt fence and or ditch with catch ponds, and or

straw bales/waddles to surround well pad area, would not be sufficient to reduce the environmental risks from more intense, upslope storms or flooding.

Oil and Gas and fracking operations bring an inherent risk of spills and releases to every site. Thornton has had eight historical spills in the last fifteen months, two of which were at least 10-15 years old.

Given the risk of spills, releases, and other impacts, placing a large industrial operation in the floodplain could be catastrophic to the functioning of Big Dry Creek for irrigation purposes and to adjacent homes and the community at large.

**7) Traffic impacts must be included in Ward Petroleum's application:** The permit application cannot be adequately evaluated or approved unless and until it depicts Ward Petroleum's actual plan. The traffic impact study submitted by Ward assumes a pipeline is used for all product, water, etc., and yet the diagram on Ward Petroleum's pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. The current traffic impact study based on using a pipeline is not applicable when a pipeline has not been officially proposed or approved. Proposed access to the Ivey site includes heavy truck traffic through high population areas and past at least 3 schools, and does not address the very dangerous "Pinch Point" at York Street at Big Dry Creek.

Colorado Department of Transportation states that an estimated 9,400 semi-trucks are required for a 6-well pad. The Ivey site truck trip estimate is 40,733 -50,000 semi-trucks during Phase I- Pre- Drilling and Phase II-Drilling and Completion. On Ward Petroleum's Request for Comments, page 3 under Phase III- Production, 4<sup>th</sup> sentence, they clearly anticipate using a tanker truck every 1-30 days per well for the next 20-40 years.

As mentioned above during Phase III- Production, Ward anticipates using at a minimum 26 tanker truck visits per month and a maximum of 780 tanker truck visits per month, 312 to 9,360 tanker trucks per year for the next 20-40 years. The current permit application must be amended or denied if it requires that residential communities be subjected to the risks of semi-trucks and tanker trucks carrying hazardous chemicals, hydrocarbons and toxic waste materials traversing through neighborhoods and past our children's schools.

<https://www.codot.gov/about/transportation-commission/documents/2015-archive-of-agendas-and-supporting-documents/april-2015/14-information-only.pdf>

**8) Require Ward Petroleum to submit easement documentation and pipeline mitigation plans:** Ward Petroleum has made misleading statements regarding pipeline approval and use during community meetings. Ward stated their intention to use a pipeline, but no pipeline plan is mentioned in its Request for Use by Special Review Permit. Ward Petroleum has indicated that it has secured the easements needed for access and pipelines to support the project, but has not provided easement documentation in its application. The requested easement documentation must be provided for pipelines, since the application details are based on the presupposition that Ward Petroleum will use a pipeline.

**9) Adams County must evaluate and assess pipeline mitigation limitations and risks:** Ward's proposed pipeline mitigations reduce truck traffic impacts on the community by

relocating the gathering station to a different area. However, pipelines do not eliminate risks of injuries, environmental damage, and property damage.

Pipelines are a risk to the community. Between 2010 and November 2016, 4,215 pipeline incidents have been documented nationally, resulting in 100 reported fatalities, 470 injuries, and property damage exceeding 3.4 billion. <https://www.fractracker.org/2016/11/updated-pipeline-incidents>

The use of pipelines does not decrease risk of human life and environmental pollution, and because pipelines increase the amount of product (oil, gas, produced water) to be transported throughout the county, requiring pipelines is not a sufficient mitigation for large-scale production near populated communities.

**10) Conduct Water Assessment:** Water required per well subject to hydraulic fracture ranges from 1.5 million to 15.8 million according to the US Geologic Survey <https://www2.usgs.gov/faq/categories/10132/3824>. Colorado is a drought sensitive area. Impacts on local water supplies and prices for residents must be considered in reviewing Ward's application.

**11) Ward Petroleum must submit a plan for transport and disposal of wastewater.** At Ward Petroleum's community meetings, their staff provided conflicting information in response to inquiries from residents at different information tables. At one of Ward's tables, NMNSE members were told that toxic wastewater, also known as produced water, would be transported by pipeline; at another table, we were told that the produced water would be transported by truck. At this time, it is clear that Ward does not have a safe plan for the transport of the toxic produced wastewater.

The Rocky Mountain Low-Level Radioactive Waste Board "has received information indicating that low-level radioactive waste in the form of NORM or TENORM from oil and gas operations may be coming into or being removed from the Compact region to be treated and disposed of at landfills and other facilities without authorization from the Board. Import and management or disposal of this waste into the Compact region requires authorization of the Board. Board Rule 12.2."

[http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice\\_Colorado%2020160818.pdf](http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice_Colorado%2020160818.pdf)

Ward Petroleum also reported at their second meeting that wastewater would be recycled back into the system. When pressed for details and facts about the toxicity of the water, Ward Petroleum then said that the water would be sent to injection wells. Injection wells have been proven to be the cause of manmade earthquakes, therefore a complete application must include a full accounting for handling and transport of produced wastewater and plans to minimize risks during every aspect of that handling and transport.

<https://pubs.usgs.gov/of/2015/1070/pdf/ofr2015-1070.pdf>

The COGCC Spill Analysis by Year 1999 -4<sup>th</sup> Qtr 2016 reports between 2010 – 2016 Water produced was 2,312,206,255 BBL, or 97,112,661,450 gallons of toxic wastewater that may have

contained NORM and TENORM and may not have been reported to The Rocky Mountain Low-Level Radioactive Waste Board or disposed of properly.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

**12) Emergency response specific to Firefighter, Hazmat and Medical Response:**

- A) Emergency Response Plan:** Ward Petroleum must provide the County with an Emergency Response Plan (ERP) to address all potential emergencies that may be associated with its oil and gas facility. Operator must also provide a copy of such plan to all emergency service providers that would respond to such emergencies. A “will-serve” letter must be obtained from the appropriate emergency provider(s).
- B) Training:** Fire Districts, Departments, and emergency medical responders within response designation must receive training to be hosted and run by Ward Petroleum at a minimum of two times per year. At the minimum, one operator hosted/run training must be completed before the onset of any activity takes place at proposed site.
- C) Personal Protective Equipment, Apparatus Equipment:** All personal protective equipment (PPE), apparatus, and equipment specific to a gas and oil emergency or incident, including but not limited to fire and hazmat, shall be supplied to all firefighters and first responders, including medical, at the expense of Ward Petroleum before onset of gas and oil activity at said site.

**13) Insurance, Liability, Responsibility:** In the event of a catastrophic event, including a spill, release, fire, or explosion – caused by human error, lightning, equipment failure, earthquake, tornado potentially impacting human life AND property value, Ward Petroleum must accept responsibility and must carry enough liability insurance to cover the damage to homes/property and lawsuits resulting from impact on the health of the community and or of children, immunocompromised and elderly. In the event of an emergency or incident including but not limited to fire, hazmat, or medical response, Ward Petroleum must be held liable and responsible and must be adequately insured for the cost of resupplying all firefighter, hazmat, first responder Personal Protective Equipment (PPE), apparatus, and/or equipment lost or damaged during response.

**14) Requirements regarding Oil and Gas Development in Adams County:** The proposed site is adjacent to Thornton Open Space. Thornton’s master plan for open space is to connect neighborhoods with bike and walking pathway, to preserve the heritage and quality of life in Thornton, and enhance and build upon Thornton’s environmental assets, and enhance the community’s identity. Residents chose to live in Thornton and Adams County because we believed in this master plan and believed this was an area in which we could have a high quality of life. Further, we chose to raise our families here because we believed that this was a safe and healthy community.

Please exercise your legislative powers, work to protect the health, safety and welfare of the residents and communities you represent, and do everything in your power to prevent these unacceptable risks from occurring in Adams County, including:

- A)** Demand that state legislators, the governor, and state agencies change state policies to prioritize the health and safety needs of Coloradans—as is promised in the oath of office for all public officials—over the demands of the oil and gas industry.
  
- B)** Consider placing small modular County offices one thousand feet from each other in open spaces subject to drilling, so that the state setback will apply to protect communities. These offices could be used to conduct baseline air, soil, storm water and other testing and otherwise document the conditions in the open space, and/or test the viability of using solar and wind power to run such offices, but they could also be used to conduct any type of business the county desires.
  
- C)** Maintain the image of Adams County as positive, healthy place to live, play, and work.

The proposed Ivey site is clearly in conflict with Thornton’s vision for the city, as well as the people’s choice to live and raise families here. Our health, safety, quality of life, and property values are at an unacceptable risk. We are greatly concerned for ourselves, our children, our families, and our community. We require and expect that the County will do everything in its power to show us that they care about the wellbeing of our families as much as we do.

**Comment 67**

**From:** [Scott Cunning](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Wellpad Concerns  
**Date:** Monday, February 20, 2017 3:45:06 PM

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In November, I attended a community meeting hosted by Ward Petroleum regarding their intended use of lands just north of our home (that we recently purchased during our relocation to the Denver area). At this meeting, I learned that there are to be 26 (up to possibly 48) three-mile wells drilled for operations. A handful of these wells will pass directly under my property at 7,000 ft. deep and the rest under the entire subdivision of Quail Valley, Rolling Hills and Wadley Farms.

First, let me say that I am a proponent for commercial and industrial development for the sake of progress. Growth is necessary in our economic system. However, I also have self-interests that include the following, presented in order of importance:

1. **Protecting my family.** I will do anything necessary to keep them safe from either direct threat or that which is secondary in nature; caused by neglect or the result of known collateral damage.

2. **Personal safety and common good of the community.** I have great neighbors, I live in a great area of town and feel safe and secure most all of the time. Soon the semi-trucks, bulldozers and drilling rigs will be a half mile up the road, stressing residential streets and towering over the once quiet, tranquil and secure neighborhood. There is no need, move further away.

3. **Protecting my property value.** We relocated here from Nebraska due to a job loss. We moved from a market that experienced 2-3% appreciation into a market that was annually at 10%. Needless to say, we have most of our life savings of the past ten years wrapped up in over-priced real estate that's value is now threatened by the existence of an eye-sore and noise pollutant for oil and gas production. Not one person involved in this operation can look me in the eye and tell me that this will not diminish the value of my home. **That said, I don't get compensated for my losses as Ward Petroleum, Adams County and the State of Colorado rake in massive benefits.** 420 residents in our neighborhood feel the same way as do more than 500 households more outside of Quail Valley. That is a fair amount of voting power at the district level. You can rest assured we will remove those that cannot adhere to the wishes of their constituents. Though it may be a long shot, I have heard of other communities successfully filing class-action suits to stall installations or seek compensation for disruptions or this nature.

I am new to this and not an activist by nature. However, I feel the time has come to share my feelings with someone that has a representative voice. I am not saying to stop the "progress," I simply want to protect what I have worked so hard for over the last decade. I want to protect my family and neighbors. At the VERY LEAST, I want to limit my negative financial exposure brought about by large commercial interests. Move this operation further away from single family homes and schools. Let it be a compromise for those that stand to lose some of their hard earned assets on account of special interests saving a few bucks per gallon. Find a different way, because I assure you, it does exist.

Thank you for taking the time to hear my concerns. Godspeed and thank you for your representation.

--

Scott L. Cunning  
Quail Valley Resident (Just west of 148th and York)  
[Scunning300@gmail.com](mailto:Scunning300@gmail.com)

**Comment 68**

**From:** [Scott](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Susan Fulton](#)  
**Subject:** Formal comments Ward Petroleum Ivey Well Site  
**Date:** Sunday, February 19, 2017 9:12:22 AM  
**Attachments:** [Adams county Ward Petroleum Ivey well sites.docx](#)

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Please find formal comments regarding non-permitted Ward petroleum Ivey well site.

Scott Fulton

General Manager

***Botany Lane Greenhouse***

1661 E 77th Ave Denver, CO. 80229

760-586-1971

Scott.f@botanylane.com

[www.botanylane.com](http://www.botanylane.com)

To: Chris Simmons  
From: J Scott Fulton  
15076 Fillmore Way  
Thornton, Colorado 80206  
Subject: Ward Petroleum Ivey Well Pad USR2016-00006

Formal comments  
02/19/2017

Response to request for comment.

We do not approve of the well site for the following reason.  
There are ambiguous statements of health concerns provided by Adams County, including Ear, Eyes, nose and throat discomfort.  
Respiratory illness.  
Head ache and nausea  
These concerns reported and disclosed and yet the county continues to allow drilling and well sites with in residential areas.  
I also have environmental concerns about ground water contamination, ground instability from drilling, also disclosed and reported around well and drill sites, and yet the county continues to allow with in residential areas.

Additonally, being a new property owner, July 2016, it was not disclosed at purchase that this drill site was preliminarily approved, otherwise I would have reconsidered my Purchase.

J. Scott Fulton

**Comment 70**

**From:** [Saira Hamidi](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments re Ward Petroleum Ivey Well Pad  
**Date:** Sunday, March 05, 2017 8:30:34 PM

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Dear Christopher Simmons:

We are writing with regards to project number USR2016-00006. Thank you for the mailing with more information on the project and for the opportunity to provide comments.

We are concerned that the project will negatively affect:

1. Air quality and safety
2. Water quality and safety
3. Road conditions and traffic
4. Property value

We are also concerned about how and where the wastewater will be disposed. Moreover, depending on the location of the wastewater site, the risk of earthquakes is also a big concern for us.

We understand that safety measures will be taken but this does not prevent accidents from happening. The chemicals used to extract the shale gas is filled with toxins and we are extremely concerned of any spills or accidents that may happen here and the impact on our water and environment.

Thank you again for the opportunity to provide comments.  
Saira Hamidi

**Comment 71**

**From:** [Sarah Kappan](#)  
**To:** [Chris Simmons](#)  
**Subject:** Concerned Neighbor  
**Date:** Sunday, March 05, 2017 8:47:58 PM

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I am very concerned with the fracking sight that will be going to near my neighborhood and elementary school. Please consider what this would mean for hard working families who live here and our children. This will cause our home values to go down, our peaceful neighborhood to become busy and loud, and become A safety concern for our children.

Please help me get my concerns heard and stop the building of this fracking sight.

Thank you,  
Sarah  
Sent from my iPhone

**Comment 72**

**From:** [Stacy Lambright](#)  
**To:** [Chris Simmons](#); [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorisio](#); [Erik Hansen](#); [Mary Hodge](#)  
**Cc:** [Norman Wright](#)  
**Subject:** Public Comment for Ward Ivey Site: Due March 6  
**Date:** Friday, March 03, 2017 10:29:47 AM  
**Attachments:** [Ward Ivey Site - Public Comments Letter to Commissioners.pdf](#)

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Hello Commissioners and Chris Simmons,

Please accept my letter for the public comment for the Ward Ivey Site due March 6.

I have many concerns regarding the Ward Ivey proposal and hope that the Commissioners will open this to a public meeting so citizens can speak to you regarding ways to work with the operator to ensure the best management practices are in place for this proposed site. Keep in mind this is for the health and safety of your citizens and voters.

I am available to talk through any of my concerns in this letter with each of you.

Stacy Lambright  
1885 E 166th Ave  
Thornton, CO 80602  
303-981-0817  
[stacylambright@gmail.com](mailto:stacylambright@gmail.com)

March 2, 2017

To Chris Simmons, Adams County Commissioners

Submitted by Stacy Lambright, 1885 E 166th Ave, Thornton, CO 80602

**Comments on Ward Ivey Site Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas**

Northwest of Intersection of 152<sup>nd</sup> and York Street, Brighton

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

The following are my comments that mirror and add to the Adams County Communities for Drilling Accountability Now (ACCDAN)'s comments on the Ward Ivey Permit Application in accordance with the comment period which closes March 6, 2017. I respectfully request a response in writing to each of its individual comments listed in the three sections of this letter.

**Comments to Adams County**

I respectfully request that Adams County:

- 1) Require the Ward Ivey permit application to be **put to a vote of the Adams County Board of Commissioners including a public hearing**. With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado.

This site will impact our home value as Ward anticipates drilling directly below our home and close to our neighborhood. Additionally there are numerous other factors that concern me which include the health and safety impacts and how these this site will impact my family.

On February 14, ACCDAN submitted 1,008 petition signatures to the county stating -- As residents of Adams County in Colorado, by signing of this petition, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county's Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (4- 10-02-05-07). The reason for this petitioned request is that we, the undersigned, believe that all large-scale oil and gas developments within 2,000 feet of an existing or planned neighborhood should require a vote of the Adams County Commissioners and a public hearing allowing ample opportunity for public education, involvement and formal public comment.

- 2) Conduct a review of the flooding concerns raised by a resident engineer, including consideration for **application of 500-year flood design standards** and/or relocating the pad to higher ground. I have photos and documented calls to 911 regarding a well site impacted in our neighborhood from the flood of 2013.
- 3) Since Ward's application and transportation impacts clearly state Ward's intention to use a pipeline and use of pipeline will reduce onsite environmental/health and local traffic impacts, **Adams County should place a condition of approval on the Ward Ivey application**, that a pipeline be in place prior to any drilling on the Ward Ivey site – i.e. **make use of a pipeline for product transportation a condition of approval.**
- 4) For any activities that may occur prior to a pipeline being in place, Adams County should require the use of E-470 for all Ward Ivey traffic rather than relying on local roadways. The number of schools surrounding this area and large number of children on foot and bikes, etc the industrial truck traffic is a major concern.

- 5) **Due to nearby resident raised concerns regarding the effects of temperature inversions on trapping of airborne emissions from the Ivey site, Adams County should work with CDPHE, Tri- County Health, City and County of Broomfield, the University of Colorado and other similar entities to commission and conduct an environmental and health study** that considers effects on resident health and air quality both before substantial drilling occurs and then following up when a majority of the more than 400 wells planned for along the E-470 corridor are drilled and in operations to enhance understanding of air quality and health impacts of large-scale urban oil and gas activities. This study should be funded in part through fees and fines collected from oil and gas activities in the northern urban corridor.
  
- 6) **Address the pinch point bridge on York Street north of the E-470 interchange.** This bridge is planned by Ward to be used for tanker traffic. It is too narrow. Barely wide enough for two cars and a **fatality occurred at this location** from a traffic accident in January 2017. This bridge needs to be repaired, widened and upgraded if it is going to be used for heavy trucks/oil tanker traffic. Please carefully evaluate and mitigate the safety of this proposed route. **Preference would be to use E-470 and avoid this stretch of York Street entirely and keep traffic away from neighborhoods.**
  
- 7) **Require traffic impact study to address school bus route considerations.**
  
- 8) Consider the precedence Adams County will be setting in allowing an oil & gas operation of this size and scale to be located so close to preschools, elementary schools and homes.

## **Application Comments and Questions for WARD PETROLEUM and ADAMS COUNTY on the Permit Application Package for Ward Ivey Site**

Please provide an operator written response to each question and comment.

- 1) The will serve letter is a requirement of the permit application and has not been submitted. The application should not be processed until the will serve letter is provided.
- 2) In the cover letter, Ward seems to indicate that it has all of the easements for access and pipelines to support the project, but the easement documentation is not provided. The requested easement documentation should be provided for pipelines, since the application details are based on the presupposition that Ward will use a pipeline for the site. **ACCDAN supports the use of pipelines for the Ivey Site and encourages Adams County to make pipelines a condition for approval.**
- 3) The county regulations require a drilling schedule to be provided. By definition, a schedule includes the start and end dates for the various activities to complete the project. Ward has not provided a drilling schedule and therefore the current application is incomplete. The information provided is generic information on how long it takes to drill any well, how long it takes to complete any well and is not a schedule for the proposed Ward Ivey project that Ward is asking the county to approve. Schedule details are provided in the traffic impact study section? Is that the planned schedule? If so, it means that you will be drilling and fracking at the Ivey site for two straight years – from August 2018 to August 2020. **This is an unacceptably long period of time to impact the surrounding area.**
- 4) The sound mitigation fencing diagram on page 15 of the pdf only shows it for location 2, what about the sound wall for location 1? On pdf page 38, the drilling operations plan site layout shows a sound wall around

the entire site. Please consistently and clearly depict the plans for the sound wall.

- 5) What will the capacity of the steel berms be? 1.5 times the capacity of the largest tank?
- 6) Please include a description of the security fencing to be installed to keep children out of all equipment areas – wells, tank batteries, etc.
- 7) The Site Plan shows no separators, no ECD (combustion units) and no tanks, does this mean you do not intend to build any ancillary equipment? However, the renderings on pdf pages 22 and 23 show a couple of VCUs and a couple of tanks. It is unclear what the project will entail.
- 8) The traffic impact study assumes a pipeline is used for all product, water, etc. and yet the diagram on pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. Most of this equipment is not needed since Ward will be using a pipeline. The application needs to depict what Ward's actual plan is consistently in the permit application. You can't have a traffic study that says pipeline and then not use a pipeline.
- 9) The Stormwater Management Plan information provided does not specifically tell how you will protect Big Dry Creek? The stormwater information is all generic but it needs to be site specific for this project.
- 10) There is no discussion in the traffic impact study of the damaged bridge on York Street north of the E-470 interchange where a fatality occurred last month because the bridge is too narrow and unsafe.
- 11) There is no discussion of what will be done with fracking waste water in terms of will it be piped or trucked out?

- 12) Page 12 of the traffic impact study says there will be 19,263 trucks during drilling and completion (is this with or without pipelines?).
- 13) On page 13 of the traffic impact study it references 144 one-way truck trips **per ye (which we assume is per year?)** during production/operations? Is this with or without pipelines? This does not seem to make sense with the statement below that indicates 21 daily trips in weekdays which would be 5,460 trips per year. Please provide a better description/explanation of the “production phase truck trips”.
- 14) The traffic impact study **DID NOT LOOK AT SCHOOL BUS ROUTES** and times. I have two children that ride the bus and this is a huge concern for me - how can I ensure their safety with industrial truck traffic. The commission of studying the school bus routes is a big omission as protecting our children as they travel to and from school is a key concern. Please add an analysis of this and describe what you will do to minimize impacts. For example, what if a school bus and an oil tanker both have to use the narrow bridge on York Street at the same time? Would the bridge hold the weight? Would it be safe?  
**Furthermore, the traffic data was gathered on Wednesday afternoon which is an early release day for Adams County schools so the traffic study is not reflective of school day traffic.**
- 15) The traffic plan avoids Stargate school but sends the traffic right past the Silver Creek Elementary School? Please explain how this makes sense?

**Comments for Ward Petroleum and Adams County – Please require the following Best Management Practices/Conditions for Approval.**

- 1) The applicant shall transport all oil, water and gas via pipelines in order to minimize traffic impacts on local roadways and emissions impacts from the Ivey site. The applicant's transportation impacts and other aspects of its permit application are predicated on a pipeline being in place and therefore, pipelines for water, waste water and all product transport should be a condition of permit approval. **Prior to initiation of construction, the applicant shall provide the applicable title and easement commitments required to construct the oil, water and gas pipelines for the facility. The pipelines must be in place prior to drilling. We have seen operators make these promises and then not fulfill them - we do not want this to happen in Adams County!**
- 2) Prior to initiation of construction, applicant shall submit a fencing plan addressing BOTH fencing during construction and permanent fencing during operations. The permanent fencing shall be a security fencing a minimum of 6 feet tall and shall fully surround all oil and gas wells, tanks, ECDs and other ancillary oil and gas equipment. The access gate shall be locked. Fencing is not optional and not left up to the surface owner to decide. It is a public safety issue when you are within walking distance of neighborhoods and schools.
- 3) Prior to initiative of construction, applicant shall submit a landscaping plan which includes a combination of berm(s), mature trees (8-plus feet in height), bushes and ground cover to adequately serve as a visual barrier between the site and surrounding neighborhoods and roadways. The landscaping plan shall be compatible with the surrounding area and is subject to county approval prior to construction initiation. The landscaping plan shall include a means and schedule for watering during establishment of vegetation and then thereafter for maintenance. Vegetation must be watered/irrigated to ensure its survival.
- 4) The sound mitigation plan shall include a sound wall during drilling and completion operations regardless of the results of the sound study.

- 5) **The applicant agrees to conduct a baseline drinking water test for any drinking water well owner within 1 mile both prior to drilling and following six months, one year and five years of operation upon the request of the owner.**
- 6) Prior to initiating construction, the applicant shall request of COGCC and CDPHE that a CDPHE evaluation of the site be conducted and shall subsequently then agree to comply with the resulting CDPHE recommendations. If CDPHE will not conduct said evaluation, the applicant shall secure the services of an independent company to conduct a similar evaluation and shall agree to comply with its recommendations.
- 7) The applicant shall agree to perform Bradenhead Annulus Pressure Monitoring (Rule 341), regardless of whether directed by COGCC or not. Operator shall monitor and record bradenhead annulus pressure during hydraulic fracturing operations, and to promptly report to Adams County and COGCC increases in pressure greater than 200 psig. These requirements help to ensure that groundwater is protected and that prompt action is taken if conditions arise that could lead to the subsurface release of hydraulic fracturing fluids.
- 8) The applicant agrees to use electric drill rigs or best available clean and quiet drilling technology to achieve sound levels of less than 45 dBA measured 200 feet from the drill rig.
- 9) The applicant agrees to use of closed loop system and to not use any open pits.
- 10) The applicant agrees to pipe in water for fracking operations and not to use truck transport for water and the applicant agrees to no use of local wells unless the well is owned by the operator and is permitted by the state for industrial use (versus residential use).

- 11) Applicant agrees to use only low-profile tanks (12-foot tall maximum during for operations) for operations. Larger temporary tanks may be used during drilling and completion. Applicant further agrees to comply with a maximum equipment height for any equipment to remain on the site for operations (such as VCUs, shafts, etc.) of 25 feet or less (Note this is in addition to the height restriction of 12 feet for all product storage tanks to be used at the site).
- 12) Applicant agrees to install steel-rimmed berms and synthetic liners everywhere and in all cases. Applicant further agrees to install berm capacity capable of containing 1.5 times the amount of liquids in the single largest tank to be present on the site at any given time.
- 13) **Applicant agrees to increased liability insurance for operators at a minimum of \$5 million per incident to cover the increased risk of drilling in or near neighborhoods.**
- 14) Requirement for no flaring except in the case of an emergency/repair after completion. Applicant agrees to requirements of Green Completion.
- 15) Strengthened requirements for dust control during operations, requiring that "no visible dust" is created which impacts neighboring properties or dust on roads impacting children.
- 16) Restrictions on well drilling traffic for safety considerations and to avoid school schedule times, rush hour and evening sleeping hours.
- 17) Requirement that once drilling starts on the first well that all planned wells for that phase must be completed within 9 months or they lose the right to drill and must repeat the permit process for remaining wells. Applicant agrees to complete all permitted wells in two phases or less

to minimize disturbance on surrounding area.

- 18) Applicant shall verify prior to commencement of drilling operations that the designated emergency responders have appropriate fire **suppressant foam on hand and that they are trained and capable of responding to oil and gas fires.** Applicant shall secure a signed letter of preparedness from the designated emergency response agency attesting to these facts. Additionally, applicant should work with the surrounding schools to address emergency evacuation plans in case of an emergency from the site. **This is a concern and issue we had at Silver Creek during the historic flood. Parents were unable to reach their children due to the limited access points to the school.**
- 19) Applicant agrees to provide Adams County with the use of FLIR camera three days per month for the county's independent inspection use for monthly inspections of facilities proximate to neighborhoods.
- 20) Requirement for all lighting used to be directed downwards and shielded upwards to minimize light pollution during nighttime operations.
- 21) If well operations are stopped for a period of 12 months, the operator must initiate removal of all well structures within 6 months of the 12th month that operations are ceased and complete full removal within 24 months of the last operations day and re-vegetate the site.
- 22) Applicant agrees to provide Adams County access for inspections with notification, but without advance notification.
- 23) Requirement for an emergency response plan to be developed including a minimum of one public meeting and then an educational pamphlet to be distributed to the 1/2 mile radius on the emergency response plan and safety mitigation measures.

*I understand the limitations Adams County feels it has on oil and gas operations; however, what we have outlined in this letter are items we feel that Adams County can achieve for the health, safety and well-being of its residents.*

**Comment 73**

**From:** [Susan Lombardi](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments on Ivey Site  
**Date:** Monday, March 06, 2017 1:17:03 PM

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Dear Chris Simmons,

As a resident of Quail Valley, I have great concerns about the Ivey Site because Ward Petroleum has not made ANY efforts to inform us of their development plans even they will directly impact my family. My husband and I attended the Broomfield meeting where Extraction was in attendance and you were there as well. Before Ward Petroleum is allowed to proceed, I would like the same opportunity to hear Ward's proposal and have a chance to submit concerns before any approval is given by the county. I heard Ward Petroleum did host a meeting but ONLY invited unincorporated Adams County which does not include over 1000+ homes that are affected by their project including ours. It makes me wonder what Ward is trying to hide if they aren't willing to face the residents they will be affecting and we know the COGCC won't protect us since they approve any permit that comes by their desk.

Thank you,  
Susan Lombardi  
14611 Vine St.  
Thornton, CO 80602

**Comment 74**

**From:** [Steve Mitchell](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Steve Mitchell](#)  
**Subject:** Ward Petroleum Ivey Well Pad USR2016-00006  
**Date:** Monday, March 06, 2017 12:26:41 PM

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March 6, 2017

Christopher Simmons  
Adams County Community and Economic Development  
4430 South Adams County Parkway, 1st Floor, Ste W2000  
Brighton, CO 80601-8204

RE: Ward Petroleum Ivey Well Pad USR2016-00006 Comments

Dear Mr Simmons,

I live within the Haven at York subdivision located a few thousand feet to the ESE of this site. My wife and I are not opposed to the removal of oil and natural gas products; however, we do have concerns with the proposed application by Ward Petroleum:

1. We request this application be referred to the full Adams County Commission for a full public hearing and final vote from our elected representatives.
2. Pipelines, both temporary and permanent, need to be used exclusively for –
  - a. Drilling/fracking operations
  - b. Production fluids/gassesThis will eliminate extensive vehicle traffic and provide for a safer and more efficient movement of materials with the least interruptions to those citizens not involved with the drilling/production operations
3. Further, to reduce/eliminate potential vehicle safety problems E470 should be used exclusively for all site traffic.
4. The production site has been affected numerous times during high water events thus the site should be built to a 500 year flood design to increase neighborhood safety from spills incurred due to flooding.
5. The site, both during construction and afterwards in production, should be:
  - a. Well secured and monitored electronically
  - b. Have sufficiently high berms/vegetation surrounding the site to conceal its above ground equipment from view on the west, south, and east sides.
  - c. Have a well rocked/paved road to the site from paved roads.
6. During actual construction and drilling non-permanent barriers should be erected and maintained around the construction site to:
  - a. Keep all light on site
  - b. Keep noises muffled/muted
  - c. This is done using best practices to keep noise and light pollution from affecting nearby neighborhoods.

Thank you for your consideration.

David S and Carolyn R Mitchell – Homeowners  
14998 Clayton Street  
Thornton, CO 80602

Sent from my iPad

**Comment 75**

**From:** [Sherrie Perl](#)  
**To:** [Chris Simmons](#)  
**Subject:** Proposed Ivey Oil Well Site  
**Date:** Thursday, February 23, 2017 5:57:09 PM

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As a nearby resident in Adams County and the City of Thornton, please read my comments and concerns about the proposed Ivey fracking well site.

The proposal includes an onsite storage of 36 crude oil and 8 waste water tanks holding approximately 20,000 gallons each, or almost a million gallons of hazardous material, in a floodplain, feet from the Big Dry Creek. This large scale operation puts thousands of residents and wildlife at an unacceptable risk. As of the January 11<sup>th</sup> community meeting I attended, I seriously doubt if Ward Petroleum is aware this facility will be located in such a perilous area.

The site is next to Big Dry Creek, and it's my understanding that according to FEMA maps, the Ivey site is part of a floodplain that would put public and environmental safety at risk. Knowing that millions of gallons of crude oil would be washing down and out of the Big Dry Creek toward our community and jeopardizing local water sources is a huge concern. I doubt if the County or City of Thornton would intentionally zone this land for such a risky industrial operation. Further, at the January 11<sup>th</sup> community meeting it was apparent that Ward Petroleum did not know where their emergency response team is located, nor what the response time would be. Is the local Thornton Fire Department prepared to handle such an emergency knowing that Ward Petroleum is based out of Fort Collins, an hour away? Do they have the proper equipment and training?

In addition, Ward Petroleum has not indicated that a perimeter fence would be installed. This must be required for safety reasons. Adams County and the City of Thornton must ensure the safety of its' tax paying residents.

Drilling has proven to dramatically increase local earthquake activity. As such, the residents expect that the operator reimburse homeowners for earthquake damage or coverage as a result of drilling operations.

A high concentration of oil well operations in the middle of an urban area is unprecedented, and the impacts on respiratory illness such as asthma have been confirmed. Further, it's inevitable the Ivey operation would release polluting emissions into the air. Near so many schools and homes, this proves what an incredibly poor location for such an operation this is.

The Ivey site is close to three major schools and is on the bus route for two of them. If there should be an industrial accident, *children will be at risk while in school*. Because of constant truck traffic, carrying heavy, hazardous material *children will be at risk while getting to school*.

There will be a significant impact on traffic to and from Silver Creek Elementary and Rocky Top Middle School, not to mention the heavier traffic that will be caused in adjacent neighborhoods. In addition, anyone on their way to work will be impacted as well.

At the January 11<sup>th</sup>, community meeting Ward Petroleum professed they were not required to disclose the planned oil production of the site. This has a direct impact on the number and frequency of truck trips required to haul the separated crude oil and wastewater off-site. The application shows 1-2 light truck trips per day and a tanker every 1-30 days. This

seems unrealistic, given a million gallons of on-site storage. It is more realistic, that 26 wells may require 20,000 truck trips on two-lane city roads and bridges (maintained by tax paying citizens of Adams County and Thornton). These roads, bridges and intersections were not designed for heavy, slow moving industrial traffic and will cause congestion, additional road deterioration and add additional pollution and frustration for residents.

The planned truck route to the NE would go on York under E-470 and through a narrow bridge over the Big Dry Creek. There is no posted weight limit for the York bridge. This bridge has already been the site of several major accidents, including one last year that damaged the bridge (yet to be repaired), and another in January where someone died and injuries occurred due to a head-on collision between two cars. Vehicles, school buses and fully loaded tanker trucks navigating their way on 2 lane roads and intersections not designed for such heavy industrial traffic is a recipe for disaster, especially in wet, snowy conditions.

Heavy truck traffic cannot be allowed on York. The Ward Petroleum staff at the January 11<sup>th</sup> community meeting was completely unaware of this hazard and did not express concern when it was raised by several people.

The Ivey site sits across the street from several housing developments and adjacent to the Big Dry Creek Open Space so Thornton residents could enjoy the natural beauty of the area. The City of Thornton is planning improvements to the open space allowing for more recreation. Locating 44 industrial well tanks that are thirty three feet high adjacent to the open space goes in fervent opposition to the use of this open space and the use of tax dollars. This clearly damages the protection of any open space.

Locating this unattractive and unwanted industrial site with its wells, noise, dirt and dust, and light pollution in plain view of many homes, will have a severe negative impact on property values and will effectively lower tax revenues for Adams County. New homes being built by Richmond Builders are built directly across the street, likely within 1000 feet of the drill site. Despite having approved housing permits prior to the proposed Ivey site, the application does not address this. The drilling plans indicate the impacts could drag on for two years.

The County has a duty to address these concerns in this growing residential area.

To summarize, this large site is unprecedented in its proximity to more than 2,600 homes and thousands of residents, as well as three schools. It creates too many health, safety, traffic and visual concerns. This project should be brought before the Adams County Board of Commissioners for a public vote hearing. The Thornton residents that are building their lives here want a safe environment for their families and deserve that much.

Thank you for your time.

The Perls

**From:** [Stewart Setchfield](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Ivey and Todd Creek sites  
**Date:** Saturday, February 25, 2017 3:59:29 PM

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As a member of the Todd Creek Farms subdivision and a conscientious citizen of Adams county, I would like to encourage Adams county to allow both the Ward Ivey and Todd Creek sites to continue as planned. Oil and gas development is safe and every effort is being made by Ward Petroleum to minimize the impact that these sights will have on the communities that they will be in. Please do not sucomb to the scare tactics of uneducated people who are trying to stop oil and gas development in Adams county based on conjecture and fear. I have attended ACCDAN meetings and all I heard was scare tactics and angry people who are uneducated about what is actually involved in oil and gas Wells. I am a Petroleum Engineer with a masters degree and I have extensive knowledge and experience. I offered to meet with ACCDAN to educate them and they refuse to meet with me. This tells me that they don't care about the truth or facts and only want to promote their agenda. Their agenda is bad for Adams county and for the state of Colorado. Thank you.

Stewart Setchfield  
9100 E 148th Circle  
Brighton CO 80602

**Comment 77**

**From:** [Tanja](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Steve O'Dorisio](#); [Chaz Tedesco](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Ward Petroleum Ivey Well Pad Project Number: USR2016-00006  
**Date:** Monday, March 06, 2017 11:54:50 AM

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**\*\*Receipt Requested\*\***

March 6, 2017

Christopher Simmons  
Adams County Community and Economic Development  
4430 South Adams County Parkway, 1<sup>st</sup> Floor, Suite W2000  
Brighton, CO 80601-8204  
**Re: USR2016-00006 Ward Petroleum Ivey Well Pad**

Dear Mr. Simmons,

As a resident of Adams County and a neighbor within ½ mile of the Ivey Well Pad, please see my comments and concerns on the application detailed below. Due the scale, duration, and proximity of the subject project to existing neighborhoods, I respectfully request that the permit application be put to a vote by the Adams County Board of Commissioners and that a formal public hearing be conducted.

I request further health studies prior to the permit application approval.

As high concentration of oil well operations in urban areas are unprecedented, further study is needed on the repercussions of public health. New Peer reviewed study published Feb, 15, 2017 - "Because oil and gas development has potential to expose a large population to known hematologic carcinogens, further study is clearly needed to substantiate both our positive and negative findings."

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0170423>

<http://www.denverpost.com/2017/02/15/cu-study-oil-gas-drilling-childhood-cancer/>

I request the use of pipeline all production fluids and gasses to off-site separators, combustors, and storage tanks.

To reduce the high risk of asthma attacks due to the frequent inversions that occur in the Big Dry Creek Valley.

With the output of the planned 12 VOC's not being fully understood and the air inversion that frequently occurs in the area, the pollution released from such an operation will be trapped and blanketed over the area. This is an incredibly poor location as it sits near schools and homes that will be blanketed by the Ivey Site emissions. NOTE: Further study of this inversion is needed before the permit application is approved.

To eliminate the risk of real estate property

value losses (estimated to be \$190 million) as well as the all REAL “quality of life” concerns.

I request exclusive use of only E-470 during the drilling and fracking operations to reduce the dangerous heavy truck safety concerns in close proximity to schools and urban areas.

• The narrow bridge over Big Dry Creek cannot handle the demanding load of heavy trucks on a daily basis. This bridge has been the site of several major accidents, including one last year that damaged the bridge; damage that has yet to be repaired. If E-470 is not used as the exclusive route to access the site, then alternate routes will have the trucks passing by Silver Creek Elementary, Stargate Charter School, or Rocky Top Middle School.

• Safety concerns will be an issue with constant heavy truck traffic during peak school hours while children are walking or being driven to and from school.

I request a complete Emergency Preparedness Plan put in place prior to beginning site drilling.

• The question was asked during the January 19<sup>th</sup> Community Meeting and there was no plan in place. Since then, I am unaware of any plan.

• As this site is less than a mile from Silver Creek Elementary and many homes, what is the plan if a significant industrial accident is to happen? Response time? If fire, where is the water source to be used to fight it? Does the Thornton Fire Department have necessary equipment and training? This project should not continue until such plan is in place and the Thornton Fire Department has the proper equipment and training.

I request a design floodplain level for the 500-year rainfall event to reduce the flooding and environmental risks from more intense, up-slope storms.

• The flood map for the selected area is number 08001C0302J, effective on 01/20/2016

<https://msc.fema.gov/portal/search?AddressQuery=Big%20Dry%20Creek#searchresultsanchor>

• The proposal includes almost a million gallons of hazardous material, in a floodplain, feet from Big Dry Creek. This large industrial operation puts thousands of residents and wildlife (including a nesting pair of eagles, located a few hundred feet north) at an unacceptable level risk.

I request a perimeter fence be installed around the Ivey Pad.

• This site is next to Big Dry Creek open space, which was purchased by the City of Thornton for the residents to enjoy the natural beauty of the area and has planned improvements to allow more recreational opportunities. As a parent, there are safety concerns especially for curious children, who could potentially get hurt.

I request a definite landscaping plan.

<!--[if !supportLists]-->• <!--[endif]-->There is only a picture of what it could look it in the application, but no definite plan for which they can be held accountable.

Again, I respectfully request that the permit application be put to a vote by the Adams County Board of Commissioners and that a formal public hearing be conducted.

Thank you,  
Tanja B. Lammers  
2150 E 149<sup>th</sup> Avenue  
Thornton, CO 80602

**From:** [Tara L. Merrell](#)  
**To:** [Chris Simmons](#)  
**Subject:** Re: Ward Petroleum Ivey Well Pad  
**Date:** Sunday, February 26, 2017 12:01:35 PM

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Mr. Simmons,

I'm writing you to summarize the numerous concerns I have with the proposed Ivey site. My family lives in the Haven @ York Street subdivision which is within eyesight of the proposed sight. We moved to this neighborhood about 2.5 years ago and have enjoyed the neighborhood and it's family-friendly atmosphere.

I have outlined my concerns below:

1) My up most concern is the health and well being of myself and my young family. Numerous studies have shown the health concerns tied to not only fracturing, but oil and gas activity as a whole. The study out of John Hopkins ties fracturing sites to increased asthma attacks. Studies have also shown correlation between stress, restlessness, fatigue, depression, and mood swings in the areas of oil and gas production. This includes worsening symptoms for those who may already be ill or suffering from long-term illness. This scenario would fit my family since my daughter Alice suffers from asthma and I suffer from a progressive for of multiple sclerosis, an auto-immune disease that affects the central nervous system. I already exhibits the aforementioned symptoms, so any of the proposed activities would only increase the affects.

2) Other credible studies have shown the drastic decrease in home values for those homes within line of sight of the production facility, some upwards of a 25% loss. I didn't sign up for that when I moved into the Haven. Home prices are already inflated in the area and none of the area homeowners can afford to risk losing any amount of equity in their homes at the expense of the County and Ward increasing their revenues. Even outside of the aesthetic sense the Ivey site brings, I'm looking bigger picture at all of the surrounding proposed (and COGCC approved) wells along E-470. It covers many square miles, some of which are undeveloped, but nonetheless, if all drilling and production goes as planned, I would imagine north Thornton to easily become a less desirable and less valuable area to raise a family.

3) I don't feel like Ward's proposed project summary addresses traffic at all. It's great they talked about traffic on their private road, but how about truck traffic during drilling? They haven't addressed all the water truck traffic that will be needed to complete hydraulic fracturing. If you've ever dropped kids off @ Silver Creek Elementary in the morning, then you're aware of the already present congestion at the intersection of York and 152nd. Numerous water truck traffic will only further congest this, significantly if trucks are routed down 144th to York. Neither Ward, nor Adams County has addressed these concerns to my

knowledge.

I believe these wells should be pushed further outward to rural areas where the environmental, health, and safety concerns are less, due to little or no population.

I strongly believe that the only way the County should approve these wells is if there is not a production pad to include all of the tanks and equipment. All fluids should again be pipelined to a more remote location.

This facility and the Todd Creek facility will set precedence for future O&G activity, so now is the time to put this in the Commissioner's hands for a vote. I vote no. I like Adams County as it is. If it's going to look like Weld County in the years to come, then Adams County is not where I want my family to be.

Thank you for understanding my concerns,

Sincerely,

Tara Merrell

**From:** [Todd O](#)  
**To:** [Chris Simmons](#); [+sodorisio@adcogov.org](#); [+ehenry@adcogov.org](#); [+mhodge@adcogov.org](#);  
[+ehansen@adcogov.org](#); [+ctedesco@adcogov.org](#)  
**Subject:** Comments on the new IVEY proposal  
**Date:** Wednesday, March 01, 2017 6:01:48 PM

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Hello,

Please put Colorado citizens and families first. Protect our air, water and land first.  
If not now, when?

Thank you,  
Todd Olk  
CO concerned citizen

**Comment 80**

**From:** [Tom Peterson](#)  
**To:** [Chris Simmons](#)  
**Subject:** Comments on Ward Petroleum Ivey Well Pad  
**Date:** Tuesday, February 28, 2017 6:45:14 PM

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Mr. Simmons,

I worked in the oil and gas industry recently and I don't have a problem with the well site or production equipment for the location. If I could make a recommendation it would be that they pipeline the separated gas and liquids to a more remote location for further processing and hauling. Sixty some tanks would require a huge footprint of land. It would be an eyesore requiring a Facility Response Plan and the truck traffic to haul away that amount of liquid would be a detriment to the nearby neighborhoods. Tank batteries with 20 tanks are huge, I cannot imagine a battery of 60+ tanks.

Regards,  
Tom Peterson  
Resident - Haven at York

**Comment 81**

**From:** [Tammie Weitzman](#)  
**To:** [Chris Simmons](#)  
**Subject:** Fracking on 152nd and York  
**Date:** Wednesday, February 15, 2017 4:24:26 PM

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Dear Christopher Simmons,

My name is Tammie and I live in the Haven at York.  
I have serious concerns about fracking located north of my neighborhood and my children's school.

A simple google search reveals the following concerns:

- Contamination of groundwater.
- Methane pollution and its impact on climate change.
- Air pollution impacts.
- Exposure to toxic chemicals.
- Blowouts due to gas explosion.
- Waste disposal.
- Large volume water use in water-deficient regions.
- Fracking-induced earthquakes

This was without even opening the article. Thousands of people call this area home and hundreds of school children could be in harms way if this area allows fracking. Please do not frack at 152nd and York. I'd prefer if you didn't frack in Adams 12 at all.

Sincerely,  
Tammie Weitzman

**From:** [Vamsi Goriparthi](#)  
**To:** [Chris Simmons](#)  
**Subject:** Request for Comments - Ward Petroleum Ivey Well Pad  
**Date:** Thursday, February 16, 2017 2:25:45 PM

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Hello Simmons

I am a resident of Haven at York Street subdivision for past 5 years. I have a lot of dreams and done a ton of research on fracking before buying a home in the neighbourhood. The biggest reason I brought a home in this neighbourhood is that there is no fracking going on near this community.

All my research tells me is that fracking has more disadvantages than advantages. In short we wouldn't be drilling an oil well next to White House in Washington DC tough it's economical. The reason being as we have very important people in the White House. We expect equal level of importance given to every life in the country.

I am very concerned with all the detrimental health and environmental effect that fracking brings. No matter what various agencies tell that fracking is not harmful. Life is NOT the same if you have an area where you frack and area where you dont frack for oil.

Let me know if you have any questions

Thank you  
GVK

**From:** [will-n-erika@comcast.net](mailto:will-n-erika@comcast.net)  
**To:** [Chris Simmons](#)  
**Cc:** [Suzanne Cabral](#)  
**Subject:** Comments on Ward Ivey Site SEC  
**Date:** Monday, March 06, 2017 12:08:11 PM  
**Attachments:** [Ivey Site Comments from William and Erika Martinez.pdf](#)

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Dear Mr. Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

I wish to inform all of you of the concerns my wife and I have about the oil drilling conducted by "Ward Petroleum."

We agree and support the requests as stated in the "Ivey site Comments" (file attached). Further more this is what we do to ensure our health and safety;

1. Right before the Ward Petroleum drilling starts; we will have our doctor issue a complete personal health report. If and when our health starts to decline, we will set out to sue all parties responsible for our "health decline."
2. We will have photos showing the condition of our house walls and structure before the drilling by "Ward Petroleum." These photos and video will be notarized by a public notary. If and when our house structure shows walls cracking or the foundation settling, we will set out to sue all parties responsible for our "house structural damage."
3. We live at 1665 E 131st Circle, Thornton, CO, 80241, Tiburon subdivision. It has come to our attention that the home owners in this subdivision have mineral rights. If Ward Petroleum starts to drill, we will unite to demand oil drilling royalties.

March 6, 2017  
To Chris Simmons  
[csimmons@adcogov.org](mailto:csimmons@adcogov.org)

**Comments on Ward Ivey Site SEC. 11 TIS R68W (SW/4 SE/4) NW of E 152nd PKWY and York ST. Adams County, Colorado Request for Use by Special Review Permit Application for 26 horizontal wells on one well pad for the production of oil and gas Northwest of Intersection of 152nd and York Street, Brighton**

Submitted by Suzanne Cabral, representative of **North Metro Neighbors for Safe Energy (NMNSE)** regarding the proposed Ivey Site. I respectfully request a response to all comments.

Dear Chris Simmons, Adams County Staff, Adams County Commissioners, and Ward Petroleum,

Given the information we are providing below, NMNSE finds that Adams County must reject Ward Petroleum's application for drilling at the Ivey site due to the deficiencies in the application and the unacceptable risks and impacts that Ward Petroleum's project would have on our communities.

NMNSE and Adams County Citizens for Drilling Accountability Now (ACCDAN) worked collaboratively to circulate the petition submitted by ACCDAN to the county on February 14, with 1,008 signatures supporting this statement:

"As residents of Adams County in Colorado, by signing this petition, we formally request that the Adams County Director of Planning and Development refer the Todd Creek, Ward, Ivey and any future large-scale oil and gas development applications to a vote of the Adams County Board of County Commissioners as allowable under the county's Administrative Use by Special Review provisions of Adams County Development Standards and Regulations (410-02-05-07). The reason for this petitioned request is that we, the undersigned, believe that all large-scale oil and gas developments within 2,000 feet of an existing or planned neighborhood should require a vote of the Adams County Commissioners and a public hearing allowing ample opportunity for public education, involvement and formal public comment."

**1) Public hearing requested:** NMNSE and ACCDAN strongly believe that "With 26 wells and 3-mile horizontals, Ward Ivey will be the largest producing site in Adams County and with an additional pad being planned by a separate operator, the combined operations have the potential to be the largest in the entire state of Colorado." Therefore, NMNSE requires the Ward Ivey permit include a public hearing and the application be put to a vote of the Adams County Board of Commissioners for the following reasons:

**2) Health assessments:** Dave Ellison, a civil engineer residing in Adams County, has submitted an assessment of the proposed Ivey Site, including access to the proposed site and exposure impacts caused by air inversion. St. Anthony North Hospital, Silver Creek Elementary School, Rocky Top Middle School, a childcare facility, Stargate Charter School, along with 2,600 homes are all located within the air inversion envelope.

WDM  
3/6/17

The Big Dry Creek Valley experiences several air inversions a month, exposing 2,600 homes (for a total of 8,500 residents), to dangerous VOC's and other hazardous industry pollutants. This greatly increases the potential risk of developing and experiencing hospitalization due to asthma attacks.

*JAMA Intern Med.* doi:10.1001/jamaintermmed.2016.2436

The Colorado Department of Health and Environment (CDPHE) reports "health effects of people living near oil and gas operations include irritation of the eyes, nose, throat, lungs or skin, or other symptoms like headache, dizziness, or nausea, and vomiting. Some people living near oil and gas operations also report sleep disturbances or anxiety."

Due to the many acute and chronic health concerns regarding the effects of living in proximity and/or exposure to concentrated emissions caused by the air inversion envelope near the Ivey site, NMNSE requests that Adams County work with the CDPHE, Tri County Health, the City and County of Broomfield, the University of Colorado, and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality **before any oil and gas development or drilling occurs.**

### 3) As suggested by the CDPHE, studies must include:

- *Continued evaluation of health risk using more comprehensive exposure data such as data from the Colorado State University studies directly measuring oil and gas emissions in Garfield County and the north Front Range and data collected by the Colorado Air Mobile Monitoring Laboratory.*
- *Continued monitoring of health effects in areas with substantial oil and gas operations including:*
- *High-quality epidemiological studies with improved characterization of exposures to directly assess the possibility of health effects in communities with substantial oil and gas operations.*
- **Exposure assessment:**
  - *The maximum air concentration of a substance represents an estimate of an acute (short-term) exposure. An acute exposure is an intermittent, infrequent exposure that could occur for a few hours to a few days. This is what the air might be like from an unanticipated release of emissions during oil and gas activities.*
  - *The highest average air concentration for a substance across all datasets is used to represent an estimate of a chronic (long-term) exposure. A chronic exposure is a prolonged continuous exposure, generally over the lifetime of an individual. The air data likely indicates what the average outdoor air is like near residences over the life of a normal operating well or wells.*
- **Health effects assessment: What are the "safe" levels of exposure for these substances?**

www  
3/6/17

The Big Dry Creek Valley experiences several air inversions a month, exposing 2,600 homes (for a total of 8,500 residents), to dangerous VOC's and other hazardous industry pollutants. This greatly increases the potential risk of developing and experiencing hospitalization due to asthma attacks.

*JAMA Intern Med.* doi:10.1001/jamaintermmed.2016.2436

The Colorado Department of Health and Environment (CDPHE) reports "health effects of people living near oil and gas operations include irritation of the eyes, nose, throat, lungs or skin, or other symptoms like headache, dizziness, or nausea, and vomiting. Some people living near oil and gas operations also report sleep disturbances or anxiety."

Due to the many acute and chronic health concerns regarding the effects of living in proximity and/or exposure to concentrated emissions caused by the air inversion envelope near the Ivey site, NMNSE requests that Adams County work with the CDPHE, Tri County Health, the City and County of Broomfield, the University of Colorado, and other similar entities to commission and conduct an environmental and health study that considers effects on resident health and air quality **before any oil and gas development or drilling occurs.**

### 3) As suggested by the CDPHE, studies must include:

- *Continued evaluation of health risk using more comprehensive exposure data such as data from the Colorado State University studies directly measuring oil and gas emissions in Garfield County and the north Front Range and data collected by the Colorado Air Mobile Monitoring Laboratory.*
- *Continued monitoring of health effects in areas with substantial oil and gas operations including:*
- *High-quality epidemiological studies with improved characterization of exposures to directly assess the possibility of health effects in communities with substantial oil and gas operations.*
- **Exposure assessment:**
  - *The maximum air concentration of a substance represents an estimate of an acute (short-term) exposure. An acute exposure is an intermittent, infrequent exposure that could occur for a few hours to a few days. This is what the air might be like from an unanticipated release of emissions during oil and gas activities.*
  - *The highest average air concentration for a substance across all datasets is used to represent an estimate of a chronic (long-term) exposure. A chronic exposure is a prolonged continuous exposure, generally over the lifetime of an individual. The air data likely indicates what the average outdoor air is like near residences over the life of a normal operating well or wells.*
- **Health effects assessment: What are the "safe" levels of exposure for these substances?**

www  
3/6/17

- **Risk Characterization: Are the exposures to people living near oil and gas operations above or below “safe” levels?**
- **Combined substances**
  - *Evaluating the combined risks to human health from multiple substances is an important component to understanding the potential for health effects to occur from oil and gas emissions.*
  - *Assessment of Potential Public Health Effects from Oil and Gas Operations in Colorado February 21, 2017 <https://www.colorado.gov/pacific/cdphe/oil-and-gas-health-assessment>*

**4) Conduct a human health risk assessment:** Given the CDPHE recommendations listed above, NMNSE believes that the medical community needs to be informed and engaged in order to collect and document objective data, and that to adequately study and review standards of acceptable exposure risk, any assessment must consider impacts on the most vulnerable in our community— pregnant women and their embryos and fetuses; children; the immunocompromised; and the elderly. Potential risk assessment must include, but is not limited to, effects on the cardiovascular, pulmonary, respiratory, endocrine, immune, neurological, integumentary, hematologic, gastrointestinal, genitourinary, reproductive, musculoskeletal systems and psychological effects.

**5) Conduct a property value impact assessment:** NMNSE requires that an independent property value and tax impact assessment be performed before a permit is issued.

Dave Ellison’s analysis:

1,322 homes are directly over the proposed south horizontal drilling and fracking area. Total number of homes over the proposed fracking area is 1,754. The homes within sight of the proposed Ivey site have an estimated value of \$760 million. For these homes, it has been estimated that their property values will be impacted by 25%. As a homeowner, I cannot afford to lose 25% of my property value. As a County, can you afford to lose the income with the decreased value?

**6) Conduct a floodplain evaluation assessment:** Approval of the Ivey permit application should be subject to a full review of probable impacts on the floodplain. As shown in Dave Ellison’s presentation, the proposed Ivey site is not in compliance with FEMA’s 500-year floodplain. This puts the immediate environment, Big Dry Creek, and the community at significant risk due to historical flooding of the area.

The COGCC Spill analysis by year 2010-2016 reports 3,980 spills.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

On January 23, 2017, Anadarko in Weld County had a release from one well that affected an area approximately 2,900 x 1,400 ft. <http://cogcc.state.co.us/weblink/results.aspx?id=449004>

WBM  
3/6/17

A design floodplain level for a 500-year rainfall implemented with construction of proposed culvert(s) for drainage to prevent washout, a silt fence and or ditch with catch ponds, and or straw bales/waddles to surround well pad area, would not be sufficient to reduce the environmental risks from more intense, upslope storms or flooding.

Oil and Gas and fracking operations bring an inherent risk of spills and releases to every site. Thornton has had eight historical spills in the last fifteen months, two of which were at least 10-15 years old.

Given the risk of spills, releases, and other impacts, placing a large industrial operation in the floodplain could be catastrophic to the functioning of Big Dry Creek for irrigation purposes and to adjacent homes and the community at large.

**7) Traffic impacts must be included in Ward Petroleum's application:** The permit application cannot be adequately evaluated or approved unless and until it depicts Ward Petroleum's actual plan. The traffic impact study submitted by Ward assumes a pipeline is used for all product, water, etc., and yet the diagram on Ward Petroleum's pdf page 49 shows 44 tanks and 12 VCUs and 26 separators. The current traffic impact study based on using a pipeline is not applicable when a pipeline has not been officially proposed or approved. Proposed access to the Ivey site includes heavy truck traffic through high population areas and past at least 3 schools, and does not address the very dangerous "Pinch Point" at York Street at Big Dry Creek.

Colorado Department of Transportation states that an estimated 9,400 semi-trucks are required for a 6-well pad. The Ivey site truck trip estimate is 40,733 -50,000 semi-trucks during Phase I- Pre- Drilling and Phase II-Drilling and Completion. On Ward Petroleum's Request for Comments, page 3 under Phase III- Production, 4<sup>th</sup> sentence, they clearly anticipate using a tanker truck every 1-30 days per well for the next 20-40 years.

As mentioned above during Phase III- Production, Ward anticipates using at a minimum 26 tanker truck visits per month and a maximum of 780 tanker truck visits per month, 312 to 9,360 tanker trucks per year for the next 20-40 years. The current permit application must be amended or denied if it requires that residential communities be subjected to the risks of semi-trucks and tanker trucks carrying hazardous chemicals, hydrocarbons and toxic waste materials traversing through neighborhoods and past our children's schools. <https://www.codot.gov/about/transportation-commission/documents/2015-archive-of-agendas-and-supporting-documents/april-2015/14-information-only.pdf>

**8) Require Ward Petroleum to submit easement documentation and pipeline mitigation plans:** Ward Petroleum has made misleading statements regarding pipeline approval and use during community meetings. Ward stated their intention to use a pipeline, but no pipeline plan is mentioned in its Request for Use by Special Review Permit. Ward Petroleum has indicated that it has secured the easements needed for access and pipelines to support the project, but has not provided easement documentation in its application. The requested easement documentation must be provided for pipelines, since the application details are based on the presupposition that Ward Petroleum will use a pipeline.

wjm  
3/6/17

**9) Adams County must evaluate and assess pipeline mitigation limitations and risks:**

Ward's proposed pipeline mitigations reduce truck traffic impacts on the community by relocating the gathering station to a different area. However, pipelines do not eliminate risks of injuries, environmental damage, and property damage.

Pipelines are a risk to the community. Between 2010 and November 2016, 4,215 pipeline incidents have been documented nationally, resulting in 100 reported fatalities, 470 injuries, and property damage exceeding 3.4 billion. <https://www.fractracker.org/2016/11/updated-pipeline-incidents>

The use of pipelines does not decrease risk of human life and environmental pollution, and because pipelines increase the amount of product (oil, gas, produced water) to be transported throughout the county, requiring pipelines is not a sufficient mitigation for large-scale production near populated communities.

**10) Conduct Water Assessment:** Water required per well subject to hydraulic fracture ranges from 1.5 million to 15.8 million according to the US Geologic Survey <https://www2.usgs.gov/faq/categories/10132/3824>. Colorado is a drought sensitive area. Impacts on local water supplies and prices for residents must be considered in reviewing Ward's application.

**11) Ward Petroleum must submit a plan for transport and disposal of wastewater.** At Ward Petroleum's community meetings, their staff provided conflicting information in response to inquiries from residents at different information tables. At one of Ward's tables, NMNSE members were told that toxic wastewater, also known as produced water, would be transported by pipeline; at another table, we were told that the produced water would be transported by truck. At this time, it is clear that Ward does not have a safe plan for the transport of the toxic produced wastewater.

The Rocky Mountain Low-Level Radioactive Waste Board "has received information indicating that low-level radioactive waste in the form of NORM or TENORM from oil and gas operations may be coming into or being removed from the Compact region to be treated and disposed of at landfills and other facilities without authorization from the Board. Import and management or disposal of this waste into the Compact region requires authorization of the Board. Board Rule 12.2."

[http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice\\_Colorado%2020160818.pdf](http://cogcc.state.co.us/documents/gov/state/RMB%20Template%20for%20Notice_Colorado%2020160818.pdf)

Ward Petroleum also reported at their second meeting that wastewater would be recycled back into the system. When pressed for details and facts about the toxicity of the water, Ward Petroleum then said that the water would be sent to injection wells. Injection wells have been proven to be the cause of manmade earthquakes, therefore a complete application must include a full accounting for handling and transport of produced wastewater and plans to minimize risks during every aspect of that handling and transport.

<https://pubs.usgs.gov/of/2015/1070/pdf/ofr2015-1070.pdf>

WAM  
3/6/17

The COGCC Spill Analysis by Year 1999 -4<sup>th</sup> Qtr 2016 reports between 2010 – 2016 Water produced was 2,312,206,255 BBL, or 97,112,661,450 gallons of toxic wastewater that may have contained NORM and TENORM and may not have been reported to The Rocky Mountain Low-Level Radioactive Waste Board or disposed of properly.

<https://cogcc.state.co.us/documents/data/downloads/environmental/SpillAnalysisByYear.pdf>

**12) Emergency response specific to Firefighter, Hazmat and Medical Response:**

- A) Emergency Response Plan:** Ward Petroleum must provide the County with an Emergency Response Plan (ERP) to address all potential emergencies that may be associated with its oil and gas facility. Operator must also provide a copy of such plan to all emergency service providers that would respond to such emergencies. A “will-serve” letter must be obtained from the appropriate emergency provider(s).
- B) Training:** Fire Districts, Departments, and emergency medical responders within response designation must receive training to be hosted and run by Ward Petroleum at a minimum of two times per year. At the minimum, one operator hosted/run training must be completed before the onset of any activity takes place at proposed site.
- C) Personal Protective Equipment, Apparatus Equipment:** All personal protective equipment (PPE), apparatus, and equipment specific to a gas and oil emergency or incident, including but not limited to fire and hazmat, shall be supplied to all firefighters and first responders, including medical, at the expense of Ward Petroleum before onset of gas and oil activity at said site.

**13) Insurance, Liability, Responsibility:** In the event of a catastrophic event, including a spill, release, fire, or explosion – caused by human error, lightning, equipment failure, earthquake, tornado potentially impacting human life AND property value, Ward Petroleum must accept responsibility and must carry enough liability insurance to cover the damage to homes/property and lawsuits resulting from impact on the health of the community and or of children, immunocompromised and elderly. In the event of an emergency or incident including but not limited to fire, hazmat, or medical response, Ward Petroleum must be held liable and responsible and must be adequately insured for the cost of resupplying all firefighter, hazmat, first responder Personal Protective Equipment (PPE), apparatus, and/or equipment lost or damaged during response.

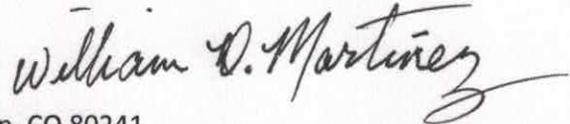
**14) Requirements regarding Oil and Gas Development in Adams County:** The proposed site is adjacent to Thornton Open Space. Thornton’s master plan for open space is to connect neighborhoods with bike and walking pathway, to preserve the heritage and quality of life in Thornton, and enhance and build upon Thornton's environmental assets, and enhance the community's identity. Residents chose to live in Thornton and Adams County because we believed in this master plan and believed this was an area in which we could have a high quality of life. Further, we chose to raise our families here because we believed that this was a safe and healthy community.

WJM  
3/6/17

Please exercise your legislative powers, work to protect the health, safety and welfare of the residents and communities you represent, and do everything in your power to prevent these unacceptable risks from occurring in Adams County, including:

- A) Demand that state legislators, the governor, and state agencies change state policies to prioritize the health and safety needs of Coloradans—as is promised in the oath of office for all public officials—over the demands of the oil and gas industry.
  
- B) Consider placing small modular County offices one thousand feet from each other in open spaces subject to drilling, so that the state setback will apply to protect communities. These offices could be used to conduct baseline air, soil, storm water and other testing and otherwise document the conditions in the open space, and/or test the viability of using solar and wind power to run such offices, but they could also be used to conduct any type of business the county desires.
  
- C) Maintain the image of Adams County as positive, healthy place to live, play, and work.

The proposed Ivey site is clearly in conflict with Thornton's vision for the city, as well as the people's choice to live and raise families here. Our health, safety, quality of life, and property values are at an unacceptable risk. We are greatly concerned for ourselves, our children, our families, and our community. We require and expect that the County will do everything in its power to show us that they care about the wellbeing of our families as much as we do.



William and Erika Martinez, 1665 E 131<sup>st</sup> Circle, Thornton, CO 80241

*We agree and support the requests as stated in the "Ivey site Comments" (file attached). Further more this is what we do to ensure our health and safety;*

*1. Right before the Ward Petroleum drilling starts; we will have our doctor issue a complete personal health report. If and when our health starts to decline, we will set out to sue all parties responsible for our "health decline."*

*2. We will have photos showing the condition of our house walls and structure before the drilling by "Ward Petroleum." These photos and video will be notarized by a public notary. If and when our house structure shows walls cracking or the foundation settling, we will set out to sue all parties responsible for our "house structural damage."*

*3. We live at 1665 E 131st Circle, Thornton, CO, 80241, Tiburon subdivision. It has come to our attention that the home owners in this subdivision have mineral rights. If Ward Petroleum starts to drill, we will unite to demand oil drilling royalties.*

*wam  
3/6/17*

**From:** [Barb Binder](#)  
**To:** [Chris Simmons](#)  
**Date:** Monday, March 06, 2017 5:16:07 PM

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Hi Mr. Simmons,

I see you are the LGD for Adams County. Never knew LGDs existed until i attended the Broomfield Oil & Gas forum in February.

What Extraction Oil & Gas is doing in Broomfield has a big impact on me since i am in unincorporated Adams County near the two pads (United and Huron). Due to pressure from residents in Anthem and Wildgrass, several of the wells originally set for the two pads (Lowell and Sheridan) closet to those neighborhoods were moved to United and Huron so now i am sitting fairly close to two pads each with 42 wells.

I am trying to understand how to be aware of additional plans by the oil and gas companies that may impact me.

I am extremely worried about spills similar to what was experienced at the Anadarko site in Weld County.

<http://www.denverpost.com/2017/01/25/anadarko-well-spill-flow-redirected/>

I was just made aware today of the plans for the **Ward Ivey Site**.

Since i just learned of this today, I understand there was a petition circulated by NMNSE. I found their letter to you online and would like to state that i agree with their position in the following:

<http://dontfrackthornton.com/nmnse-comments-to-adams-county-commissioners-re-ward-petroleum-application-to-drill-at-ivey-site/>

Thank you,  
Barbara Binder  
15583 Quivas St  
Broomfield, CO 80023-7436  
Unincorporated Adams County

**Comment 85**

**From:** [Becky Pitchford](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ivey Site Permit - Public Comment  
**Date:** Monday, March 06, 2017 5:11:52 PM  
**Attachments:** [Ivey Site Permit Public Comment.docx](#)

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Dear Mr. Simmons,

Thank you for the opportunity to provide comments regarding the Ivey well site. Please see the attached document in response to solicitation for public comment.

Thank you,  
Becky Pitchford

March 6, 2017

Christopher Simmons  
Adams County Community and Economic Development  
4430 South Adams County Parkway, Suit W2000A  
Brighton, CO 80601-8216

Dear Mr. Simmons,

Thank you for the opportunity to provide comments regarding the Request for a Use by Special Review Permit for the Ward Petroleum Ivey Well Pad (Project Number: USR2016-00006). Below is a summary of my comments in response to the permit application.

- Based on FEMA Map 08001C0302J (Revised 1/16/16), the site is near or within the 1% annual chance of flood where Base Flood Elevations have been determined (Zone AE). The Zone AE area must be kept free of encroachment per FEMA. Also, due to the proximity to urban development and the detrimental impacts a flood of any frequency could have on the storm water, community health, and quality of life, suggest requiring Ward Petroleum provide mitigation and controls for the 500-year flood event.
- The duration is not clearly specified for Phase II of the development plan. It states the duration for each well is 7-12 days. Based on this timeline, Ward could theoretically be drilling for a 312 days. Please limit the number of consecutive drilling and completion days of phase 2 to a reasonable duration for Agricultural and Open Space area (not industrial) without prior written authorization from Adams County; or require clarification from Ward on the total duration for Phase II.
- Traffic impacts are not discussed for Phases I and II. These phases will have the highest impact and should be addressed by Ward's sequence of major activities. The permit sequence of major activities appears inconsistent with the independent Traffic Impact Study for traffic volume (which states 21 daily weekday trips).
- In the description of Phase III, "limited vehicle traffic" is defined as 1-2 trucks per day. Is this consistent with Adam's county definitions of limited vehicle traffic for large trucks? The type of truck is not well defined by Ward and could substantially change the impacts to existing roadways. Also, the range of traffic volume of a tanker truck every 1 to 30 days is too large to realistically describe the scope of traffic impacts during Phase III. Theoretically, a tanker truck every day for 20-40 years would be authorized by approval of this permit.
- In the letter from Upstream Petroleum Management, it states that Ward Petroleum "intends to add landscaping". This should be required in order to be compatible with surrounding existing land use. Request compliance by updating language to "Ward Petroleum shall add landscaping in accordance with Adams County local code".
- Although per the letter of the law the Ivey site may be outside of the COGCC Exception and Buffer Zones and Urban Mitigation Area, this area is experiencing rapid urban growth. Request Ward follow the additional regulations of the COGCC Buffer Zones and Urban Mitigation Areas as good stewards for responsible oil and gas development, as it is likely that within a short amount of time, this area would be considered a part of the urban mitigation area or buffer zone.

- In the Material Handling and Spill Prevention Section, Ward describes a steel containment berm with a synthetic liner. What volume is the containment berm designed to? The capacity must be sufficient for oil spill plus major rainfall events. This section also states that inspections shall be accomplished after any precipitation event. There should be a maximum duration between inspections, i.e. time between inspections not to exceed 90 calendar days.
- No discussion is provided on the plan for fracking waste water disposal.
- The Traffic Impact Study appears to be based on frac water and oil pipelines being permitted. Ward does not provide sufficient detail in the permit application if pipelines will be used.

Please consider the above comments during your review of this permit application for the Ivey Well Pad.

In general, as a citizen of Adams County, I am concerned with the ever increasing amount of large scale oil and gas development within and near our community. I believe sites like the Ivey well pad will negatively impact the desire to live and work within Adams County. While fracking has been providing useful production for a long time, the size of this site is unprecedented near thousands of existing homes. I understand that due to recent litigation in surrounding Colorado cities, Adams County has little voice in the approval of oil and gas permits approved by COGCC. However, the future of our community is dependent Adams County staff continuing to serve its mission "To responsibly serve the Adams County community with integrity and innovation".

Thank you,

Becky Pitchford

**From:** [Donna Dethouars](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorisio](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Revised Comments Regarding Ivey Well Site  
**Date:** Monday, March 06, 2017 8:21:46 PM  
**Attachments:** [Revised Comments Ivey Well 3-6-17 .pdf](#)

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Attached are our revised comments to the Ivey Well site.

Thanks,  
Donna Dethouars

Christopher Simmons, Oil & Gas Liaison  
Community & Economic Development Department  
4430 S. Adams County Parkway, 1<sup>st</sup> Floor, Suite W2000A  
Brighton, CO 80601

March 6, 2017

Dear Chris and Staff,

We would like to express our concerns regarding the proposed oil and gas drilling at the Ivey site. We have been residents of Quail Valley for 13 years; our home is located less than 2,000 feet from the Ivey site. We are very concerned this drilling site is in a designed floodplain. During our 13 years in Quail Valley, we have experienced severe flooding forcing the closure of 144<sup>th</sup> Ave and 152<sup>nd</sup> Parkway between York and Washington Street. The most recent closure was just last summer. In 2013, Colorado experienced **historic** rainfall and flooding, again our area was flooded forcing the closures of these roads. Multiple ground flooding has been visible from our house covering the natural floodplains bordering Big Dry Creek during the last 13 years. This is very troubling that a large-scale drilling operation will be in operation in this floodplain.

We are deeply worried how this project will impact the quality of life of our family, our neighbors, the environment, our health, and wildlife. In addition, we are property owners on the gulf coast of Florida. We were personally and financially affected by the British Petroleum (BP) spill in 2010. It was considered the largest accidental marine oil spill in the history of the petroleum industry. The US Government estimated the total discharge at 4.9 million barrels of oil. It killed thousands of marine and wildlife, as well as destroying the ecosystem. It had a 'devastating' effect on marine life in the Gulf. It was an environmental disaster and we would never ever want to see anything like this happen again!

We love the area, especially the open space surrounding our subdivision. We often go biking, jogging, and walking along the bike path that borders the Creek. Big Dry Creek is the natural feature that shapes Thornton's central northwest area. Big Dry Creek travels approximately 6 miles, from the city's western boundary at I-25 and approximately 132nd Ave to northeast of 168th Ave, east of Colorado Boulevard. Big Dry Creek is approximately 110 miles long, its watershed begins at the mouth of Coal Creek Canyon and flows to Standley Lake. From Standley Lake, Big Dry Creek then flows in a northeasterly direction through the cities of Westminster and Thornton. It then flows to unincorporated Adams and Weld Counties to where it joins the South Platte River near Fort Lupton. Big Dry Creek provides outstanding opportunities for preservation and enhancement as a passive recreation, wildlife habitat and open space area. As identified in Thornton's Parks and Open Space Master Plan, Big Dry Creek and its floodplain are an important natural resource for east-west wildlife movement and regional trail connectivity through this ecologically diverse drainage corridor. A large-scale oil and drilling operation this close to the Creek and our neighborhoods would cause great harm to us, the environmental, and our health if a disaster would occur. In addition, we the voters passed a City of Thornton ballot initiative in 1997 and 2013 allowing for a .25% sales and use tax for parks and open space acquisition and development. In addition, the city was recently awarded a \$75,000 Great Outdoors Colorado planning grant to help fund the Big Dry Creek

Recreation and Floodplain Restoration Master Plan and Corridor Design. Using these funds, and along with Adams County, over 300 acres of open land along the corridor in Thornton have been preserved, mostly as natural stream bordered by undeveloped floodplain. **The development intent for the corridor is to remain natural and be used primarily as open space and wildlife habitat with passive recreation.** Locating 44 large tanks that are 16'H and 16'W and 12 VOCs as a part of this drilling well site right next to our beautiful open space is unimaginable. The proposed well site is adjacent to Section V. (See enclosed map of open space and proposed well site)



## Big Dry Creek Open Space - Quail Valley

**\*Source City of Thornton Website**

We have worked very hard to achieve the American Dream to own a home, raise two daughters, and to give back to our Thornton community by volunteering our time. All of that can be gone in a blink of an eye. We know that a large-scale oil and gas drilling so close to 2,600 homes and three schools is a horrible idea. It's a no win for property owners as public records show that property values can decrease as much as 25 percent. We can't just sell our home and move away to a new community where we have no fear of drilling. Our way of life, health and property values are at stake. So, what has happened to our rights as a taxpayer and citizen? Why does corporate profits have to dictate how decisions are determined?

What we ask is you consider us, not the oil revenues. Please no large-scale oil and drilling in our large urban neighborhoods!

Thank you for considering our concerns.

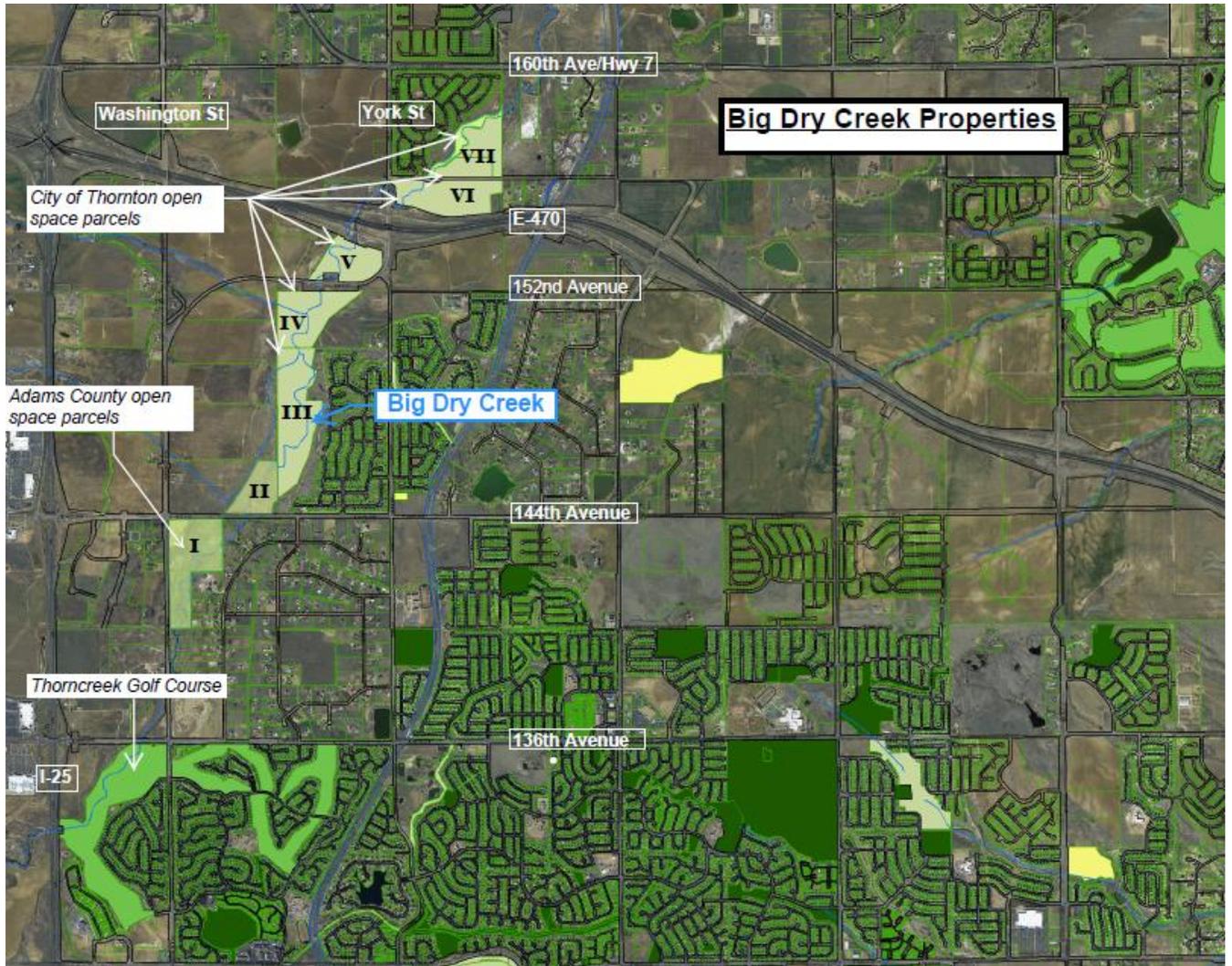
*Signed by Robert and Donna Dethouars*

Robert and Donna Dethouars  
14576 Williams Street  
Thornton, CO 80602

**Comment 87**

cc: Adams County Commissioners; Thornton Mayor and City Council

### Enclosures





**From:** [Donna Dethouars](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Eva Henry](#); [Chaz Tedesco](#); [Steve O'Dorisio](#); [Erik Hansen](#); [Mary Hodge](#)  
**Subject:** Re: Revised Comments Regarding Ivey Well Site  
**Date:** Tuesday, March 07, 2017 7:30:57 AM

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One additional comment is to please give the citizens of Adams County a public hearing on the proposed Ivey oil and well drilling.

Thank you

Sent from my iPhone

> On Mar 6, 2017, at 8:21 PM, Donna Dethouars <ddethouars@gmail.com> wrote:  
>  
> Attached are our revised comments to the Ivey Well site.  
>  
> Thanks,  
> Donna Dethouars  
>  
>  
> <Revised Comments Ivey Well 3-6-17 .pdf>

**Comment 88**

March 6, 2017

To: Chris Simmons, Adams County LGD

From: Jacky Kowalsky

RE: Comments on Ward Petroleum Ivey Well Pad Application, USR2016-00006

The application for Ward's Ivey Well Pad, consisting of 26 wells, should be referred to the BOCC for a public hearing as the application lacks cohesion and coherence on one of the biggest impacts to the hundreds of surrounding homeowners: large volumes of industrial truck traffic. Ward's traffic impact study in the application is based on installing pipelines to bring in and out the frac water, and also pipe oil production off site. However, the rest of the application does not even indicate pipelines will be used on the site. In addition, the site map shows 44 oil and water tanks on site, and Ward has a COGCC permit for the site that includes 62 oil and water tanks. At a minimum, during a BOCC public hearing the commissioners can get specific answers to the many questions still outstanding on this proposal. No permit should be issued for the Ivey site until the residents surrounding the site have been able to comment on a clear and coherent application.

Nowhere in the application does Ward discuss the use of specific Best Management Practices (BMPs) to be used at this site located so near neighborhoods. Surprisingly, not a single BMP is listed on the COGCC 2A permit for the Ivey location either. The section on drilling and completion in the AUSR application, arguably the phase with the greatest impacts to the surrounding communities, was described in just 4 sentences out of 155 pages. The entire subdivision being built right now south of the Ivey site will be less than ½ mile from the facility; five or more neighborhoods are situated along the road access route and within 1 mile of the Ivey site. These people have not been given the information necessary to determine how this large oil and gas facility might impact them.

Due to the large volume of truck traffic expected at this site, the county should require all haul trucks to come and go from the site using only E470. There is an exit at York and E470 that would eliminate the need for tens of thousands of trucks to pass by at least 4 of the neighborhoods currently on the road access route. All haul trucks should be equipped with GPS devices that record route information to insure E470 is the route being used. Road access and pipeline requirements should be included in any permit issued by the county as a condition of approval.

**Comment 89**

**From:** [JACQUI RUCKSTUHL](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Petroleum Ivey Well Pad  
**Date:** Monday, March 06, 2017 7:08:50 PM

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Dear Mr. Simmons,

I am writing to let you know that I am strongly against the Ivey fracking site and hope that Adams County will not approve the application/permit for Ward Petroleum. I live in Quail Valley, about a half mile away from the proposed Ivey site. The Ivey site is way too close to home and schools. There are so many health concerns related to fracking but I will focus on asthma because my 12 year old daughter has asthma and I am very concerned for her health. I'm a registered nurse and have read some research about fracking and health concerns.

Two new studies were recently published on [www.pubmed.gov](http://www.pubmed.gov) relating fracking and asthma exacerbations. One is titled "Fracking is linked to asthma increase, study finds," and the other is titled "Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations." Without even reading the studies it is apparent that fracking is causing people with asthma to have increased asthma attacks.

I'm asking you to do the right thing and deny the application submitted by Ward Petroleum for the Ivey Site. Please don't put my daughters health at more risk than it already is. Fracking needs to be further away from homes and schools. How you would you feel if it were in your backyard?

Sincerely,  
Jacqui Ruckstuhl, RN  
14668 Gaylord St.  
Thornton, CO 80602

**Comment 90**

**From:** [Kevin Arellano](#)  
**To:** [Chris Simmons](#)  
**Cc:** [Melissa Arellano](#)  
**Subject:** Ward Petroleum Ivey Well Pad Project  
**Date:** Monday, March 06, 2017 5:17:28 PM

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Mr. Simmons:

I'm writing to express my concern related to the Ward Petroleum Ivey Well Pad Project. While I don't pretend to be an expert on fracking, there is enough controversy and related concern that it's garnered my attention. Can I start with what's in it for me? As I understand it, this project has been approved without a vote of the residents who stand to be most impacted (decreases in property value, noise, safety). This matter needs to be put before a proper vote of the people and not rubber stamped. Please do everything in your purview to ensure this matter is reviewed fairly and appropriately.

Sincerely,  
Kevin & Melissa Arellano  
Homeowners, the Haven at York Street

**Comment 91**

**From:** [Laura Kauffman](#)  
**To:** [Chris Simmons](#)  
**Subject:** Ward Ivey Site  
**Date:** Monday, March 06, 2017 9:53:55 PM

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Mr. Simmons,

As a North Thornton resident with children attending school nearby I would like to express my concerns regarding the proposed Ward Ivey Site.

I am greatly concerned that an industrial process of this nature, which includes the storage of almost 1 million gallons of hazardous materials, is being considered so close to schools, homes, and open space. Not only is the storage and drilling of concern but also the proposed traffic plan which involves large trucks on small two-lane roads which were not designed for this type of activity.

While I understand the necessity of oil and gas drilling I do not believe that these activities belong in neighborhoods near schools and open space. These activities are exposing children and adults to airborne chemicals whose health effects have not been fully studied. We should not rush to drill without consideration for the health and safety of our most vulnerable residents.

Thank you,

Laura Kauffman

**From:** [LGreen2000](#)  
**To:** [Chris Simmons](#)  
**Subject:** IVEY SITE  
**Date:** Monday, March 06, 2017 10:05:09 PM

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I just want to make sure that Adams county is uncovering every opportunity to make the air my family breathes from the IVEY site the cleanest in can be by providing monitoring stations and closely the site for excessive containments.

Secondly, Please make sure the best and safest possible route is being used in and out of the IVEY site by the companies servicing the site. Including their own special entrance to e-470 instead of taking the local roads.

Thank you for your efforts in keeping our communities safe.

Linda Snodderly

Sent from my T-Mobile 4G LTE Device

**From:** [Matt Ferris](#)  
**To:** [Chris Simmons](#)  
**Subject:** IVEY  
**Date:** Monday, March 06, 2017 10:39:23 PM

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Commissioner Simmons,

As the Ivey project comes to fruition, I ask you, on behalf of my family and community, to ensure that the most stringent regulations are in place to promote the safety and health of all of our community members affected by the Ivey well site. Environmental and health concerns are at the top of everyone's mind, especially on the heels of recent research published on the negative health impacts these very sites are linked to. If this project cannot be stopped, please be the voice for the community, your constituents, to ensure our neighborhoods remain beautiful and safe.

Sincerely,

Matt Ferris

2335 E 160th PL  
Thornton, CO 80602

**Comment 94**

**From:** [Michael Rodriguez](#)  
**To:** [Chris Simmons](#)  
**Subject:** Public Comment Re: Ivey site  
**Date:** Monday, March 06, 2017 9:44:13 PM

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Good morning,

Michael Rodriguez here. I just want to make sure that Adams county is uncovering every opportunity to make the air my family breathes from the IVEY site the cleanest in can be by providing monitoring stations and closely the site for excessive containments.

Secondly, Please make sure the best and safest possible route is being used in and out of the IVEY site by the companies servicing the site. Including their own special entrance to e-470 instead of taking the local roads.

Thank you for your efforts in keeping our communities safe.

Michael John Rodriguez (MRod)  
15629 Josephine Street,  
Trailside Neighborhood  
Thornton, Colorado  
Cell and Text: 303-214-4479

Sent with [Mailtrack](#)

EXHIBIT 4.2  
APPLICANT RESPONSES

<p style="text-align: center;"><b>Adams County Community and Economic Development Department Development Review Comments</b></p>				
		<p><b>Case Number: USR2016-00006</b></p>		<p><b>Case Name: Ward Ivey</b></p>
		<p><b>Applicant: Ward Petroleum</b></p>		<p><b>Date Initiated: 3/13/2017</b></p>
<p><b>Referral Comment No.</b></p>	<p><b>Mapped?</b></p>	<p><b>Reviewer Initials</b></p>	<p><b>County Comment</b></p>	<p><b>Applicant Response (August 27, 2017)</b></p>
<p>1</p>	<p>No</p>	<p>JR</p>	<p>Staff has reviewed the concerns, which include public and environmental health.</p>	<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>

				<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>

			<ul 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> </ul> <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> <ul 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> </ul>
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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>

				<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.  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>

			<p>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.</p>	<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.	<p>2. The plan for pipeline are discussed in response to Referral Letter #3.</p> <p>3. 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</p>

				<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>

				<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>. 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>

				<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>

				<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. 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>

				<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.

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>

				<p>compounds (VOCs), through emission control devices (ECD's) and leak detection and repair (LDAR).</p> <p>Slide #10 See response to slide #2. Slides #11-16 See response to slide #1 Slide #16 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. Slide #17 Comment noted.</p>
28	Yes	JR	Staff has reviewed the comments, which include concerns about traffic and public and environmental safety, noise, lights, and vibrations. Would like a moratorium.	<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>

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. An emergency response plan has been prepared with input from emergency responders and the Adams 12 school district. 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.

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>

				<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>

				<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>

				<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>

				<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>

			<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 H<sub>2</sub>S.</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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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>

				<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>

				<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>

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>

				<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>

				<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>

				<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>

			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.

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>

				<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>

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.

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>

				<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>

				<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

				<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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EXHIBIT 4.3  
COMMENTS RECEIVED AFTER HEARING NOTICE

RECEIVED

NOV 01 2017

Adams County  
Commissioners' Office

Adams County Commissioners  
4430 South Adams County Parkway  
Brighton, CO 80601

October 26, 2017

Dear Adams County Commissioners:

I am the owner of mineral rights in the area that Ward Petroleum will access through the Ivey Wellpad. I have owned these minerals for over 30 years, and have the legal right to access those minerals.

Following is a brief history of why the Ivey Wellpad was selected.

Synergy Oil and Gas was the original Lessor of my mineral rights, and purchased a 35 acre parcel in the Wadley Farm community as a well pad area. This parcel met all Colorado Oil and Gas Commission requirements including necessary setbacks. After numerous meetings with homeowners in the area, Synergy felt it would be too difficult a site to completely satisfy the majority of the homeowners' concerns. Synergy had many other drilling projects in Colorado, and elected to sell their lease to Ward Petroleum.

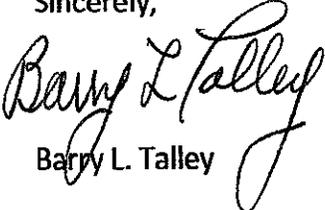
After Ward Petroleum had reviewed the Wadley Farm Wellpad and the neighbors' concerns, they elected to search for a more suitable site for accessing these minerals.

Ward Petroleum found a site approximately 1.5 miles north with very little neighborhood impact. The Ivey pad is adjacent to E-470 which means any noise from drilling or truck traffic is mitigated by the noise from E-470, and the trucks have easy and quick access to the highway. In addition, because of this site's location, there is much less visual impact to any surrounding neighborhoods.

25% of the royalties from the minerals owned by my partner and myself will go to The Challenge Foundation, a charity helping underprivileged children access quality education from 6<sup>th</sup> grade through college.

We ask for your vote in favor of the Ivey Wellpad as the best possible solution for accessing minerals in this area.

Sincerely,

  
Barry L. Talley



22 S. 4<sup>th</sup> St Ste. #205  
Brighton, CO 80601

Adams County Commissioners  
Adams County  
4430 Adams County Pkwy  
Brighton, CO 80601

Re: Ward Petroleum/Ivey Well Pad AUSR

The Brighton Chamber of Commerce is pleased to submit this letter of support on behalf of Ward Petroleum and its Ivey site project. The Brighton Chamber of Commerce is the principal voice of the Brighton area business community. In a spirit of cooperation, and through a collective effort, our mission is to provide, maintain and enhance a favorable business and social environment for chamber members. The Chamber is dedicated to supporting businesses and organizations including Oil and Gas Organizations with honorable reputations, excellent safety records and a solid history following Colorado's stringent oil and gas regulations.

Ward Petroleum is a Chairman's Circle Investor with the Chamber. As an active member, they also focus their efforts to help build a strong community. Their recent support of the New Teacher Luncheon and Mayoral forum shows that partnership.

Recently a presentation by Ward Petroleum personnel about the Ivey site at 152nd Avenue and York Street, followed by an informative question and answer period to the Board of Directors reviewed any concerns that the Board had. Ivey is the ideal oil and gas project to support because it exceeds by a factor of five Colorado Oil and Gas Conservation Commission (COGCC) setback requirements. The well pad is a half-mile from the nearest neighbors. Additionally Ward is using a permanent pipeline to transport product off-site, reducing traffic congestion on Adams County roads.

The economic development benefits for Adams County are substantial. According to an economic impact study commissioned by Ward, the total fiscal impact is estimated at \$76 million over the 25-year lifetime of the project. Additionally, the Ivey Well Pad is estimated to provide 71 jobs with salaries totaling \$6.6 million over the same period.

The Brighton Chamber of Commerce is pleased to support Ward Petroleum on their Ivey site project and their efforts.

Sincerely,

A handwritten signature in blue ink that reads "Naomi Colwell". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Naomi Colwell  
President/ CEO  
Brighton Chamber of Commerce

EXHIBIT 5.1  
REQUEST FOR COMMENTS



## Request for Comments

Case Name: Ward Petroleum Ivey Well Pad  
Project Number: USR2016-00006

February 13, 2017

Adams County Community and Economic Development Department is requesting comments on the following request:

**Request for a Use by Special Review Permit to allow twenty-six (26) horizontal wells on one (1) well pad for the production of oil and gas and one (1) on-site production facility.**

This request is located northwest of the intersection of East 152<sup>nd</sup> Parkway and York Street.

The Assessor's Parcel Number is 0157311400006.

The legal description of the parcel:

SECT, TWN, RNG: 11-1-68 DESC: S2 SE4 EXC RD AND EXC HIWAY AND EXC PARC (2009000014855) AND EXC PARC (2016000001353) 31/769A

Please forward any written comments on this application to the Department of Community and Economic Development at 4430 South Adams County Parkway, Suite W2000A Brighton, CO 80601-8216 by *Monday, March 6, 2017* so that your comments may be taken into consideration in the review of this case. Please send your response by way of e-mail to [csimmons@adcogov.org](mailto:csimmons@adcogov.org).

Application submittal items and additional information about the case can be found at <https://www.adcogov.org/planning/currentcases>.

Additional information about oil and gas development can be found at <https://www.adcogov.org/oil-and-gas-information>.

Thank you for your review of this case.

Christopher Simmons  
Case Manager



Ward Petroleum Corporation  
**Ivey Wellpad**  
SW/4 SE/4  
Sec. 11 T1S R68W  
Adams County, Colorado  
Surface: Fee  
Mineral Lease: Fee

The proposed project consists of the construction of 1 wellpad with up to 26 wells and access road for an oil and gas well to be operated by Ward Petroleum Corporation (Ward). Ward does not intend to drill all 26 wells consecutively. The drilling schedule is subject to change due to economic conditions, business development priorities and equipment availability.

**Sequence of Major Activities and Estimated Completion Date**

**Access Road and Wellpad:**

**Phase I-Pre-Drilling (14 - 21 days)**

The existing access road will be upgraded and graveled to crown/ditch standards. Ripping and dozing will be done on the contour to prevent erosion while improving the road. There will be minimal traffic during construction. Pad construction will be done simultaneously with road construction. The drilling rig will be moved onto the pad over the bladed road and drilling will begin. The private surface owner or good engineering practices (i.e. if a culvert is needed for drainage to prevent washout) will stipulate whether culverts will be installed at this point. A silt fence and/or ditch with catch ponds, and/or straw bales/waddles will surround the wellpad area during the drilling operations to prevent erosion pursuant to stormwater requirements.

The access road will be graveled. After the drilling rig is moved out, a truck mounted service rig will be moved in for well completion activities. Any additional operations, including well stimulation will be done at this point.

**Phase II-Drilling and Completion (Drilling: 7 – 12 days per well, Completion: 3-6 days per well)**

After the drilling rig is moved out a truck mounted service rig will be moved in for well completion activities. Any additional operations including well stimulation will be done at this point.

Final drainage design as designated or approved by the private surface owner will be implemented. Stormwater/erosion controls will continue, culverts, low water crossings, equipment installation, etc. will be done in this phase.

**Phase III-Production**

Well completion activities will be completed by this point and the well may be put online. Phase III can last 20 to 40 years. There will be minimal vehicle traffic; 1-2 light trucks per day may travel the road to check the wells and perform maintenance. Depending on liquid production, a tanker truck may come to the site once every 1-30 days. During the life of the well, declining production would result in less tanker truck activity. Periodic downhole maintenance and repair will be done on an as needed basis with truck mounted service rigs or similar equipment

**Construction Standards**

**Access Road:**

Running surface width to be 20'-26', with a maximum running road surface of 30', total distributed width to be no more than 40'. A minimum of one turnout will be constructed along the access road.

Borrow ditches are to be back-sloped 3:1 or shallower or as stipulated by the private surface owner. The borrow ditches along the access roads will be reseeded if the well is completed as a producer. Reseeding of the borrow ditches will reduce the area that will be utilized.

If necessary, culverts will be installed prior to commencement of drilling operations. Drainage to consist of borrow ditches on both sides. Low water crossings are not anticipated. However, if necessary, low water crossings will be used during drilling, as conditions dictate and upon completion. Crossings will be upgraded with corrugated metal pipes and/or gravel-bottomed low water crossings. Culverts will be placed on grade and aligned with the natural channel bed. Culvert sizes will be a minimum of 18" diameter or as stipulated by private surface owner.

The surfacing materials will consist of native material from road crown and the topsoil will be windrowed during construction and placed in the borrow ditch back slope upon road completion. The back slope of the borrow ditch will be reseeded.

Construction materials will be obtained from available permitted sources, if needed, and consist of pit gravel.

**Wellpad:**

The Wellpad is anticipated to cover approximately 6.8 acres and then approximately 3.4 acres after interim reclamation. Wellpad construction will commence approximately two (2) to five (5) weeks prior to drilling.

The traveled portion of production site will be gravel-surfaced prior to moving the drilling rig onsite. Site preparation will be done with standard excavation equipment using native materials. Additional surface material will be obtained from commercial sources or an approved borrow area. Salvaging and spreading topsoil will not be performed when the ground or topsoil is frozen or too wet to adequately support construction equipment. If such equipment creates ruts in excess of four (4) inches deep, the soil will be deemed too wet. In this case, all construction activities which may result in erosion will cease until the soil is deemed dry enough to resume activities.

Production facilities may vary according to the actual reservoir discovered and will be engineered upon completion of well tests. Production facilities will be clustered and placed away from cut/fill slopes to allow maximum recontouring of cut/fill slopes.

**Compliance Statement:**

The Ivey Wellpad complies with Section 4-10-02-05-02(3). Ward purchased the Ivey Wellpad and associated previously approved COGCC permitted wells and production facilities. The location was chosen due to surface owner request, preservation of cropland, topography and avoiding nearby neighborhoods. In addition, the location falls outside of the Colorado Oil and Gas Conservation Commission Buffer Zone of 1,000' to any residence. Ward will employ Best Management Practices (BMP's) to reduce or eliminate impacts. BMPs may change at any time due to site conditions, enhanced knowledge and technology. The county will be advised of any significant or structural BMP changes. The location was chosen as the ideal site for the following reasons:

- The location does not fall within a floodplain and wetlands.
- The location is outside the COGCC Exception and Buffer Zones and Urban Mitigation Area.
- The proximity to the E-470 will assist in mitigating noise during drilling and completions.
- The topography is conducive to a multi-well pad.
- There are existing oil and gas facilities and access road adjacent to the site which will be

- utilized, negating any new road disturbance.
- The Ivey site would eliminate the need to utilize the surface of the undeveloped 35 acre Wadley Farms site for drilling and production activities. Ward instead intends to drill and produce (if economically and technically feasible) the minerals beneath the undeveloped 35 acre Wadley Farms site from the Ivey surface location.
  - The location is outside any city limits.
  - The location will not affect any current open space.
  - The wellpad is over 3,000' from any public gathering area.

**Estimated Project Start Date:**

April, 2017.

**Proposed Mitigation Measures:**

**Community Outreach**

Ward has already spoken with and met with Adams County Communities for Drilling Accountability Now (ACCDAN) representatives to discuss the Ivey Wellpad and learn about their questions and concerns regarding the location. Ward held two (2) neighborhood meetings on November 15 and 16, 2016. Ward continues to be available for discussion with the community.

**Planning**

Development from existing well pads: Ward has permitted an Oil and Gas Location Assessment - Form 2A as a multi well pad through the Colorado Oil and Gas Conservation Commission (COGCC). This will eliminate the need for multiple well pads which would ultimately require more surface disturbance. The location was chosen after careful consideration of setbacks, including existing overhead utility lines, topography, and discussions with the surface owner. The location is not within 1,000' of any building unit (COGCC Buffer Zone) and is adjacent to existing production facilities.

**Noise Mitigation:** The requirements of Rule 802 of the COGCC regulations will be met. An ambient sound study has been conducted to determine noise impacts to the nearby residents. Sound walls will be erected to reduce noise pollution during drilling and completions. Ward plans on installing 1,060' of sound walls. Please the attached Exhibit showing the location.

**Odor Mitigation:** Ward will comply with Rule 805 and Department of Public Health and Environment, Air Quality Control Commission, Regulation No. 2 Odor Emission, 5 C.C.R. 1001-4, Regulation No. 3 (5 C.C.R. 1001-5), and Regulation No. 7 Section XVII.B.1 (a-c) and Section XII. Ward will utilize an Emission Control Device to reduce odor emissions during production.

**Visual Mitigation:** Pursuant to Rule 804, the tank battery shall be painted in uniform, non-contrasting, non-reflective color tones with the colors matched to but slightly darker than the surrounding landscape. Sound walls will be erected that will act as a visual barrier during drilling and completions.

**Lighting:** All permanent lighting will be directed downward and internally. Temporary lighting shall conform to COGCC Rule 803 and not adversely affect adjacent residential properties. Temporary lighting will be directed downward to minimize light. Sound walls will partially block temporary ground level lighting.

**Landscaping:** Ward will adhere to County requirements and/or surface owner preferences. Where feasible, native vegetation will be minimally impacted. Motorized equipment will be restricted to the well sites and access roads to the well sites. If approved by landowner, additional landscaping may be added.

**Weed Control and Management:** Ward will manage weed control at the oil and gas facility and along the access road during construction, operations and until final abandonment and final reclamation is completed per county or COGCC regulations.

**Dust Mitigation:** Dust mitigation measures shall include but are not limited to the use of speed restrictions, regular road maintenance, restrictions of construction activities during high wind days, and silica dust controls when handling sand used in hydraulic fracturing operations. The access road will be constructed with road base aggregate material. Additional management practices such as road surfacing, wind breaks and barriers may be used. A street sweeper and/or water tank will be on call to limit dust when necessary.

**Erosion Control Measures:** Ward will maintain a Stormwater Management Plan with site specific measurements to address erosion control. Ward will make thorough inspections, in accordance with the requirements set forth by CDPHE Water Quality Division (WQD) and the COGCC Rule 1002 f. The inspection schedule is as follows:

While the site is under construction, an inspection is required at least every 14 calendar days; post storm event inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.

Inspection records will be kept on file for a minimum of three (3) years from expiration or inactivation of permit coverage. These records will be made available to the regulatory agencies upon request.

**Traffic Control:** Ward will construct all leasehold roads to accommodate local emergency vehicle access requirements and will be maintained in a reasonable condition. Please see the Traffic Plan for details.

### **General Housekeeping**

**Guy Line Anchors:** All guy line anchors left buried for future use will be identified by a marker of bright color not less than four feet in height and not greater than one foot further of the guy line anchor.

**Removal of Surface Trash:** Ward agrees that all trash, refuse pipe, equipment, liquids, chemicals or other materials that are not necessary for the continued operations of the wells will be removed and disposed of no later than 30 days after completion. No such items will be burned or buried on location.

### **Material Handling and Spill Prevention**

To ensure protection for the surface during fracturing treatment, the location will be specifically constructed to contain any releases or spills. Secondary containment from any chemical spills or leaks will surround any trucks that carry, mix, or add chemicals associated with production operations as well as connections that could possibly leak fluid. Should any spill or release occur, every reasonable step will be taken to quickly remediate the area disturbed. Daily audio, visual, olfactory inspections will be recorded and kept in Ward's District office and available to regulatory agencies. Records will be kept electronically indefinitely. Ward will also abide by EPA mandated SPCC rules to ensure proper fluid containment.

For any spills and releases reportable to COGCC, Ward will also notify Adams County verbally or in writing to the County's LGD, Local Planning and Development Department, Sheriff's Office, and the local fire district immediately, but no more than 24 hours after discovery of the spill or release by Ward. This includes spills/releases: 1) of any size that impacts or threatens to impacts any waters of the state, a residence or occupied structure, livestock, or public byway; 2) in which one (1) or more barrels or more of Exploration and Production Waste or produced fluids is spilled or released outside of berms or other secondary confinement; and 3) of five (5) or more barrels regardless of whether the spill/release is completely contained within berms or other secondary confinement. In addition, Ward will notify the surface owners or the surface owner's tenant of spills and releases in compliance with COGCC rules.

**Control of Fire Hazards:** Ward and its contractor's will employ best management practices during the drilling and production of its wells and facilities. They will comply with appropriate COGCC and any county rules concerning fire and safety. Ward will ensure that any flammable material will remain no less than 25 feet from the wellhead (s), tanks and separator(s).

**Berm Construction:** A steel containment berm or structure will be erected around the oil and water storage tanks. A synthetic liner will be installed inside the berm. The berm will be inspected at least every 14 calendar days while the site is under construction and within 24 hours of a precipitation event. Inspection records will be kept on file for a minimum of three (3) years from expiration or inactivation of permit coverage. These records will be made available to the regulatory agencies upon request.

SDS (Safety Data Sheets) for materials and chemicals used will be kept onsite and updated/modified for each phase of operations

### **Fencing**

Fencing: The wellsite will be fenced if requested by the private surface owner and pursuant to COGCC Rule 605. C.(3).

### **Drilling/Completion Operations**

**Closed Loop System:** A Closed Loop System will be used for drilling and fluid management. No reserve pit will be used. Water based cuttings will be generated and assessed for land farming applications. Any cuttings other than water based will be hauled to an approved waste disposal site

**Green Completions: Emission Control Systems.** Test separators and associated flow lines and sand traps shall be installed on-site to accommodate Green completion techniques pursuant to COGCC Rules 805 b.(3) and 604 c(2)C.

**Air Emissions:** Air containment emission sources shall comply with the permit and control provisions of the state air quality control program and the rules and regulation promulgated by the State Air Quality Control Division pursuant to Regulation #7. Ward will employ such control measures and operating procedures as are necessary to minimize fugitive particulate emissions into the atmosphere. Emission Control Devices will be used.

**Wildlife and Wildlife Habitat:** The proposed oil and gas wells are not within a sensitive wildlife habitat as defined in Section 100 of the COGCC regulations. Consequently, Ward, to the extent possible, will not cause significant degradation of wildlife.

**BOPE for well servicing operations:** Adequate blowout prevention equipment will be used on any servicing operations associated with this well. Backup stabbing valves shall be required on well servicing operations during reverse circulation. Valves will be pressure tested before each well servicing operation using both low-pressure and high-pressure fluid.

**Water Sampling:** Ward will adhere to COGCC Rule 318.A. and Ward Petroleum's MOU (Memorandum of Understanding) with Adams County. Ward will utilize COGCC's criteria and protocol for analysis and submission to the COGCC data system. If there are no available water sources within a ½ mile radius of the proposed oil and gas facility, Ward will test the nearest downgradient water source within a one mile radius prior to construction.

**Interim Restoration (Production):** As required by the COGCC Rule 1003, rehabilitation of unneeded, previously disturbed areas will consist of back sloping, and contouring all cut & fill slopes. These areas will be reseeded. The portions of the cleared well site not needed for operational and safety purposes will be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible consistent with surface owner preferences. Sufficient level area will remain for setup of a workover rig and to park equipment. In some cases, rig anchors may need to be pulled and reset after recontouring to allow for maximum interim reclamation.

**Final Reclamation**

Well site cleared. Within 90 days subsequent to the time of plugging and abandonment of wellbore(s) the entire site, superfluous debris and equipment shall be removed from the site. Final reclamation will be conducted pursuant to the preference of the landowner consistent with COGCC regulation Rule 1004.

**Estimated Project Completion Date:**

Final stabilization of the well area will mean revegetation of all areas not including the permanently installed well anchor points. All other areas will be revegetated or covered by permanent materials before they are considered finally stabilized and complete.

EXHIBIT 5.2  
PROPERTY OWNER MAILING LABELS

**Exhibit 5.2**

144TH AND WASHINGTON LLC  
4330 W 37TH AVE  
DENVER CO 80212

AMACK MATTHEW AND  
AMACK STEPHANIE  
2538 E 148TH PLACE  
THORNTON CO 80602

152ND AND WASHINGTON LLC  
PO BOX 247  
EASTLAKE CO 80614-0247

ANDRETICH MICHAEL AND  
ANDRETICH SANDRA  
2408 E 148TH PLACE  
BRIGHTON CO 80602

152ND AND YORK LLC  
PO BOX 247  
EASTLAKE CO 80614-0247

ANTILLON HILDEBERTO  
14918 CLAYTON ST  
THORNTON CO 80602-7341

ABBUHL KEVIN A AND  
ABBUHL SHERYL L  
2021 E 148TH DR  
THORNTON CO 80602-7395

APARICIO-ACEVEDO FAMILY TRUST  
2456 E 149TH AVE  
THORNTON CO 80602-7365

ADAIR BRYAN  
15670 JOSEPHINE ST  
THORNTON CO 80602

APODACA FRED M II AND  
APODACA TAMARA L  
14953 COLUMBINE STREET  
THORNTON CO 80602

ADAMS 12 FIVE STAR SCHOOLS  
1500 E 128TH AVE  
THORNTON CO 80241

ARAGON DAVID J AND  
ARAGON TIMMIE S  
14837 CLAYTON STREET  
BRIGHTON CO 80602

ADAMS 12 FIVE STAR SCHOOLS AKA  
ADAMS COUNTY SCHOOL DIST NO 12  
1500 E 128TH AVE  
DENVER CO 80241-2601

ARELLANO JOSHUA T AND  
ARELLANO CHELSEA  
3126 E 152ND PL  
BRIGHTON CO 80602-7716

ADLER BENJAMIN H AND  
ADLER JAIMMIE E  
2486 E 149TH AVE  
BRIGHTON CO 80602

ARMIJO WILLIAM S AND  
ARMIJO BRIAN CLAYE  
2966 E 152ND PL  
BRIGHTON CO 80602-7948

ALEJANDRO MIGUEL A  
9300 W 108TH CIR  
BROOMFIELD CO 80021

ARMSTRONG SCOTT A AND  
BARBOSA CLAUDIA  
1996 E 148TH DR  
THORNTON CO 80602-7396

ALLSHOUSE BRAD ALAN AND  
ALLSHOUSE JOHANNA NICOLE  
14983 COLUMBINE ST  
THORNTON CO 80602-7362

ARTZ JEFFREY AND  
ARTZ KIMBERLY A  
7351 W 95TH AVE  
BROOMFIELD CO 80021-4828

AST BRANDON G AND  
AST LAUREN K  
15082 FILLMORE WAY  
THORNTON CO 80602

BEARD RENDA M AND BEARD LUKE M  
15085 FILLMORE WAY  
THORNTON CO 80602-7944

BABKIEWICH FRANK R AND  
BABKIEWICH CHER I  
14972 RACE STREET  
THORNTON CO 80602

BERGMAN MEGAN D AND  
BERGMAN ERIK M  
14901 WILLIAMS ST  
THORNTON CO 80602-7393

BACA KRISTIN AND  
BACA BRANDON  
3074 E 148TH PL  
THORNTON CO 80602-8800

BERTSCH JOHN G AND  
BERTSCH JENNIFER L  
14818 GAYLORD STREET  
THORNTON CO 80602

BAIG MIRZA G.A. AND  
SULTANA FATIMA  
15023 COLUMBINE STREET  
THORNTON CO 80602

BEVERIDGE JEFFERY D AND  
BEVERIDGE MICHELE L  
15002 JOSEPHINE ST  
THORNTON CO 80602-7357

BAKER SLATE J AND  
BAKER MELISSA G  
2251 E 149TH AVENUE  
THORNTON CO 80602

BIAGGI ANDREW AND  
BIAGGI KRISTA  
15072 FILLMORE WAY  
THORNTON CO 80602-7943

BALES STEVEN J AND  
BALES NIKI L  
3054 E 150TH DRIVE  
THORNTON CO 80602

BILLINGTON CHARLES R AND  
BRUNO LOREE BILLINGTON  
14950 WILLIAMS STREET  
THORNTON CO 80602

BARKER ALLAN L AND  
BARKER ANN M  
14978 VINE STREET  
THORNTON CO 80602

BIRK ERIK L AND  
BIRK EILEEN F  
15062 ELIZABETH CT  
THORNTON CO 80602

BARTLETT ROBERT W AND  
BARTLETT DIANA M  
15192 FILLMORE WAY  
THORNTON CO 80602-7946

BLATNER CHRISTINE L AND  
BLATNER DAVID R  
2402 E 148TH DR  
THORNTON CO 80602-7335

BATES MATTHEW LIVING TRUST AND  
BATES CYNTHIA LIVING TRUST  
15037 CLAYTON ST  
THORNTON CO 80602-7342

BOGGS REBECCA N  
2583 E 150TH PL  
THORNTON CO 80602-8811

BAXENDALE TODD  
14952 RACE STREET  
THORNTON CO 80602

BOH MATT AND  
BOH LAURA  
15054 COLUMBINE ST  
THORNTON CO 80602-7364

BOLGER KEVIN J AND  
BOLGER DEBRA L  
2552 E 150TH PL  
THORNTON CO 80602-8813

BUCKLEY M SCOTT AND  
BUCKLEY VICKIE J  
14917 WILLIAMS STREET  
THORNTON CO 80602

BOLTON PETER J AND  
BOLTON BRENDA F  
2907 E 151ST PLACE  
THORNTON CO 80602

BURGESS RUSTIN R AND  
BURGESS JENNIFER D  
2590 E 150TH AVE  
THORNTON CO 80602-7361

BORUNDA JILLIAN B AND  
BORUNDA PHILIP J  
15659 JOSEPHINE ST  
THORNTON CO 80602-7723

BURLESON BRADY AND  
BURLESON TERRI  
14937 WILLIAMS ST  
THORNTON CO 80602-7393

BOUCHER MATTHIEU AND  
BOUCHER RACHELLE  
2493 E 150TH PL  
THORNTON CO 80602-8810

BUSCH AMY E  
3129 E 152ND PL  
BRIGHTON CO 80602-7950

BROOKS MILLARD T AND  
BROOKS COURTNEY A  
14838 GAYLORD STREET  
THORNTON CO 80602

BUSHEY BRIAN E AND  
BUSHEY HEATHER V  
15092 FILLMORE WAY  
THORNTON CO 80602

BROWN CARRIE KIDDER AND  
BROWN JAMES DOUGLAS  
15739 JOSEPHINE ST  
THORNTON CO 80602

BUTCHER YVONNE T  
2060 E 148TH PLACE  
THORNTON CO 80602

BROWN FLETCHER DC AND  
BROWN RHONDA R  
2603 E 150TH PL  
THORNTON CO 80602-8812

CAGE JORDAN J AND  
RUTTEN JAMIE L  
2562 E 150TH PL  
THORNTON CO 80602-8813

BROWN KENNETH AND ANNE FAMILY TRUST  
15675 COLUMBINE ST  
THORNTON CO 80602

CALDWELL BOBBY AND  
CALDWELL SHERYN  
2200 E 149TH AVE  
THORNTON CO 80602

BROWN RALPH E AND  
BROWN MARY P  
14878 GAYLORD STREET  
THORNTON CO 80602

CALVO LOUIS AND  
CALVO DENISE  
15680 JOSEPHINE ST  
THORNTON CO 80602

BUCHER DANIEL M AND  
BUCHER JULIE A  
14845 COLUMBINE CT  
THORNTON CO 80602-7346

CAMERA JOSEPH C AND  
CAMERA CECILIA P  
14938 CLAYTON STREET  
THORNTON CO 80602

CAPRA JOHN C AND  
CAPRA PATSY M  
2519 E 148TH PLACE  
THORNTON CO 80602

CHAPMAN RICHARD F II AND  
CHAPMAN JANET M  
14933 RACE STREET  
THORNTON CO 80602

CAREW MICHAEL A AND  
CAREW SUSAN J  
2102 E 149TH AVENUE  
THORNTON CO 80602

CHIVERS ANDREW HOWARD JR AND  
CHIVERS LAURA JEAN  
15092 JOSEPHINE ST  
THORNTON CO 80602-7358

CARLSON BLAKE 25%/CARLSON SARA 25%  
JUMPS BRIAN 25%/REED STEPHANIE 25%  
10261 ARAPAHOE RD  
LAFAYETTE CO 80026-9347

CHEVARRIA NICHOLAS AND  
CHEVARRIA LORRAINE  
15719 JOSEPHINE ST  
THORNTON CO 80602

CARLSON CLARKE D 1/285% INT ET AL  
PO BOX 247  
EASTLAKE CO 80614-0247

CIANFRANCE JASON T AND  
CIANFRANCE JENNIFER A  
3114 E 150TH DR  
THORNTON CO 80602-7945

CASADY BRENDA J  
3039 E 152ND PL  
THORNTON CO 80602-7949

CITY OF THORNTON  
9500 CIVIC CENTER DR  
THORNTON CO 80229

CASTILLE AUGUST L III/ JENNIFER G  
AND DUQUAINE DIANNE M  
15057 ST PAUL ST  
THORNTON CO 80602-7951

CITY OF THORNTON  
9500 CIVIC CENTER DR  
THORNTON CO 80229-4326

CASTRO ROMAN M AND  
CASTRO RESHAUN L  
3084 E 150TH DRIVE  
THORNTON CO 80602

CITY OF THORNTON  
9500 CIVIC CENTER DR  
DENVER CO 80229-4326

CELLA MARTIN S AND  
CELLA LISA  
14974 FILLMORE WAY  
THORNTON CO 80602-8804

CITY OF THORNTON  
9500 CIVIC CENTER DRIVE  
THORNTON CO 80229-4326

CHAMBERLAIN DANNY W AND  
CHAMBERLAIN JULIE C  
2248 E 149TH AVENUE  
THORNTON CO 80602

CITY OF THORNTON  
9500 CIVIC CENTER DR  
THORNTON CO 80229-4300

CHAMOT DONALD K AND  
CHAMOT KATERINA C  
2469 E 148TH PLACE  
THORNTON CO 80602

CITY OF THORNTON THE  
9500 CIVIC CENTER DRIVE  
THORNTON CO 80229-1220

COLLIER WILLIAM G AND  
COLLIER KRISTY  
14984 FILLMORE WAY  
THORNTON CO 80602-8804

CURREY JUSTIN  
15032 JOSEPHINE ST  
THORNTON CO 80602-7357

CONOVER MARK D AND  
CONOVER LINDSAY M  
15008 CLAYTON STREET  
THORNTON CO 80602

DAHLMAN MICHAEL R AND  
DAHLMAN AMANDA  
15047 CLAYTON ST  
THORNTON CO 80602

COONTS RORY D AND  
COONTS PATRICIA L  
3109 E 152ND PL  
BRIGHTON CO 80602-7950

DARNELL DOUGLAS R AND  
DARNELL CLARA L  
15036 ELIZABETH STREET  
THORNTON CO 80602

CORTEZ IAN AND  
CORTEZ CHARLENE R  
15715 COLUMBINE ST  
THORNTON CO 80602

DAVIDSON CRAIG H  
2150 E 149TH AVE  
THORNTON CO 80602-7374

COUGHENOUR CRAIG R AND  
COUGHENOUR AMY M  
15006 ELIZABETH STREET  
THORNTON CO 80602

DAVIS JAMES E AND  
DAVIS MARIE S VILLA  
15003 COLUMBINE ST  
THORNTON CO 80602-7363

CRAGIN PATRICK AND  
CRAGIN BARBARA  
15014 COLUMBINE ST  
THORNTON CO 80602

DAVIS ROBERT E AND  
DAVIS IONA R  
2521 E 150TH AVENUE  
THORNTON CO 80602

CRANNELL KEVIN S AND  
CRANNELL KELLI NOEL  
2489 E 148TH PL  
THORNTON CO 80602-7343

DE ZAFRA AARON A AND  
DE ZAFRA CHRISTINA  
2443 E 156TH PL  
THORNTON CO 80602-7722

CROUCH ERIC AND  
CROUCH BRITTANY  
15082 JOSEPHINE ST  
THORNTON CO 80602-7358

DELELLIS MARK AND  
DELELLIS TERRI L  
2996 E 152ND PLACE  
THORNTON CO 80602

CUNNING SCOTT L AND  
CUNNING ANNE E  
2011 E 148TH DR  
THORNTON CO 80602-7395

DERR HEIDI  
3281 W 111TH LOOP UNIT B  
WESTMINSTER CO 80031-8084

CURNOW DAVID A AND  
CURNOW TARA L B  
14991 JOSEPHINE ST  
THORNTON CO 80602-7347

DEWALD BRIAN J AND  
DEWALD ANNETTA M  
3069 E 152ND PL  
THORNTON CO 80602-7949

DIANA DOULAS AND  
DIANA JULIET  
14982 JOSEPHINE STREET  
THORNTON CO 80602

ELDREDGE BRUCE AND  
ELDREDGE KRYSTAL A  
15088 ELIZABETH CT  
THORNTON CO 80602

DITZLER ERIC AND DITZLER NICOLE  
14838 CLAYTON ST  
THORNTON CO 80602-7340

ELLISON SAMUEL D AND  
ELLISON RUTH H  
15073 ST PAUL STREET  
THORNTON CO 80602

DODD DEBORAH L AND  
DODD BARRY E  
15045 WASHINGTON ST  
BROOMFIELD CO 80023-9155

ELLSAESSER BRYAN B AND  
ELLSAESSER MARI A  
2963 E 150TH DR  
THORNTON CO 80602-7942

DOUGLASS CHRISTOPHER A AND  
DOUGLASS JENNY A  
15088 ST PAUL ST  
THORNTON CO 80602-7951

ELMORE JEREMY T AND  
ELMORE APRIL M  
2984 E 150TH DR  
THORNTON CO 80602-7942

DRAGOIN MICHELLE M AND  
WALSH PATRICK K  
1997 E 148TH PL  
THORNTON CO 80602-7019

EMERSON STEVEN A AND  
EMERSON CATALINA V  
15058 CLAYTON STREET  
BRIGHTON CO 80602

DUNCAN JENNIFER AND  
DUNCAN JOSHUA  
15073 COLUMBINE CT  
THORNTON CO 80602-8809

ENNEY BRIAN KEITH AND  
ZAHN TRACY LEIGH  
15096 FILLMORE WAY  
THORNTON CO 80602-7943

DUPREE MICHELLE J  
2999 E 152ND PL  
THORNTON CO 80602-7948

ERDMAN ALAN L AND  
ERDMAN KAYLEEN D  
2155 E 149TH AVE  
THORNTON CO 80602-7373

EBERLY DON A AND  
EBERLY FRAN M  
2299 EAST 149TH AVENUE  
THORNTON CO 80602

ERICKSON BRIAN D  
14861 GAYLORD ST  
THORNTON CO 80602-7375

EICHEM ROBERT W AND  
EICHEM REBECCA K  
2561 E 150TH AVENUE  
THORNTON CO 80602

ERNBERGER DEREK J AND  
ERNBERGER KRISTINE A  
15024 COLUMBINE STREET  
THORNTON CO 80602

EL V LTD  
C/O DAN PERGOLA  
3720 W 81ST PLACE  
WESTMINSTER CO 80031

ESPARZA JAMES AND  
ESPARZA TONYA I  
15081 FILLMORE WAY  
THORNTON CO 80602

EVERS JODY D  
14967 WILLIAMS ST  
THORNTON CO 80602-7393

FORD JESSICA N  
2959 E 150TH DR  
THORNTON CO 80602-7942

FARMER JESSICA AND  
FARMER KYLAND  
15669 JOSEPHINE ST  
THORNTON CO 80602

FORD SCOTT T AND  
FORD MELINDA P  
3033 E 148TH PLACE  
THORNTON CO 80241

FARRER JANET LESLIE AND  
HAMILTON ALEXANDER C  
15084 ST PAUL ST  
THORNTON CO 80602-7951

FOREMAN JOHN R AND  
FOREMAN KATHLEEN  
15098 ELIZABETH CT  
THORNTON CO 80602-7368

FEDJE ANDREW I AND  
FEDJE LISA R  
15068 CLAYTON STREET  
THORNTON CO 80602

FOWLER WALTER W AND  
FOWLER MORLEY A  
14901 JOSEPHINE ST  
THORNTON CO 80602-7347

FENG XIAOMING  
15710 JOSEPHINE ST  
THORNTON CO 80602

FRALEY SONIA AND  
FRALEY NATHAN  
15721 JOSEPHINE CIR W  
THORNTON CO 80602

FERNANDEZ RICHARD D AND  
FERNANDEZ ESTELLA R  
14978 GAYLORD ST  
THORNTON CO 80602-7353

FRANK ERIK D AND FRANK KATHY L  
15193 ST PAUL ST  
THORNTON CO 80602-7952

FLEMING SONJA L  
2131 E 149TH AVENUE  
THORNTON CO 80602

FRANKLIN ROBERT L  
2407 E 148TH DRIVE  
THORNTON CO 80602

FLINT DAVID A AND  
FLINT STEPHANIE  
2633 E 150TH PL  
THORNTON CO 80602-8812

FREDRICH SHAHREEN AND  
FREDRICH CRAIG  
15686 COLUMBINE ST  
THORNTON CO 80602

FLOREN DAVID AND  
FLOREN URSULA  
14936 ELIZABETH ST  
THORNTON CO 80602-7367

FREEMAN KAREN M  
15664 ELIZABETH ST  
THORNTON CO 80602

FLORES ALBINO ALFRED JR AND  
FLORES JOIE MARIE  
14942 VINE STREET  
THORNTON CO 80602

FULTON SUSAN M AND  
FULTON JOHN SCOTT  
15076 FILLMORE WAY  
THORNTON CO 80602-7943

GAHM JOHN W AND  
GAHM MARY JO  
15048 CLAYTON STREET  
THORNTON CO 80602

GEHLEN CHARLES J JR AND  
GEHLEN CHERYL F  
1970 E 148TH PL  
THORNTON CO 80602

GAILUS NOBI J AND  
GAILUS KIMBERLY K  
14947 WILLIAMS STREET  
THORNTON CO 80602

GEHM CARL R AND  
GEHM VALETHA L  
14988 GAYLORD ST  
THORNTON CO 80602-7353

GALLIVAN RUSSELL G AND  
GALLIVAN AMI L  
14971 JOSEPHINE STREET  
THORNTON CO 80241

GLASS TREVOR E AND  
GLASS LORI J  
14818 CLAYTON ST  
THORNTON CO 80602-7340

GANS MEL S AND  
GANS JUDITH S  
14908 GAYLORD ST  
THORNTON CO 80602-7353

GLAZA TODD M AND  
GLAZA BROOKE L  
15077 SAINT PAUL STREET  
THORNTON CO 80602

GARDNER KERRY J AND  
GARDNER EILEEN C  
3004 E 148TH PLACE  
THORNTON CO 80241

GOERIG JEFFREY AND  
GOERIG LAURA  
2570 E 150TH AVE  
THORNTON CO 80602-7361

GARNER MICHELE A AND  
GARNER CLINTON R  
14967 CLAYTON ST  
THORNTON CO 80602-7342

GOLDSTEIN MYRON ET AL  
16281 WILD PLUM CIR  
MORRISON CO 80465-2153

GARRISON LARRY J AND  
GARRISON SHARON S  
14951 GAYLORD STREET  
THORNTON CO 80602

GOMEZ ANDREA  
2982 E 151ST PL  
BRIGHTON CO 80602-7947

GASKINS WILLIAM D AND  
GASKINS ABIGAIL K  
2580 E 150TH AVENUE  
BRIGHTON CO 80602

GOMEZ MARY A  
15074 ST PAUL ST  
THORNTON CO 80602-7951

GAULT RYAN J AND GAULT JAIMIE L  
2936 E 152ND PL  
BRIGHTON CO 80602-7948

GONZALES ARNOLD AND  
GONZALES CECILIA  
2422 E 156TH PL  
THORNTON CO 80602

GAYLORD PROPERTIES LLC  
C/O HARRY W CARLSON  
4531 REED ST  
WHEAT RIDGE CO 80033-3521

GONZALES LISA M AND  
GONZALES STEVEN R  
15684 ELIZABETH ST  
THORNTON CO 80602

GORIPARTHI VAMSI K AND  
KOLUSU SRAVANI  
15026 ELIZABETH ST  
THORNTON CO 80602-7368

HARMON GLENN A JR AND  
HARMON KIMBERLY  
14826 COLUMBINE COURT  
THORNTON CO 80602

GOYAL ISHWAR LAL  
15055 ELIZABETH ST  
THORNTON CO 80602-7370

HARMOUSH ROBERT J TRUSTEE OF THE  
HARMOUSH ROBERT J TRUST THE  
6066 S ALTON WAY  
GREENWOOD VILLAGE CO 80111

GRAJEDA MATTHEW B AND  
GRAJEDA SHELLY  
2666 E 149TH AVENUE  
THORNTON CO 80602

HARRIS BRIAN K  
14961 JOSEPHINE STREET  
THORNTON CO 80602

GREIN KENNETH D AND  
GREIN MARION SUE  
3013 E 148TH PL  
THORNTON CO 80602-8802

HARRIS DAVID M AND  
HARRIS LAURA F  
15097 SAINT PAUL STREET  
THORNTON CO 80602

GRESTINI CRAIG T AND  
GRESTINI KARI M  
15034 COLUMBINE ST  
THORNTON CO 80602-7364

HARTENSTEIN MICHAEL AND  
HARTENSTEIN TRACY  
1987 E 148TH PL  
THORNTON CO 80602-7019

GRODECKI JACEK AND  
GRODECKI BARBARA  
15071 FILLMORE WAY  
THORNTON CO 80602-7944

HARVEY MAX AND  
HARVEY JENNIFER  
14955 ELIZABETH STREET  
THORNTON CO 80602

GROSS JOHN G II AND  
GROSS AMY M  
2179 E 149TH AVE  
THORNTON CO 80602-7373

HASSAN BASSEM A AND  
HAMIDI SAIRA Y  
2423 E 156TH PL  
THORNTON CO 80602-7722

GUNN BRIAN K AND  
GUNN KATHRYN  
14801 GAYLORD ST  
THORNTON CO 80602-7375

HASTINGS AARON AND  
HASTINGS SUSAN  
3063 E 148TH PL  
THORNTON CO 80602-8802

HALL ZACHARY D AND  
HALL JANAY  
14961 WILLIAMS ST  
THORNTON CO 80602-7393

HASTINGS JOSEPH AND  
HASTINGS MARY  
2546 E 149TH AVENUE  
THORNTON CO 80602

HANSEN KEVIN S AND  
HANSEN MICHELLE R  
2198 E 149TH AVENUE  
THORNTON CO 80602

HAYDEN STEVEN M AND  
COX SUSAN L  
15085 ELIZABETH STREET  
THORNTON CO 80602

HEARN KENNETH E AND  
HEARN MARY E  
14994 FILLMORE WAY  
BRIGHTON CO 80602

HINCHMAN KELLEY AND  
HINCHMAN CHRISTOPHER  
2937 E 151ST PL  
BRIGHTON CO 80602-7947

HEIMANN GREGORY P AND  
HEIMANN DIANNE M  
14951 WILLIAMS ST  
THORNTON CO 80602

HINRICHS JAMES D AND  
PARKINSON-HINRICHS ANNE  
15653 ELIZABETH ST  
THORNTON CO 80602

HEPLER CYRUS M  
14948 CLAYTON STREET  
THORNTON CO 80602

HINTON JACK L REVOCABLE TRUST UND 1/2  
HINTON ALICE L REVOCABLE TRUST UND 1/2  
15091 FILLMORE WAY  
THORNTON CO 80241

HERNANDEZ JUAN M AND  
HERNANDEZ ANDREA  
14902 WILLIAMS STREET  
THORNTON CO 80602

HOBBS BRIAN M AND  
HOBBS MUTIARA A  
15154 ST PAUL ST  
THORNTON CO 80602-7952

HERNANDEZ LAURA E AND  
HERNANDEZ MARIO  
2462 E 156TH PL  
THORNTON CO 80602

HOCH KATHERINE E  
15178 ST PAUL ST  
THORNTON CO 80602-7952

HERNANDEZ MICHAEL A AND  
HERNANDEZ STEPHANIE  
2442 E 156TH PL  
THORNTON CO 80602

HOLBROOK BRYON C AND  
HOLBROOK BRANDY E  
15093 ST PAUL ST  
THORNTON CO 80602-7951

HERONIMA ERIC C AND  
HERONEMA LUANNE J  
14963 VINE STREET  
THORNTON CO 80602

HOLMAN ROBERT D AND  
HOLMAN DEEANNE  
15051 JOSEPHINE STREET  
THORNTON CO 80602

HERPEL CHRISTINE N  
2037 E 148TH PL  
THORNTON CO 80602-7015

HOPWOOD DALE F AND  
HOPWOOD LINDSEY H  
15066 FILLMORE WAY  
THORNTON CO 80602-7943

HERRERA MARC R AND  
HERRERA TRACY M  
15690 JOSEPHINE ST  
THORNTON CO 80602

HORAN JOSEPH A AND  
HORAN JENA O  
14938 GAYLORD STREET  
THORNTON CO 80602

HICKS CECIL L AND  
HICKS M KAYE  
14985 ELIZABETH STREET  
THORNTON CO 80602

HOWE BARBARA LOUISE ET AL  
17661 N SADDLE RIDGE DR  
SURPRISE AZ 85374

HOWE MICHAEL F AND  
HOWE PETRA M  
2032 E 148TH AVE  
THORNTON CO 80602-7013

JANKOWSKI CHRISTOPHER NATHANIEL  
2017 E 148TH PL  
THORNTON CO 80602-7015

HUNG TEHSIN REVOCABLE TRUST  
2542 E 150TH PL  
THORNTON CO 80602

JANOWSKI RICHARD AND  
JANOWSKI MELISSA C  
13336 LAFAYETTE WAY  
THORNTON CO 80241-1193

HUNSTAD FINANCIAL LLC  
HUNSTAD DARREN AND HUNSTAD BOBETTE  
2443 COUNTRY CLUB LOOP  
DENVER CO 80234-2639

JANSSEN BRIAN S AND  
JANSSEN MELISSA D  
15071 JOSEPHINE ST  
THORNTON CO 80602-7733

INOUYE COREY K AND  
INOUYE JESSICA J  
3155 E 105TH PL  
NORTHGLENN CO 80233-4462

JARNOT JULIE A AND  
NGUYEN ANH H  
15771 JOSEPHINE CIR W  
THORNTON CO 80602

IREY DUSTIN M  
2006 E 148TH DRIVE  
THORNTON CO 80602

JATKO LARA AND  
JATKO CHRISTOPHER  
15761 JOSEPHINE CIR W  
THORNTON CO 80602

IVERSON CHRISTOPHER H AND  
IVERSON CHELSEA  
1976 E 148TH DR  
THORNTON CO 80602-7396

JAVADEZADEH CYNTHIA KAY UND 1/3 INT  
65 RANCHO ROAD  
BELL CANYON CA 91307

JACKSON CHRISTOPHER A AND  
DENT MICHELLE M  
3159 E 152ND PL  
BRIGHTON CO 80602-7950

JENIK KYLE AND  
JENIK VICKY  
2174 E 149TH AVE  
THORNTON CO 80602-7374

JACKSON JEFFREY A AND  
JACKSON DENISE M  
14911 JOSEPHINE ST  
THORNTON CO 80602-7347

JENKINS FAMILY TRUST THE  
2079 E 148TH PLACE  
THORNTON CO 80602

JACOBS BENJAMIN D AND  
JACOBS MICHELLE ENDERLE  
3099 E 152ND PL  
BRIGHTON CO 80602-7949

JENSEN ANTHONY J AND  
JENSEN WENDY L  
14960 VINE ST  
THORNTON CO 80602-7350

JANIS LYNNE A AND  
JACKSON THOMAS M  
2942 E 151ST PL  
BRIGHTON CO 80602-7947

JIMENEZ GLORIA A AND  
JIMENEZ THEODORE V  
15781 JOSEPHINE CIR W  
THORNTON CO 80602

JOHNSON BARBARA A  
15655 COLUMBINE ST  
THORNTON CO 80602

KIJOWSKI STEVE D AND  
KIJOWSKI LISA J  
14941 GAYLORD ST  
THORNTON CO 80602-7352

JOHNSON GREGG R AND  
MAI MARIE V  
2047 E 148TH PLACE  
THORNTON CO 80602

KILLEAN JAMES J AND  
KELLEAN KATHRYN L  
15065 ELIZABETH STREET  
THORNTON CO 80602

JOHNSON SCOTT H AND  
JOHNSON SUSAN E  
14928 CLAYTON STREET  
THORNTON CO 80602

KLUGE PATRICK W AND  
KLUGE DAWN M  
14964 FILLMORE WAY  
THORNTON CO 80241

JONES MARK S AND  
KELLY-JONES MICHELLE E  
2511 E 150TH AVENUE  
THORNTON CO 80602

KNABB KLATON D AND  
KNABB LISA S  
14827 CLAYTON ST  
THORNTON CO 80602-7340

JUDD ROBERT S AND  
JUDD MELISSA I  
15676 COLUMBINE ST  
THORNTON CO 80602

KNUDSON KENNARD AND  
KNUDSON VICKI  
14971 VINE ST  
THORNTON CO 80602-7351

KAPPAN STEVEN L AND  
KAPPAN SARAH L  
15011 JOSEPHINE ST  
THORNTON CO 80602-7733

KOCI STEPHEN D AND  
KOCI DARLA J  
2642 E 150TH PLACE  
THORNTON CO 80602

KB HOME COLORADO INC  
7807 E PEAKVIEW AVE STE 300  
ENGLEWOOD CO 80111-6849

KONCZAK MICHAEL L AND  
KONCZAK DEBRA S  
14958 GAYLORD STREET  
THORNTON CO 80602

KEITH MARK AND  
KEITH DANIELLE  
15731 JOSEPHINE CIR W  
THORNTON CO 80602-7745

KOPALA JOHN E AND  
KOPALA DOROTHY E  
15078 ST PAUL ST  
THORNTON CO 80602-7951

KHALSA GURU MITTAR  
14956 ELIZABETH ST  
THORNTON CO 80602-7367

KOPPLINGER SCOTT W AND  
KOPPLINGER LISA B  
2902 E 151ST PLACE  
THORNTON CO 80602

KIEFER STEPHEN N AND  
KIEFER JENNIFER  
2643 E 150TH PLACE  
THORNTON CO 80602

KORON JEFFREY L  
PO BOX 981  
HAYS KS 67601-0981

KORRELL STEVEN S AND  
KORRELL DEBORAH D  
15098 ST PAUL ST  
THORNTON CO 80602-7951

LATTA PATRICIA L AND  
VANBLADEREN KRISTINA A  
15004 COLUMBINE STREET  
THORNTON CO 80602

KOWALSKI CURTIS E AND  
KOWALSKI MEGHAN R  
2909 E 152ND PL  
THORNTON CO 80602-7948

LAY HELEN AND  
LAY RAYMOND  
15172 FILLMORE WAY  
THORNTON CO 80602-7946

KRIEGER MICHAEL A AND  
KRIEGER TERESA M  
14982 RACE STREET  
THORNTON CO 80602

LAYTON ROGER H AND  
BILLINGER RANDY J  
15654 ELIZABETH ST  
THORNTON CO 80602

KRYGER FAMILY TRUST  
C/O KRYGER SHEILA D/ROBERT C TRUSTEES  
1061 SYRACUSE DRIVE  
CLAREMONT CA 91711

LE KHA N AND  
LE KIMBERLEE R  
3043 E 148TH PLACE  
THORNTON CO 80603

KYLE MATTHEW S AND  
KYLE RHODA M  
2997 E 151ST PL  
BRIGHTON CO 80602-7947

LEBSACK JAMES C  
14927 WILLIAMS ST  
THORNTON CO 80602

LAHMAN VIRGINIA JEAN  
1980 E 148TH PL  
THORNTON CO 80602

LEE MATTHEW W AND  
LEE MARIA A  
15122 FILLMORE WAY  
THORNTON CO 80602-7946

LAMOS NATHAN H AND  
LAMOS SARAH K BUNTING  
15064 COLUMBINE CT  
THORNTON CO 80602-8809

LEHMAN BENJAMIN R AND  
LEHMAN AMBER M  
15041 JOSEPHINE ST  
THORNTON CO 80602-7733

LANFORD GARY AND GINA LIVING TRUST THE  
14841 GAYLORD ST  
THORNTON CO 80602-7375

LEMONS RAMON AND  
SOGI-LEMONS TRACEY A  
2513 E 150TH PL  
THORNTON CO 80602-8810

LANGE VIRGIL C SR AND  
LANGE CAROL  
15720 JOSEPHINE STREET  
THORNTON CO 80602

LEYBA MATTHEW L AND  
LEYBA DIANE M  
15042 JOSEPHINE STREET  
BRIGHTON CO 80602

LARDES DOUGLAS JASON AND  
BIRCHER BAILEY L  
2080 E 148TH PL  
THORNTON CO 80602-7015

LINDHOLM DOUGLAS M AND  
LINDHOLM GINA C  
14979 VINE STREET  
THORNTON CO 80602

LISTER ERNEST DALE AND  
LISTER JULIE A  
14858 CLAYTON STREET  
BRIGHTON CO 80602

MADRID GERALD E AND  
MADRID TERESA E  
2126 E 149TH AVENUE  
THORNTON CO 80602

LMB CAPITAL PARTNERS LLC  
905 W 124TH AVE SUITE 200  
WESTMINSTER CO 80234

MADSEN DAVID  
15033 COLUMBINE ST  
THORNTON CO 80602-7363

LOH CHIN LIANG ESTATE OF  
2791 JOLIET ST  
DENVER CO 80238

MAGARA THOMAS FRANK AND  
MAGARA JUDITH ANN  
15640 JOSEPHINE ST  
THORNTON CO 80602-7723

LOMBARDI RICHARD A AND  
LOMBARDI SANDRA K  
14957 WILLIAMS ST  
THORNTON CO 80602

MALLOY LINDA F  
15075 FILLMORE WAY  
THORNTON CO 80602-7944

LONG HONG CA AND  
YE ELAINE XIU  
2503 E 148TH DRIVE  
THORNTON CO 80602

MANUEL JOHN AND  
MANUEL CYNTHIA  
15695 COLUMBINE ST  
THORNTON CO 80602-7726

LOPEZ JAY E AND  
LOPEZ JONNA L  
2994 E 150TH DR  
THORNTON CO 80602-7942

MARKS J SCOTT AND  
MARKS CATHY  
15068 ST PAUL ST  
THORNTON CO 80602-7951

LOUNSBERRY LIVING TRUST C/O SHARON D  
AND DENNIS B LOUNSBERRY/TRUSTEES  
1420 N ALTA MESA WAY  
BREA CA 92821

MARTIN HELEN T  
15665 COLUMBINE ST  
THORNTON CO 80602

LOVATO KENNETH C AND  
LOVATO ATHENA R  
14928 GAYLORD STREET  
THORNTON CO 80602

MARTINDALE JOHN A AND  
MARTINDALE DELORES O  
14987 CLAYTON STREET  
THORNTON CO 80602

LYMAN DANIEL P AND  
LYMAN CLAUDINE L  
2401 E 148TH DR  
THORNTON CO 80602

MARTINEZ ALIENA A AND  
MARTINEZ JOHN A  
2613 E 150TH PL  
THORNTON CO 80602-8812

MADDOCKS DALE E AND  
MADDOCKS MELANIE L  
14824 FILLMORE WAY  
THORNTON CO 80602

MARTINEZ BENNIE T AND  
MARTINEZ CHRISTIANE  
15650 JOSEPHINE ST  
THORNTON CO 80602

MARTINEZ ROBERT J  
14908 CLAYTON ST  
THORNTON CO 80602-7341

MC LAUGHLIN ALAN R  
14958 CLAYTON STREET  
THORNTON CO 80602

MARUYAMA ERIC R RESIDENTIAL TRUST THE  
14923 RACE ST  
THORNTON CO 80602-7391

MCATEE KIMBERLY A AND  
MARSH LARRIETTA D  
14918 GAYLORD ST  
THORNTON CO 80602-7353

MASCARENAS LEO G AND  
MASCARENAS EDELIN Y  
2539 E 148TH PL  
THORNTON CO 80602-7344

MCCLURE BRYAN E AND  
MCCLURE JOANNA M  
14858 GAYLORD ST  
THORNTON CO 80602-7375

MASTERSON FAMILY LIVING TRUST  
13062 MONROE DR  
DENVER CO 80241-2113

MCCLYMONDS FAMILY TRUST  
3053 E 148TH PLACE  
THORNTON CO 80602

MATNEY JOSEPH M AND  
MATNEY LINDA J  
14943 RACE ST  
THORNTON CO 80602

MCLACHIAN AARON R  
2449 E 148TH PL  
THORNTON CO 80602-7343

MAYER DEREK AND  
SANDOVAL LISA S  
15700 JOSEPHINE ST  
THORNTON CO 80602

MCLAIN PATRICK J AND  
MCLAIN KARMU J  
14924 VINE ST  
THORNTON CO 80602-7350

MC CLEERY MARTHA C  
14835 FILLMORE WAY  
THORNTON CO 80602-8805

MCLAUGHLIN DAVID AND  
MCLAUGHLIN KARLIN  
15749 JOSEPHINE ST  
THORNTON CO 80602

MC GEE MICHAEL A AND  
MC GEE CHRISTINA M  
2541 E 150TH AVE  
THORNTON CO 80602

MENDENHALL MATTHEW D AND  
MENDENHALL KARI A  
15072 ELIZABETH CT  
THORNTON CO 80602-7368

MC GOWEN RONALD L AND  
MC GOWEN LINDA L  
3003 E 148TH PLACE  
THORNTON CO 80241

MERITAGE HOMES OF COLORADO INC  
6892 S YOSEMITE CT STE 1-201  
CENTENNIAL CO 80112-1464

MC KINLEY SARAH J AND  
OYER RYAN J  
14855 FILLMORE WAY  
THORNTON CO 80602-8805

MERRELL JEFFREY AND  
MERRELL TARA  
2509 E 148TH PL  
THORNTON CO 80602-7344

METZLER THOMAS L AND  
METZLER LISA M  
14941 JOSEPHINE STREET  
THORNTON CO 80602

MOOSE HILL INVESTMENTS LLC  
2605 FAIRFAX ST  
DENVER CO 80207-3222

MICHALKOW STANISLAW AND  
MICHALKOW KRZYSTYNA D  
2030 E 148TH PLACE  
THORNTON CO 80602

MOREY SUSAN AND  
RODRIGUEZ MICHAEL  
15629 JOSEPHINE ST  
THORNTON CO 80602

MILE HIGH INVESTMENTS GROUP LLC  
4174 E 139TH AVE  
THORNTON CO 80602-7045

MORGAN JAMES H AND  
MORGAN CINDY L  
15649 JOSEPHINE ST  
THORNTON CO 80602

MILLER LAMBERTINE A  
14973 COLUMBINE STREET  
THORNTON CO 80602

MORGEN JAMES C AND  
MORGEN JENIFER J  
14910 WILLIAMS STREET  
THORNTON CO 80602

MILLER RUSSELL B AND  
MILLER SUE V  
15689 JOSEPHINE ST  
THORNTON CO 80602

MORRIS NICHOLAS AND  
MUNOZ AMANDA  
15696 COLUMBINE ST  
THORNTON CO 80602

MILLER THOMAS G/LINDA A COTRUSTEES  
MILLER THOMAS G/LINDA A REVOC LIVING TRU  
2483 E 150TH PL  
THORNTON CO 80602-8810

MORTUS JOSEPH M AND  
MORTUS DEBRA S  
14993 COLUMBINE STREET  
THORNTON CO 80602

MITCHELL DAVID STEPHEN AND  
MITCHELL CAROLYN RODGERS  
14998 CLAYTON STREET  
THORNTON CO 80602

MOUSEL WILLIAM TROY  
15091 JOSEPHINE ST  
THORNTON CO 80602-7733

MITCHELL JEFFREY L AND  
MITCHELL CATHERINE A  
15038 CLAYTON ST  
THORNTON CO 80602-8807

MUNOZ MIGUEL AND  
MUNOZ DIANA I  
15156 FILLMORE WAY  
THORNTON CO 80602-7946

MODEN KELLY J AND  
MODEN MARIE E  
110 BEIN ST  
BERTHOUD CO 80513-2634

MURRAY JOHN P AND  
PLATA GARY J  
14992 JOSEPHINE STREET  
BRIGHTON CO 80602

MONTANO JOSHUA M  
11669 COUNTRY CLUB LN  
DENVER CO 80234-2648

MUSICH MARK E AND  
MUSICH CORRIE L  
14987 VINE STREET  
THORNTON CO 80602

NAIR KRISHNAN R AND  
MURALEEDHARA-MENON MISHA  
2431 E 150TH AVE  
THORNTON CO 80602-7359

O CONNOR CHRISTOPHER AND  
OCONNOR BODI L  
2553 E 150TH PL  
THORNTON CO 80602-8811

NEELY MATTHEW D AND  
NEELY CHRISTINE R  
14913 RACE ST  
THORNTON CO 80602-7391

O LEARY MELISSA A  
15016 ELIZABETH ST  
THORNTON CO 80602-7368

NELSON RANDY L AND  
NELSON BRITTANY DIANE  
14815 FILLMORE WAY  
BRIGHTON CO 80602

O NEAL VALERIE B AND  
O NEAL PATRICK L  
15072 JOSEPHINE ST  
THORNTON CO 80602

NEUHAUSER ROBERT B AND  
NEUHAUSER JENNIFER  
14930 WILLIAMS STREET  
THORNTON CO 80602

OEHLERT AMIE C AND  
OEHLERT MATTHEW A  
15044 COLUMBINE ST  
THORNTON CO 80602-7364

NEWMAN STEPHEN M AND  
RAJU TARA  
2613 E 149TH AVENUE  
THORNTON CO 80602

OENES DANIEL L AND  
OENES KRISTIE L  
15104 SAINT PAUL STREET  
THORNTON CO 80602

NICKS DEVON AND  
NICKS CARRIE  
2969 E 152ND PL  
THORNTON CO 80602-7948

ORAM PETER AND ORAM COLETTE  
15067 SAINT PAUL ST  
THORNTON CO 80602

NIELSEN JUSTIN C AND  
NIELSEN TAMARA P  
14847 CLAYTON STREET  
THORNTON CO 80602

ORTEGA CATHERINE  
2405 E 148TH DR  
THORNTON CO 80602-7335

NORTH WASHINGTON WATER USERS  
ASSOCIATION  
PO BOX 508  
EASTLAKE CO 80614

PALANIAPPAN KALAISELVAN AND  
KALAISELVAN RATHI SREE  
14825 COLUMBINE CT  
THORNTON CO 80602-7346

NUNEZ NORMA  
14972 JOSEPHINE STREET  
THORNTON CO 80602

PAPKE BRYAN AND  
PAPKE JODI  
15056 FILLMORE WAY  
THORNTON CO 80602-7943

NYQUIST ERIC AND  
NYQUIST KRISTEN  
14977 CLAYTON ST  
THORNTON CO 80602-7342

PARYS TIMOTHY J AND  
PARYS JENNIFER L  
14981 JOSEPHINE STREET  
THORNTON CO 80602

PAULSEN TORGEIR AND  
PAULSEN NANCY O  
2523 E 150TH PLACE  
THORNTON CO 80602

PETROFF CHRISTOPHER L REVOCABLE TRUST  
AND PETROFF LINDA L REVOCABLE TRUST THE  
14921 WILLIAMS ST  
THORNTON CO 80602-7393

PAYAN GEORGE AND  
PAYAN SHALAINE  
2501 EAST 148TH DRIVE  
THORNTON CO 80602

PHENICIE SANFORD AND  
PHENICIE CAROLINE  
3139 E 152ND PL  
BRIGHTON CO 80602-7950

PELSTER FAMILY TRUST THE  
15063 ST PAUL ST  
THORNTON CO 80602-7951

PHILLIPS MARK E AND  
PHILLIPS EILEEN M  
14903 RACE STREET  
THORNTON CO 80602

PEOPLES NATHAN W AND  
PEOPLES CHRISTINA M  
15068 ELIZABETH CT  
BRIGHTON CO 80602-7740

PITCHFORD ADAM R AND  
PITCHFORD REBECCA BING  
2576 E 149TH AVE  
THORNTON CO 80602-7365

PEREGO RICHARD E AND  
PEREGO TOMASENA L  
2902 E 148TH PL  
THORNTON CO 80602-7747

PONTER RUSSELL AND  
PONTER KIM  
14978 CLAYTON ST  
THORNTON CO 80602-7341

PEREZ ALVRO H  
2603 E 149TH AVENUE  
THORNTON CO 80602

POOR JUDITH L  
15656 COLUMBINE ST  
THORNTON CO 80602

PERRY MARK AND  
PERRY KRISTINE A  
15007 CLAYTON ST  
THORNTON CO 80602-7342

POTTER GENE W AND  
POTTER TRICIA L HINTON  
2964 E 150TH DR  
THORNTON CO 80602-7942

PETERS DONALD E AND  
PETERS BARBARA L  
2046 E 148TH DR  
THORNTON CO 80602-7396

PRIVETT CHANG I AND  
PRIVETT SARAH J  
14963 COLUMBINE STREET  
THORNTON CO 80602

PETERS JIMMY D AND  
PETERS CYNTHIA K  
2593 E 150TH PL  
THORNTON CO 80602-8811

QUABECK ROBERT H HERITAGE TRUST  
15663 ELIZABETH ST  
THORNTON CO 80602

PETERSON KRISTI M AND  
HARMER JANE E  
4265 E 133RD PLACE  
THORNTON CO 80241

QUAIL VALLEY 1 2 3 OWNERS ASSOCIATION IN  
ASSOCIATION INC  
11654 HURON STREET NO. 100  
NORTHGLENN CO 80234

QUINLAN CAROL A AND  
QUINLAN PATRICK M  
2010 E 148TH PL  
THORNTON CO 80602-7013

RICHMOND AMERICAN HOMES OF  
COLORADO INC  
4350 S MONACO ST  
DENVER CO 80237-3400

QUINTANA ANTHONY R AND  
QUINTANA JULIE ROSE  
15021 JOSEPHINE ST  
THORNTON CO 80602-7733

RICKERT RICHARD A AND  
RICKERT JUDY L  
15674 ELIZABETH ST  
THORNTON CO 80602

RAJU RAMASWAMY AND  
RAMACHANDRAN LATHA  
15073 ELIZABETH COURT  
THORNTON CO 80602

RIGITELLO CORY W AND  
RIGITELLO TINA  
14851 VINE ST  
THORNTON CO 80602-7322

RATLIFF CHRISTOPHER LEE AND  
NGUYEN THANH-TUYET THI  
3014 E 148TH PL  
THORNTON CO 80602-8800

RILEY WILLIAM J  
14864 FILLMORE WAY  
THORNTON CO 80602

RAY TIMOTHY P AND  
RAY JODY A  
14921 GAYLORD STREET  
THORNTON CO 80602

RISLEY J P AND  
RISLEY LESLIE R  
3023 E 148TH PL  
THORNTON CO 80602-8802

RECH LEAH  
15064 ST PAUL ST  
THORNTON CO 80602-7951

ROBERTS FRANKLIN L  
PO BOX 781  
BOULDER CO 80306-0781

REFFEL JACK R AND  
REFFEL KIMBERLY D  
14932 RACE STREET  
THORNTON CO 80602

ROBERTS RYAN MICHAEL  
15639 JOSEPHINE ST  
THORNTON CO 80602

REIDLE DEVIN AND  
REIDLE BRIANA L  
14931 VINE STREET  
THORNTON CO 80602

ROBIRDS MARSHA L AND  
ROBIRDS DANIEL R  
2543 E 150TH PL  
THORNTON CO 80602-8811

REXROTH ERIC J AND  
REXROTH PENNY Y  
2573 E 150TH PL  
THORNTON CO 80602-8811

ROBY BRET N AND  
ROBY JESSICA B  
15084 COLUMBINE COURT  
THORNTON CO 80602

RHEA KAREN S AND  
RHEA JERRY L  
2531 E 150TH AVE  
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RODRIGUEZ CRYSTAL L LOBATO AND  
LOBATO PHILLIP J  
2402 E 156TH PL  
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RODRIGUEZ REGINA B  
3064 E 148TH PLACE  
THORNTON CO 80241

RUSH WILLIAM  
2533 E 150TH PL  
THORNTON CO 80602-8811

RODRIGUEZ SANTOS C AND  
RODRIGUEZ BERTHA M  
14968 GAYLORD STREET  
THORNTON CO 80602

RUWET GEORGE S AND  
RUWET KAREN JO  
1991 E 148TH DR  
THORNTON CO 80602-7395

ROHLFING STANLEY W AND  
ROHLFING LINDA M  
2107 E 149TH AVE  
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RYAN JAMES M AND  
RYAN SHERYL H  
15095 ELIZABETH ST  
THORNTON CO 80602-7370

ROTH STEVE F AND  
ROTH DOROTHY A  
2404 E 148TH DRIVE  
THORNTON CO 80602

SAENZ CLARK D AND  
SAENZ TONYA G  
15058 ST PAUL STREET  
THORNTON CO 80602

RUCH RYAN R AND  
RUCH LAURA E  
3024 E 150TH DR  
THORNTON CO 80602-7945

SALE JAYSON D AND  
SALE JONI M  
15086 FILLMORE WAY  
THORNTON CO 80602

RUFFING JOHN E AND  
RUFFING CHRISTINE  
14864 VINE ST  
THORNTON CO 80602-7317

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PETERSON BRETT  
2403 E 148TH DRIVE  
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SAVAGE KEVIN R AND  
SAVAGE HOPE L  
14946 ELIZABETH STREET  
THORNTON CO 80602

RUMREY MATTHEW R AND  
RUMREY HEATHER R  
14965 ELIZABETH STREET  
THORNTON CO 80602

SAVAGE TRAVIS H AND  
SAVAGE MEGAN A  
15092 ELIZABETH CT  
THORNTON CO 80602-7700

RUMSEY IAN S AND  
RUMSEY JAMIE L  
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THORNTON CO 80602

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SAWYER LYNN M  
15063 COLUMBINE COURT  
THORNTON CO 80602

RUNNER MARK A AND  
RUNNER DEBRA J  
9695 ORANGEWOOD DR  
THORNTON CO 80260-5451

SAYAVONG VANASOOK AND  
SAENGPRASEUTH DAENG  
15062 JOSEPHINE ST  
THORNTON CO 80602-7358

SCARPELLA JASON A AND  
SCARPELLA JANESSA R  
2296 E 149TH AVE  
THORNTON CO 80602

SHAFER NATHANAEL  
2503 E 150TH PL  
THORNTON CO 80602-8810

SCHANKER DAVID J AND  
SCHANKER MICHELE L  
3156 E 152ND PL  
BRIGHTON CO 80602-7950

SHAYLER MICHAEL AND  
SHAYLER CHRISTIE  
14811 GAYLORD ST  
THORNTON CO 80602

SCHIRNICK HOLGER A  
15028 CLAYTON STREET  
THORNTON CO 80602

SHEAHEN TIMOTHY J  
15022 JOSEPHINE ST  
THORNTON CO 80602-7357

SCHMIDT YVONNE K 50% INT AND  
FUCHS HENRY R/DARLENE H 50% INT  
PO BOX 454  
FREDERICK CO 80530

SHELBY MARK AND  
SHELBY NOEMI  
14955 FILLMORE WAY  
BRIGHTON CO 80602

SCOTT DAVID A AND  
SCOTT CYNTHIA S  
15679 JOSEPHINE ST  
THORNTON CO 80602

SHI LINI AND  
PHU VINH S  
15078 ELIZABETH CT  
THORNTON CO 80602

SCRIBNER LISA L AND  
SCRIBNER PATRICK M  
15094 ST PAUL ST  
THORNTON CO 80602-7951

SHINEFIELD TIMOTHY R AND  
SHINEFIELD LAURA K  
15043 COLUMBINE COURT  
THORNTON CO 80602

SEEBaum CHARLES G II AND  
SEEBaum KIMBERLY J  
14835 COLUMBINE COURT  
THORNTON CO 80602

SHORTELL REBECCA AND  
SHORTELL STEPHEN  
14962 JOSEPHINE STREET  
BRIGHTON CO 80602

SEIBEL GILBERT R  
14952 JOSEPHINE ST  
THORNTON CO 80602-7348

SIBLEY H ROSS III AND  
HOGAN ANN NETTIE  
14947 VINE ST  
THORNTON CO 80602-7351

SERWITZ DANIEL J  
14951 JOSEPHINE ST  
THORNTON CO 80602-7347

SIEFKEN AARON J AND  
SIEFKEN CECELIA  
14921 JOSEPHINE ST  
THORNTON CO 80602-7347

SEXTON BRADLEY D AND  
SEXTON RENEE L  
2471 E 150TH AVE  
THORNTON CO 80602

SILL STEPHEN II AND  
SILL JENNIFER  
15729 JOSEPHINE ST  
THORNTON CO 80602-7725

SIMMONS JASON D AND  
SIMMONS KANDICE M  
14962 WILLIAMS ST  
THORNTON CO 80602-7394

SORENSEN STEPHEN M AND  
STIEB-SORENSEN LYNNETTE  
2505 E 148TH DRIVE  
THORNTON CO 80602

SING JEREMY  
2906 E 152ND PL  
THORNTON CO 80602-7948

SOUKUP JASON PAUL  
2606 E 149TH AVE  
THORNTON CO 80602

SKIBA MICHAEL J  
14975 ELIZABETH STREET  
THORNTON CO 80602

SPADE LINDA L AND  
SPADE GARY P  
3054 E 148TH PLACE  
BRIGHTON CO 80603

SKLENAR JOSEPH A AND  
SKLENAR MARIBETH  
15052 FILLMORE WAY  
THORNTON CO 80602

SPOTTS LUKE AND  
SPOTTS KAREN  
2967 E 151ST PL  
THORNTON CO 80602-7947

SLEEMAN ELIZABETH R AND  
SLEEMAN AARON  
15083 ST PAUL ST  
THORNTON CO 80602-7951

STAATS WHITNEY L AND  
SMITH STEVEN HG  
15082 ELIZABETH CT  
THORNTON CO 80602-7700

SMITH BRIAN K AND  
SMITH PAMELA S  
14948 GAYLORD STREET  
THORNTON CO 80602

STEPHAN YURY P AND  
STEPHAN EMILY F  
15153 SAINT PAUL STREET  
THORNTON CO 80602

SMITH KEVIN E AND  
SMITH AMY M  
14888 GAYLORD STREET  
THORNTON CO 80602

STEPHENS RYAN L  
14942 RACE ST  
THORNTON CO 80602-7392

SMITH LARRY R AND  
SMITH AMANDA C  
14828 VINE STREET  
THORNTON CO 80602

STEVENSON JOHN M AND  
STEVENSON KIMBERLY A  
15053 COLUMBINE COURT  
THORNTON CO 80602

SNODDERLY LOGAN AND  
SNODDERLY LINDA  
15065 FILLMORE WAY  
THORNTON CO 80602-7944

STIER REBECCA R  
15660 JOSEPHINE ST  
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SOLANIK DAVID M AND  
SOLANIK BRANNIN HM  
1981 E 148TH DR  
THORNTON CO 80602-7395

STOCKEY BRIAN A AND  
STOCKEY COLLEEN J  
15031 JOSEPHINE ST  
THORNTON CO 80602-7733

STOKOE RICHARD W AND  
STOKOE JEANNE M  
14941 WILLIAMS ST  
THORNTON CO 80602-7393

SZULLO ATTILA AND  
SZULLO MARY K  
2939 E 152ND PL  
BRIGHTON CO 80602-7948

STORY DAMIAN AND  
STORY CHRISTA  
2429 E 148TH PLACE  
THORNTON CO 80602

TAYLOR JAMES L AND  
TAYLOR MARY A  
14808 GAYLORD STREET  
THORNTON CO 80602

STRETTER ROSE M AND  
STRETTER BILLY F  
15012 JOSEPHINE ST  
THORNTON CO 80602-7357

THAN THANH T AND  
TAT PHUONG LE  
15017 CLAYTON STREET  
THORNTON CO 80602

SUESS JOHN M AND  
SUESS MARY Z  
14962 RACE STREET  
THORNTON CO 80602

THE HAVEN AT YORK STREET  
HOMEOWNERS ASSOCIATION INC  
10700 E GEDDES AVENUE SUITE 100  
ENGLEWOOD CO 80112

SULLIVAN MICHAEL J AND  
SULLIVAN SANDRA L  
14828 CLAYTON STREET  
THORNTON CO 80602

THE HAVEN AT YORK STREET HOMEOWNERS  
ASSOCIATION INC  
7340 E CALEY AVE STE 300  
CENTENNIAL CO 80111-6710

SULLIVAN PATRICK AND  
SULLIVAN SARAH  
15709 JOSEPHINE ST  
THORNTON CO 80602

THOMAS BRUCE E  
14846 VINE STREET  
THORNTON CO 80602

SUNDQUIST DANIEL K  
2041 E 148TH DRIVE  
THORNTON CO 80602

THORNE RICHARD M AND  
THORNE GINA E  
14931 WILLIAMS STREET  
THORNTON CO 80602

SUNKEL RONALD R  
7990 W 21ST AVE  
LAKEWOOD CO 80214

THORNTON LISA J AND  
THORNTON CRAIG L  
15054 ST PAUL STREET  
THORNTON CO 80602

SWAIM CLIFFORD D III AND  
SWAIM TRACI M J  
2050 E 148TH PL  
THORNTON CO 80602-7015

TIEMANN DARRYL A AND  
TIEMANN JOANNE E  
2426 E 149TH AVE  
BRIGHTON CO 80602

SWIDERSKI MARCIN AND  
FRACZEK BARBARA  
2529 E 148TH PL  
THORNTON CO 80602-7344

TOLIVER CHRISTINA AND  
TOLIVER TERRY  
15619 JOSEPHINE ST  
THORNTON CO 80602

TRAVER ROBERT THOMAS AND  
TRAVER LISA MARIE  
15013 COLUMBINE ST  
THORNTON CO 80602-7363

VALENTINE JOHN R AND  
VALENTINE LAURA G  
14966 ELIZABETH STREET  
THORNTON CO 80602

TREMMEL WILLIAM J AND  
TREMMEL PATRICIA M  
14844 FILLMORE WAY  
THORNTON CO 80602

VANG XUE AND VANG JULY M  
2451 E 150TH AVE  
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TRETO RAUL L AND  
TRETO ANGELITA  
14955 VINE STREET  
THORNTON CO 80602

VAUGHAN BRIAN E AND  
VAUGHAN EMILY  
15052 JOSEPHINE STREET  
THORNTON CO 80602

TRUJILLO STEVEN R AND  
TRUJILLO MY KUE  
2528 E 148TH PL  
THORNTON CO 80602-7345

VELA AUDRA L AND  
VELA JOSEPH A  
3009 E 152ND PL  
BRIGHTON CO 80602-7949

TUCCIO BRENT J AND  
TUCCIO PAULA A  
14970 WILLIAMS STREET  
THORNTON CO 80602

VERVERS BRANDY AND  
VERVERS ROBERT MASSEY  
15699 JOSEPHINE ST  
THORNTON CO 80602

TWINEM WILLIAM J AND  
TWINEM DENA M  
15018 CLAYTON STREET  
THORNTON CO 80602

VILLAGOMEZ TOMAS AND  
VILLAGOMEZ MELVA  
15161 WASHINGTON ST  
BROOMFIELD CO 80023-9130

UNITED POWER INC  
PO BOX 929  
BRIGHTON CO 80601

VISSER BRUCE AND  
VISSER DEBRA BRUNETTI  
14922 WILLIAMS STREET  
THORNTON CO 80602

UPCHURCH CHRISTOPHER AND  
UPCHURCH JESSICA  
15062 FILLMORE WAY  
THORNTON CO 80602-7943

VOGEL GARY J AND  
VOGEL CAROLYN J  
14882 VINE STREET  
THORNTON CO 80602

UPTON AMY M  
14848 CLAYTON ST  
THORNTON CO 80602-7340

VOWLES TIMOTHY AND  
VOWLES NICOLE  
2516 E 149TH AVE  
THORNTON CO 80602-7365

URLING MATT AND  
URLING LISA  
15128 ST PAUL ST  
THORNTON CO 80602-7952

VUE FENG JOUA AND  
VUE KAO  
14931 JOSEPHINE ST  
THORNTON CO 80602-7347

WADDELL BARRY J AND  
WADDELL STACEY S  
2623 E 149TH AVENUE  
THORNTON CO 80602

WELANDER PAUL D AND  
WELANDER CATHY L  
15081 JOSEPHINE STREET  
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WAGNER HOWARD F JR AND  
WAGNER DEBRA  
14846 COLUMBINE COURT  
THORNTON CO 80602

WILDENSTEIN ALISHA C AND  
WILDENSTEIN KENNETH M  
15673 ELIZABETH ST  
THORNTON CO 80602

WALKER JEFFREY M AND  
WALKER TRICIA A  
15705 COLUMBINE ST  
THORNTON CO 80602

WILKINS JON M AND  
WILKINS TAMARA R  
3073 EAST 148TH PLACE  
THORNTON CO 80241

WALSH JUSTIN H AND  
WALSH RACHEL A  
15046 ELIZABETH STREET  
THORNTON CO 80602

WILLIAMS DONNA NICOLE AND  
WILLIAMS JASON DEAN  
15056 ELIZABETH ST  
THORNTON CO 80602-7368

WARD KURT T AND  
WARD VICTORIA B  
15095 FILLMORE WAY  
THORNTON CO 80602

WILSON MARK CHRISTOPHER AND  
WILSON VICKI ANN  
15099 JOSEPHINE ST  
THORNTON CO 80602-7733

WARNER MARTIN D AND  
WARNER DEBORAH J  
15645 COLUMBINE ST  
THORNTON CO 80602

WILT SUSAN E AND  
DYKE WARREN  
2000 E 148TH PL  
BRIGHTON CO 80602

WARNER-GARCIA LESLIE AND  
GARCIA SAMUEL J  
15646 COLUMBINE ST  
THORNTON CO 80602

WINSTON ROBERT B AND  
WINSTON KRISTA  
15063 ELIZABETH CT  
THORNTON CO 80602-7700

WARREN LARRY AND  
WARREN BILLIE  
15643 ELIZABETH ST  
THORNTON CO 80602

WINTENBURG SCOTT A  
2518 E 148TH PL  
THORNTON CO 80602-7345

WARRINER FREDERICK JR AND  
WARRINER CAROL M  
14968 CLAYTON ST  
THORNTON CO 80602-7341

WIRICK VICTOR J AND  
WIRICK SHEILA  
14836 COLUMBINE COURT  
THORNTON CO 80602

WEED LESLIE A  
2203 E 149TH AVE  
THORNTON CO 80602-7372

WOLFE RUSSELL C AND  
WOLFE DEBRA K  
14942 WILLIAMS STREET  
THORNTON CO 80602

WOODWARD STEPHEN S AND  
WOODWARD TERESA L  
14939 VINE STREET  
THORNTON CO 80602

WRAY VIRGINIA L  
2067 E 148TH PL  
THORNTON CO 80602

WURSTER MARY  
15075 ELIZABETH ST  
THORNTON CO 80602-7370

YANG TOUSUA AND  
YANG MAYNA M  
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THORNTON CO 80602

YBARRA FRANK A JR AND  
YBARRA NICOLE K  
14997 CLAYTON STREET  
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YORK 80 LLC UND 15/096 INT AND  
152ND AND YORK LLC UND 84/094 INT  
PO BOX 247  
EASTLAKE CO 80614-0247

ZABEL KARL B AND  
ZABEL MELISSA R  
15177 ST PAUL ST  
THORNTON CO 80602-7952

ZABROSKI DAVID P AND  
ZABROSKI JOY L  
15087 ST PAUL ST  
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ZHOU MAN YU AND  
SCARPINO MARK LEO  
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ZIEMBA EUGENE AND  
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EXHIBIT 5.3  
AMBIENT SOUND STUDY

# Ivey 11-N Pad Noise Modeling Report

November 7, 2016

Prepared for:

Ward Petroleum Corporation  
215 W Oak Street, Suite #1000  
Fort Collins, CO 80521

Prepared by:

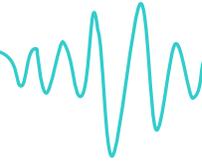
Behrens and Associates, Inc.  
13806 Inglewood Avenue  
Hawthorne California, 90250



Andrew Truitt  
Rocky Mountains Area  
Acoustical Engineer



Thomas Corbishley  
Engineering Manager



## 1. Introduction

The following report provides a noise modeling assessment of the proposed drilling and fracing operations at the Ivey 11-N pad operated by Ward Petroleum Corporation in relation to the Colorado Oil and Gas Conservation Commission (COGCC) noise regulations. The noise modeling includes both unmitigated and mitigated scenarios. The Ivey 11-N pad (39°58'29.51"N, 104°57'56.34"W) is located off East 152<sup>nd</sup> Avenue approximately 6.7 miles east of Lafayette, Colorado. The site is bordered by E-470 to the north, agricultural land to the west, and East 152<sup>nd</sup> Avenue to the south and east. Figure 1-1 identifies the pad location.

To assess the noise levels of the proposed Ivey 11-N pad, historical noise level data previously measured and typical of Xtreme Drilling Rig #22 and Liberty Oilfield Services fracing equipment. The noise model was developed using SoundPLAN 7.4 software.

The following is provided in this report:

- A brief introduction of the fundamentals of noise.
- Introduction of applicable COGCC noise standards.
- Discussion of noise modeling methodology and results.

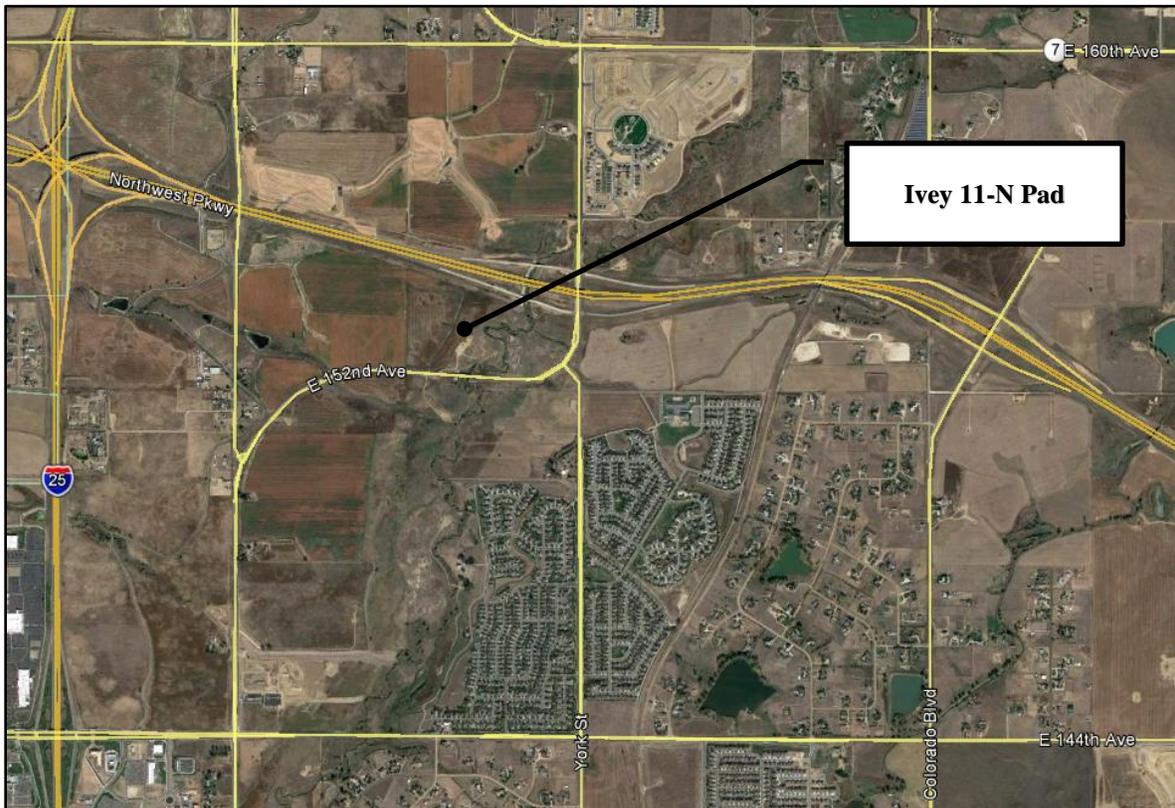


Figure 1-1 Ward Petroleum Pad Location



## 2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a “rumble” or “boom”. At the higher end of the range are high-pitched sounds that might be described as a “screch” or “hiss”.

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment, but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Typical indoor and outdoor A-weighted sound levels are shown in Figure 2-1.

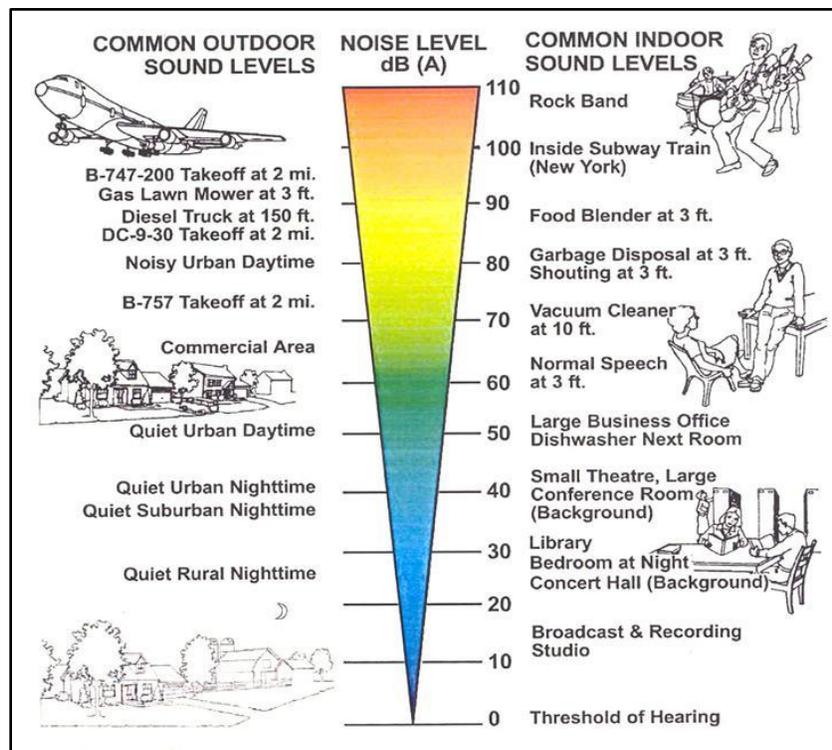


Figure 2-1 Typical Indoor and Outdoor A-Weighted Sound Levels

Detailed acoustical definitions have been provided in Appendix A -Nomenclature.



## 3. Noise Standards

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The modeling analysis was developed to evaluate drilling and fracing noise levels at adjacent occupied structures and verify compliance of operations with the Colorado Oil and Gas Conservation Commission (COGCC) Section 802 “Noise Abatement” requirements. The COGCC Code lists exterior noise limits for stationary noise sources. The noise limits are provided in Table 3-1.

**Table 3-1. COGCC Sec. 802(b) Noise Abatement Requirements “Exterior Noise Level Limits”**

<b>Zone</b>	<b>7:00 am to next 7:00 pm</b>	<b>7:00 pm to next 7:00 am</b>
Residential/Agricultural/Rural	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

Section 802.b of the standard states:

The type of land use of the surrounding area shall be determined by the Director in consultation with the Local Government Designee taking into consideration any applicable zoning or other local land use designation. In the hours between 7:00 a.m. and the next 7:00 p.m. the noise levels permitted above may be increased ten (10) dB(A) for a period not to exceed fifteen (15) minutes in any one (1) hour period. The allowable noise level for periodic, impulsive or shrill noises is reduced by five (5) dB (A) from the levels shown.

- (1) Except as required pursuant to Rule 604.c.(2)A., operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Section 802C.(1) of the standard states:

Sound levels shall be measured at a distance of three hundred and fifty (350) feet from noise source. At the request of the complainant, the sound level shall also be measured at a point beyond three hundred fifty (350) feet that the complainant believes is more representative of the noise impact. If an oil and gas well site, production facility, or gas facility is installed closer than three hundred and fifty (350) feet from an existing occupied structure, sound levels shall be measured at a point twenty-five (25) feet from the structure toward the noise source. Noise level from oil and gas facilities located on surface property owned, leased, or otherwise controlled by the operator shall be measured at the three hundred and fifty (350) feet or at the property line, whichever is greater.



Section 802(d) of the standard states:

In situations where the complainant or Commission onsite inspection indicates that low frequency noise is a component of the problem, the Commission shall obtain a sound level measurement twenty-five (25) feet from the exterior wall of residence or occupied structure to the noise source, using a noise meter calibrated to the dB(C). If this reading exceeds 65 dB(C), the Commission shall require the operator to obtain a low frequency noise impact analysis by qualified sound expert, including identification of any reasonable control measures available to mitigate such low frequency noise impact.

## **Colorado Oil and Gas Conservation Commission Setback Rules**

Section 604.c.(2)

A. Noise.

Operations involving pipeline or gas facility installation or maintenance, or the use of a drilling rig, are subject to the maximum permissible noise levels for Light Industrial Zones, as measured at the nearest Building Unit. Short-term increases shall be allowable as described in 802.c. Stimulation or re-stimulation operations and Production Facilities are governed by Rule 802.



## 4. Ivey 11-N Pad Noise Modeling

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### 4.1 Noise Modeling Methodology

The noise modeling was completed with use of three-dimensional computer noise modeling software. All models in this report were developed with SoundPLAN 7.4 software using the ISO 9613-2 standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. SoundPLAN 7.4 software simulates light downwind conditions in all directions to ensure conservative assessments. The predicted noise levels represent only the contribution of the drilling and fracing operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

The sound level data for the drilling rig were based on historical measurements from Xtreme Rig #22 per the request of Ward Petroleum. Rig placement and orientation was coordinated with Ward Petroleum and oriented to minimize noise impact when possible. The modeling results predicted are dependent on equipment and mitigation orientation as indicated.

The sound level data for the fracing equipment were based on historical measurements from Liberty Oilfield Services per the request of Ward Petroleum. Fracing equipment placement and orientation was coordinated with Ward Petroleum and oriented to minimize noise impact when possible. The modeling results predicted are dependent on equipment and mitigation orientation as indicated.

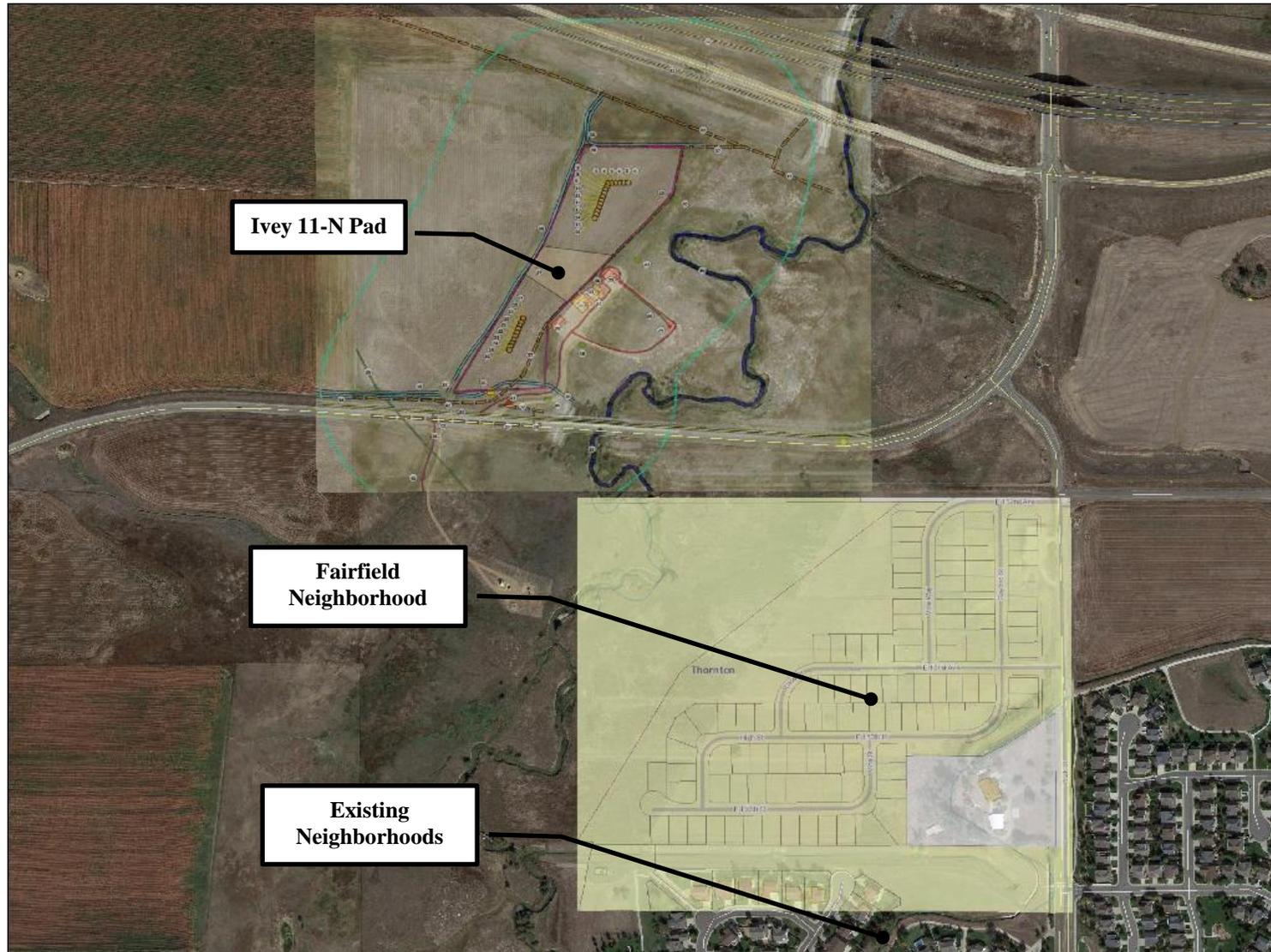
### 4.2 Noise Sensitive Receptors

The noise sensitive receptors have been chosen to be consistent with the requirements of the COGCC noise standards. The requirements indicate that dBA noise levels shall comply with the applicable noise limits as measured at 350 feet from the nearest noise source or at the property line, whichever is greater. The requirements indicate that dBC noise levels shall comply with the applicable noise limits as measured at 25 feet from the exterior wall of residence or occupied structure to the noise source.

The proposed Ivey 11-N pad contains two wellhead groups. As such, drilling and fracing activities were modeled for each wellhead group with distinct dBA and dBC noise sensitive receptors for each. Figure 4-1 shows the pad layout and illustrates the two wellhead groups. Figure 4-2 shows the location of the proposed Fairfield neighborhood in relation to the Ivey 11-N pad. The Fairfield neighborhood is currently under construction but was included in this modeling report at the request of Ward Petroleum. Figure 4-3 shows the dBA and dBC noise sensitive receptor locations for location 1 (wells 1 -16) and Figure 4-4 shows the dBA and dBC noise sensitive receptors for location 2 (wells 17-26).



**Figure 4-1 Proposed Ivey 11-N Pad Layout and Wellhead Locations**



**Figure 4-2 Proposed Ivey 11-N Pad and Fairfield Neighborhood Overlay**

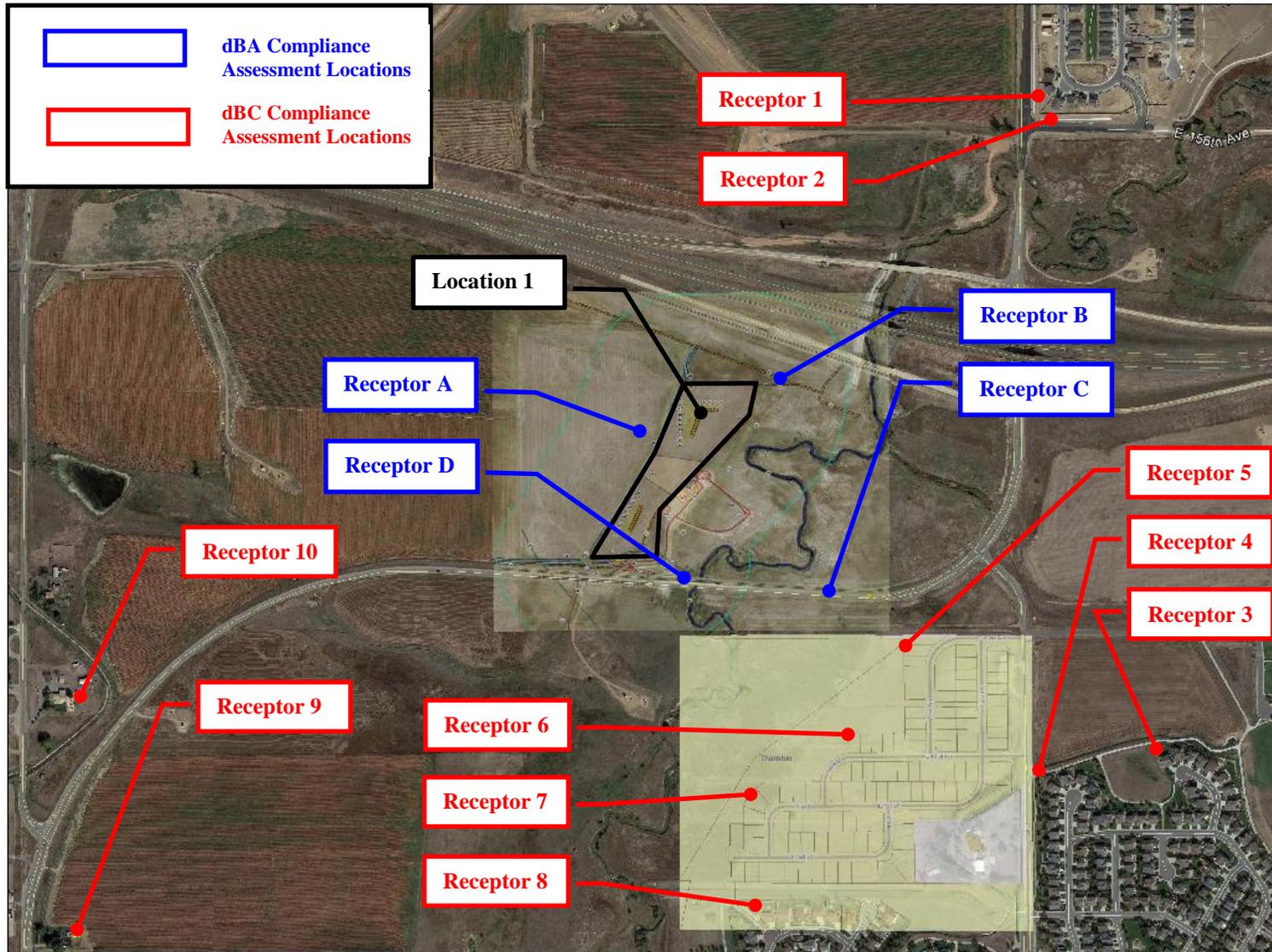


Figure 4-3 Noise Sensitive Receptor Locations for Location 1

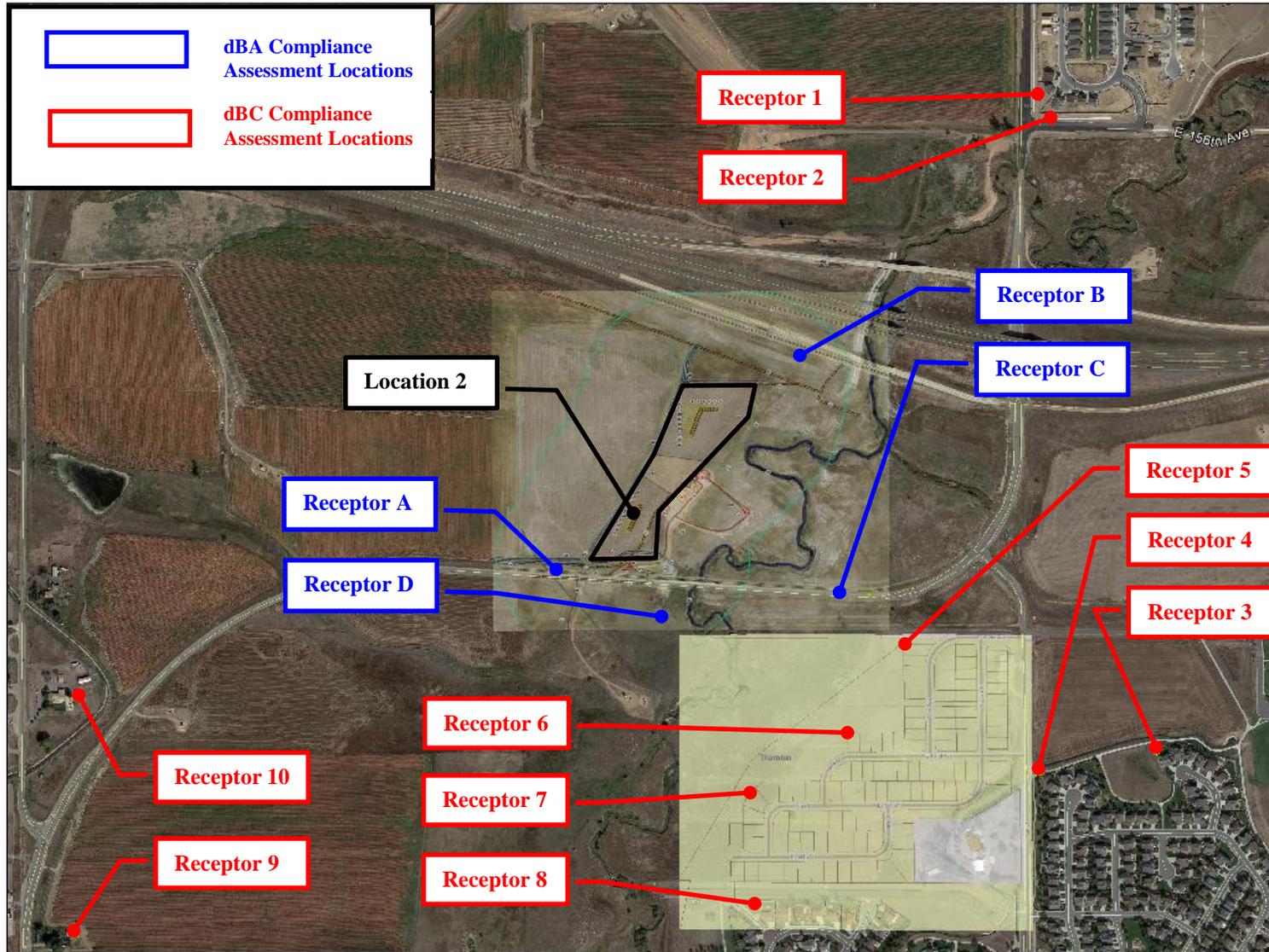


Figure 4-4 Noise Sensitive Receptor Locations for Location 2



## 4.3 Unmitigated Noise Modeling Results

The results of the unmitigated noise modeling are presented in Tables 4-1 through 4-4 with values out of compliance shown in red. The locations in the tables correspond to the receptor locations identified in Figures 4-3 and 4-4. The results of the noise modeling are also shown as noise contour maps. Figure 4-5 through 4-18 show the Unmitigated Drilling Noise Contour Maps in dBA and dBC for both locations and Figure 4-9 through 4-12 show the Unmitigated Fracing Noise Contour Maps in dBA and dBC for both locations. The noise contours are provided in 5 dB increments with the color scale indicating the sound level of each contour.

**Table 4-1 Unmitigated Noise Modeling Results Location 1 (dBA)**

Receptor	Location Description	Drilling dBA	Fracing dBA
Location A	350 ft. West of Nearest Noise Source	69.2	78.1
Location B	Northeast Property Line	56.8	77.9
Location C	Southeast Property Line	53.1	71.9
Location D	South Property Line	60.5	72.6
<b>Allowable Noise Level</b>	<b>350 ft from the noise source towards an existing, occupied structure or at the property line, whichever is greater</b>	<b>70.0 Day / 65.0 Night</b>	<b>80.0 Day / 75.0 Night</b>

**Table 4-2 Unmitigated Noise Modeling Results Location 2 (dBA)**

Receptor	Location Description	Drilling dBA	Fracing dBA
Location A	350 ft. Southwest of Nearest Noise Source	64.7	78.3
Location B	Northeast Property Line	48.0	67.4
Location C	Southeast Property Line	51.6	71.9
Location D	350 ft. South of Nearest Noise Source	68.4	77.9
<b>Allowable Noise Level</b>	<b>350 ft from the noise source towards an existing, occupied structure or at the property line, whichever is greater</b>	<b>70.0 Day / 65.0 Night</b>	<b>80.0 Day / 75.0 Night</b>



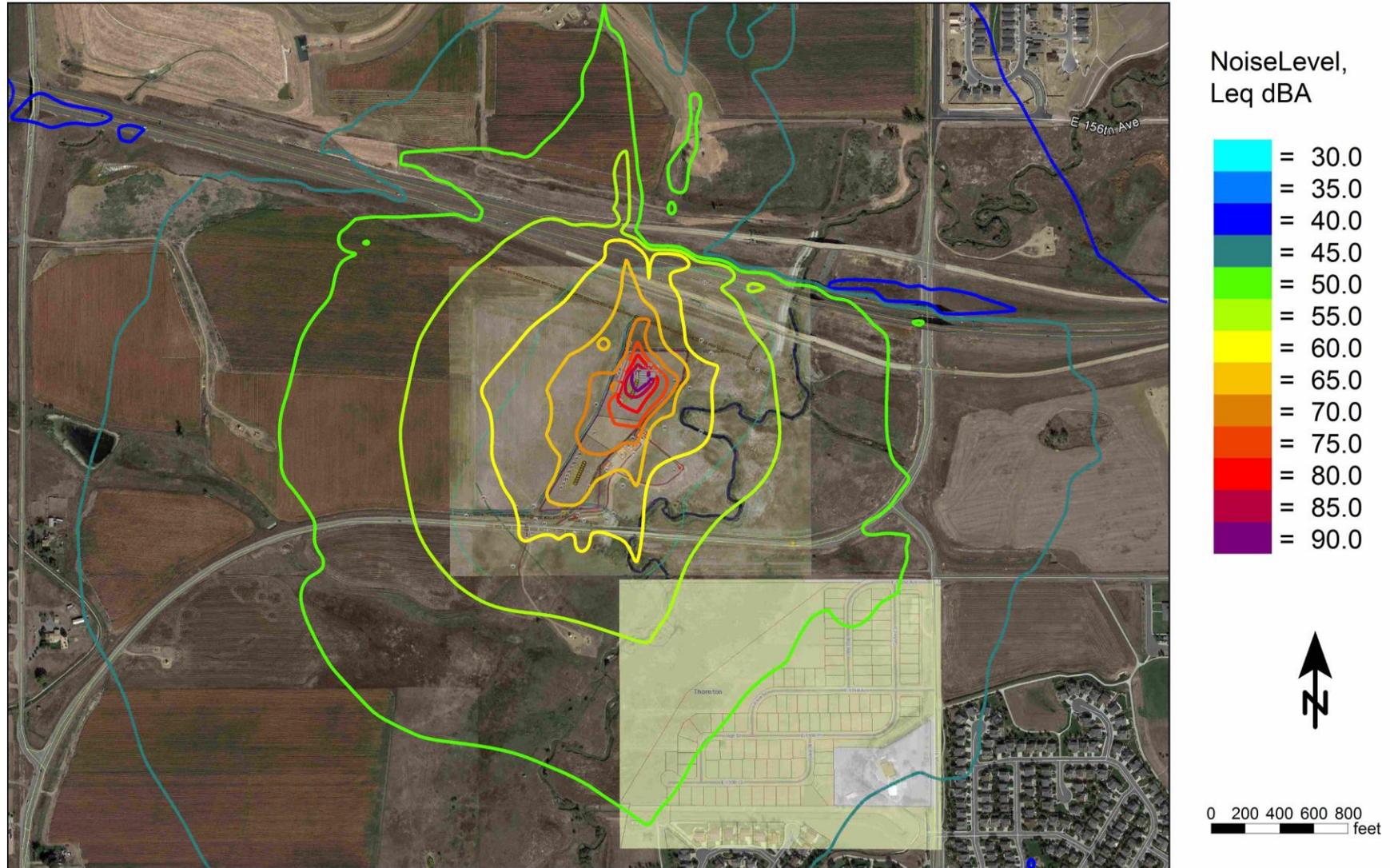
**Table 4-3 Unmitigated Noise Modeling Results Location 1 (dBC)**

Receptor	Location Description	Drilling dBC	Fracing dBC
Location 1	25 Feet from Northeast Residence 1	54.9	62.5
Location 2	25 Feet from Northeast Residence 2	54.4	62.7
Location 3	25 Feet from Southeast Residence 1	56.1	61.6
Location 4	25 Feet from Southeast Residence 2	57.3	63.5
Location 5	25 Feet from Southeast Residence 3	61.3	69.7
Location 6	25 Feet from Southeast Residence 4	60.8	68.3
Location 7	25 Feet from South Residence 1	60.6	66.5
Location 8	25 Feet from South Residence 2	58.0	63.5
Location 9	25 Feet from Southwest Residence 1	53.2	57.1
Location 10	25 Feet from Southwest Residence 2	53.9	59.4
<b>Allowable Noise Level</b>	<b>25 ft from the exterior wall of a residence or occupied structure towards the noise source</b>	<b>65.0</b>	<b>65.0</b>

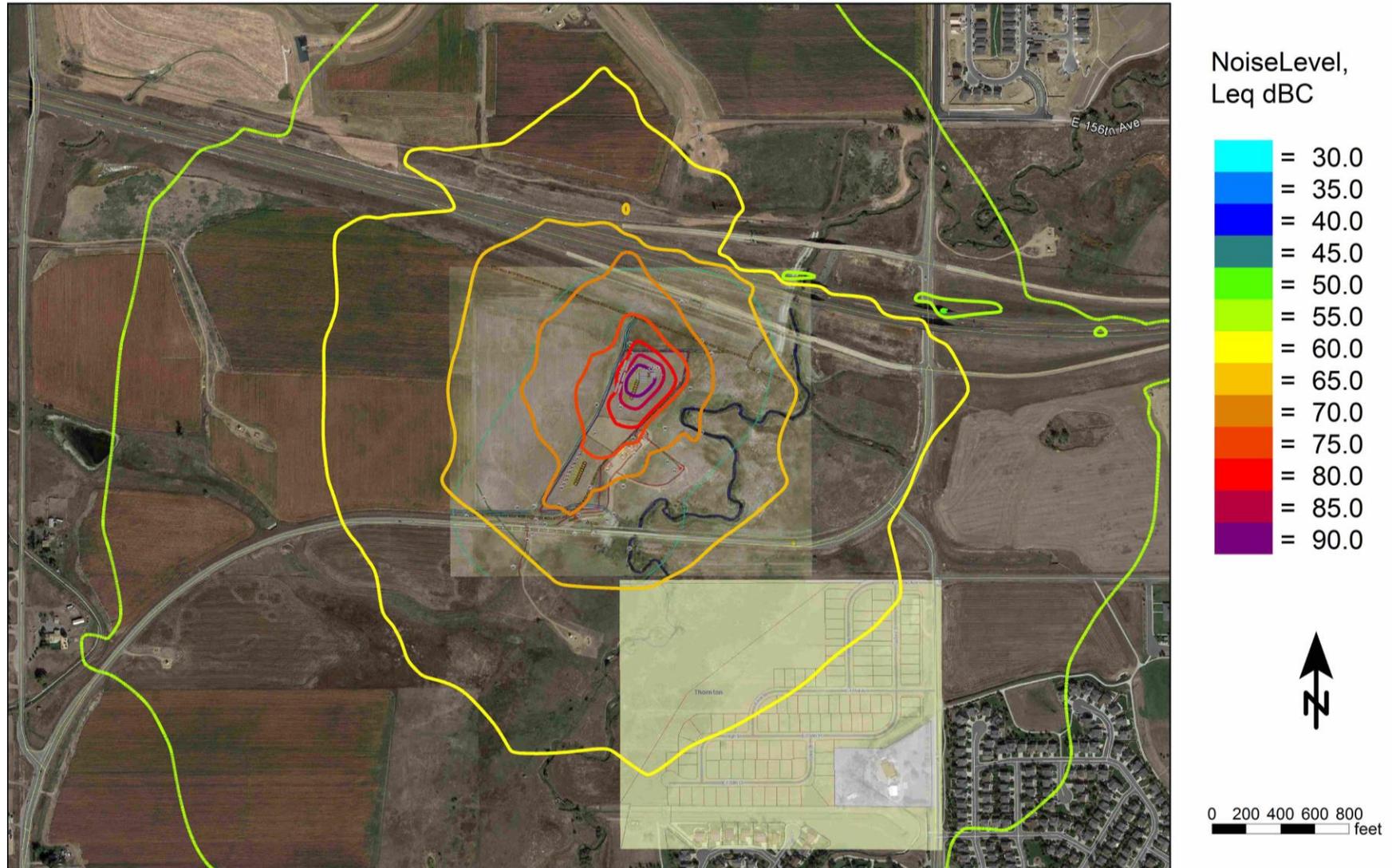


**Table 4-4 Unmitigated Noise Modeling Results Location 2 (dBC)**

Receptor	Location Description	Drilling dBC	Fracing dBC
Location 1	25 Feet from Northeast Residence 1	52.1	60.6
Location 2	25 Feet from Northeast Residence 2	52.2	60.7
Location 3	25 Feet from Southeast Residence 1	54.9	61.2
Location 4	25 Feet from Southeast Residence 2	57.5	63.8
Location 5	25 Feet from Southeast Residence 3	60.8	69.7
Location 6	25 Feet from Southeast Residence 4	62.8	69.4
Location 7	25 Feet from South Residence 1	63.4	70.4
Location 8	25 Feet from South Residence 2	60.5	65.9
Location 9	25 Feet from Southwest Residence 1	55.0	59.1
Location 10	25 Feet from Southwest Residence 2	56.2	60.7
<b>Allowable Noise Level</b>	<b>25 ft from the exterior wall of a residence or occupied structure towards the noise source</b>	<b>65.0</b>	<b>65.0</b>



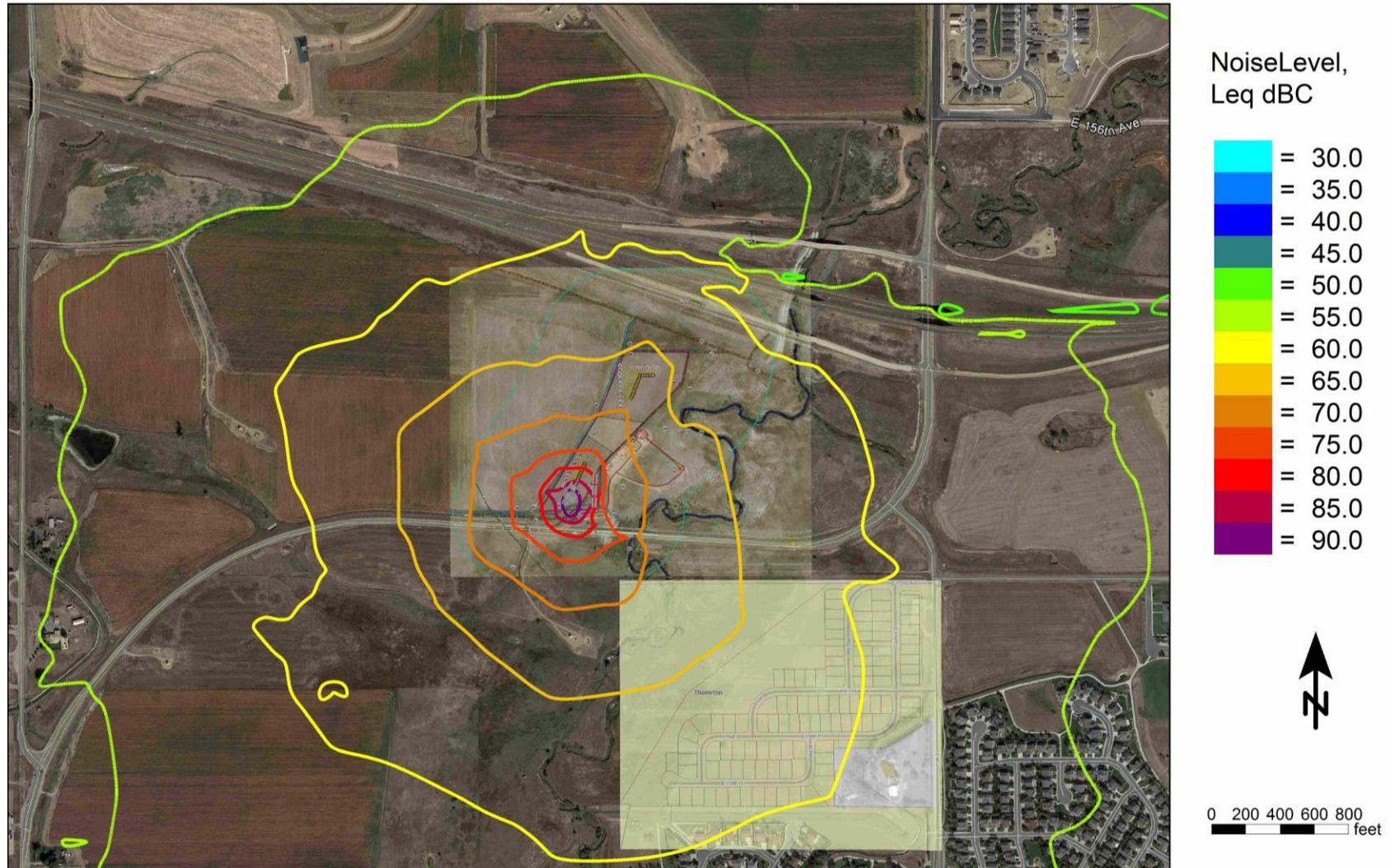
**Figure 4-5 Unmitigated Drilling Location 1 Noise Contour Map (dBA)**



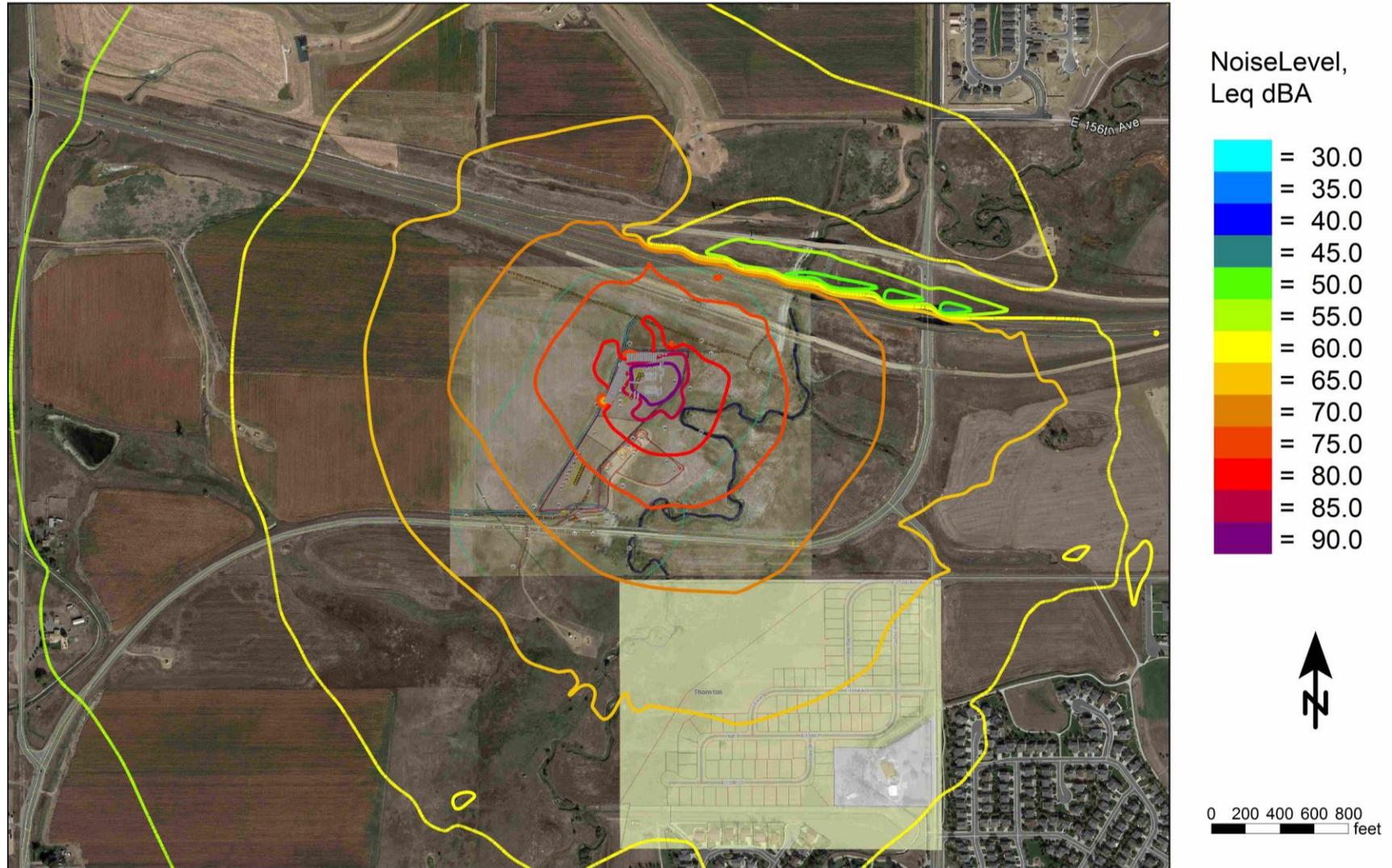
**Figure 4-6 Unmitigated Drilling Location 1 Noise Contour Map (dBC)**



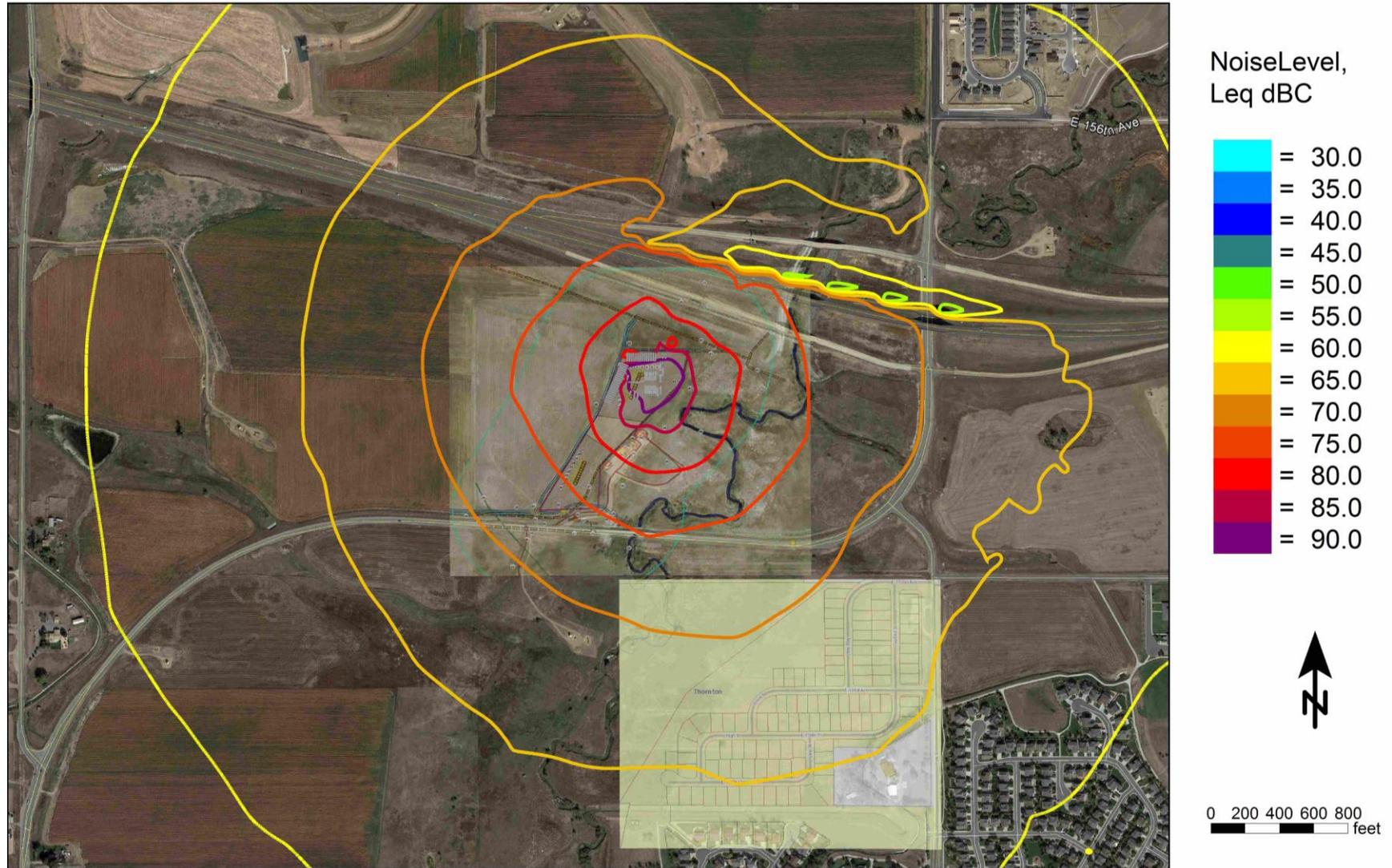
**Figure 4-7 Unmitigated Drilling Location 2 Noise Contour Map (dBA)**



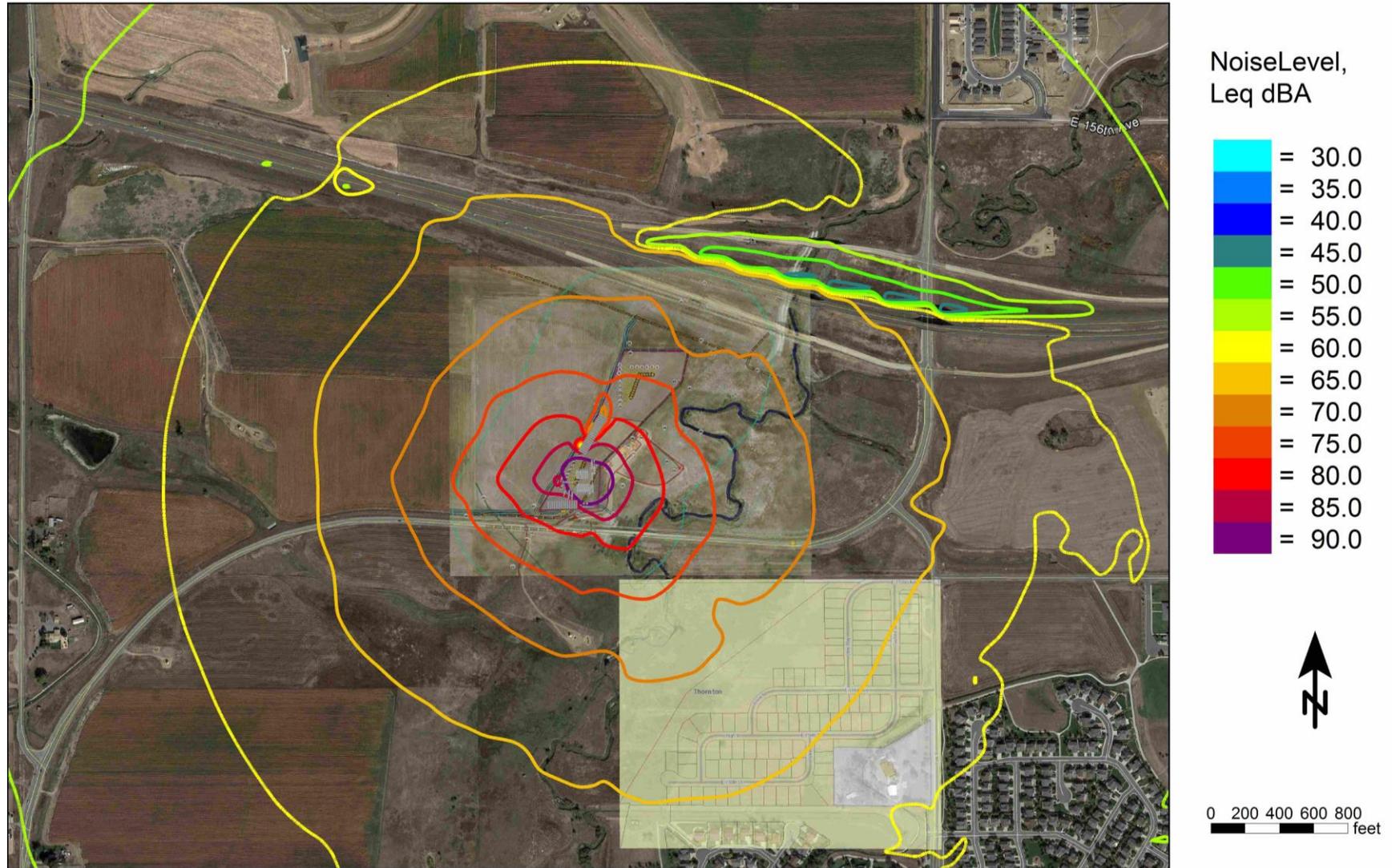
**Figure 4-8 Unmitigated Drilling Location 2 Noise Contour Map (dBC)**



**Figure 4-9 Unmitigated Fracing Location 1 Noise Contour Map (dBA)**



**Figure 4-10 Unmitigated Fracing Location 1 Noise Contour Map (dBC)**



**Figure 4-11 Unmitigated Fracing Location 2 Noise Contour Map (dBA)**

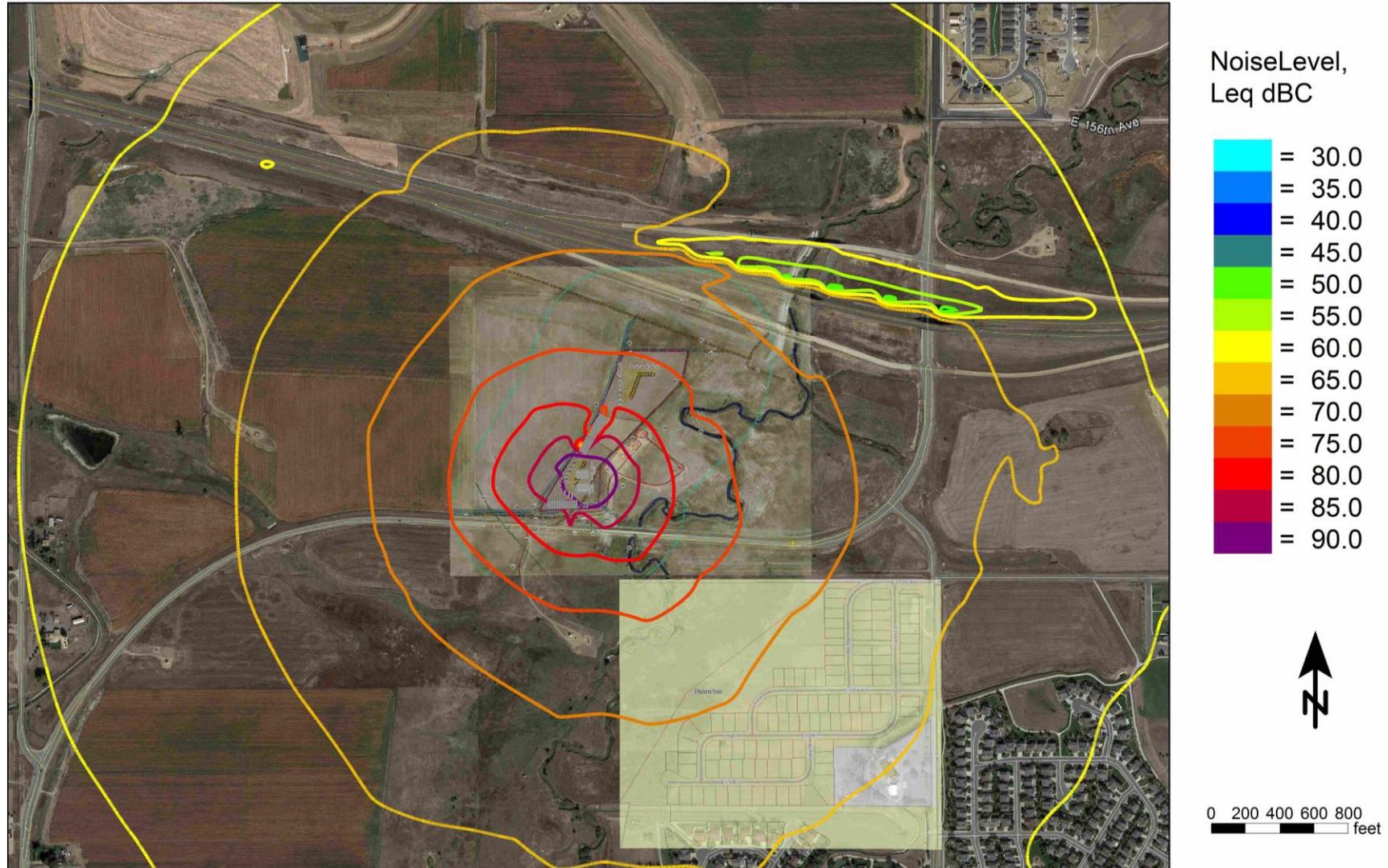


Figure 4-12 Unmitigated Fracing Location 2 Noise Contour Map (dBC)

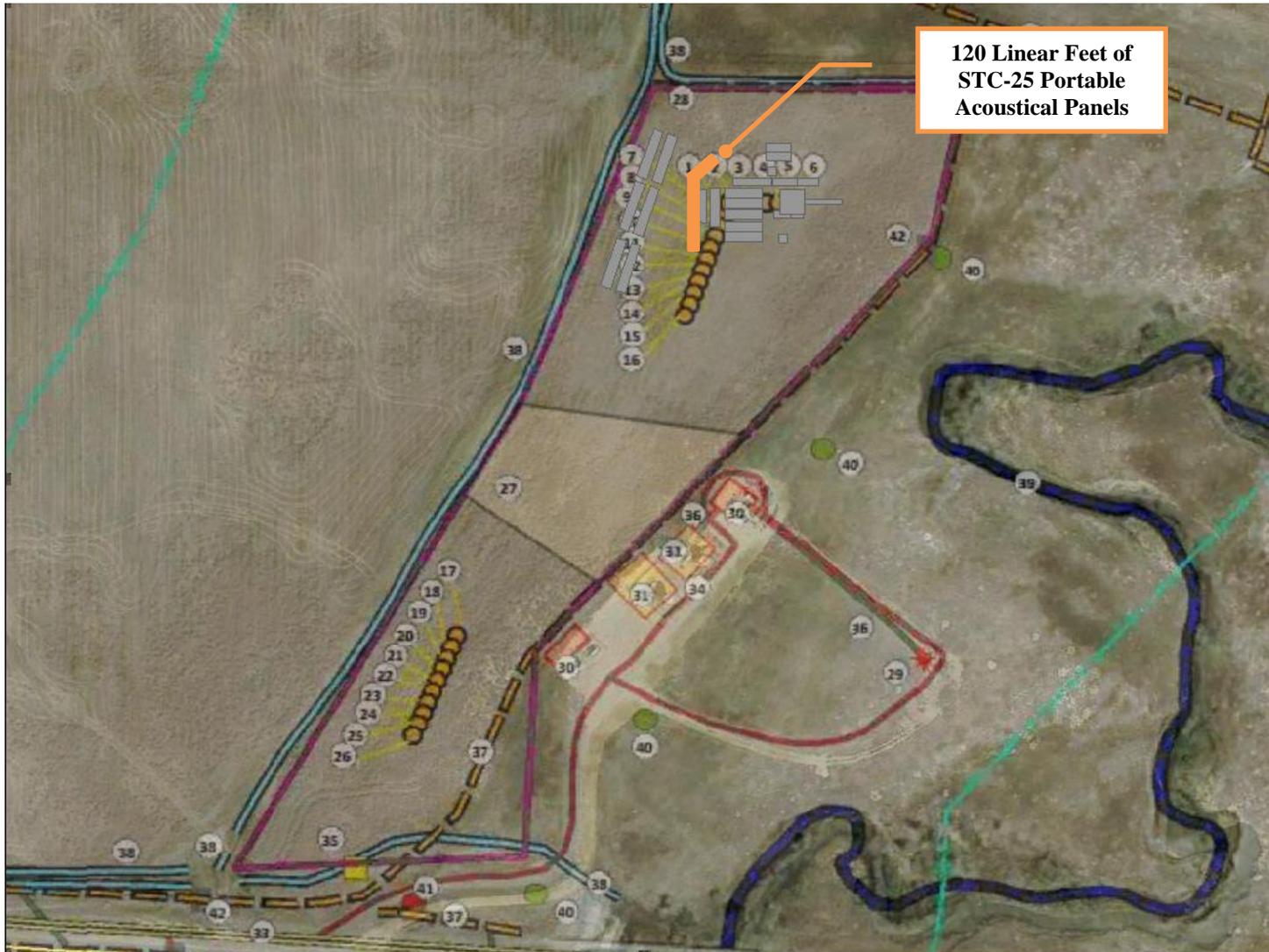


## 4.4 Mitigation Recommendations

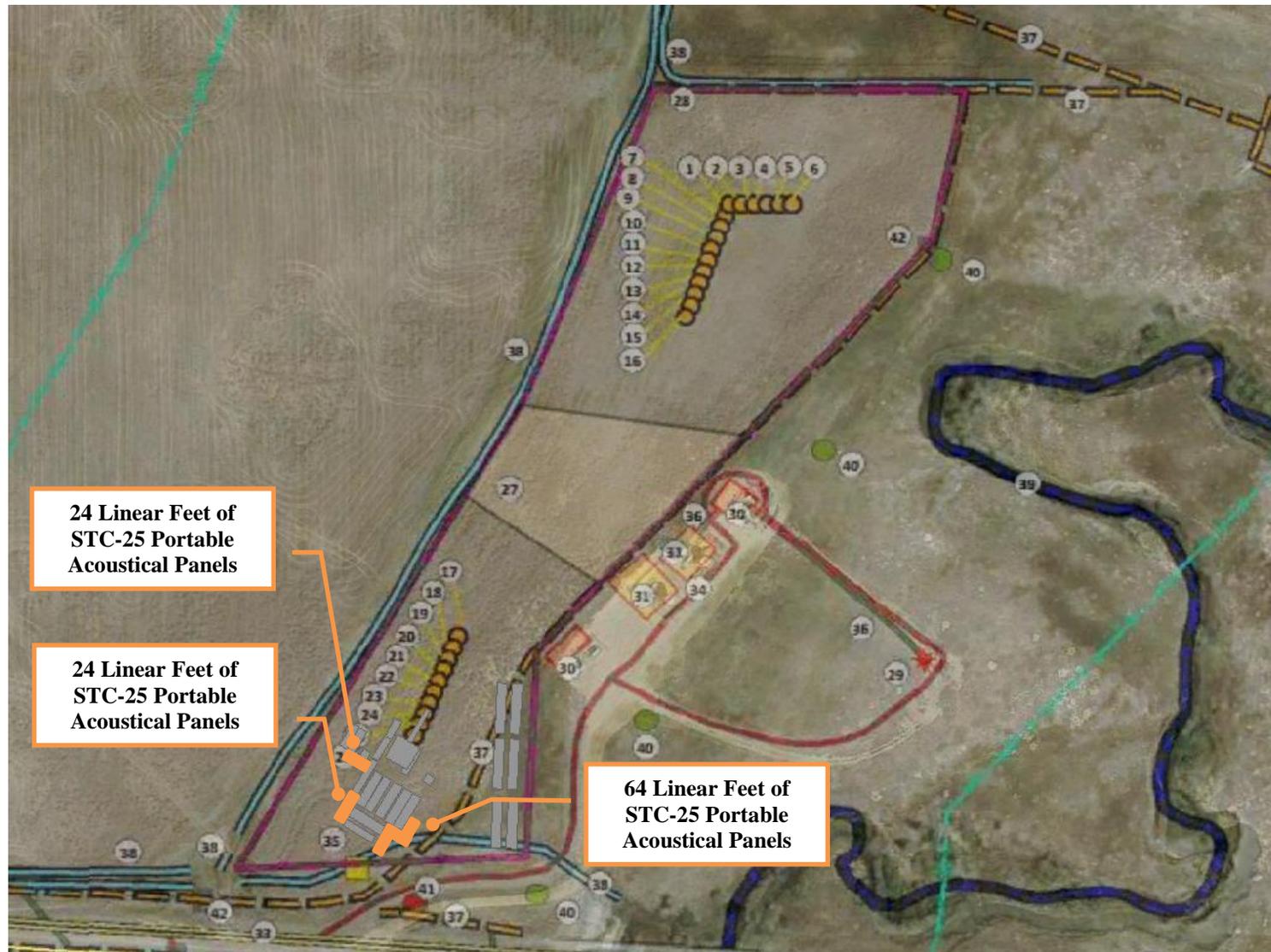
The results of the unmitigated modeling indicate that the proposed Ivey 11-N pad activities will exceed dBA and dBC COGCC noise limits at various receptors for drilling and fracing activities. Noise mitigation was added to the unmitigated models to determine the mitigation measures required to reduce noise levels associated with the pad activities at the residences adjacent to the site. Table 4-5 lists the individual components of the recommended mitigation layouts. Figures 4-13 and 4-14 show the drilling mitigation layouts per location and Figures 4-15 and 4-16 show the fracing mitigation layouts per location.

**Table 4-5 Modeled Mitigation Scenarios**

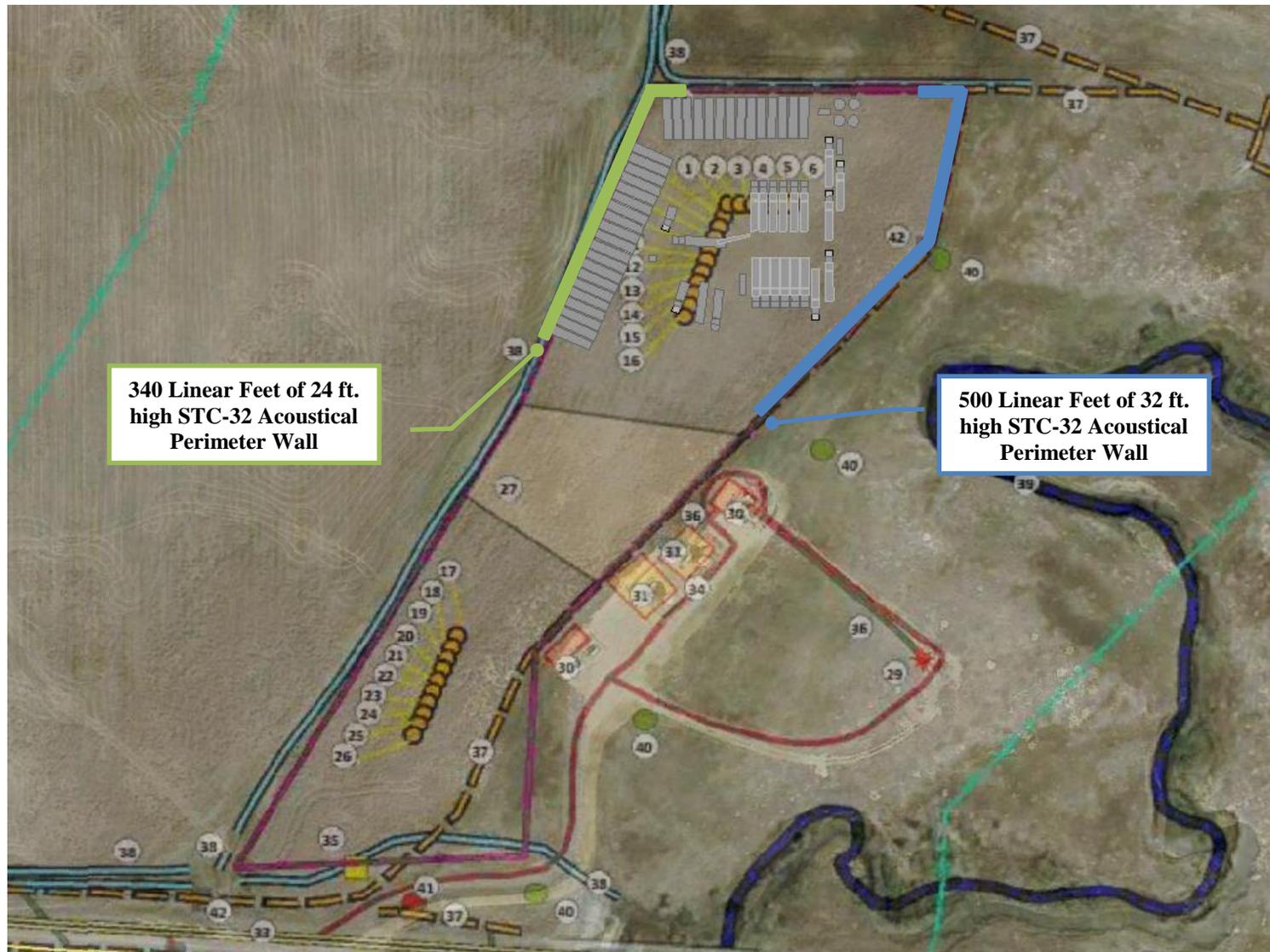
Modeled Scenario	Description
Drilling Mitigation Location 1	<ul style="list-style-type: none"> <li>A total of 120 linear feet of 12-ft high, Sound Transmission Class (STC) 25 portable acoustical panels installed to the west of the generators, load banks, and centrifuge.</li> </ul>
Drilling Mitigation Location 2	<ul style="list-style-type: none"> <li>A total of 112 linear feet of 12-ft high, Sound Transmission Class (STC) 25 portable acoustical panels installed to the south of the centrifuge and shakers, to the west of the load bank and pump house, and on the south side of the generators.</li> </ul>
Fracing Mitigation Location 1	<ul style="list-style-type: none"> <li>A total of 340 linear feet of 24-ft high, Sound Transmission Class (STC) 32 acoustical wall installed along the northwestern pad perimeter.</li> <li>A total of 500 linear feet of 32-ft high, Sound Transmission Class (STC) 32 acoustical wall installed along the northeastern pad perimeter.</li> </ul>
Fracing Mitigation Location 2	<ul style="list-style-type: none"> <li>A total of 1,060 linear feet of 32-ft high, Sound Transmission Class (STC) 32 acoustical wall installed along the southeastern, southern, and southwestern pad perimeter.</li> </ul>



**Figure 4-13 Modeled Mitigated Drilling Scenario Layout Location 1**



**Figure 4-14 Modeled Mitigated Drilling Scenario Layout Location 2**



**Figure 4-15 Modeled Mitigated Fracing Scenario Layout Location 1**



**Figure 4-16 Modeled Mitigated Fracing Scenario Layout Location 2**



## 4.5 Mitigated Noise Modeling Results

The results of the mitigated noise modeling are presented in Tables 4-6 through 4-9. The locations in the tables correspond to the receptor locations identified in Figures 4-3 and 4-4. The results of the noise modeling are also shown as noise contour maps. Figure 4-17 through 4-20 show the Mitigated Drilling Noise Contour Maps in dBA and dBC for both locations and Figure 4-21 through 4-24 show the Mitigated Fracing Noise Contour Maps in dBA and dBC for both locations. The noise contours are provided in 5 dB increments with the color scale indicating the sound level of each contour.

**Table 4-6 Mitigated Noise Modeling Results Location 1 (dBA)**

Receptor	Location Description	Drilling dBA	Fracing dBA
Location A	350 ft. West of Nearest Noise Source	64.8	74.4
Location B	Northeast Property Line	57.6	67.5
Location C	Southeast Property Line	53.1	60.8
Location D	South Property Line	60.5	71.6
<b>Allowable Noise Level</b>	<b>350 ft from the noise source towards an existing, occupied structure or at the property line, whichever is greater</b>	<b>70.0 Day / 65.0 Night</b>	<b>80.0 Day / 75.0 Night</b>

**Table 4-7 Mitigated Noise Modeling Results Location 2 (dBA)**

Receptor	Location Description	Drilling dBA	Fracing dBA
Location A	350 ft. Southwest of Nearest Noise Source	62.1	71.2
Location B	Northeast Property Line	48.6	64.7
Location C	Southeast Property Line	51.3	61.6
Location D	350 ft. South of Nearest Noise Source	59.3	66.2
<b>Allowable Noise Level</b>	<b>350 ft from the noise source towards an existing, occupied structure or at the property line, whichever is greater</b>	<b>70.0 Day / 65.0 Night</b>	<b>80.0 Day / 75.0 Night</b>



**Table 4-8 Mitigated Noise Modeling Results Location 1 (dBC)**

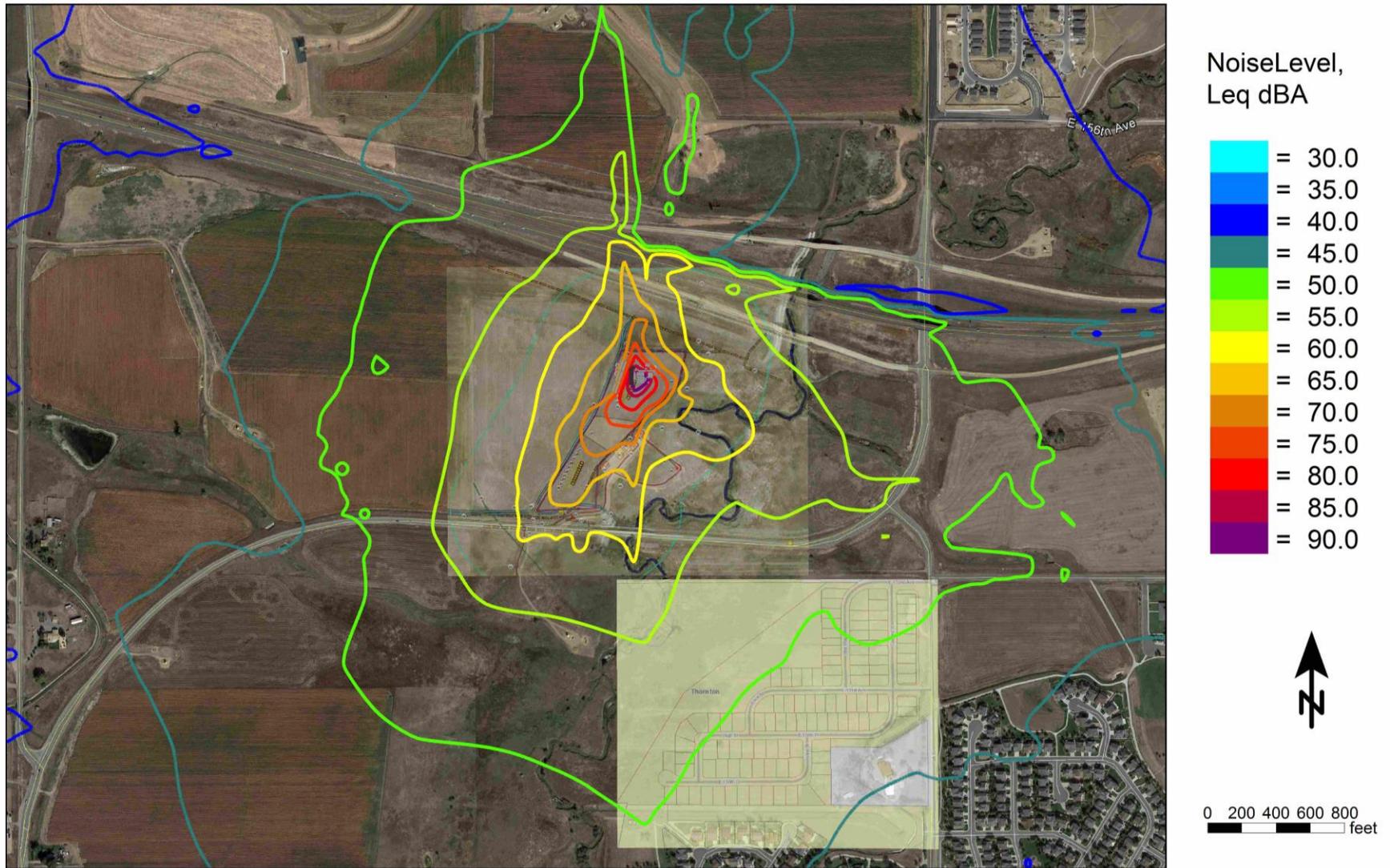
<b>Receptor</b>	<b>Location Description</b>	<b>Drilling dBC</b>	<b>Fracing dBC</b>
Location 1	25 Feet from Northeast Residence 1	54.9	61.4
Location 2	25 Feet from Northeast Residence 2	54.5	61.1
Location 3	25 Feet from Southeast Residence 1	56.2	59.9
Location 4	25 Feet from Southeast Residence 2	57.4	60.9
Location 5	25 Feet from Southeast Residence 3	61.3	63.9
Location 6	25 Feet from Southeast Residence 4	60.8	63.5
Location 7	25 Feet from South Residence 1	60.6	63.8
Location 8	25 Feet from South Residence 2	58.0	61.9
Location 9	25 Feet from Southwest Residence 1	53.2	57.1
Location 10	25 Feet from Southwest Residence 2	54.2	59.2
<b>Allowable Noise Level</b>	<b>25 ft from the exterior wall of a residence or occupied structure towards the noise source</b>	<b>65.0</b>	<b>65.0</b>



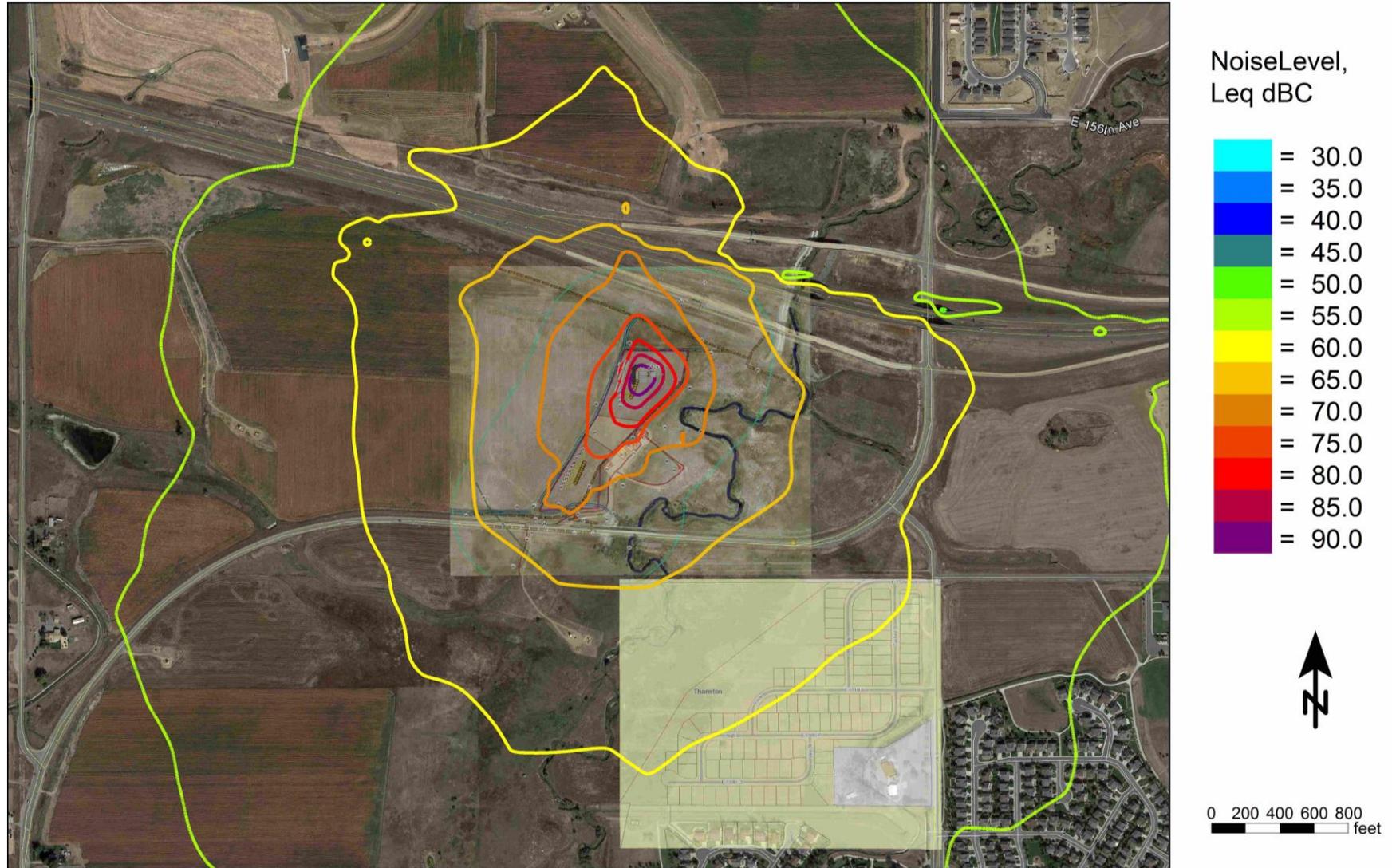
**Table 4-9 Mitigated Noise Modeling Results Location 2 (dBC)**

Receptor	Location Description	Drilling dBC	Fracing dBC
Location 1	25 Feet from Northeast Residence 1	52.5	58.4
Location 2	25 Feet from Northeast Residence 2	52.5	58.3
Location 3	25 Feet from Southeast Residence 1	54.7	59.6
Location 4	25 Feet from Southeast Residence 2	57.3	61.4
Location 5	25 Feet from Southeast Residence 3	60.7	64.2
Location 6	25 Feet from Southeast Residence 4	61.7	64.5
Location 7	25 Feet from South Residence 1	61.2	64.1
Location 8	25 Feet from South Residence 2	59.3	61.3
Location 9	25 Feet from Southwest Residence 1	54.2	59.2
Location 10	25 Feet from Southwest Residence 2	55.6	61.6
<b>Allowable Noise Level</b>	<b>25 ft from the exterior wall of a residence or occupied structure towards the noise source</b>	<b>65.0</b>	<b>65.0</b>

The predicted results of the mitigated drilling noise modeling indicate that the proposed Ivey 11-N pad activities will comply with dBA and dBC COGCC noise limits at all modeled receptor locations with installation of the mitigation recommendations. The predicted results of the mitigated fracing noise modeling indicate that the proposed Ivey 11-N pad fracing activities will comply with dBA and dBC COGCC noise limits at all modeled receptor locations with installation of the mitigation recommendations.



**Figure 4-17 Mitigated Drilling Location 1 Noise Contour Map (dBA)**



**Figure 4-18 Mitigated Drilling Location 1 Noise Contour Map (dBC)**

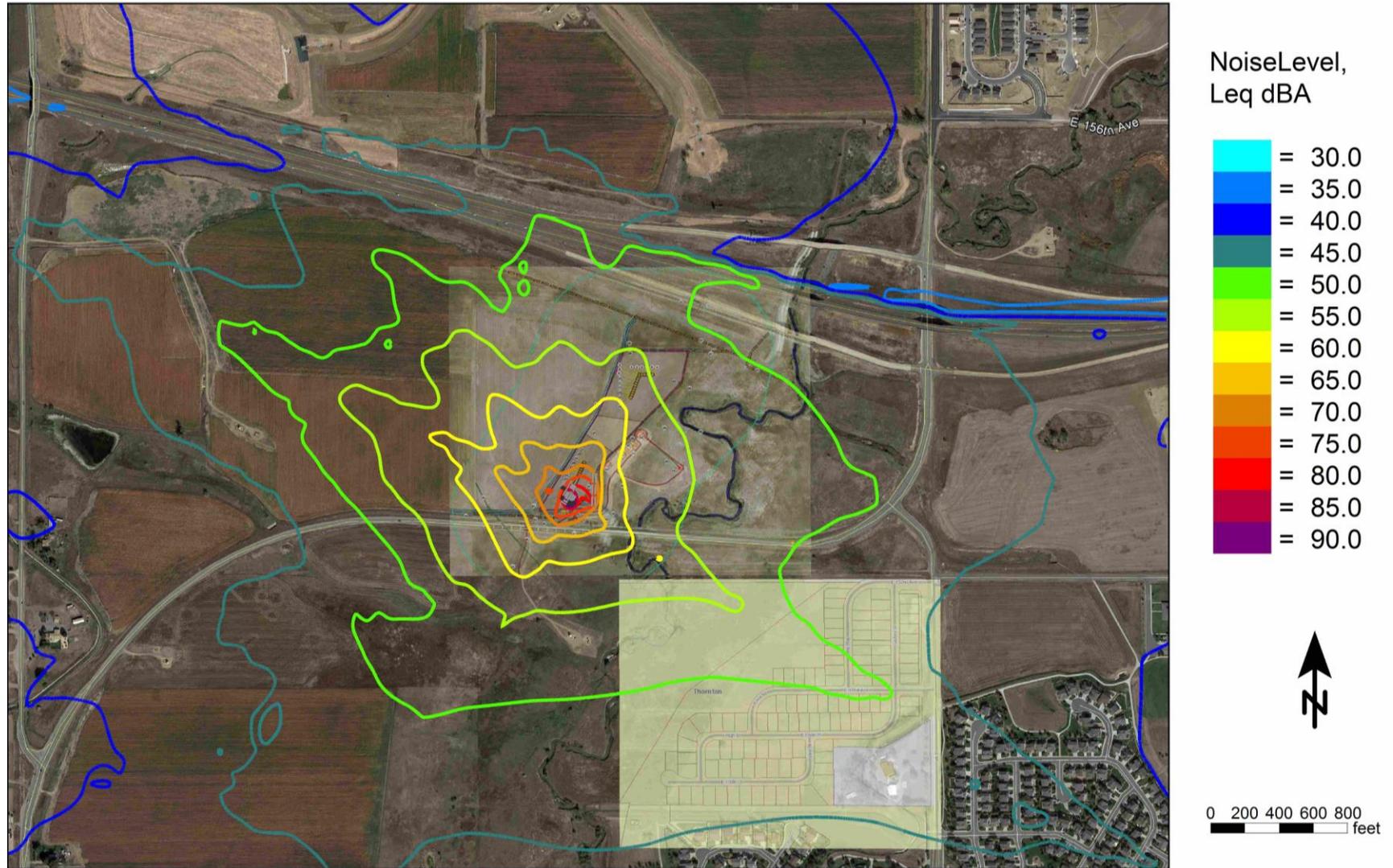
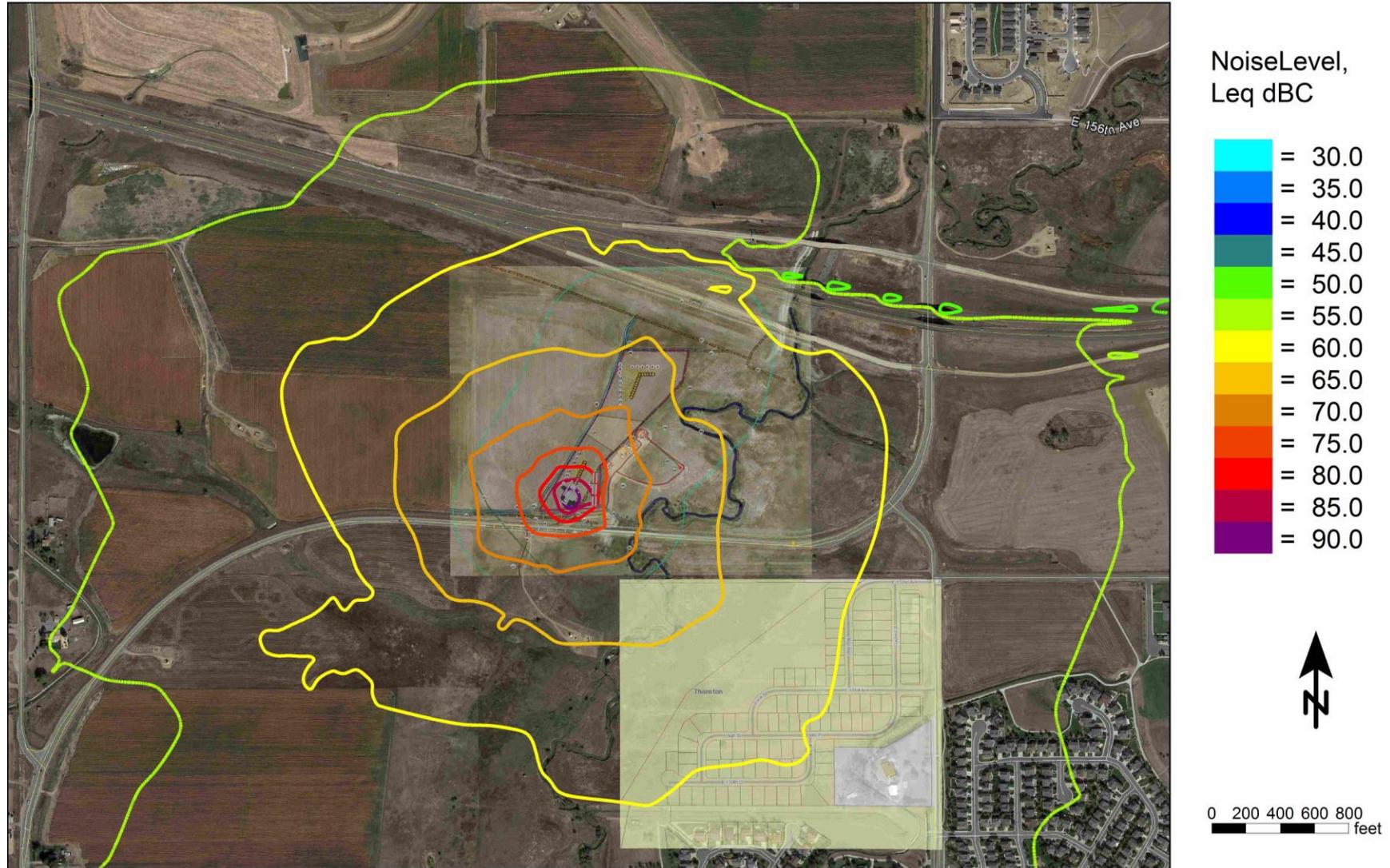
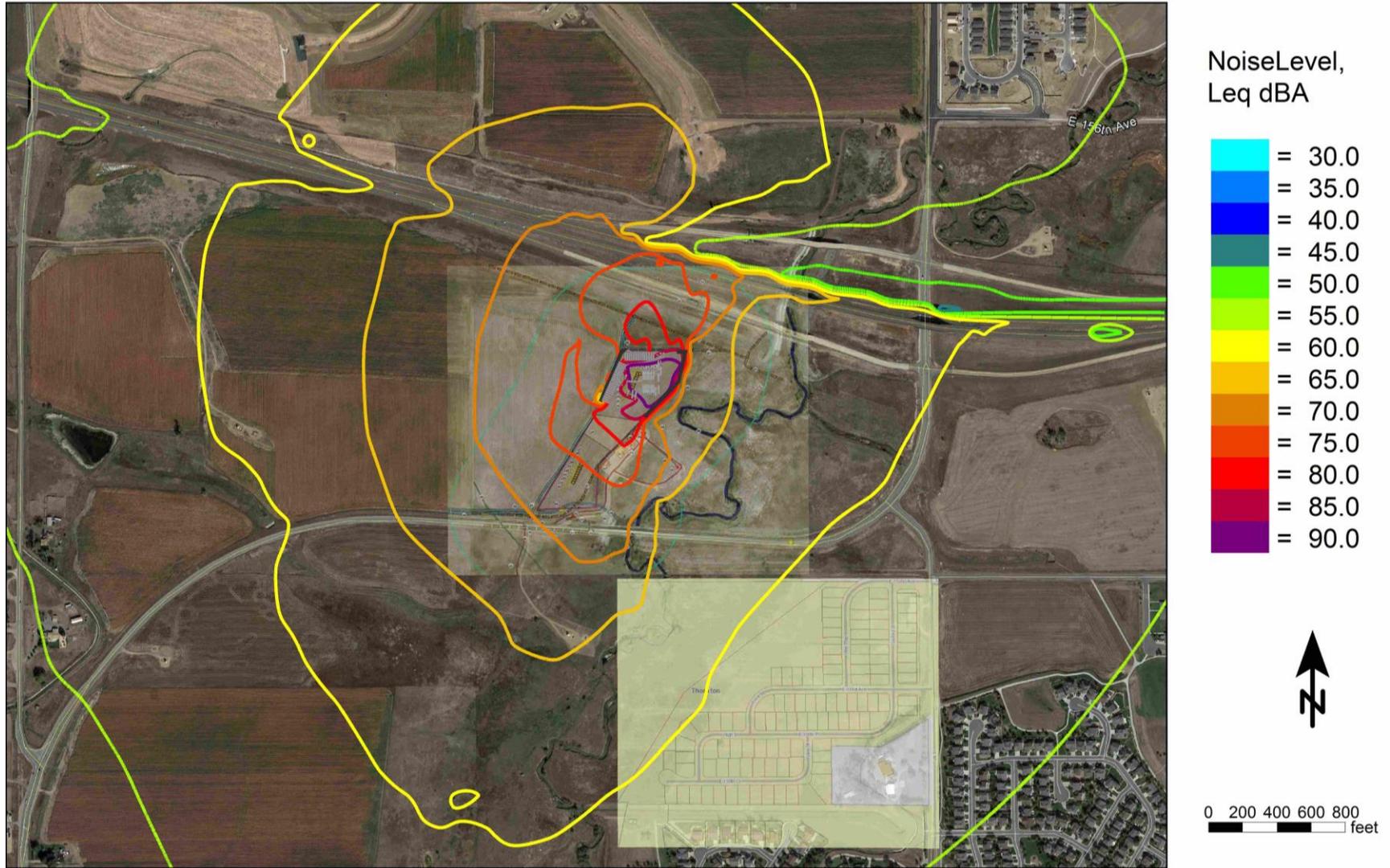


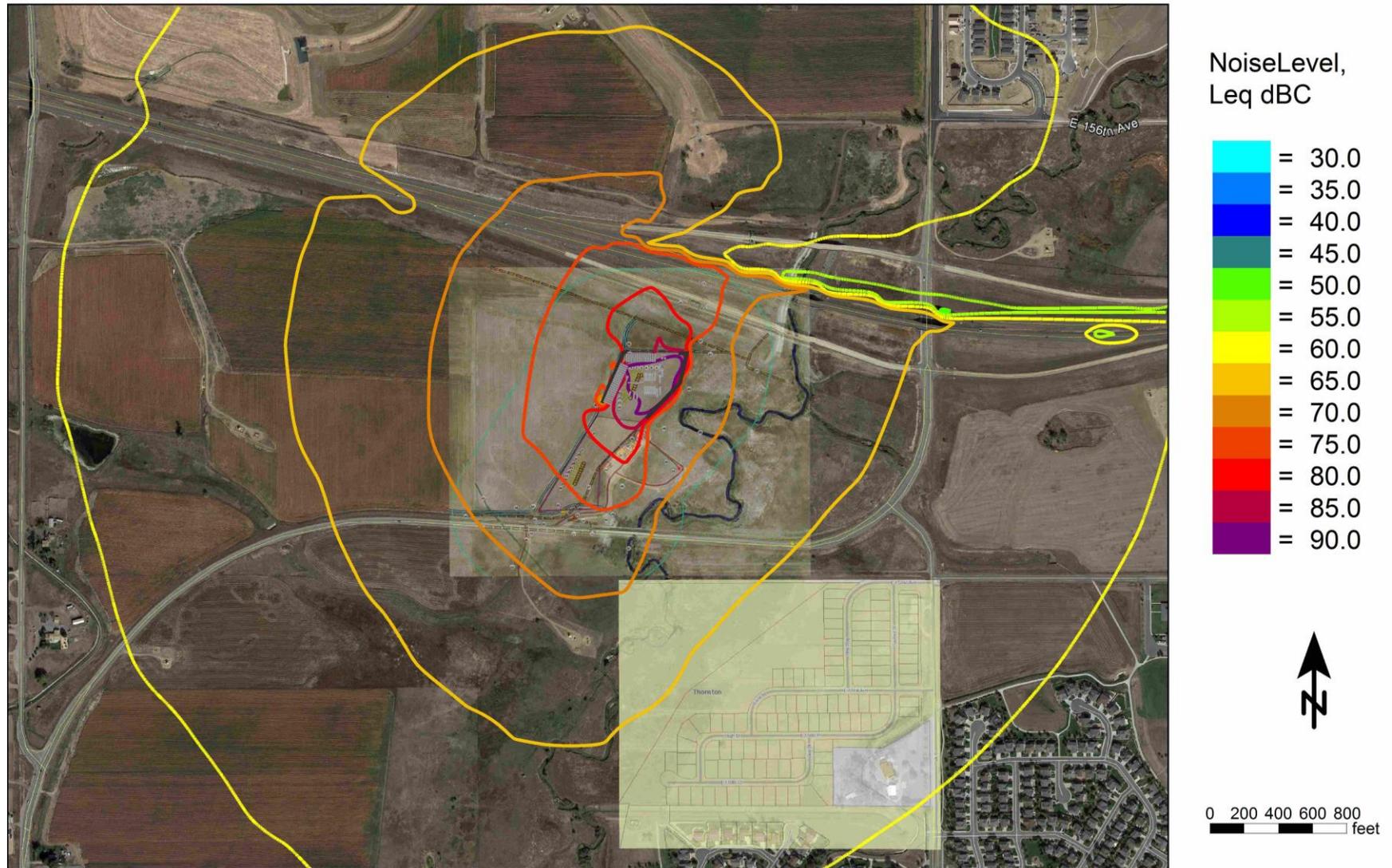
Figure 4-19 Mitigated Drilling Location 2 Noise Contour Map (dBA)



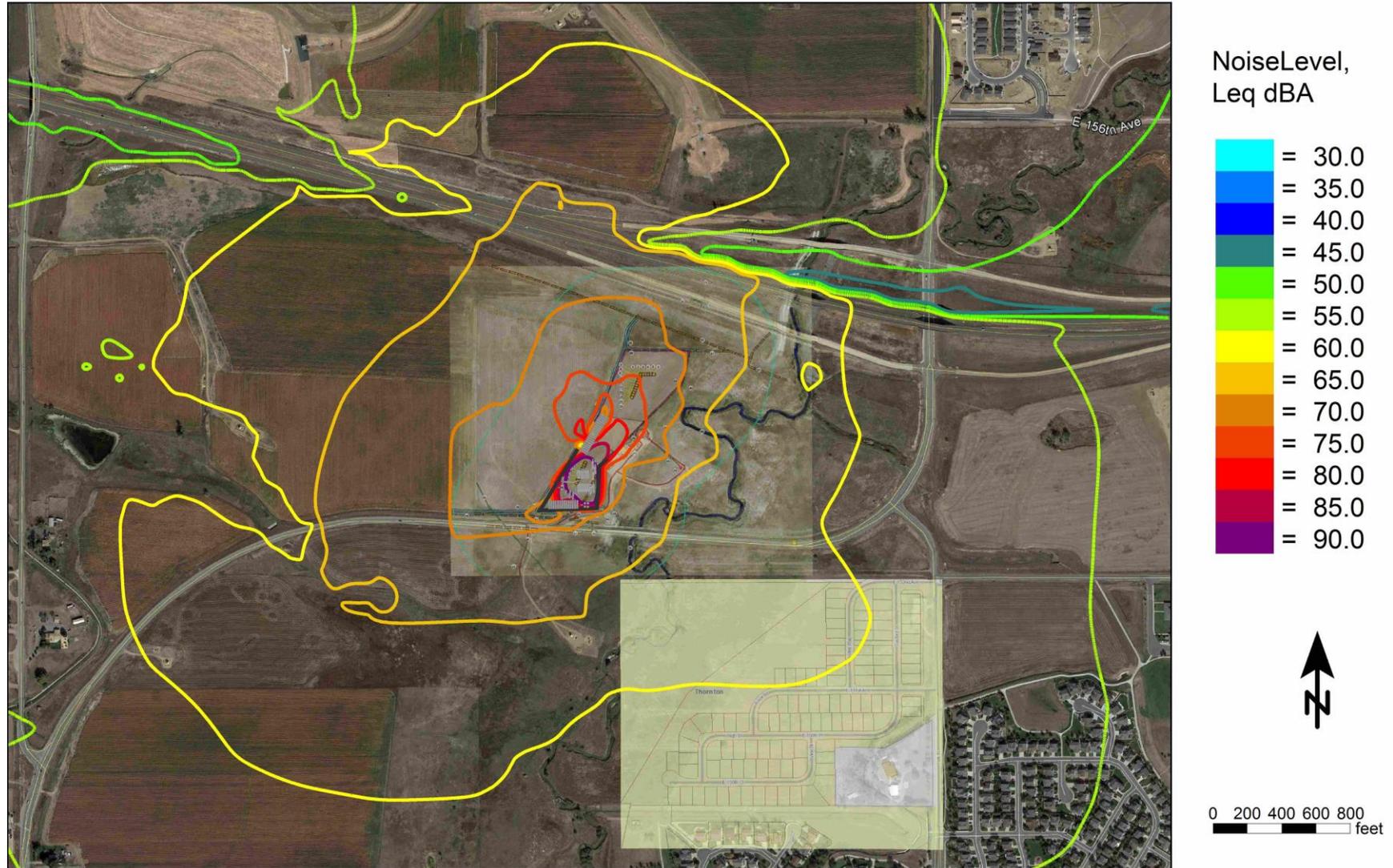
**Figure 4-20 Mitigated Drilling Location 2 Noise Contour Map (dBC)**



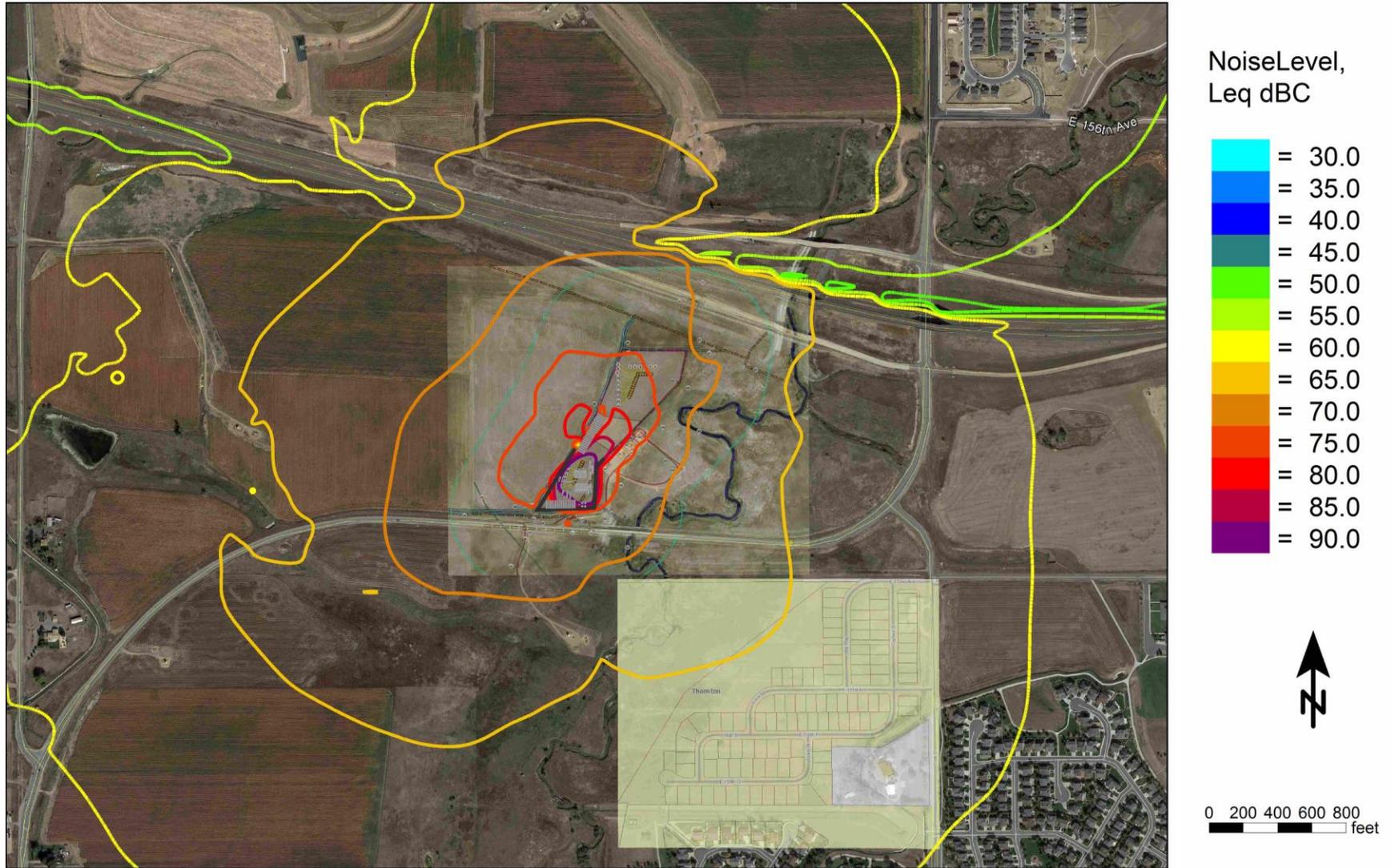
**Figure 4-21 Mitigated Fracing Location 1 Noise Contour Map (dBA)**



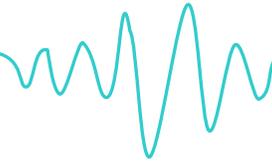
**Figure 4-22 Mitigated Fracing Location 1 Noise Contour Map (dBC)**



**Figure 4-23 Mitigated Fracing Location 2 Noise Contour Map (dBA)**



**Figure 4-24 Mitigated Fracing Location 2 Noise Contour Map (dBC)**

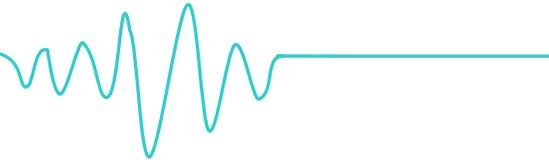


## 5. Conclusion

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Unmitigated noise models were created to represent the proposed drilling and fracing operations at the Ivey 11-N site. Our analysis indicated that unmitigated drilling and unmitigated fracing operations will exceed allowable dBA and dBC noise limits per COGCC at various receptor locations.

Recommended mitigation scenarios were created for both drilling and fracing activities and were modeled. With implementation of the recommended mitigation measures, the drilling activities will comply with the COGCC allowable dBA and dBC noise limits at all modeled receptor locations. With implementation of the recommended mitigation measures, the fracing activities will comply with the COGCC allowable dBA and dBC noise limits at all modeled receptor locations.



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**Appendix A - Nomenclature**

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## **Ambient Noise**

The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources both near and far.

## **Average Sound Level**

See Equivalent-Continuous Sound Level

## **A-Weighted Decibel Scale**

The human ear is more sensitive to some sound frequencies than others. It is therefore common practice to apply a filter to measured sound levels to approximate the frequency sensitivity of the human ear. One such filter is called the A-weighted decibel scale which emphasizes sounds between 1,000 and 5,000 Hertz by discounting the frequencies outside of this range. As the human ear is less sensitive to low frequency noise, the A-weighted decibel scale begins to increasingly discount noise below 500 Hertz.

Measurements conducted utilizing the A-weighted decibel scale are denoted with an “(A)” or “A” after the decibel abbreviation (dB(A) or dBA). The A-weighted scale is nearly universally used when assessing noise impact on humans.

## **C-Weighted Decibel Scale**

High level low frequency noise can propagate large distances from its source. Although not always audible, high levels of low frequency noise can induce vibrations in objects or structures which could become evident in ways that might be annoying to humans (e.g., rattling of windows). The C-weighted decibel scale, which was developed to estimate human ear sensitivity to high noise levels, is a flatter filter that does not discount low frequency noise as much as the A-weighted decibel scale. As a result, a C-weighted decibel measurement could be significantly higher than an A-weighted decibel measurement if the noise being measured contains a heavy low frequency content.

Measurements conducted utilizing the C-weighted decibel scale are denoted with an “(C)” or “C” after the decibel abbreviation (dB(C) or dBC). C-weighted noise level limits are sometimes included in noise regulations as a way to address low frequency environmental noise issues.

## **Community Noise Equivalent Level (CNEL)**

A 24-hour A-weighted average sound level which takes into account the fact that a given level of noise may be more or less tolerable depending on when it occurs. The CNEL measure of noise exposure weights average hourly noise levels by 5 dB for the evening hours (between 7:00 pm and 10:00 pm), and 10 dB between 10:00 pm and 7:00 am, then combines the results with the daytime levels to produce the final CNEL value. It is measured in decibels, dB.

## **Day-Night Average Sound Level (Ldn)**

A measure of noise exposure level that is similar to CNEL except that there is no weighting applied to the evening hours of 7:00 pm to 10:00 pm. It is measured in decibels, dB.



## **Daytime Average Sound Level**

The time-averaged A-weighted sound level measured between the hours of 7:00 am to 7:00 pm. It is measured in decibels, dB.

## **Decay Rate**

The time taken for the sound pressure level at a given frequency to decrease in a room. It is measured in decibels per second, dB/s.

## **Decibel (dB)**

The basic unit of measurement for sound level.

## **Direct Sound**

Sound that reaches a given location in a direct line from the source without any reflections.

## **Divergence**

The spreading of sound waves from a source in a free field, resulting in a reduction in sound pressure level with increasing distance from the source.

## **Energy Basis**

This refers to the procedure of summing or averaging sound pressure levels on the basis of their squared pressures. This method involves the conversion of decibels to pressures, then performing the necessary arithmetic calculations, and finally changing the pressure back to decibels.

## **Equivalent-Continuous Sound Level (Leq)**

The average sound level measured over a specified time period. It is a single-number measure of time-varying noise over a specified time period. It is the level of a steady sound that, in a stated time period and at a stated location, has the same A-Weighted sound energy as the time-varying sound. For example, a person who experiences an Leq of 60 dB(A) for a period of 10 minutes standing next to a busy street is exposed to the same amount of sound energy as if he had experienced a constant noise level of 60 dB(A) for 10 minutes rather than the time-varying traffic noise level. It is measured in decibels, dB.

## **Fast Response**

A setting on the sound level meter that determines how sound levels are averaged over time. A fast sound level is always more strongly influenced by recent sounds, and less influenced by sounds occurring in the distant past, than the corresponding slow sound level. For the same non-steady sound, the maximum fast sound level is generally greater than the corresponding maximum slow sound level. Fast response is typically used to measure impact sound levels.

## **Field Impact Insulation Class (FIIC)**

A single number rating similar to the impact insulation class except that the impact sound pressure levels are measured in the field.



## **Field Sound Transmission Class (FSTC)**

A single number rating similar to sound transmission class except that the transmission loss values used to derive this class are measured in the field.

## **Flanking Sound Transmission**

The transmission of sound from a room in which a source is located to an adjacent receiving room by paths other than through the common partition. Also, the diffraction of noise around the ends of a barrier.

## **Frequency**

The number of oscillations per second of a sound wave

## **Hourly Average Sound Level (HNL)**

The equivalent-continuous sound level,  $L_{eq}$ , over a 1-hour time period.

## **Impact Insulation Class (IIC)**

A single number rating used to compare the effectiveness of floor/ceiling assemblies in providing reduction of impact-generated sound such as the sound of a person's walking across the upstairs floor.

## **Impact Noise**

The noise that results when two objects collide.

## **Impulse Noise**

Noise of a transient nature due to the sudden impulse of pressure like that created by a gunshot or balloon bursting.

## **Insertion Loss**

The decrease in sound power level measured at the location of the receiver when an element (e.g., a noise barrier) is inserted in the transmission path between the sound source and the receiver.

## **Inverse Square Law**

A rule by which the sound intensity varies inversely with the square of the distance from the source. This results in a 6dB decrease in sound pressure level for each doubling of distance from the source.

## **Ln Percentile Sound Level**

The noise level exceeded for n% of the measurement period where n is between 0.01% and 99.99%. Usually includes a descriptor i.e. A-weighting. Common Ln values include LA10, LA50, and LA90 levels. LA10 would represent the A-weighted sound level that is exceeded for 10% of the measurement period.

## **Masking**

The process by which the threshold of hearing for one sound is raised by the presence of another sound.

## **Maximum Sound Level (L<sub>max</sub>)**

The greatest sound level measured on a sound level meter during a designated time interval or event.



## **NC Curves (Noise Criterion Curves)**

A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard NC curves to determine the NC level of the space.

## **Noise Isolation Class (NIC)**

A single number rating derived from the measured values of noise reduction between two enclosed spaces that are connected by one or more partitions. Unlike STC or NNIC, this rating is not adjusted or normalized to a measured or standard reverberation time.

## **Noise Reduction**

The difference in sound pressure level between any two points.

## **Noise Reduction Coefficient (NRC)**

A single number rating of the sound absorption properties of a material. It is the average of the sound absorption coefficients at 250, 500, 1000, and 2000 Hz, rounded to the nearest multiple of 0.05.

## **Normalized Noise Isolation Class (NNIC)**

A single number rating similar to the noise isolation class except that the measured noise reduction values are normalized to a reverberation time of 0.5 seconds.

## **Octave**

The frequency interval between two sounds whose frequency ratio is 2. For example, the frequency interval between 500 Hz and 1,000 Hz is one octave.

## **Octave-Band Sound Level**

For an octave frequency band, the sound pressure level of the sound contained within that band.

## **One-Third Octave**

The frequency interval between two sounds whose frequency ratio is  $2^{(1/3)}$ . For example, the frequency interval between 200 Hz and 250 Hz is one-third octave.

## **One-Third-Octave-Band Sound Level**

For a one-third-octave frequency band, the sound pressure level of the sound contained within that band.

## **Outdoor-Indoor Transmission Class (OITC)**

A single number rating used to compare the sound insulation properties of building façade elements. This rating is designed to correlate with subjective impressions of the ability of façade elements to reduce the overall loudness of ground and air transportation noise.

## **Peak Sound Level (Lpk)**

The maximum instantaneous sound level during a stated time period or event.

## **Pink Noise**

Noise that has approximately equal intensities at each octave or one-third-octave band.



## **Point Source**

A source that radiates sound as if from a single point.

## **RC Curves (Room Criterion Curves)**

A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard RC curves to determine the RC level of the space.

## **Real-Time Analyzer (RTA)**

An instrument for the determination of a sound spectrum.

## **Receiver**

A person (or persons) or equipment which is affected by noise.

## **Reflected Sound**

Sound that persists in an enclosed space as a result of repeated reflections or scattering. It does not include sound that travels directly from the source without reflections.

## **Reverberation**

The persistence of a sound in an enclosed or partially enclosed space after the source of the sound has stopped, due to the repeated reflection of the sound waves.

## **Room Absorption**

The total absorption within a room due to all objects, surfaces and air absorption within the room. It is measured in Sabins or metric Sabins.

## **Slow Response**

A setting on the sound level meter that determines how measured sound levels are averaged over time. A slow sound level is more influenced by sounds occurring in the distant past than the corresponding fast sound level.

## **Sound**

A physical disturbance in a medium (e.g., air) that is capable of being detected by the human ear.

## **Sound Absorption Coefficient**

A measure of the sound-absorptive property of a material.

## **Sound Insulation**

The capacity of a structure or element to prevent sound from reaching a receiver room either by absorption or reflection.

## **Sound Level Meter (SLM)**

An instrument used for the measurement of sound level, with a standard frequency-weighting and standard exponentially weighted time averaging.



## **Sound Power Level**

A physical measure of the amount of power a sound source radiates into the surrounding air. It is measured in decibels.

## **Sound Pressure Level**

A physical measure of the magnitude of a sound. It is related to the sound's energy. The terms sound pressure level and sound level are often used interchangeably.

## **Sound Transmission Class (STC)**

A single number rating used to compare the sound insulation properties of walls, floors, ceilings, windows, or doors. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of speech, radio, television, and similar noise sources in offices and buildings.

## **Source Room**

A room that contains a noise source or sources

## **Spectrum**

The spectrum of a sound wave is a description of its resolution into components, each of different frequency and usually different amplitude.

## **Tapping Machine**

A device used in rating different floor constructions against impacts. It produces a series of impacts on the floor under test, 10 times per second.

## **Tone**

A sound with a distinct pitch

## **Transmission Loss (TL)**

A property of a material or structure describing its ability to reduce the transmission of sound at a frequency from one space to another. The higher the TL value the more effective the material or structure is in reducing sound between two spaces. It is measured in decibels.

## **White Noise**

Noise that has approximately equal intensities at all frequencies.

## **Windscreen**

A porous covering for a microphone, designed to reduce the noise generated by the passage of wind over the microphone.

EXHIBIT 5.4  
PHOTOMETRIC STUDY

# Ward Petroleum

## Ivey Pad

Adams County, Colorado

## Photometric Study

Job Number 2017-04

August 24, 2017



Prepared By:

Lisa Denke, PE

[lldenke@earthlink.net](mailto:lldenke@earthlink.net)

661-547-2770



## IVEY PAD PHOTOMETRIC PLAN

### BACKGROUND

Photometric plans are used to analyze light trespass from developments. The light reflected from the ground surface is presented in units of foot-candles. Electrical engineers generally perform the analysis for photometric plans for residential and commercial developments. Per Jen Rutter, Senior Environmental Analyst, Adams County Community & Economic Development Department, a foot-candle intensity of 0.5 at the edges of the property is ideal.<sup>1</sup> For comparison, the light from a full moon is about 0.01 foot-candles, and 20 to 100 foot-candles is recommended for work areas.

A typical photometric plan might analyze lights or “luminaires” that are mounted on poles in a parking lot. An example is shown here:

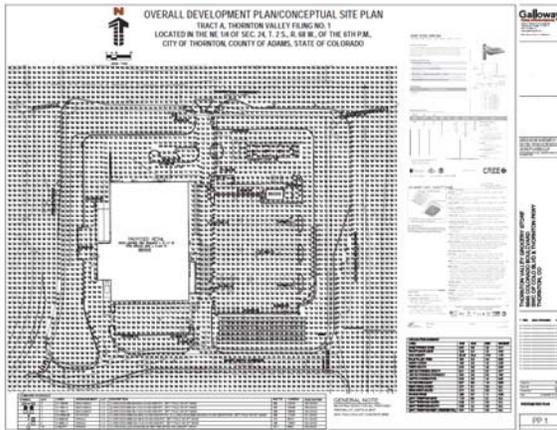


FIGURE 1. TYPICAL PHOTOMETRIC PLAN<sup>2</sup>

Generally, the lights in a parking are mounted on poles or on the side of a building. They are not mounted, for example, within a building. Here are three examples:



It is unusual to analyze the lights within a structure or building for a photometric plan, however, light emission from the drilling site is a concern. A photometric plan was requested by the Adams

<sup>1</sup> Email from Jen Rutter, April 4, 2017.

<sup>2</sup>[http://www.cityofthornton.net/departments/CityDevelopment/Development/DevProjects/Documents/PROJECTS/Thornton\\_Valley\\_F1/DP/1st\\_Submittal/2015-12-23\\_DP\\_Plans.pdf](http://www.cityofthornton.net/departments/CityDevelopment/Development/DevProjects/Documents/PROJECTS/Thornton_Valley_F1/DP/1st_Submittal/2015-12-23_DP_Plans.pdf)



County Planning staff. Local engineers were approached about performing the analysis; however, this type of analysis was not available locally.

Research revealed that a few photometric plans have been done for rigs in Canada, where lighting for safety is a concern due to low ambient light conditions during winter months. A firm was located that performs analysis in Alberta and British Columbia. They agreed to take on the work.

## RIG AS-BUILT

---

It is not known which rig will drill the wells at Ivey Pad. A contract will need to be made to rent the rig, pending permit approval. However, certain rigs are favored for this type of work. A rig of this type was as-built to determine the type and location of the luminaries, as well as the angle and elevation. The lights were found to be mainly LED's, which are favored for their low power consumption. Fluorescent lights are used inside buildings, such as the generator and pump buildings, and above the doors of these buildings. LED and metal halide floodlights, mostly pointed down, or at 30° down, are used for area lighting. A light plant is used in the pipe rack area when installing pipe in the well.

Numerous rigs are in the process of changing out older lights for LED lighting. The process is somewhat complex and expensive, as the lights must meet industrial safety standards. Regular LED lights cannot be used.

Sound walls were installed at the rig when the as-built was completed; however, the analysis was done without the sound walls in order to give the most conservative estimate of the light falling on the ground at the edge of the site.



FIGURE 2. ANGLES OF FIXTURES WERE NOTED. THIS RIG WAS BEING PREPARED FOR TRANSIT.

## PRESENTATION OF DATA

---

The data have been presented to conform to the plans normally submitted with development plans. The data presented are for the light reflected from the ground surface at a given point: the data do not represent the light one would see when looking directly at a light source.



We recognize that there is potential for people to look directly at the lights. This cannot be represented on the photometric plan, so we have considered mitigation separately. The possible mitigation includes:

- The sound walls block most of the light. These are the tall tan or green walls around drilling sites.
- Pointing lights down makes a big difference.
- Certain rigs have higher “drill floors” than others. If the drill floor is above the sound walls, the lights associated with the drill floor will also be above the sound walls.
- Topography has an effect. We observed numerous rigs, and certain rigs had more light trespass due to topography.
- Derrick (mast) wrapping is a relatively new practice that can mitigate light trespass.
- Some rigs have LED’s in the mast along only one side. This works, because the structure is painted white, and is illuminated by reflected light.



FIGURE 3. SOUNDWALLS SEEN FROM THE INSIDE.



FIGURE 4. THIS RIG HAS THE LIGHTS POINTING STRAIGHT OUT, AND NO SOUNDWALL. THIS RIG WAS LOCATED IN A RURAL AREA.



FIGURE 5. DERRICK WRAP MATERIAL.



FIGURE 6. RIG BEHIND SOUNDWALL. NOTE THAT NONE OF THE EQUIPMENT IS VISIBLE EXCEPT THE TOP OF THE MAST (DERRICK). RIG HAS LED'S ONLY ON ONE SIDE; THIS VIEW IS FROM THE SIDE OPPOSITE LED'S IN MAST.



FIGURE 7. RIG WITHOUT SOUNDWALL. VIEW DIRECTLY AT LED'S IN MAST, FROM ~300 FEET AWAY. NO DERRICK WRAP. SAME RIG AS FIGURE 5.



## SIMULATION

---

The Illuminating Engineering Society (IES) publishes a standard for analyzing light. The data for each luminaire, corresponding to this standard, was obtained. A three-dimensional model, including the structures on the rig, was developed. Each light was placed at the correct elevation and orientation, and the model run.

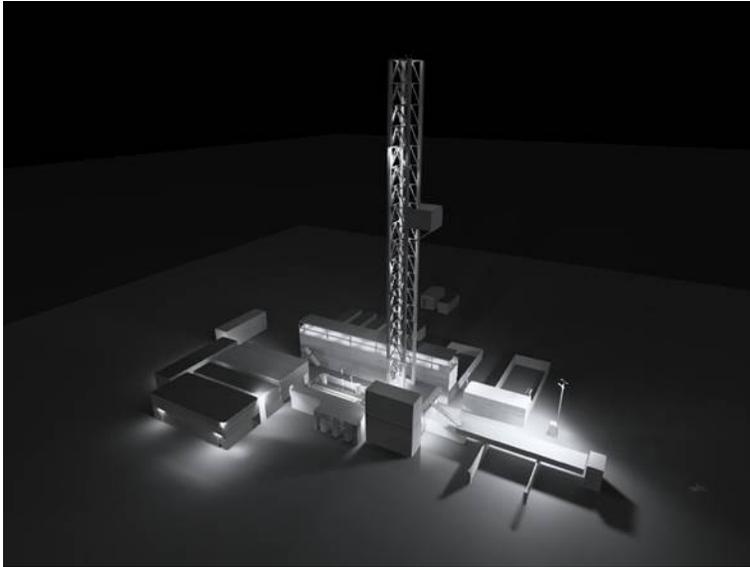
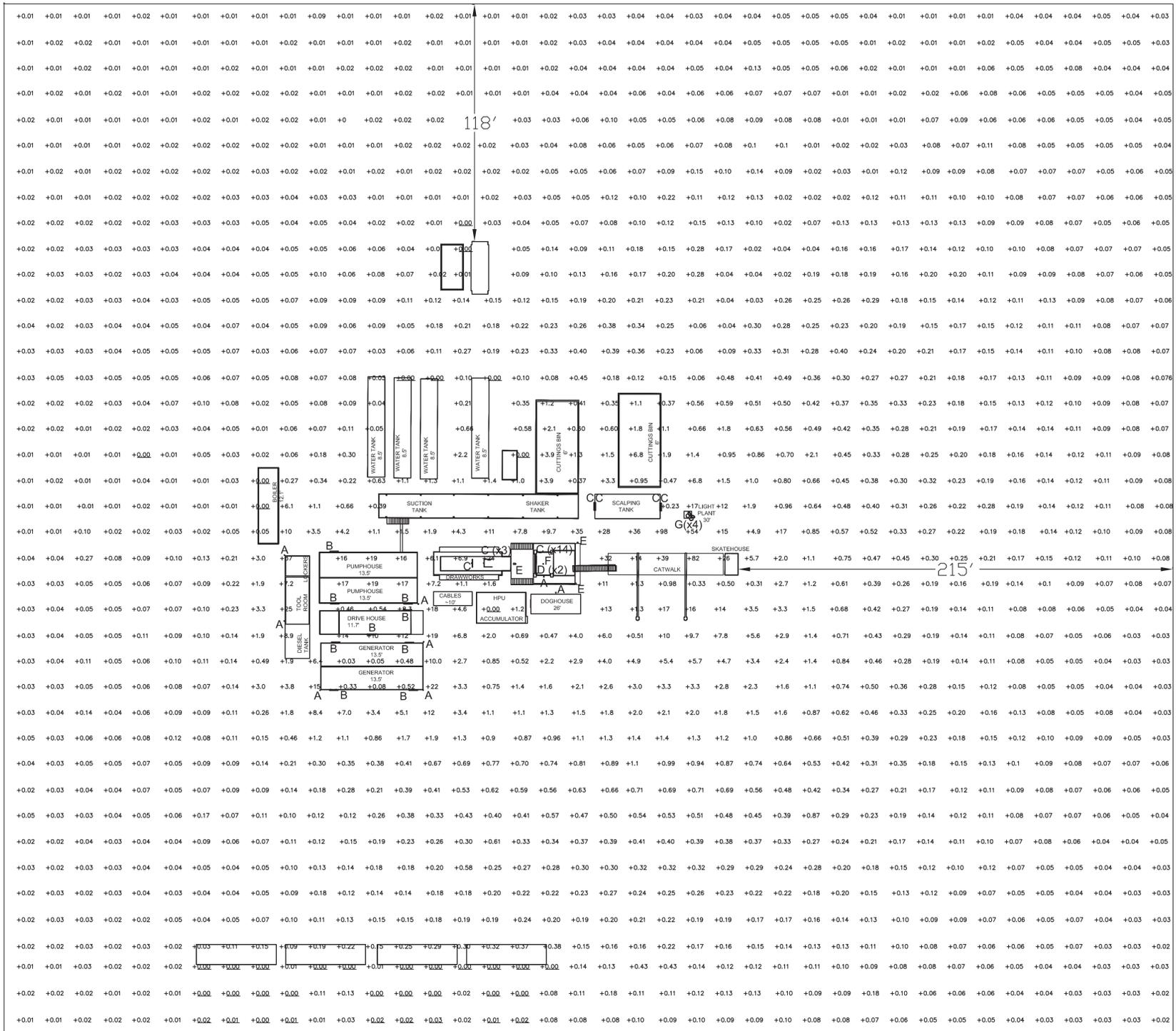


FIGURE 8. MODEL OF RIG.

The resulting data were presented as a standard photometric plot.



Luminaire Schedule						
Type	Photo	Description	Lamp	File	Product	Mounting
A		Flood Lighting 400 W Metal Halide 42000 Lumens	METAL HALIDE	MHW-65-X-400.es	MANUFACTURER - GROUSE HINDS PART NUMBER - MHW-651-400-RR-LI-ED28-HAZ	11.5' @ 0° (x2) 11.5' @ 30° 11.7' @ 30° 13.5' @ 0° 13.5' @ 30° 26' @ 30° 128' @ 0°
B		2' 35 W 4050 LUMENS PER LAMP	FLUORESCENT T12	FP260-1313.es	MANUFACTURER - COOPER LIGHTING PART NUMBER - FP260	8' @ 30° 11.5' @ 0° 11.5' @ 30° 11.7' @ 30° 13.5' @ 0° 13.5' @ 30° 26' @ 30°
C		4' 66 W LED 7000 LUMEN	LED	LTD3C4M2P.es	MANUFACTURER - DIALIGHT PART NUMBER - LTD3C4M2P	16' @ 0° (x3) 18' @ 30° (x4) 25' @ 90° (x2) 34' @ 90° 41.5' @ 90° 56.5' @ 90° 64' @ 90° 79' @ 90° 100' @ 90° (x2) 109' @ 90° 116.5' @ 90° 124' @ 90° 131.5' @ 90° 139' @ 90°
D		2' 32.9 W LED 3500 LUMEN	LED	LTD3C4D2P.es	MANUFACTURER - DIALIGHT PART NUMBER - LTD3C4D2P	72' @ 90° 79.5' @ 90°
E		FLOOD LIGHTING 130 W, 5000K	LED	VMV131AUNV1.es	MANUFACTURER - GROUSE HINDS PART NUMBER - VMV131	12' @ 0° (x2) 16' @ 0°
F		MAST BEACON 150W, IP66 ZONE 1	INCANDESCENT	EVA2301-200W.es	MANUFACTURER - GROUSE HINDS PART NUMBER - AEV-EOLA	151'
G		FLOOD LIGHTING 1000 W, 110,000 LUMENS 4 LAMPS	METAL HALIDE	PR210MHD064N.es	MANUFACTURER - MAGNUM PART NUMBER - MLT3050	30'

- NOTES:
- VALUES LISTED ARE IN FOOTCANDLES (fc). ANALYSIS POINTS ON 14.5' CENTER HORIZONTAL; 12.75' VERTICAL.
  - MAINTAINED LEVELS AT GRADE BASED UPON A 0.80 LIGHT LOSS FACTOR.
  - THE PHOTOMETRIC ANALYSIS DEPICTED REPRESENTS A TYPICAL DRILLING RIG. LUMINAIRES ON WORKING RIG IN THE DENVER-JULESBERG BASIN WERE AS-BUILT AS A BASIS FOR THE STUDY. THE DRILLING RIG USED FOR A GIVEN SITE MAY VARY FROM THE RIG USED FOR THE ANALYSIS.
  - ANALYSIS PRESENTED IS AN UNMITIGATED CASE. SOUND AND LIGHT WALLS ARE NOT INCORPORATED IN THE ANALYSIS.
  - LUMINAIRES MAY VARY BY RIG. LIST SHOWN IS FOR THE RIG USED FOR THE STUDY.
  - LIGHT VALUES SHOWN REPRESENT THE LIGHT REFLECTED BY THE GROUND SURFACE, PER THE STANDARD IES ANALYSIS.



1 SITE PHOTOMETRIC PLAN  
SCALE: 1" = 30'

DRAWING LIST		
NO.	DRAWING NAME	SCALE
E1	SITE PHOTOMETRIC PLAN	1" = 30'

**COFFEY**  
ENGINEERING & SURVEYING  
4045 St. Cloud Drive, Suite 180  
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Ph. 970-622-2095  
www.coffey-engineering.com

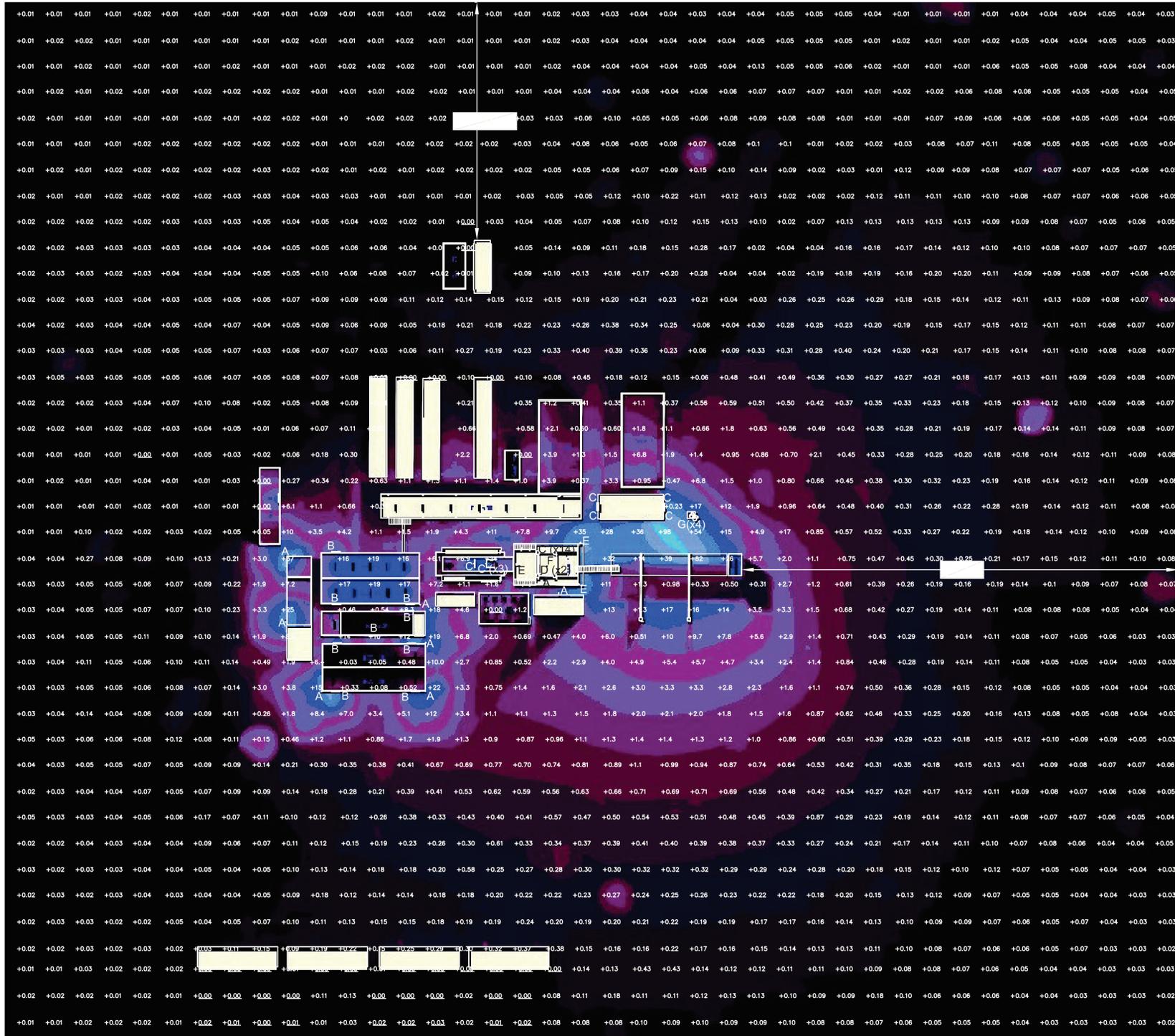
**ICS**  
Engineering  
ELECTRICAL CONSULTANTS  
460-21, 10405 JASPER AVE NW  
EDMONTON, AB  
Ph. 780-851-5166  
support@icsengroup.com

project title  
PROPOSED SITE PHOTOMETRIC PLAN  
**WARD PETROLEUM DRILLING SITE**  
UNMITIGATED CASE

drawing title  
**PHOTOMETRIC PLAN**

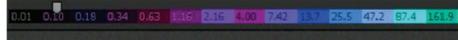
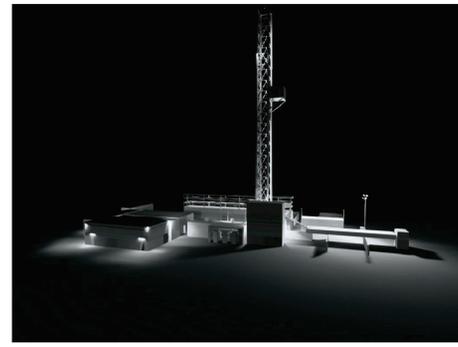
drawn by ND date APR 27, 2017  
checked by GL date JUNE 2, 2017  
scale AS SHOWN  
project number PL17-109

seal  
  
sheet  
**E1**  
revision no.  
02



Luminaire Schedule						
Type	Photo	Description	Lamp	File	Product	Mounting
A		Flood Lighting 400 W Metal Halide 42000 Lumens	METAL HALIDE	MHW-65-X-400.ies	MANUFACTURER - CROUSE HINDS PART NUMBER - MHW-65T-400-RR-LL-ED28-HAZ	11.5' @ 0° (x2) 11.5' @ 30° 11.7' @ 30° 13.5' @ 0° 26' @ 30° 128' @ 0°
B		2' 35 W 4050 LUMENS PER LAMP	FLUORESCENT T12	FP5260-1313.ies	MANUFACTURER - COOPER LIGHTING PART NUMBER - FP5260	8' @ 30° 11.5' @ 0° 11.5' @ 30° 11.7' @ 30° 13.5' @ 0° 13.5' @ 30° 26' @ 30°
C		4' 66 W LED 7000 LUMEN	LED	LT03C4M2P.ies	MANUFACTURER - DIALIGHT PART NUMBER - LT03C4M2P	16' @ 0° (x3) 18' @ 30° (x4) 25' @ 90° (x2) 34' @ 90° 41.5' @ 90° 56.5' @ 90° 64' @ 90° 71.5' @ 90° 79' @ 90° 100' @ 90° (x2) 109' @ 90° 116.5' @ 90° 124' @ 90° 131.5' @ 90° 139' @ 90°
D		2' 32.9 W LED 3500 LUMEN	LED	LT03C4D2P.ies	MANUFACTURER - DIALIGHT PART NUMBER - LT03C4D2P	72' @ 90° 79.5' @ 90°
E		FLOOD LIGHTING 130 W, 5000K	LED	VWV13LA-UNV1.ies	MANUFACTURER - CROUSE HINDS PART NUMBER - VWV13L	12' @ 0° (x2) 16' @ 0°
F		MAST BEACON 150W, IP66 ZONE 1	INCANDESCENT	EVA2301-200W.ies	MANUFACTURER - CROUSE HINDS PART NUMBER - ADV-EG1A	151'
G		FLOOD LIGHTING 1000 W, 110,000 LUMENS 4 LAMPS	METAL HALIDE	PB2C10MH0064N.ies	MANUFACTURER - MAGNUM PART NUMBER - MLT3060	30'

- NOTES:**
- VALUES LISTED ARE IN FOOTCANDLES (fc). ANALYSIS POINTS ON 14.5' CENTER HORIZONTAL; 12.75' VERTICAL.
  - MAINTAINED LEVELS AT GRADE BASED UPON A 0.80 LIGHT LOSS FACTOR.
  - THE PHOTOMETRIC ANALYSIS DEPICTED REPRESENTS A TYPICAL DRILLING RIG. LUMINAIRES ON WORKING RIG IN THE DENVER-JULESBERG BASIN WERE AS-BUILT AS A BASIS FOR THE STUDY. THE DRILLING RIG USED FOR A GIVEN SITE MAY VARY FROM THE RIG USED FOR THE ANALYSIS.
  - ANALYSIS PRESENTED IS AN UNMITIGATED CASE. SOUND AND LIGHT WALLS ARE NOT INCORPORATED IN THE ANALYSIS.
  - LUMINAIRES MAY VARY BY RIG. LIST SHOWN IS FOR THE RIG USED FOR THE STUDY.
  - LIGHT VALUES SHOWN REPRESENT THE LIGHT REFLECTED BY THE GROUND SURFACE, PER THE STANDARD IES ANALYSIS.



1 SITE PHOTOMETRIC PLAN  
SCALE: 1" = 30'

DRAWING LIST		
NO.	DRAWING NAME	SCALE
E1	SITE PHOTOMETRIC PLAN	1" = 30'
E2	SITE PHOTOMETRIC PLAN	1" = 30'

02	ISSUED FOR DEVELOPMENT PERMIT	17.06.02
01	ISSUED FOR REVIEW	17.05.29
NO.	REMARKS	YY.MM.DD
consultant		DATE

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project title  
PROPOSED SITE PHOTOMETRIC PLAN  
**WARD PETROLEUM DRILLING SITE**  
UNMITIGATED CASE

drawing title  
**PHOTOMETRIC PLAN**

drawn by ND date APR 27, 2017  
checked by GL date JUNE 2, 2017  
scale AS SHOWN  
project number PL17-109

seal  
  
sheet **E2**  
revision no. 02

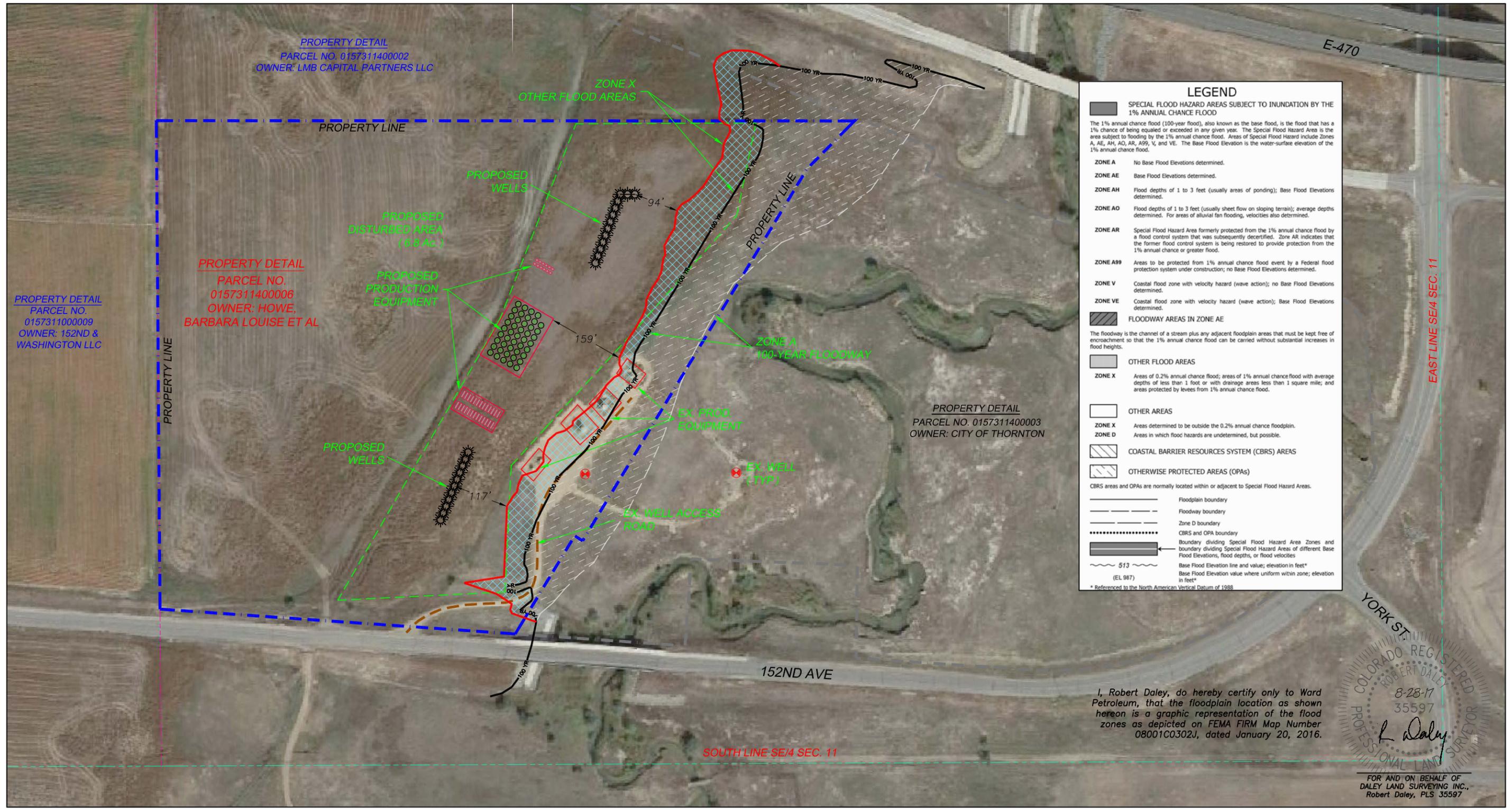
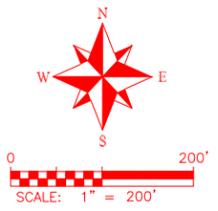


# FLOODPLAIN SURVEY

# SITE PLAN

## IVEY WELL AND PRODUCTION PAD

SECTION 11, T.1S., R.68W., 6TH P.M.  
ADAMS COUNTY, COLORADO



### LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 Base Flood Elevation line and value; elevation in feet\* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet\*

\* Referenced to the North American Vertical Datum of 1988

PROPERTY DETAIL  
PARCEL NO. 0157311400002  
OWNER: LMB CAPITAL PARTNERS LLC

PROPERTY DETAIL  
PARCEL NO. 0157311400006  
OWNER: HOWE, BARBARA LOUISE ET AL

PROPERTY DETAIL  
PARCEL NO. 0157311400003  
OWNER: CITY OF THORNTON

I, Robert Daley, do hereby certify only to Ward Petroleum, that the floodplain location as shown hereon is a graphic representation of the flood zones as depicted on FEMA FIRM Map Number 08001C0302J, dated January 20, 2016.



FOR AND ON BEHALF OF  
DALEY LAND SURVEYING INC.,  
Robert Daley, PLS 35597

EXHIBIT 5.5  
TRAFFIC IMPACT STUDY

**Ward Petroleum Ivey Pad**  
Adams County, Colorado

**Traffic Impact Study**

KE Job #2017-011

Prepared For:

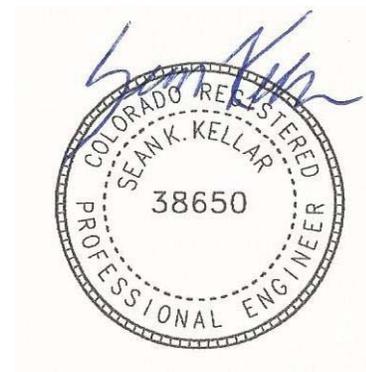
**Ward Petroleum Corporation**  
215 W. Oak Street, Suite 1000  
Fort Collins, CO 80521

Prepared By:



**KELLAR ENGINEERING**

[skellar@kellarengineering.com](mailto:skellar@kellarengineering.com)  
970.219.1602 phone



**August 25, 2017**

**Sean K. Kellar, PE, PTOE**

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## 1.0 Introduction

The objective of this Traffic Impact Study (TIS) consists of analyzing the peak traffic associated with the construction/operation of Ward Petroleum's well pad (Ivey Pad) in Adams County, CO. See Figure 1: Vicinity Map. This TIS will: identify project traffic generation characteristics, identify potential traffic related impacts on the adjacent street system, and develop mitigation measures required for identified traffic impacts.

Kellar Engineering LLC (KE) has prepared the TIS to document the results of anticipated traffic conditions in accordance with Adams County's requirements and to identify any projected impacts to the local and regional transportation system. The route plan is to have the large trucks arrive and depart from the north (east), rather than from the south in order to avoid large trucks traveling adjacent to Stargate Charter School. The Ivey Pad's peak traffic is conservatively anticipated to generate approximately 580 daily weekday trips, 58 AM peak hour trips, and 58 PM peak hour trips. See Table 1: Trip Generation.

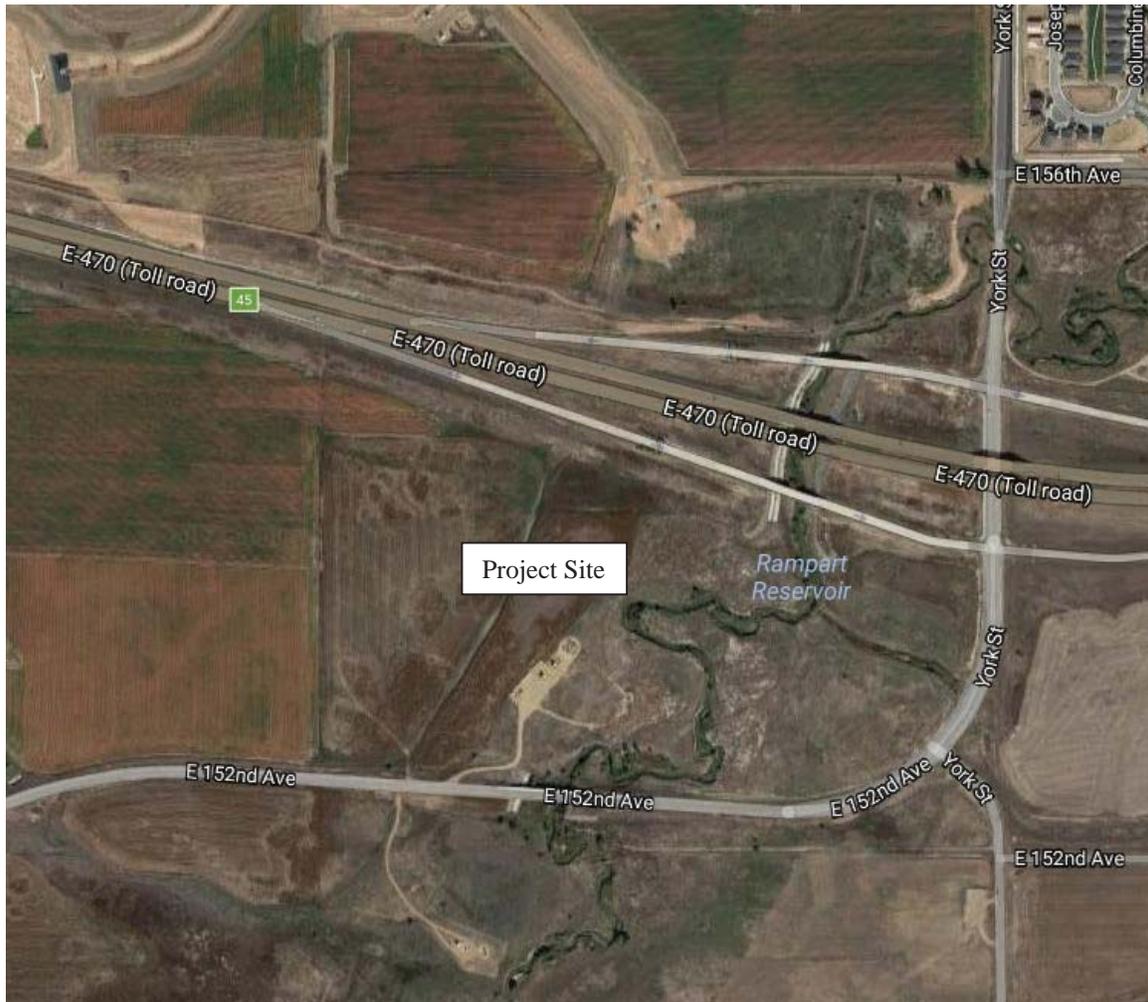
## 2.0 Existing Conditions and Roadway Network

The project site is located north of 152<sup>nd</sup> Avenue, and south of E-470. Access to the site is proposed from a new access point to 152nd Avenue located just west of an existing unpaved driveway approximately 2,000' west of the intersection of 152nd Avenue/York Street. This new access point is proposed in order to accommodate a new westbound right-turn lane for the project's traffic. 152<sup>nd</sup> Avenue is an existing 2-lane arterial roadway with 12' wide thru lanes, gravel shoulders, and a posted speed of 55 mph adjacent to the project site. 152<sup>nd</sup> Avenue is classified as a major arterial in the Adams County Transportation Plan. The existing access point location to 152<sup>nd</sup> Avenue is at a good location from a traffic engineering perspective. The access point is situated at a location that has good sight distance and good access spacing from intersections and high volume driveways. The access point is at a straight portion of 152<sup>nd</sup> Avenue and not adjacent to horizontal curves where sight distance can be a concern.

## 2.1 Existing Traffic Volumes

Existing peak hour traffic volume counts were conducted by All Traffic Data Services Inc. using Miovision data collection cameras at the site access to 152<sup>nd</sup> Avenue on Wednesday, January 18, 2017. The counts were conducted during the AM and PM peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. These turning movement counts are shown in Figure 3 with count sheets provided in Appendix A.

Figure 1: Vicinity Map



Google Maps



### 3.0 Pedestrian/Bicycle Facilities

Currently there are no existing sidewalks or bicycle facilities adjacent to the project site. Additionally, the project is not anticipated to generate additional pedestrian or bicycle trips. Any additional pedestrian or bicycle traffic from this project, if any, would be negligible.

### 4.0 Proposed Project

The proposed project consists of analyzing the peak traffic associated with the construction/operation of Ward Petroleum's well pad (Ivey Pad) in Adams County, CO. See Figure 2: Site Plan.

#### 4.1 Trip Generation

Site generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Report* published by the Institute of Transportation Engineers (ITE). ITE has established trip generation rates in nationwide studies of similar land uses. The Institute of Transportation Engineers' (ITE) Trip Generation Manual, 9th Edition does not provide detailed data on well pads. As such, detailed data provided from prior well pads is being used to calculate the peak trip generation for the project.

#### 4.12 Ivey Pad Trip Generation

Section 4.12 by Lisa Denke Consulting

This Traffic Impact Study (TIS) updates a previous study submitted on February 6, 2017. A study of traffic characteristics was carried out by Lisa Denke Consulting to produce the trip generation and vehicle counts for Ivey Pad.

Per the County and City of Thornton comments, this study has been revised to show the effect if an oil shipping pipeline were not installed by the time the well site begins production operations. Ward Petroleum plans to use an oil pipeline, for which a permit has been filed separately by the company installing it. Shipping oil by pipeline is more practicable and more economical than shipping by truck.

*In addition to updating the TIS for oil shipping, information gathered since the February 6, 2017 submittal was incorporated, and the assumptions were made more conservative. The intent is to put forth the most conservative scenario to better plan for the impact of the traffic associated with the Ivey location.*

#### **Site Definition**

Ward Petroleum plans to drill, complete and produce 26 wells at the Ivey Pad site, which is located near the intersection of 152<sup>nd</sup> Avenue and York Street in Adams County, Colorado. The site is in the jurisdiction of Adams County; however, 152<sup>nd</sup> Avenue is in the jurisdiction of the City of Thornton. The pad is located on parcel number 0157311400006, in Sec 11, Township 1 South, Range 68 West.

#### **Parameters Summary**

A summary of the traffic parameters is given in the following table. The Development Phase is used for the Traffic Impact Study.

Table 1. Trip Generation Table, With Pipeline

<b>IVEY PAD: DEVELOPMENT PHASE, WITH PIPELINE AS PLANNED</b>					
<b>Peak Hour Trips (at busiest point, during flowback)</b>					
	<b>% In</b>	<b>Peak Hour Trips In</b>	<b>% Out</b>	<b>Peak Hour Trips Out</b>	<b>Total</b>
Pickups & Cars	50%	7	50%	7	14
Trucks	50%	10	50%	10	20
Total	50%	17	50%	17	34

Table 2. Trip Generation Table, Without Pipeline

<b>IVEY PAD: DEVELOPMENT PHASE, WITH OIL TRUCKING</b>					
<b>Peak Hour Trips (at busiest point, during flowback)</b>					
	<b>% In</b>	<b>Peak Hour Trips In</b>	<b>% Out</b>	<b>Peak Hour Trips Out</b>	<b>Total</b>
Pickups & Cars	50%	10	50%	10	20
Trucks	50%	19	50%	19	38
Total	50%	29	50%	29	58

Table 3. Truck Percentages

<b>Truck Percentages</b>		
Pipeline case	21% trucks average	64% peak
Oil trucking case	45% trucks average	91% peak

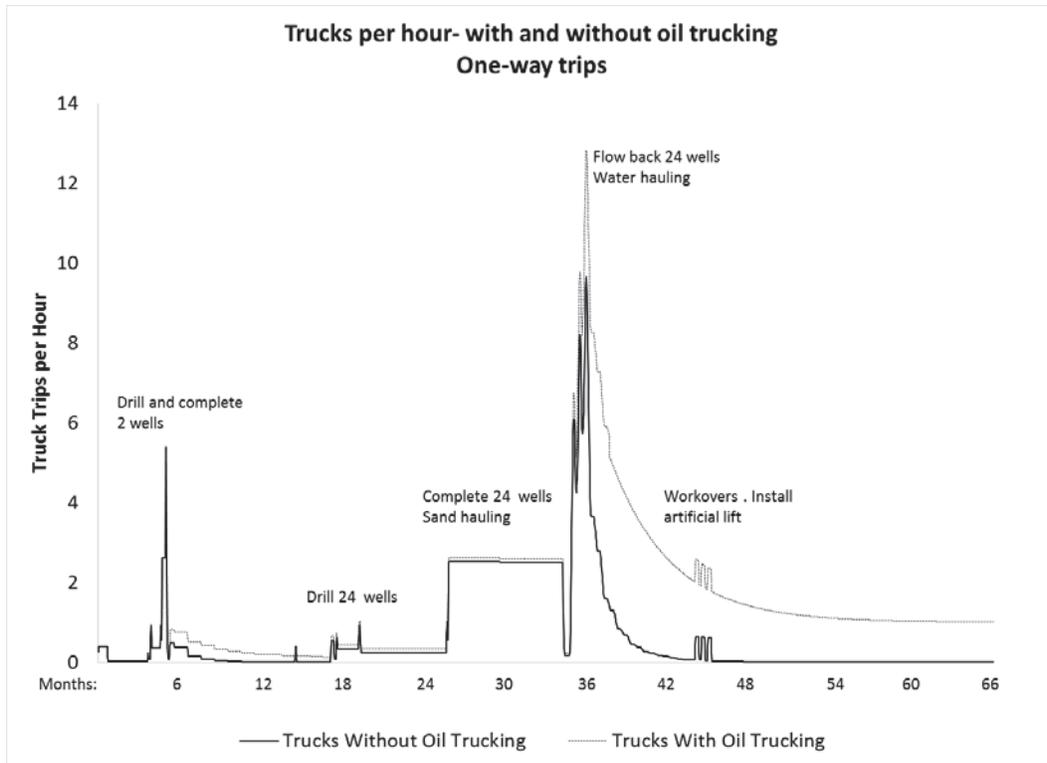


Figure 1. Variation of truck traffic with time.

Average daily traffic (ADT) varies over the course of the project. The ADT can be estimated at 10 times the peak hour traffic.

### Route

Truck traffic will be routed from the north to avoid the Stargate Charter School located 1.2 miles south of the work site.

Vehicles will be routed to the site primarily via E-470 and 152<sup>nd</sup> Avenue. Pickups and cars, including employees commuting to work, may arrive at the site using streets.

Routing for placarded vehicles is restricted under Colorado regulations. These vehicles must use I-25 and US-85, then exit and proceed to their delivery point using the most direct route. An analysis of the length of three routes is included as an Appendix to this report.

### Access (Turn out)

Per City of Thornton Engineering, a deceleration lane will be required at the access point. A pre-application meeting was held with the City on June 27, 2017, and design is underway for the turn lane. A second meeting was held July 20, 2017 to discuss engineering issues.

Comments received from Adams County Engineering outline requirements for the access. It is understood that the requirements include the following:

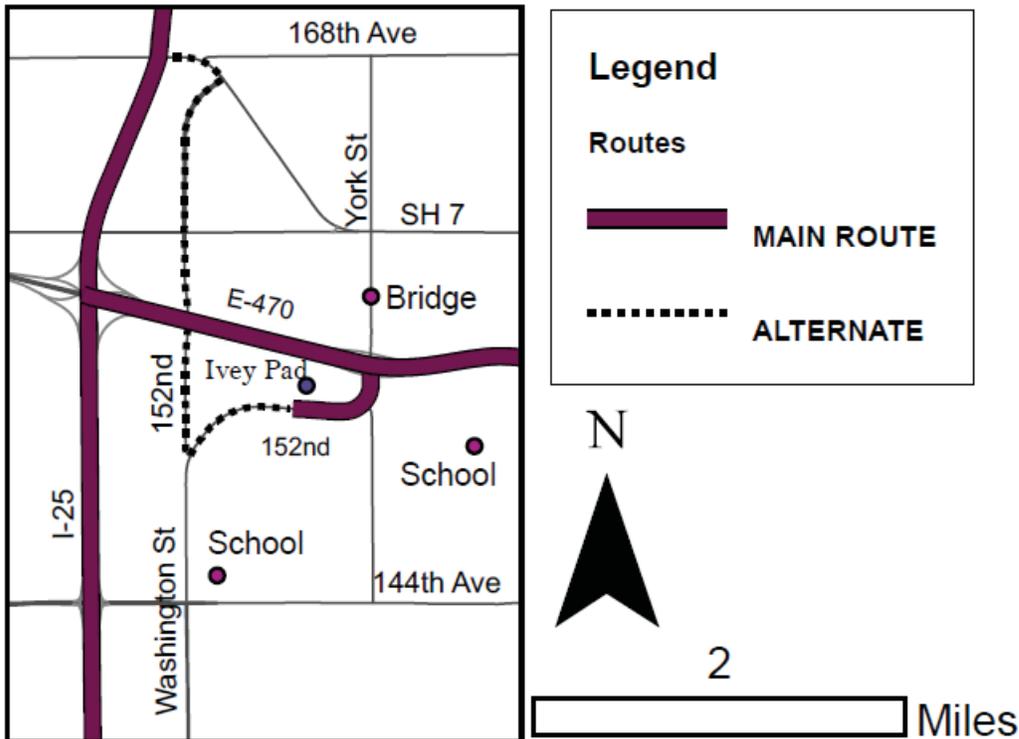
- No more than one access shall be provided to an individual parcel or contiguous parcels under the same ownership unless it can meet the exceptions identified in Chapter 8,

page 8-4, Table 8.2 of the Adams County Development Standards and Regulations. The table is located at <http://www.adcogov.org/development-standards-regulations>.

- We feel that the exception that 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” applies. Having a turn lane will significantly benefit the safety and operation of the street.

### Map

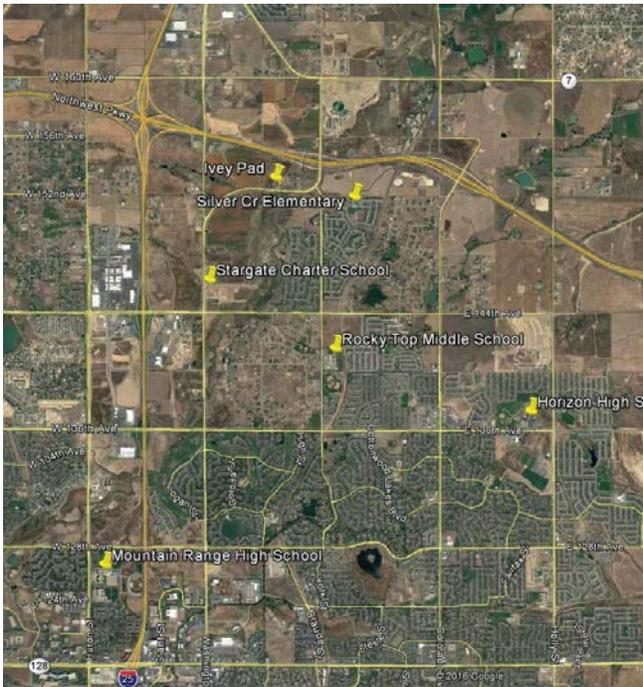
## IVEY PAD ROUTING



**Figure 2. Map showing proposed site and truck routing. The trucks will be routed on E-470. Flowback water will be taken to disposal wells in Weld County via I-25 or US-85. Materials to be landfilled will be taken to Republic Landfill per the Waste Management Plan on file with COGCC. A Traffic Control Plan (TCP) is also being filed with Adams County, which will show signage at the site.**

### Schools

Schools were mapped to find the proximity to the proposed location. Most vehicles will be coming from the I-25 or US-85 corridors, and then to E-470, exiting at York Street (152<sup>nd</sup> Avenue), which will minimize the impact to the schools. Some employee personal vehicles, which are a portion of the total light vehicle count, will originate in neighborhoods as they commute to work.



*Figure 3. Schools mentioned in comments*

Silver Creek Elementary, part of the Adams 12 Five Star Schools system, is the closest to the pad, and is located 3200 feet away.

Adams 12 Five Star Schools have requested that truck traffic along the York Street corridor be restricted as much as possible during the following hours:

- 7:00 am to 9:00 am, Monday through Friday
- 1:00 pm to 4:00 pm, Monday and Tuesday, and Thursday and Friday
- 11:00 am and 1:00 pm on Wednesday

This will help to mitigate effects on York Street near Silver Creek Elementary at 15101 Fillmore St. In addition, the location of the school on a side street keeps traffic impacts low. Traffic counts on Fillmore Street have been 1087 VPD (Vehicles per Day) historically (see Figure 4), which may be due to traffic at the school itself.



*Figure 4. Zoomed in view, featuring Silver Creek Elementary*

### Approximate Overall Schedule

The actual schedule is dependent on when permits are issued, and may change depending on other factors, such as development projects by other entities in the area. However, the operations will proceed in this order:

- Initial Construction of the pad and road
- Drilling/Completions (Fracturing) of first two wells, consisting of 24/7 operations
- First two wells to be produced for ~1 to 2 years before the other 24 wells are drilled. During this time, the traffic will be much less than during drilling and completions, and will consist mainly of pickup trucks for personnel monitoring the wells.
- Drilling/Completions of remaining 24 wells will occur, followed by approximately 30 years of production operations.
- Decommissioning, consisting of plugging and reclaim.



Figure 5. Anticipated schedule. Drilling and fracturing will not take place the entire time.

### Traffic Description

Traffic during development (construction, drilling and completion operations) will be relatively high, and traffic afterwards will be lower. While traffic impact studies for other land uses, such as housing, are typically conducted for the post-development phase, this traffic study was conducted for the development phase to perform a realistic estimate of the impact. The idea is to be able to assess and plan to mitigate the impact.

Pipelines are planned for oil and gas shipping, and for using a temporary above ground water line to bring water to the pad for completion operations when hydraulic fracturing is conducted. The temporary water line will reduce trucking.

This land use has the following transportation features:

- Employees access the site in pickups, cars and company vans. A few employees remain onsite during the entirety of the drilling and completion activities, while the rest

are shift workers, similar to other land uses. Depending on the phase of operations, there may be 2 or 3 shifts per day. Traffic peaks result from shift workers arriving at the job site. In this way, the site is similar to other job-producing land uses.

- This analysis assumes that each employee will drive their own vehicle, one person per car. No reduction of traffic has been assumed for use of company vans or other mass transit.
- Materials are delivered using various sizes of vehicles, including pickups and different classes of larger trucks. Five-axle semi-trucks are common, especially for sand delivery and immediately after fracturing for hauling frac flowback water.
- Truck and pickup mounted equipment arrives for certain events. For example, high pressure pumps for hydraulic fracturing are mounted on the back of trucks, and remain on the trucks during pumping.



*Figure 6. Fracturing pump truck, showing deck engine on front of trailer and pump on back. Image from <http://www.stewartandstevenson.com/markets/oil-gas/frac-well-stim-equipment/frac-pumps>*

Workers and supervisors may come from the local area. Others may come from outside the area via I-25 or US-85, and will arrive in pickups or cars via York Street, Washington Street, or E-470.

Peaks in traffic result from pad construction, delivery of sand during fracturing operations, and from hauling flowback water from the pad after wells are fractured.

Because the traffic impact is larger during development, the development phase was analyzed. The production phase was not analyzed in detail because the associated traffic effects are relatively small.

### **Method for Trip Generation**

Our basis for the trip generation was the following:

1. Field data gathering at drilling, hydraulic fracturing and flowback operations in the DJ Basin. Vehicles were counted in mid-March to mid-April 2017.
2. Soliciting information from Subject Matter Experts (SME's). Lisa Denke has experience in drilling, fracturing, and oilfield construction, as well as civil engineering and land development. She was responsible for gathering and analyzing detailed information from SME's.
3. Key parameters were calculated numerically using industry accepted methods, such as material balances. Data from Ward Petroleum, and data gathered from nearby wells from COGCC and Frac Focus were analyzed to determine sand, oil, water, mud, cement, and chemical volumes.
4. A review of published reports was carried out.

### **Field Data Gathering: Examples**

Field data gathering was performed to validate truck traffic and to constrain the pickup truck traffic. Manual counts of vehicles at five sites in suburban Erie and Windsor, Colorado were taken during different phases of the operation. Truck counts were found to be consistent with material balances.

Pickup data were found to be variable per site type. Based on these counts, for drilling, a minimum of 77 pickups per day are assumed. During hydraulic fracturing, a minimum of 95 pickups a day is assumed.

Peak hour traffic for the TIS simulation is derived from the field data.

A tour of a site when hydraulic fracturing was underway was arranged by the design engineer from the service company performing the work. The recent changes to the fracturing operations, such as use of modular sand containers, were observed, and equipment inventoried. The design engineer also provided information on the truck trips required for different parts of the hydraulic fracturing operation.

A visit to a drilling rig storage yard yielded information about the equipment that was about to be moved to previously permitted Ward Petroleum location. Drilling operations, including installation of casing pipe and cementing, were observed at a Ward location. The installation of the sound wall at the location was observed.



*Figure 7. A water truck is deployed on Ward Petroleum's Schaefer drill site during a cement job.*

An engineer observed a tank facility site with the construction foreman and gathered information about the pad construction, containments, equipment, and installation requirements.

### **Subject Matter Expert (SME) Interviews**

Subject Matter Experts were interviewed or provided information by phone/email for each phase of operations to develop a count of the trucks and pickups. Examples of the SME's include:

- The development engineer, who provided information about Ward Petroleum's operations. He also contacted suppliers for information on the number of truck trips and types of trucks.
- The reservoir engineer, who provided expected water flowback volumes. She also provided data on oil production and the rate of decline of both fluids. The production foreman provided information on historic hauling requirements. The information from the two individuals agreed.

- Sand haulers, who provided typical numbers for the sand deliveries to locations in the DJ Basin. These numbers corroborated the mass balances.
- Tubing and casing suppliers, who provided information on the number of trucks required to deliver tubular goods.
- Individuals on a hydraulic fracturing location, including the security guard, who provided insight into the traffic to be expected for pickup trucks arriving each day.
- The construction foreman, who clarified that DJ Basin construction practices result in more materials being delivered in pickups and on small trailers, whereas in other areas materials are delivered on semi-trailers. Also, the practice of installing low profile (short) tanks in urban areas means that two tanks can be delivered per truckload, reducing the overall truck count.
- The production foreman, who clarified practices around plunger lift and workovers.
- Personnel from a local road and well pad construction company. This company has built well pads for numerous oil companies in the DJ Basin.
- Personnel from two local drilling companies and a heavy hauling company that specializes in moving rigs in the DJ Basin. The drilling companies provided lists of the equipment and supplies to be moved. An additional load list was located from an internet search.
- The foreman from the wireline and bridge plug supplier, who supplied information on the number of trucks and trips for perforation and bridge plugs.
- The drillout supervisor, who provided information on trucks and trips for each type of truck for that operation.
- The workover supervisor, who provided information on the workover rig and support equipment.
- Gathering field data is the best way to gain knowledge of the number of trips and the types of trucks being used.

### ***Calculation of Key Parameters***

#### ***Key Parameters: Construction***

Gravel amounts were conservatively estimated. The exact configuration of the road access is not known yet, so the gravel amounts from a bigger site, with a longer road, were used to ensure that the gravel truck trips were not underestimated.

Truck trips to haul production facility equipment were calculated to match the permit submittal diagram. SME input was incorporated to reflect that some equipment items are hauled on a trailer behind a pickup, rather than on semis, and that tanks fit two on a truck. Boomtrucks were added for unloading equipment. Trucks and pickups were added for construction crews, backhoes, electrical equipment, containment materials, and other items.

#### ***Key Parameters: Drilling***

Rig moves and mobilization of equipment were carefully accounted for. For example, for pad drilling, the upper part of the well (surface hole) is drilled by a different rig than the bottom part (production hole), resulting in additional trips to move rig equipment. These were added for the group of 24 wells to be drilled as a pad. For the initial 2 wells, it will be more economic to have the same rig drill the surface hole as the production hole.

Actual rig equipment lists from three companies were obtained, and a rig moving contractor was

contacted to discuss the trucking involved. Specialty trucks are used to move the large loads.

Trucking of materials for sound and light walls was accounted for. Trucks are needed to transport I-beams, steel frames, and soundproofing material.

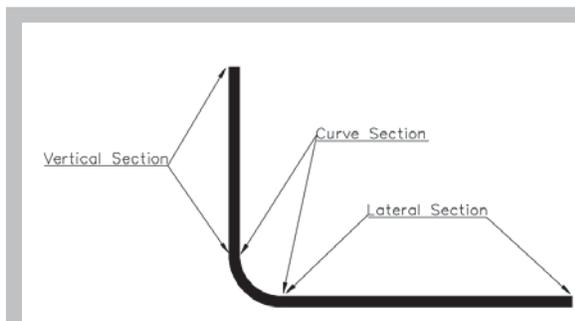
Volumes of cement and water used in drilling were calculated from volumes used on nearby wells, and from the volume of the hole. Both in-house and COGCC data were used. Information from SME's was used to validate the volumes. Mud hauling was adjusted to account for different fluids in the surface hole and production hole.

Waste streams, for example, drill cuttings and tanks full of drilling fluid were accounted for. The drill cuttings volumes were calculated as the volume the size of the hole being drilled. The tanks were assumed full at the end of the job, and the volumes assumed equal to the published volumes of tanks on Xtreme Drilling's website.

### ***Key Parameters: Completions***

Weights of sand from previous frac jobs, both at Ward Petroleum and other operations, were examined. Public-domain data from Frac Focus and COGCC were also used.

The amount of sand can be expressed in terms of pounds per foot of lateral section. The "lateral" is the horizontal part of the well, so the phrase "pounds per lateral foot" of sand is used.



*Figure 8. Horizontal well terminology*

Historically, between 900 and 1100 lb of sand per lateral foot have been achieved in this area. It may be possible to place more sand, which will increase the production. A higher amount of sand, 2000 lb per lateral foot, was used to make sure to account for enough sand hauling.

Longer wells require more sand because there are more lateral feet. Some Ivey Pad wells reach 3 miles, some reach 2 miles. For the calculations, it was assumed that all wells reach 3 miles. Longer wells does require more trucking to Ivey Pad, however, it means that fewer pads are required. In the long run, trucking is reduced by longer horizontal wells.

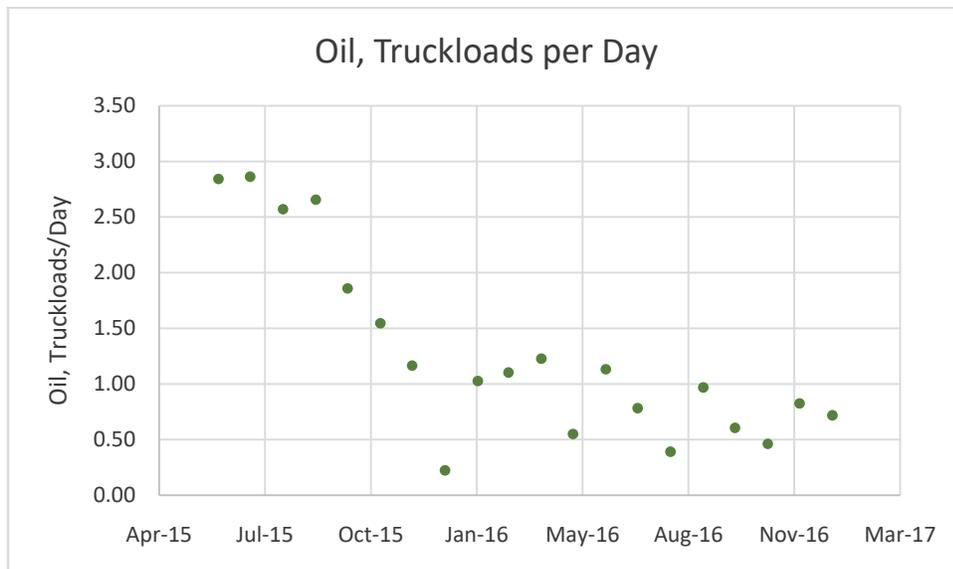
No matter how long the wells are, the frac pumps can only pump the water and sand at the same rate (gallons per minute of water and pounds per minute of sand).For this reason, for a given fluid design, the same number of sand trucks will arrive each day for longer wells as for shorter wells.

**Key Parameters: Fluid production**

Pipelines are planned for gas and oil from the wells. After the water pumped during the hydraulic fracturing has been initially flowed back, water production from Niobrara/Codell wells in this area has historically been low, and it is planned to truck the water. Although the water is forecast to decline to nearly zero, to be conservative, it is forecast that there will always be at least one truckload of water per month, during the 30-year life of the wells.

Although an oil pipeline is planned, it is required that oil trucking be included as an assumption in the TIS for the production life of the wells. This raises the number of trucks significantly.

Both data from Ward Petroleum and publicly available data for nearby wells were analyzed to determine how much water and oil will flow from the wells during flowback and production. These data were used to compute the number of truck trips required to haul the fluids. As an example, the oil production data from the Colorado Oil and Gas Commission is shown below for the Ward Riverdale #14-4-12HC<sup>1</sup> well.



*Figure 9. Oil production data from the Colorado Oil and Gas Commission for the well Ward Riverdale 14-4-12HC horizontal well.*

Flowback operators schedule tanker trucks and monitor the tanks when the water pumped during the hydraulic fracturing job is flowing back from the wells. The operators drive to and from the site in their cars and pickups. Subject Matter Expert input from Ward Petroleum operations and from flowback contractors was solicited regarding the number of trips, and the numbers adjusted accordingly. Each well does not add additional pickups: there are economies of scale as additional wells are included. Additionally, vehicles at a flowback operation near Windsor, Colorado were counted to verify the data.

The flowback water for wells in this area is lower than for wells in other basins, as shown in this graph from Environmental Science and Technology Letters.

<sup>1</sup><http://cogcc.state.co.us/cogis/ProductionWellMonthly.asp?APICounty=001&APISeq=09845&APIWB=00&Year=All>

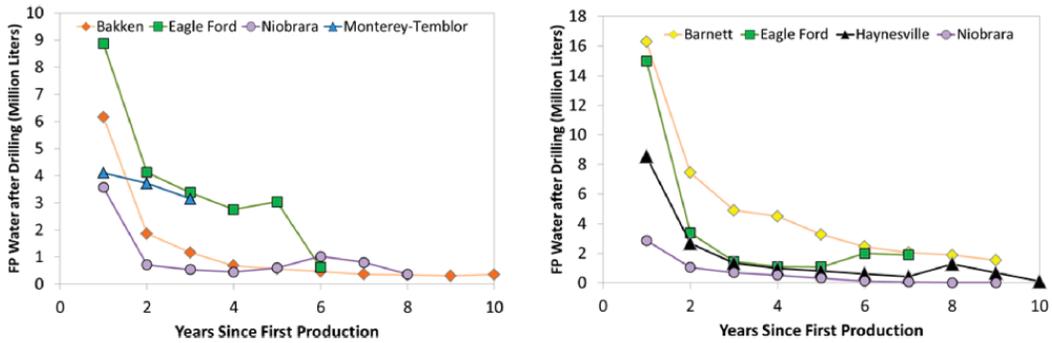


Figure 10. Decline curves of Flowback and Produced (FP) water over the course of well production for unconventional oil (left) and gas (right) formations. Reproduced from Andrew Kondash and Avner Vengosh, “Water Footprint of Hydraulic Fracturing,” *Environmental Science and Technology Letters*, 2015, 2 (10), pp 276–280. DOI: 10.1021/acs.estlett.5b00211

These numbers hold true for wells near the proposed Ivey Pad, for example, the Raisa 12-16H-4 well in Adams County has the water production shown in the following graph.

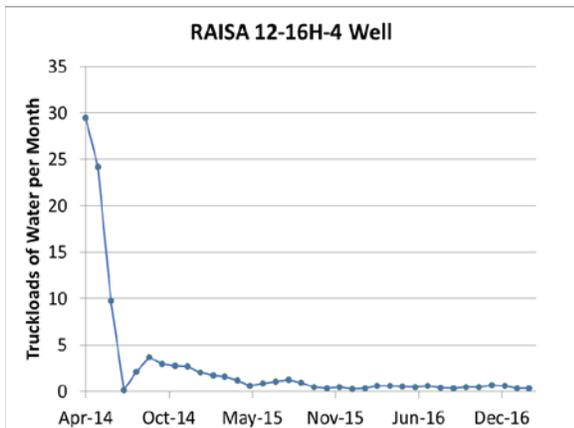


Figure 11. Raisa 12-16H-4 Horizontal Well water production. Data from Colorado Oil and Gas Commission. <http://coGCC.state.co.us/coGIS/ProductionWellMonthly.asp?APICounty=001&APISeq=09778&APIWB=00&Year=All> Downloaded May 2, 2017.

**Incorporation of Information from Published Reports**

A worker utilizing data from trucking studies will encounter the following challenges:

- Operating practices vary markedly from one geologic basin to another.
- Practices are rapidly evolving. Six months’ time can make a difference.
- The window of time over which trucks are counted matters. Trucks must be counted through the end of completions, but the question arises of how long to count the trucks during flowback. To compare data between studies, one must know how much flowback was considered.
- Good practices have unintended consequences. Water recycling is good, but may necessitate more water hauling, and more truck trips.

- Economies of scale affect comparisons. All else being equal, a 24-well pad will require fewer trips *per well* than a 12-well pad.

Numerous trucking studies exist, but most focus on other basins. Key differences in the DJ Basin include markedly lower water production, facility designs that are adapted to urban settings, use of sound and light mitigation, and regular use of fit-for-purpose, smaller drilling rigs. It is difficult to extrapolate the data from one basin to another, and field specific data gathering is recommended to ensure accurate truck counts.

The only viable method to determine the number of trucks is to interview Subject Matter Experts, and to go to the field and inventory the equipment in service. Moreover, as conditions change, this exercise must be repeated: new equipment innovations are constantly being developed, as service companies are competitive and keen to increase market share.

Two key studies in the DJ Basin are the following:

1. Felsburg, Holt and Ullevig, in conjunction with BBC Consulting, prepared the "Traffic Fee Impact Study for the City of Thornton" in 2016, using data from studies in the Marcellus Shale in Maryland & New York, the Uintah Basin in Utah and the Bakken Formation in North Dakota. The study dates ranged from 2011 to 2014. This study presents data in terms of round trips, which is to say, trucks are counted as they arrive at the site, and counted again as they leave the site.
2. Also by Felsburg, Holt and Ullevig, in conjunction with BBC Consulting, the "Boulder County Oil and Gas Roadway Impact Study, Final Draft" was published in January 2013. This study presents data in terms of 1-way trips, which is to say, vehicles are counted only as they arrive at the site.

Either round trips or 1-way trips may be used: one must be aware of the two types of data.

FHU/BBC point out that the length of boreholes has increased in recent years. This is certainly true for Ivey Pad, for which the laterals will be as long as 14,920 ft (nominally 3-miles)<sup>2</sup>. The advantage of long boreholes is that fewer wells are needed to access the same volume of reservoir, and fewer pads can be sited. There are economies of scale with the trucking, for example, the sound walls and rig would need to be set up more times and more pipelines would need to be constructed if there were more well pads, resulting in more trucking.

### ***Trucking Table***

At Ivey, Ward Petroleum plans to drill 2 wells in 2017, followed by 24 wells roughly a year later. The trucking associated with the different phases of the operation is shown below. Trucking is included for all 26 wells.

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<sup>2</sup> Due to certain regulatory matters, a horizontal well in Colorado is often missing 460 feet at each end of the lateral. A one-mile well is 4360 feet; a two-mile well is 9640 feet.

Table 4. Comparison of truck trips between submittals

<b>All numbers are 1-way trips. Each truck is counted going into site only. For round-trip, multiply by 2.</b>				
<b>Phase</b>	<b>1<sup>st</sup> Submittal (2/6/17)</b>	<b>This submittal, w/o oil trucking</b>	<b>This submittal, with oil trucking</b>	<b>Notes</b>
Construction	400	250	250	Fewer trucks are used than originally thought. Gravel volumes calculated to less, even with conservative assumptions.
Drilling	1,200	2,150	2,150	Added conductor & surface hole rigs, sound & light mitigation, cuttings removal
Completion	8,900	17,350	17,350	Doubled amount of sand pumped to make calculations more conservative
Flowback	9,000	9,000	35,150	For oil trucking case, added oil at request of jurisdiction. Oil pipeline is planned.
<b>Total</b>	<b>19,500</b>	<b>28,750</b>	<b>54,900</b>	<b>Development + 1 Year of Production</b>

Numbers from the first submittal have been summarized and rounded to the nearest 100 trucks. For a derivation from the detailed table presented in the first submittal, an appendix is provided for the interested reader.

Table 5. Number of days per phase

<b>Phase</b>	<b>1st submittal</b>	<b>2nd submittal</b>	<b>Comments</b>
<b>Construction, total for all wells</b>	42	90	
<b>Drilling, per well</b>	5	10	Time for large rig does not increase
<b>Completion, per well</b>	5	11	
<b>Flowback, per well</b>	374	374	

Construction time was increased to account for site constraints. Drilling time per well was increased to account for installation of sound walls, drilling of conductor holes, and other ancillary operations. Completion time per well was increased because a typical time for the DJ Basin was used on the first submittal, while a more detailed calculation was used on the present submittal.

## ***Analysis of difference between submittals***

### ***Construction***

Construction time increased, while trucking decreased. The construction for this site is projected to be labor intensive, but not as trucking intensive as some construction.

The construction truck trips decreased between submittals because the trucking for equipment deliveries was too high on the first submittal. The estimated trucking was based on facility construction in California and North Dakota oilfields, where equipment items are usually delivered on 5-axle semi's. Interviewing an SME about the deliveries to DJ Basin sites, as well as looking at the sites, resulted in adjustment of the numbers.

The DJ Basin, of which Adams County is a part, is urbanized, and as a result, equipment is smaller and less obtrusive than most oilfields. For example, typical tanks in North Dakota are 20 feet tall. By contrast, it is typical for cities and counties in Colorado to require low profile tanks. Since the tanks are smaller, two tanks can fit on the same truck, reducing the number of loads. Some equipment that would be hauled on semi-trucks in other states is transported on pickups in Colorado to reduce the amount of trucking. Examples are piping, wire, and backhoes. Since the sites are small, a pickup pulling a trailer is better able to maneuver than a semi.



*Figure 12. Example of a pickup delivering equipment. Note that the pickup also has a welding set-up mounted on the back.*

### ***Drilling***

Drilling time and trips increased between the first and second submittals due to inclusion of additional detail. Here are some examples of additional information that was included.

On the present(second) submittal, it was recognized that the practice of pad drilling would likely mean contracting a small rig to drill the surface hole, then a larger rig to drill the production hole. The surface hole rig is smaller and will be more efficient for drilling the shallow surface holes, compared to using the large rig to drill the entire distance. This allows the overall operation to be completed in less time. The surface hole rig adds about 50 trips to set up the rig, and 50 to remove it.

The conductor rig, sound & light mitigation materials, and cuttings & other waste removal were also accounted for. In each case, field studies were conducted to validate the number of truck trips.

A useful table can be found in the FHU/BBC Thornton study. "Table 4" gives normalized data

for well pads of different sizes, including a 20 well pad. While the difficulty of normalizing this type of data is appreciated, it will be useful to compare the drilling trip generation truck counts to the Thornton “Table 4” data.

FHU/BBC estimate 2,062 “1-way trips” in the drilling phase for a 20-well pad<sup>3</sup>. Ward proposes a 26-well pad. If we multiply by 26/20, we would have 2681 truck trips.

$$2060 * \frac{26}{20} = 2681$$

For Ivey Pad, 2,150 trips are projected for the drilling phase, which is 20% less.

*2150 Ivey Pad Drilling Truck Trips < 2681 Expected Number of Truck Trips*

So, whereas drilling trips increased compared to the first submittal, there are fewer trips than the FHU/BBC normalized data would predict.

The trips for this study are calculated assuming the wells on Ivey Pad will be 3-mile<sup>4</sup>horizontal wells, whereas the data used for the Thornton study is from Marcellus and Bakken wells drilled in previous years. Those wells would have been shorter. Two miles was a typical lateral length for the Bakken in that timeframe. A person might well ask, “how can Ivey Pad wells require 20% fewer trips than the Bakken wells, which are shorter wells?”

Two factors are drilling fluids and the size of the rigs. Drilling fluids equipment used in the DJ Basin is closed loop, and drilling “mud” is recycled. Recycling the fluid, and using the same mud on subsequent wells, reduces trucking. One no longer sees earthen pits in use on DJ Basin drill sites, which maintains the “mud” in better condition; moreover, there is no trucking associated with digging pits, emptying them, or filling them in.

Rigs have modernized, reducing the amount of equipment needed. Lean Thinking methodology has reduced the amount of excess equipment and material that is trucked from one site to the next. Innovations such as LED lighting have reduced the amount of fuel used, decreasing the amount of diesel that needs to be trucked in. Modern rigs are used in the Bakken as well, but by comparison to the DJ Basin, a Bakken rig requires a larger footprint.

### **Completion (Fracturing)**

The number of trips in the fracturing phase is 1.9 times the amount in the first submittal. The intention with this TIS is to conservatively predict the impact of the operations, so the sand was increased. The amount historically pumped has been around 1000 lb/foot of lateral section: this amount was doubled. Since sand is the largest factor in trucking during fracturing, truck trips nearly doubled.

It is planned to pipeline the completions supply water, eliminating trucking for water supply

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<sup>3</sup> The table is given in terms of 2-way trips. Divide the numbers in the table by 2 to get 1-way trips.

<sup>4</sup> The wells are actually planned for about half 3-mile and half 2-mile laterals. The assumption of all 3-mile wells is thus a very conservative assumption, resulting in a larger number of truck trips, and higher traffic volumes than will actually occur. In this submittal, about 2500 extra sand trucks result from this assumption: other frac materials are also increased. For flowback, about 5400 extra oil and water trucks have been added in the first year for the “no pipeline” case, and 650 extra water trucks for the “pipeline” case. The assumption of all 3-mile wells was made in both submittals.

during completions. This assumption was also made in the first submittal.

A comparison with the FHU/BBC “Table 4” is not meaningful for the Completion phase. The assumptions used in generating the table do not match well with the planned operation.

- It is planned to use modular trucks such as Sandbox or PropX, to comply with silica dust regulations. The number of fracture sand trips in the FHU/BBC “Table 4” for the 20 well pad, 1,852 round-trips, appears low, indicating that a different technology may have been assumed for development of this table.
- Fracture water trucking was assumed in FHU/BBC “Table 4,” resulting in 17,641 round-trips for “Fracture Water, Chemicals and Fluids.” It is planned to pipeline the frac water. Around 200 truckloads for guar gum and other chemicals are expected to be used.
- “Fracturing Equipment (pump trucks, tanks, etc)” of 194 items, is consistent with a site receiving water by truck. If the water is trucked, large numbers of tanks are required. If a steady supply of water is available by temporary pipeline, about 10 tanks are required.

### ***Flowback Hauling***

Felsburg, Holt & Ullevig was contacted about the length of flowback data considered in their Thornton study. It was indicated that the length of flowback was uncertain. Due to uncertainty in the timeframe of the data in their study, it is not possible to compare the Ivey Pad flowback data to the Thornton study data.

### ***Conclusion***

The peak hour traffic has been estimated by on-site, in-person observations at frac pads, drilling sites, and flowback sites in suburban Erie and Windsor, Colorado. Truck counts have been calculated by the methods detailed above.

This Traffic Impact Study represents a scenario calculated based on information presented prior to the commencement of the study. Lisa Denke Consulting and Kellar Engineering LLC are not responsible for increases in traffic resulting from operational changes not communicated prior to the beginning of trip generation.

In light of the above information, the Ivey Pad’s peak traffic is conservatively anticipated to generate approximately 580 daily weekday trips, 58 AM peak hour trips, and 58 PM peak hour trips. See Table 1: Trip Generation.

## 4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns and volumes, anticipated surrounding development areas, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site generated traffic that approaches the site from a given direction and departs the site back to the original source. For this project trucks will not access from west (south) of the project site in order to avoid having large trucks traveling adjacent to Stargate Charter School to the south. Therefore approximately 94% of the project traffic will be distributed to the north.

## 4.3 Traffic Assignment

Traffic assignment was obtained by applying the trip distribution to the estimated trip generation of the development. Figure 4 shows the site generated peak hour traffic assignment.

## 4.4 Traffic Counts Plus Project Traffic

Site generated peak hour traffic volumes were added to the recent peak hour traffic volumes to represent the estimated traffic conditions for the total projected traffic conditions for the Ivey Pad site. See Figure 5: Traffic Counts Plus Project Traffic.

## 5.0 Traffic Operation Analysis

KE's analysis of traffic operations in the site vicinity was conducted to determine the capacity at the identified intersection. The acknowledged source for determining overall capacity is the 2010 Edition of the Highway Capacity Manual.

### 5.1 Analysis Methodology

Capacity analysis results are listed in terms of level of service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. LOS ranges from an A (very little delay) to an F (long delays). A description of the level of service (LOS) for signalized and unsignalized intersections from the 2010 Highway Capacity Manual are also provided in Appendix B.

## 5.2 Intersection Operational Analysis

Operational analysis was performed for the Recent Peak Hour Traffic and the Traffic Counts Plus Project Traffic. The calculations for this analysis are provided in Appendix F. Using the Traffic Counts Plus Project Traffic volumes shown in Figure 5, the project is projected to operate acceptably. See Table 3.

**Table 1: Trip Generation**

ITE Code	Land Use	Size	Average Daily Trips		AM Peak Hour Trips				PM Peak Hour Trips						
			Rate	Total	Rate	In	Rate	Out	Total	Rate	In	Rate	Out	Total	
*	Well Pad	3.4 acres	*	580	*	29	*	29	*	29	*	29	*	29	58

N/A = Not Available

\*

The Institute of Transportation Engineers' (ITE) Trip Generation Manual, 9th Edition does not provide detailed data on well pads. As such, detailed data provided from prior well pads is being used to calculate the peak trip generation for the project. See Section 4.12: Ivey Pad Trip Generation.

Figure 3: Recent Peak Hour Traffic

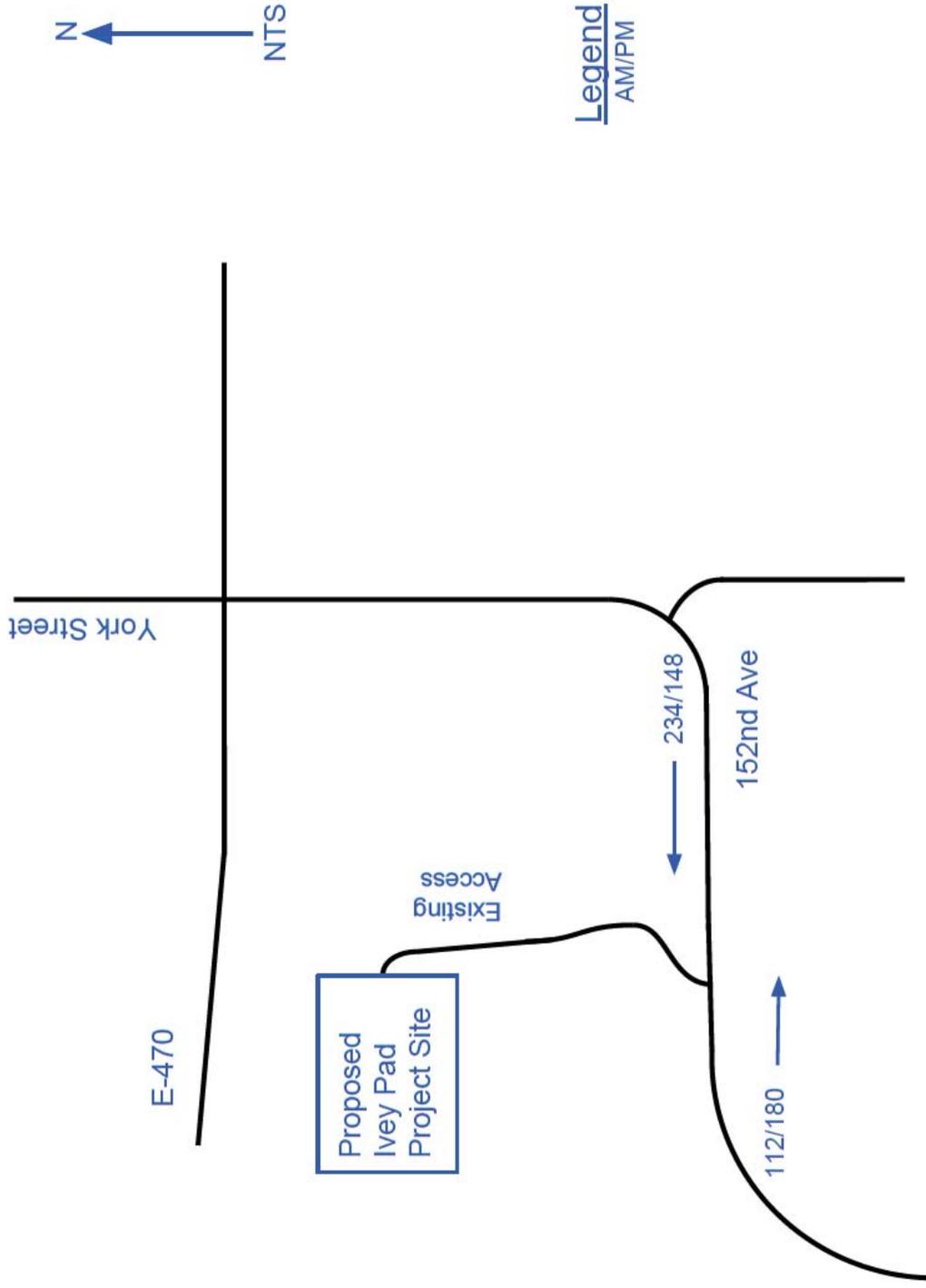


Figure 4: Site Generated Traffic

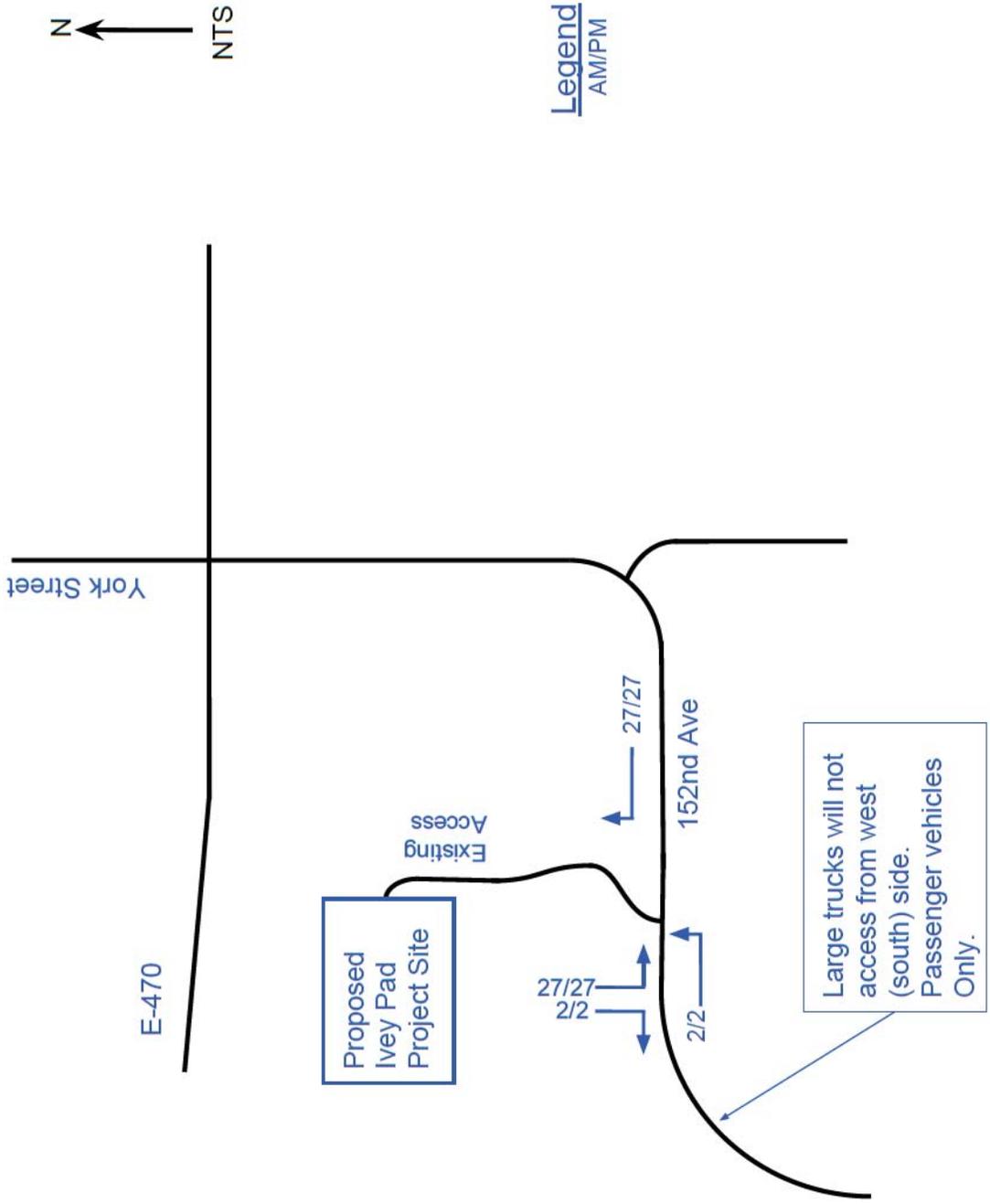
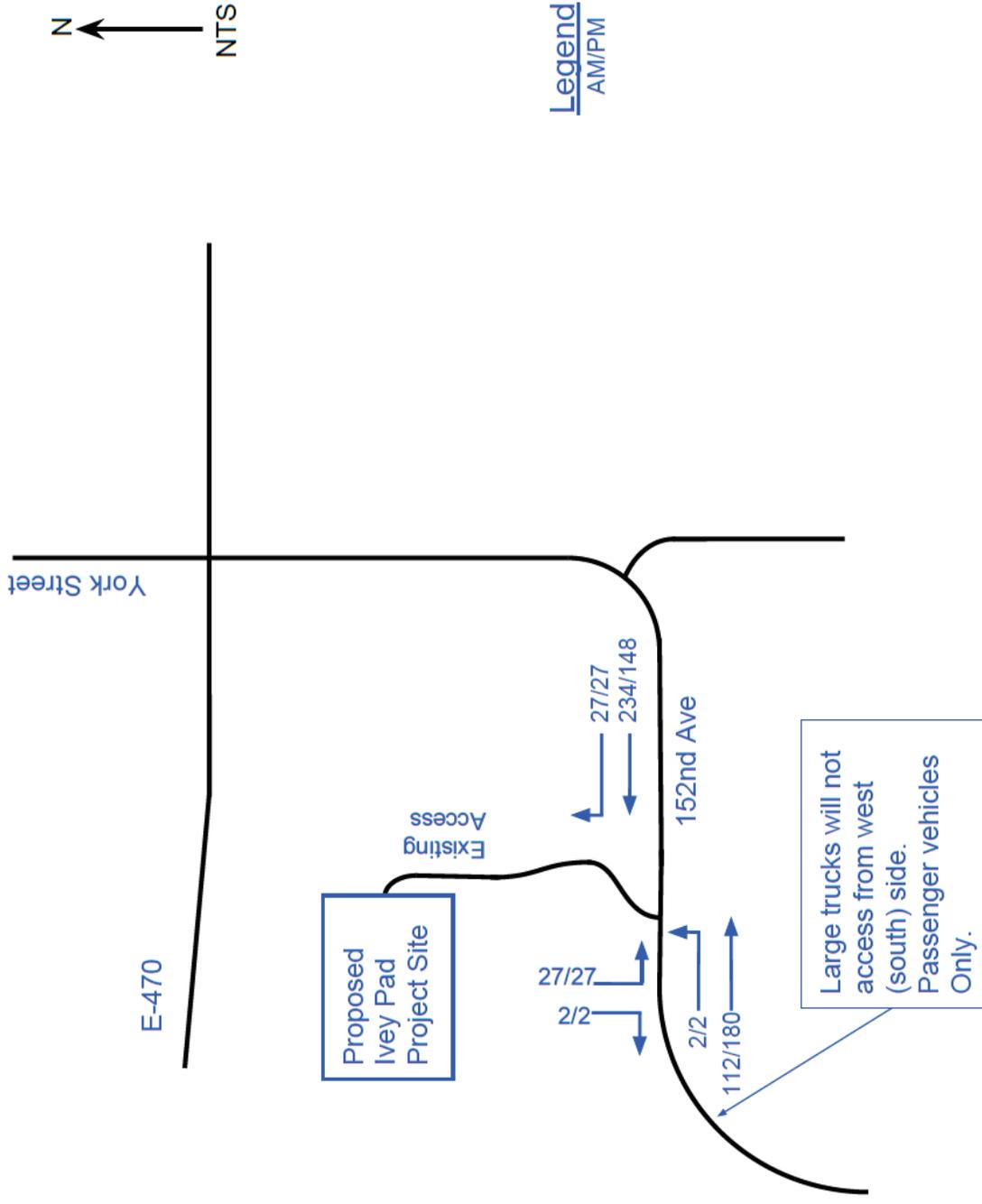


Figure 5: Traffic Counts Plus Project Traffic



**Table 2 - Recent Peak Hour Operation**

Intersection	Movement	Level of Service (LOS)	
		AM	PM
		LOS	LOS
Site Access	EB Thru/Left/Right	A	A
	EB Approach	A	A
	WB Thru/Left/Right	A	A
	WB Approach	A	A
	SB Left/Right	A	A
	SB Approach	A	A
	Overall	A	A

**Table 3 – Traffic Counts Plus Project Traffic Peak Hour Operation**

Intersection	Movement	Level of Service (LOS)	
		AM	PM
		LOS	LOS
Site Access	EB Thru/Left/Right	A	A
	EB Approach	A	A
	WB Thru/Left/Right	A	A
	WB Approach	A	A
	SB Left/Right	B	B
	SB Approach	B	B
	Overall	A	A

## 6.0 Findings

Based upon the analysis in this study, the proposed Ward Petroleum Ivey Pad located north of 152<sup>nd</sup> Avenue, and south of E-470 in Adams County, CO will be able to meet Adams County and City of Thornton requirements and not create a negative impact upon the local and regional traffic system.

The findings of the TIS are summarized below:

1. The proposed Ivey Pad's peak traffic is conservatively anticipated to generate approximately 580 daily weekday trips, 58 AM peak hour trips, and 58 PM peak hour trips.
2. Access to the site is proposed from a new access point to 152<sup>nd</sup> Avenue located just west of an existing unpaved driveway approximately 2,000' west of the intersection of 152<sup>nd</sup> Avenue/York Street. This new access point is proposed in order to accommodate a new westbound right-turn lane for the project's traffic. This westbound right-turn lane will accommodate right-turn entering vehicles at the site access and will be designed to City of Thornton standards. See Appendix F.
3. The 152<sup>nd</sup> Avenue/site access intersection will operate acceptably during the AM and PM peak hours with the Proposed Development (per Chapter 8 in Adams County Development Standards and Regulations).
4. The access point location to 152<sup>nd</sup> Avenue is at a good location from a traffic engineering perspective. The access point is situated at a location that has good sight distance and good access spacing from intersections and high volume driveways.
5. Signal warrants are not anticipated to be met at the 152<sup>nd</sup> Avenue/site access intersection.

## APPENDICES:

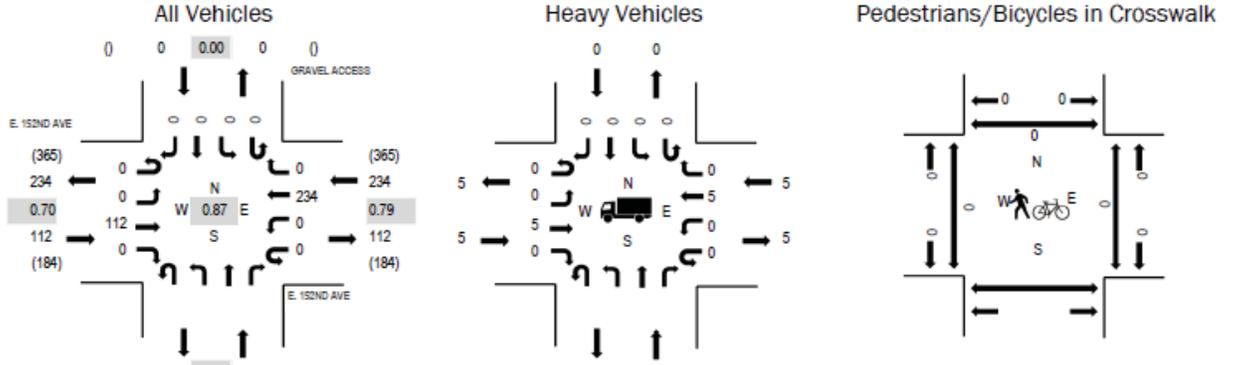
Appendix A: Traffic Counts



(303) 216-2439  
www.alltrafficdata.net

Location: 1 GRAVEL ACCESS & E. 152ND AVE AM  
Date and Start Time: Wednesday, January 18, 2017  
Peak Hour: 07:15 AM - 08:15 AM  
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.5%	0.70
WB	2.1%	0.79
NB		
SB	0.0%	0.00
All	2.9%	0.87

Traffic Counts - All Vehicles

Interval Start Time	E. 152ND AVE Eastbound				E. 152ND AVE Westbound				Northbound				GRAVEL ACCESS Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	18	0	0	0	33	0					0	0	0	0	51	327
7:15 AM	0	0	20	0	0	0	66	0					0	0	0	0	86	346
7:30 AM	0	0	16	0	0	0	75	0					0	0	0	0	91	320
7:45 AM	0	0	36	0	0	0	63	0					0	0	0	0	99	278
8:00 AM	0	0	40	0	0	0	30	0					0	0	0	0	70	222
8:15 AM	0	0	20	0	0	0	40	0					0	0	0	0	60	
8:30 AM	0	0	13	0	0	0	36	0					0	0	0	0	49	
8:45 AM	0	0	21	0	0	0	22	0					0	0	0	0	43	
Count Total	0	0	184	0	0	0	365	0					0	0	0	0	549	
Peak Hour	0	0	112	0	0	0	234	0					0	0	0	0	346	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

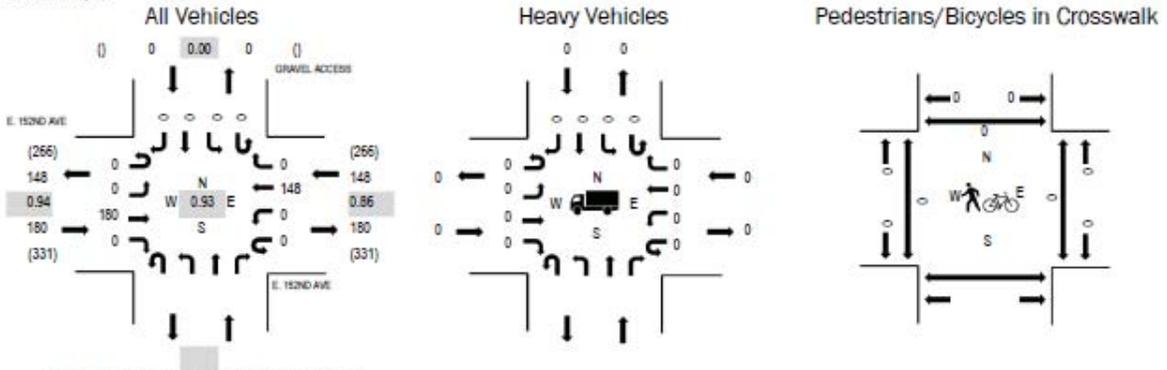
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:15 AM	0	0	3	0	3	7:15 AM	0	0	0	0	0
7:30 AM	4	0	0	0	4	7:30 AM	0	0	0	0	0
7:45 AM	0	0	2	0	2	7:45 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1	8:00 AM	0	0	0	0	0
8:15 AM	2	0	3	0	5	8:15 AM	0	0	0	0	0
8:30 AM	1	0	0	0	1	8:30 AM	0	0	0	0	0
8:45 AM	2	0	1	0	3	8:45 AM	0	0	0	0	0
Count Total	10	0	9	0	19	Count Total	0	0	0	0	0
Peak Hour	5	0	5	0	10	Peak Hour	0	0	0	0	0



(303) 216-2439  
www.alltrafficdata.net

Location: 1 GRAVEL ACCESS & E. 152ND AVE PM  
Date and Start Time: Wednesday, January 18, 2017  
Peak Hour: 04:45 PM - 05:45 PM  
Peak 15-Minutes: 05:30 PM - 05:45 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.94
WB	0.0%	0.86
NB		
SB	0.0%	0.00
All	0.0%	0.93

**Traffic Counts - All Vehicles**

Interval Start Time	E. 152ND AVE Eastbound				E. 152ND AVE Westbound				GRAVEL ACCESS Northbound				GRAVEL ACCESS Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	24	0	0	0	28	0					0	0	0	0	52	270
4:15 PM	0	0	41	0	0	0	27	0					0	0	0	0	68	300
4:30 PM	0	0	38	0	0	0	32	0					0	0	0	0	70	310
4:45 PM	0	0	40	0	0	0	40	0					0	0	0	0	80	328
5:00 PM	0	0	50	0	0	0	32	0					0	0	0	0	82	327
5:15 PM	0	0	45	0	0	0	33	0					0	0	0	0	78	
5:30 PM	0	0	45	0	0	0	43	0					0	0	0	0	88	
5:45 PM	0	0	48	0	0	0	31	0					0	0	0	0	79	
Count Total	0	0	331	0	0	0	266	0					0	0	0	0	597	
Peak Hour	0	0	180	0	0	0	148	0					0	0	0	0	328	

**Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk**

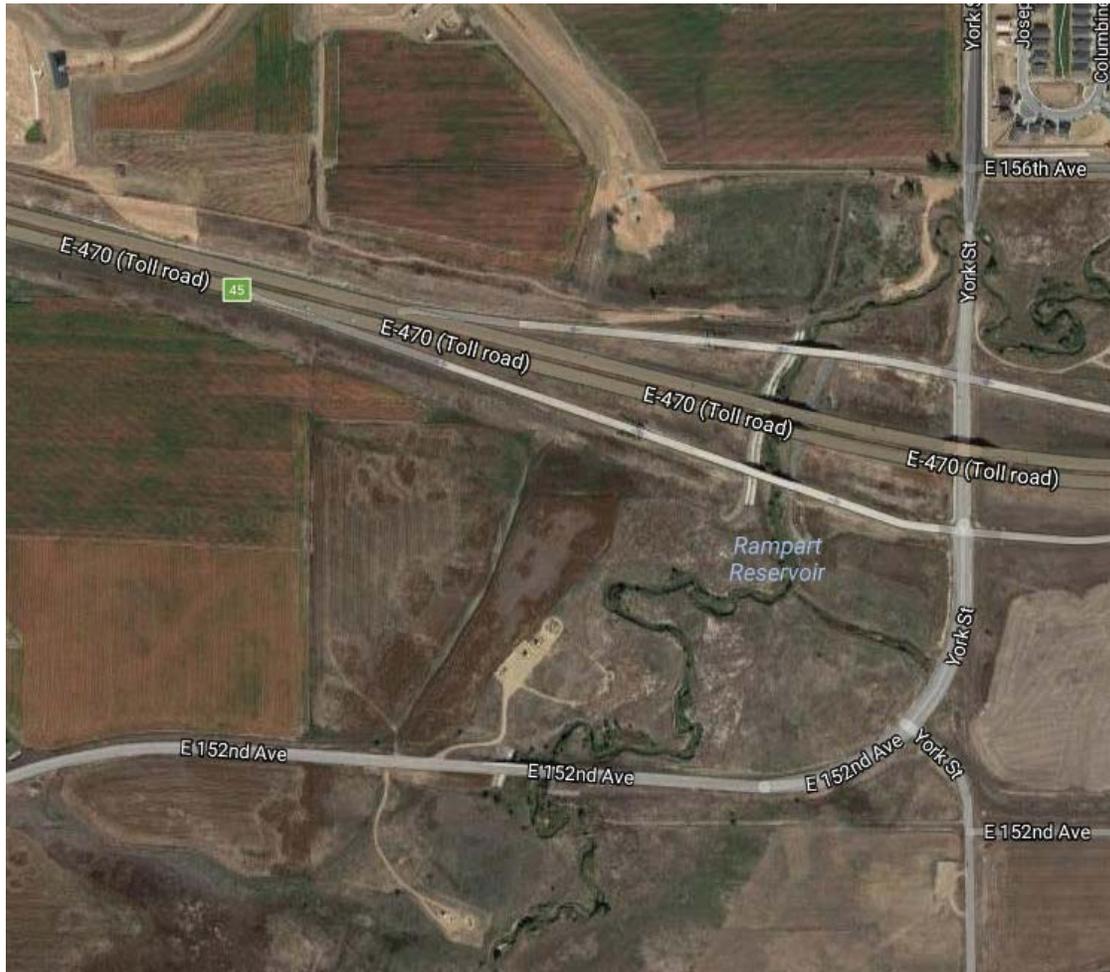
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4		1	0	5	4:00 PM	0		0	0	0
4:15 PM	0		0	0	0	4:15 PM	0		0	0	0
4:30 PM	0		0	0	0	4:30 PM	0		0	0	0
4:45 PM	0		0	0	0	4:45 PM	0		0	0	0
5:00 PM	0		0	0	0	5:00 PM	0		0	0	0
5:15 PM	0		0	0	0	5:15 PM	0		0	0	0
5:30 PM	0		0	0	0	5:30 PM	0		0	0	0
5:45 PM	0		0	0	0	5:45 PM	0		0	0	0
Count Total	4		1	0	5	Count Total	0		0	0	0
Peak Hour	0		0	0	0	Peak Hour	0		0	0	0

Appendix B: Level of Service (LOS) Tables

**Level of Service Definitions**

Level of Service (LOS)	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	$\leq 10$	$\leq 10$
B	$> 10$ and $\leq 20$	$> 10$ and $\leq 15$
C	$> 20$ and $\leq 35$	$> 15$ and $\leq 25$
D	$> 35$ and $\leq 55$	$> 25$ and $\leq 35$
E	$> 55$ and $\leq 80$	$> 35$ and $\leq 50$
F	$> 80$	$> 50$

Appendix C: Aerial Image (Google Earth)





Appendix E: Detailed Trucking Table

Appendix E: Detailed Trucking Table by Lisa Denke Consulting

Here is the table of truck trips presented in the first Traffic Impact Study for Ivey Pad, submitted February 6, 2017:

*Table 6. Truck trips table, as submitted in February 6, 2017 Traffic Impact Study. Typographical errors corrected*

Stage	Activity	1-Way Truck Trips	Duration (days)	Average Truck Trips per Day (by Stage)	Average Truck Trips per Day (by Activity)	Notes
Construction	Pad and Road	412	42	10	10	
Drilling	Move In, Rig Up Drilling Rig	54	5	10	11	
	Drilling, Initial 2 Wells	70	8		9	
	Rig Down, Move Out Drilling Rig	54	5		11	
Completion	Move In, Rig Up, Frac Equipment	19	2	3	10	
	Install Above Ground Storage Tank & Working Tanks	14	1		14	Use of large above ground tank reduces trips.
	Frac Initial 2 wells	670	10		67	Sand hauling accounts for most traffic. Water will be pipelined to pad.
	Rig Down, Move Out Frac Equipment	19	2		10	
	Flowback Water Disposal / Production	696	374		2	Initial 2 wells produced for one year.
Drilling	Move In, Rig Up Drilling Rig	54	5	9	11	
	Drilling, 24 Wells	840	96		9	
	Rig Down, Move Out Drilling Rig	54	5		11	
Completion	Move In, Rig Up, Frac Equipment	19	2	32	10	
	Install Above Ground Storage Tank & Working Tanks	14	1		14	
	Frac 24 wells	8040	120		67	
	Rig Down, Move Out Frac Equipment	19	2		10	
	Flowback Water Disposal / Production	8215	374 <sup>5</sup>		22	Includes drill out with coiled tubing.
TOTAL	All Phases, 26 Wells	19263	1054	21		

<sup>5</sup> This value was reported as 224 days in the first TIS, but should be 374 days. It includes 9 days of initial high volume flowback, plus 1 year of flowback at normal decline.

Some operations can be done at the same time. For example, “Move In, Rig Up, Frac Equipment” will happen at the same time as “Install Above Ground Storage Tank & Working Tanks.”

This table contains a lot of detail. It will be useful to condense it to more easily compare it with the new scenarios.

Below is a condensed table. The last column shows the numeric values from the “1-Way Truck Trips” column in the table above that were summed to get the number in the “Trucks” column.

*Table 7. Summarized table. Original submittal numbers*

Phase	Description	Trucks	Sum of which entries?
Construction	Pad, road and facility construction	412	412
Drilling I	Drilling of initial 2 wells	178	54 + 70 + 54
Completion I	Fracturing of initial 2 wells	722	19 + 14 + 670 + 19
Flowback I	Flowback of 2 wells, 12 months	696	696
Drilling II	Drilling of 24 wells	948	54 + 840 + 54
Completion II	Fracturing of 24 wells	8092	19 + 14 + 8040 + 19
Flowback II	Flowback of 24 wells, 12 months	8215	8215
<b>Total</b>	<b>Total</b>	<b>19263</b>	<b>19263</b>

The table can be further condensed by summing similar phases, and rounding off the numbers:

*Table 8. Abbreviated table*

Phase	Round Numbers, 1 <sup>st</sup> Ivey TIS Submittal (2/6/17)
Construction	400
Drilling	1200
Completion	8900
Flowback	9000
<b>Total</b>	<b>19500</b>

## Appendix F: Response to City and County Traffic Engineering Comments

### Appendix F: Response to Comments by Lisa Denke Consulting

Jurisdiction comments are in regular font. *Responses to comments are italicized. Responses are specific to Traffic Engineering only.*

*These Responses reference a turn lane required by the City of Thornton because the site is on an arterial street. A pre-application meeting was held with the City on June 27, 2017, and design is underway for the turn lane. A second meeting was held July 20, 2017 to discuss engineering issues.*

#### **Adams County Comments and Responses**

COMMENT 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 well pad. Will the pipelines be installed before the well pads 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 well pad?

*RESPONSE TO ENG1:The oil product line is being built by a midstream pipeline company, and is currently in the permitting process. The TIS has been revised to show the possible impact of trucking oil.*

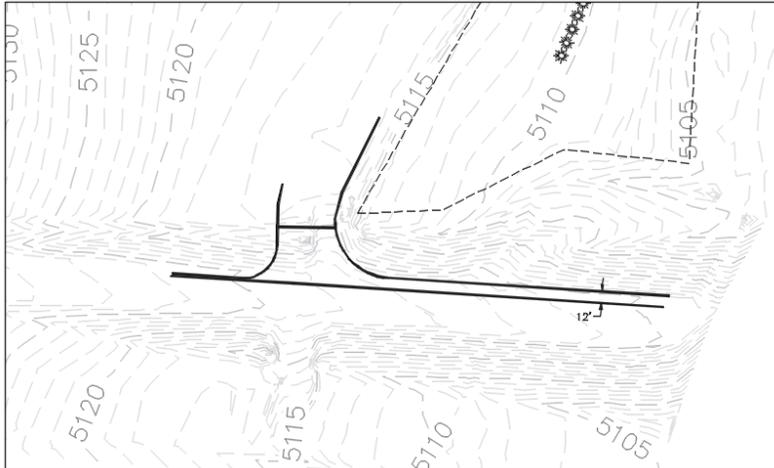
*A temporary pipeline will be used for fracturing water. This line can be installed by a crew in a few days' time. The line will be removed and re-used at another site after fracturing is complete. As the line can be installed in a few days' time, the study was not revised to show trucking fracturing water.*

COMMENT 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.

*RESPONSE TO ENG2:This TIS is limited in scope to transportation issues, accordingly, this Response addresses only the access.*

*The existing oilfield access appears to be in the floodplain, however, it will not be used. A turn lane is to be constructed at a new proposed access point, per City of Thornton requirements. See figure below. A topo survey for the anticipated turn lane construction area was completed by a PLS and shows the turn lane is above the 100 year floodplain elevation (5103') per FIRM map 08001C0302J.*

*The FIRM map has been updated January 20, 2016. The area formerly shown on Map Number 08001C0302H is now shown on Map Number 08001C0302J. The 100 year floodplain elevation for the site was 5103' both before and after the revision.*



*Figure 13. Conceptual sketch of proposed turn lane. Existing one foot contours are shown with labels every five feet. Proposed grading is not shown. The existing access is not shown: it is southeast of the pad. The turn lane and associated grading will be above the 5103' floodplain.*

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

***RESPONSE TO ENG3:** 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.*

**COMMENT ENG4:** The applicant's proposed scope of work shows the new addition of impervious surface is less than 3000 square feet. A drainage study and analysis is not required. A grading and drainage plan will be required for any proposed change in grade or improvements to the site.

***RESPONSE TO ENG 4:** Analysis of drainage and grading will be performed for the turn lane project, to be submitted to the City. It is anticipated that the drawings will be referred to the County for review.*

**COMMENT ENG5:** 152<sup>nd</sup> 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, Table 8.2. Applicant must use the existing access point onto 152<sup>nd</sup> Parkway. The applicant is required to upgrade access to current standards which shall include the orientation of access onto 152<sup>nd</sup> Parkway, the width of access, and the type of material used in the construction of the access point.

***RESPONSE TO ENG5:** We are proposing a solution that we feel meets this requirement, while accommodating the needs of other organizations. Please reference the figure below for the following discussion, in which the existing access point referenced in the comment above is labeled "Existing oilfield access to remain."*

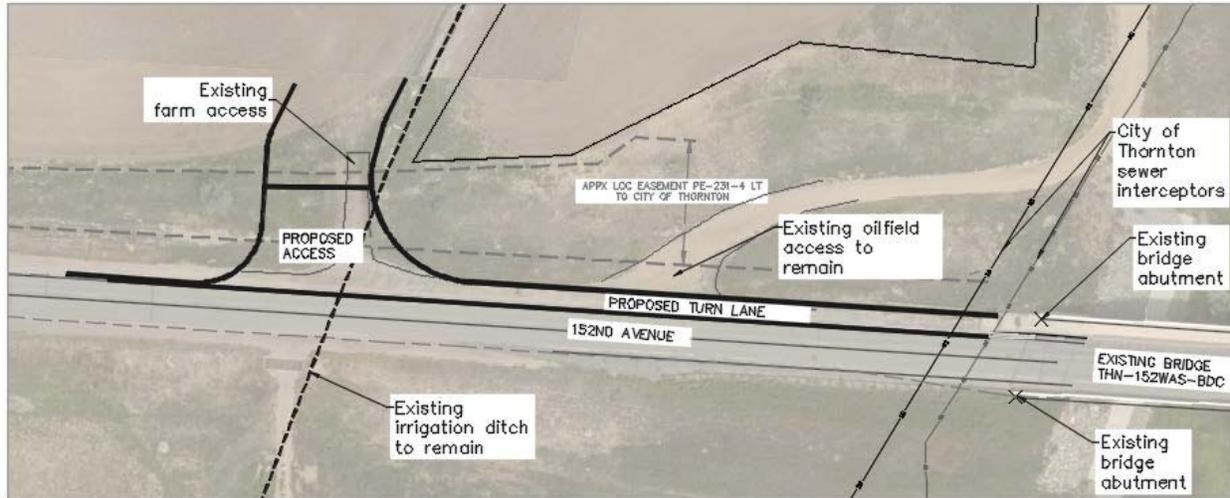


Figure 14. Conceptual sketch of proposed access. All proposed information is conceptual and subject to change.

The City of Thornton requires a turn lane to be installed, 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.

The existing oilfield access will continue to be used by other parties. The City plans to use the existing access for a sanitary sewer interceptor project, and it is in use as an oilfield access by other companies, so the access is to remain. Hence, more than one access will exist on the same parcel.

We feel that 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.

**COMMENT 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.

**RESPONSE TO ENG6:** The turn lane will be in the City. Legal descriptions, exhibits, and easement documents will be developed and submitted with the Construction Documents to City of Thornton Development Engineering.

**City of Thornton Comments and Response**

Note: Numbers have been added for reference.

COMMENT THORNTON 1:The traffic study assumed that all water would be piped onsite and all product would be piped offsite. Given that none of the pipe infrastructure is currently in place, the City requests an updated traffic study that evaluates the impact of this development assuming water and product is trucked onsite and offsite.

RESPONSE TO THORNTON 1:*It is planned to have pipelines in service prior to beginning production.*

*The oil product line is being built by a midstream pipeline company, and is currently in the permitting process. The TIS has been revised to show the possible impact of trucking oil.*

*A temporary pipeline will be used for fracturing water. This line can be installed by a crew in a few days' time. The line will be removed and re-used at another site after fracturing is complete. As the line can be installed in a few days' time, the study was not revised to show trucking fracturing water.*

*Natural gas cannot be trucked, and must be shipped by pipeline.*



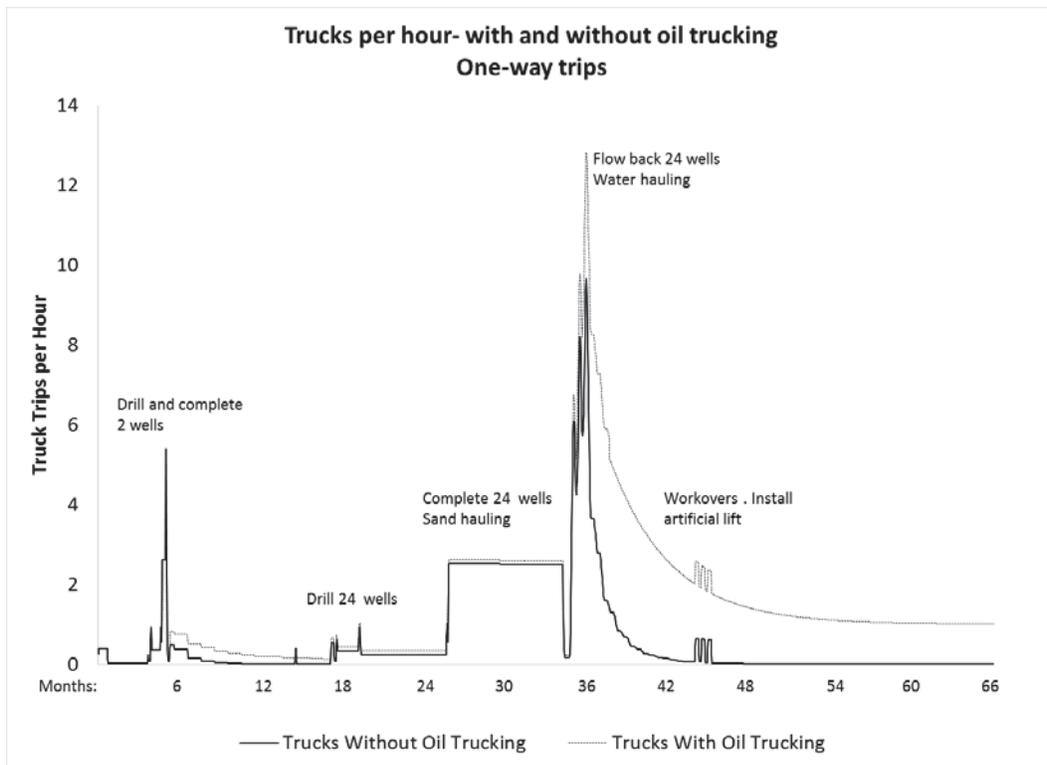
12" Lay Flat Hose

*Figure 15. Typical "Lay Flat" line. The line will be round when there is water in it.*  
<http://www.bigdco.com/water-transfer/lay-flat-hose>

COMMENT THORNTON 2:Regarding the trucking routes, the City is concerned about heavy volumes of truck traffic on York Street north of E-470 and access onto Highway 7 from York Street.

RESPONSE TO THORNTON 2: *The expected volumes of truck traffic per hour are shown below. The highest traffic is anticipated during flowback. Numbers shown are calculated conservatively, in other words, the calculations project relatively high numbers<sup>6</sup>. See the response to Comment 5 for field data.*

<sup>6</sup> For example, 3-mile laterals are assumed: some wells will have 2-mile laterals. Sand concentrations are assumed to be 2000 lb/ft, a high concentration.



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 same engineer who carried out the studies has observed trucking for residential construction in the area near the proposed Ivey Pad. The additional truck traffic for the residential development and for oil and gas development is similar.

During periods of gravel hauling, the residential construction traffic can be heavy; however, the constructors are able to manage the traffic safely. Residential construction gravel truck volumes of 18 trucks per hour, one-way, were observed on Washington Street/152nd, just north of 152<sup>nd</sup> Avenue intersection, on July 7, 2017. 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.



*Figure 16. Gravel truck for residential construction (front vehicle) on Washington Street. Similar gravel trucks will be used for Ivey Pad construction. Water and sand trucks are the same size and weight as gravel trucks.*



*Figure 17. Side view of gravel truck working on residential construction. Similar trucks will be used at Ivey Pad.*

**COMMENT THORNTON 3:** The current route crosses a two-lane bridge, passes by a residential development, and accesses an undersized intersection. The City requests that the truck routes be modified to use E-470 from York Street.

RESPONSE TO THORNTON 3: The route has been modified to use E-470 as the main route.

## IVEY PAD ROUTING

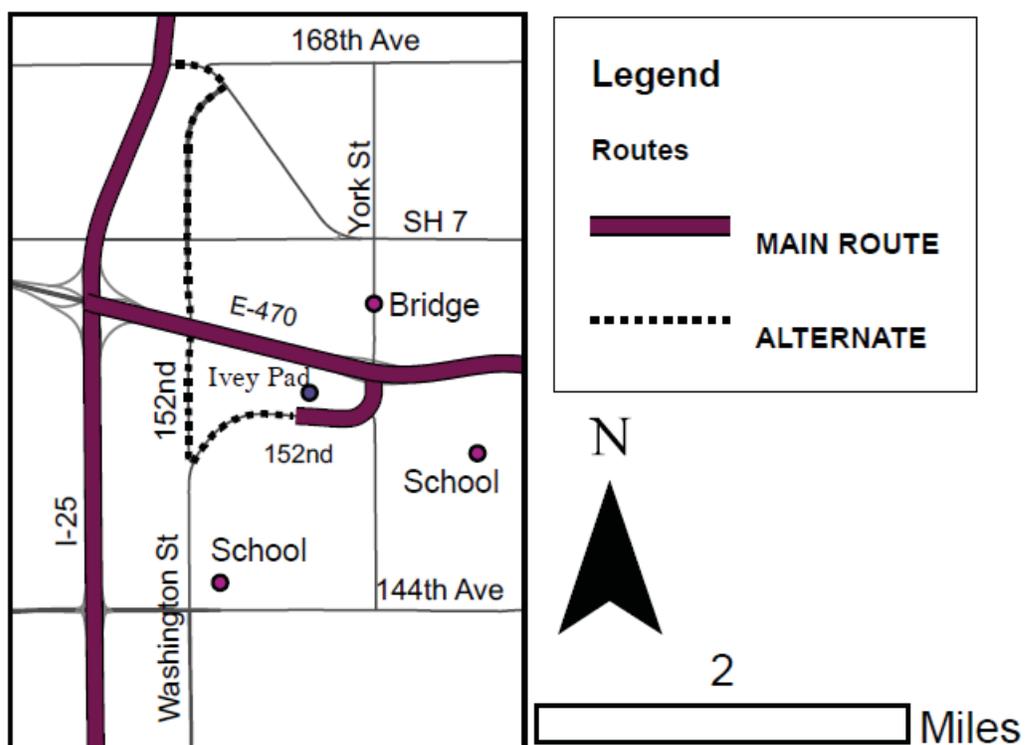


Figure 18. Main route is as shown. In case that route is not available, an alternate route is shown. The narrow bridge on York Street is indicated north of E-470.

COMMENT THORNTON 4: There are also access issues to the site from 152nd Avenue and the City will require the construction of a deceleration lane on westbound 152nd Avenue.

RESPONSE TO COMMENT THORNTON 4: A project is in progress to design and install a deceleration lane.

COMMENT THORNTON 5: The City requests that the access road be paved leading up to 152nd Avenue and install signage restricting right turns out of the site and left turns into the site to ensure no trips occur west of the site.

RESPONSE TO THORNTON 5: The access road design will be evaluated in conjunction with the turn lane design. Design will be done to prevent tracking onto 152<sup>nd</sup> 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 a large number of 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.

Actual vehicle counts from fracturing and flowback pads are included below for reference. The counts are for vehicles on the road to the site.

Table 9. Field data from fracturing and flowback sites

<b>3/23/2017 Gilcrest Site. Fracturing.</b>					
	<b>Small Out</b>	<b>Small In</b>	<b>Large Out</b>	<b>Large In</b>	<b>Comments</b>
Case 1	10	10	3	1	5:00 to 6:00 pm Large vehicles were all sand trucks. Small vehicles only counts oilfield vehicles. One car came in and went to a house, not the wellpad.
<b>4/7/17 2nd Windsor Site. Flowback of multiple well pad. Fracturing complete.</b>					
	<b>Small Out</b>	<b>Small In</b>	<b>Large Out</b>	<b>Large In</b>	<b>Comments</b>
Case 2	11	8	5	1	5:30 to 6:30 pm Large vehicles were all water transports (no placards). Small vehicles included shift workers' personal vehicles. Several had customizations that would be atypical for company vehicles, or were sedan-type cars.
Case 3	8	4	4	4	7:00 to 8:00 pm Large vehicles are water transports.

**COMMENT THORNTON 6:** Finally, the City is considering implementing an Access Road Permit and Access Road Fee that would be applicable to this development and will look to negotiate compensation for anticipated road degradation.

**RESPONSE TO THORNTON 6:** Noted. 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 this section.

## APPENDIX. ROUTES LENGTH ANALYSIS

Some materials used at Ivey Pad will be classified as Hazardous Materials (“HAZMAT”).

Per Colorado Title 42, Article 20, Part 3, routing for HAZMAT vehicles on *state* highways must follow designated routes. Once the vehicle leaves the designated route, it must proceed by the most direct route to the delivery point on highways and streets. These vehicles will transport chemicals, fuel, and perforating materials.

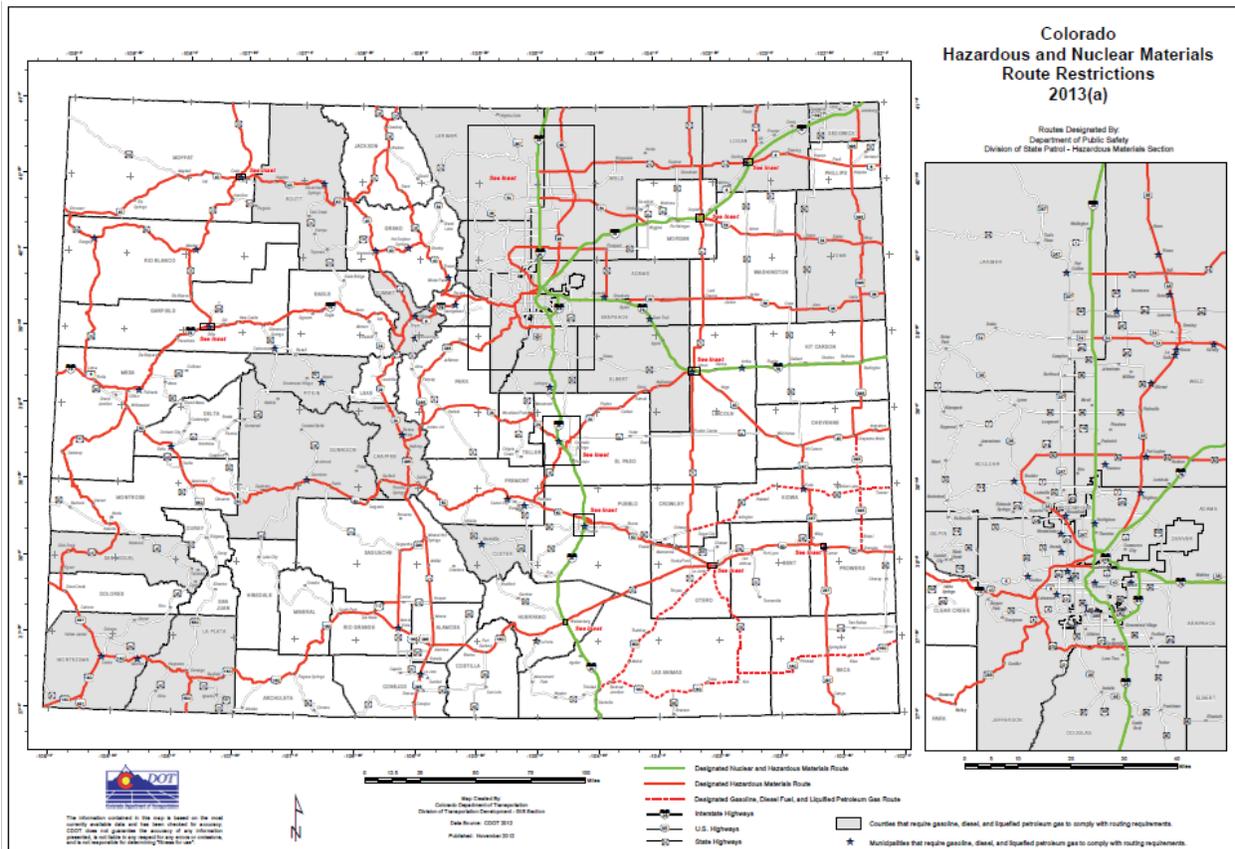


Figure 19. Colorado Hazardous Materials Routes. A full size map can be downloaded from the CDOT website.

The route to the pad was discussed with CHP. CHP cannot designate a route for a given project: to designate a route, a government body, such as a county or city, must lead a formal process for designation. Designation is a process that takes place over a timeframe of months to years, and includes opportunities for public and agency comment. After a route is designated, it is added to the map shown above.

As such, the final determinations of whether routes chosen by truck drivers for this project are the most direct lies with CHP patrol officers.

Three routes to Ivey Pad were analyzed to determine the most direct route from I-25.

## ROUTE LENGTH ANALYSIS FROM I-25

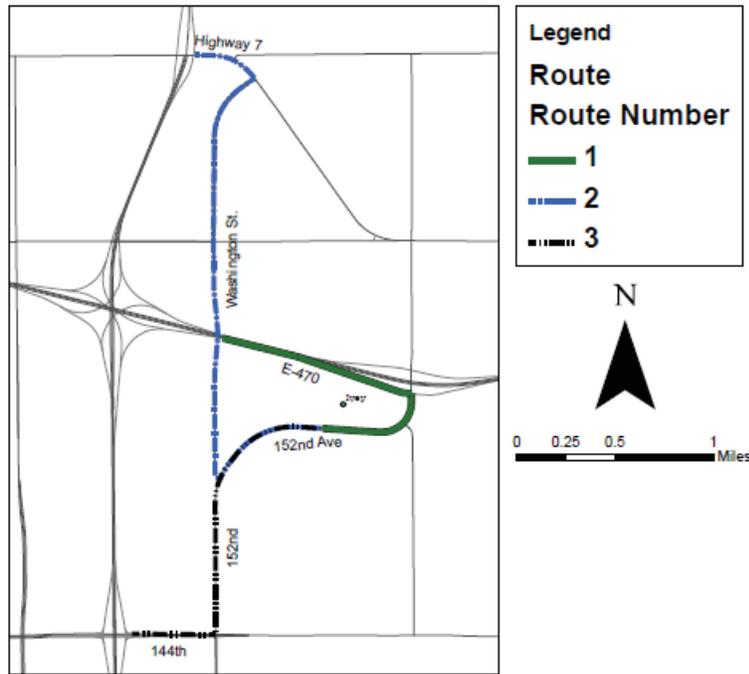


Figure 20. Routes analyzed for length

Routes shown were analyzed for length, starting at the end of the I-25 ramp. Lengths are as follows:

- Route 1: (I-25 to E-470 to York/152nd Ave): 8,360 feet
- Route 2: (Highway 7 to Washington St. to 152nd Ave): 16,500 feet
- Route 3: (144th Ave to 152nd Ave): 9,780 feet

The most direct route to Ivey Pad from I-25 is via E-470 to 152nd Avenue (Route 1).

Appendix G: HCM Calculations (Synchro Version 9.1)

**Intersection**

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	0	112	234	0	0	0
Future Vol, veh/h	0	112	234	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	5	5	2	2	2	2
Mvmt Flow	0	132	275	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	275	0	275
Stage 1	-	-	275
Stage 2	-	-	132
Critical Hdwy	4.15	-	6.22
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.245	-	3.318
Pot Cap-1 Maneuver	1271	-	764
Stage 1	-	-	771
Stage 2	-	-	894
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1271	-	764
Mov Cap-2 Maneuver	-	-	600
Stage 1	-	-	771
Stage 2	-	-	894

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1271	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

**Intersection**

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	0	180	148	0	0	0
Future Vol, veh/h	0	180	148	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	212	174	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	174	0	174
Stage 1	-	-	174
Stage 2	-	-	0
Critical Hdwy	4.12	-	6.22
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.318
Pot Cap-1 Maneuver	1403	-	869
Stage 1	-	-	856
Stage 2	-	-	13
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1403	-	869
Mov Cap-2 Maneuver	-	-	617
Stage 1	-	-	856
Stage 2	-	-	61

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1403	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

**Intersection**

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	2	112	234	27	27	2
Future Vol, veh/h	2	112	234	27	27	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	95	95	2
Mvmt Flow	2	132	275	32	32	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	307	0	427
Stage 1	-	-	291
Stage 2	-	-	136
Critical Hdwy	4.12	-	7.35
Critical Hdwy Stg 1	-	-	6.35
Critical Hdwy Stg 2	-	-	6.35
Follow-up Hdwy	2.218	-	4.355
Pot Cap-1 Maneuver	1254	-	443
Stage 1	-	-	587
Stage 2	-	-	705
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1254	-	442
Mov Cap-2 Maneuver	-	-	442
Stage 1	-	-	587
Stage 2	-	-	704

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1254	-	-	-	455
HCM Lane V/C Ratio	0.002	-	-	-	0.075
HCM Control Delay (s)	7.9	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

**Intersection**

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	180	148	27	27	2
Future Vol, veh/h	2	180	148	27	27	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	95	95	2
Mvmt Flow	2	212	174	32	32	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	206	0	190
Stage 1	-	-	190
Stage 2	-	-	216
Critical Hdwy	4.12	-	6.22
Critical Hdwy Stg 1	-	-	6.35
Critical Hdwy Stg 2	-	-	6.35
Follow-up Hdwy	2.218	-	3.318
Pot Cap-1 Maneuver	1365	-	852
Stage 1	-	-	662
Stage 2	-	-	642
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1365	-	852
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	662
Stage 2	-	-	641

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	471
HCM Lane V/C Ratio	0.002	-	-	-	0.072
HCM Control Delay (s)	7.6	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

EXHIBIT 5.6  
CERTIFICATE OF POSTING



## **CERTIFICATE OF POSTING**

**I, Christopher LaMere do hereby certify that I had the property posted at**

**Northwest of 152<sup>nd</sup> Parkway and York Street**

**on October 19, 2017**

**in accordance with the requirements of the Adams County Zoning Regulations**

*Christopher LaMere*

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Christopher LaMere

EXHIBIT 5.7  
PUBLIC HEARING NOTICE



## Public Hearing Notification

Case Name:	Ward Petroleum Ivey Well Pad
Case Number:	USR2016-00006
Board of County Commissioners Hearing Date:	11/8/2017 at 6:00 p.m.

October 20, 2017

A public hearing has been set by the Adams County Board of County Commissioners to consider the following request:

**A Use by Special Review Permit to allow twenty-six (26) horizontal wells on one (1) well pad for the production of oil and natural gas and one (1) on-site production facility.**

This request is located northwest of the intersection of East 152<sup>nd</sup> Parkway and York Street.

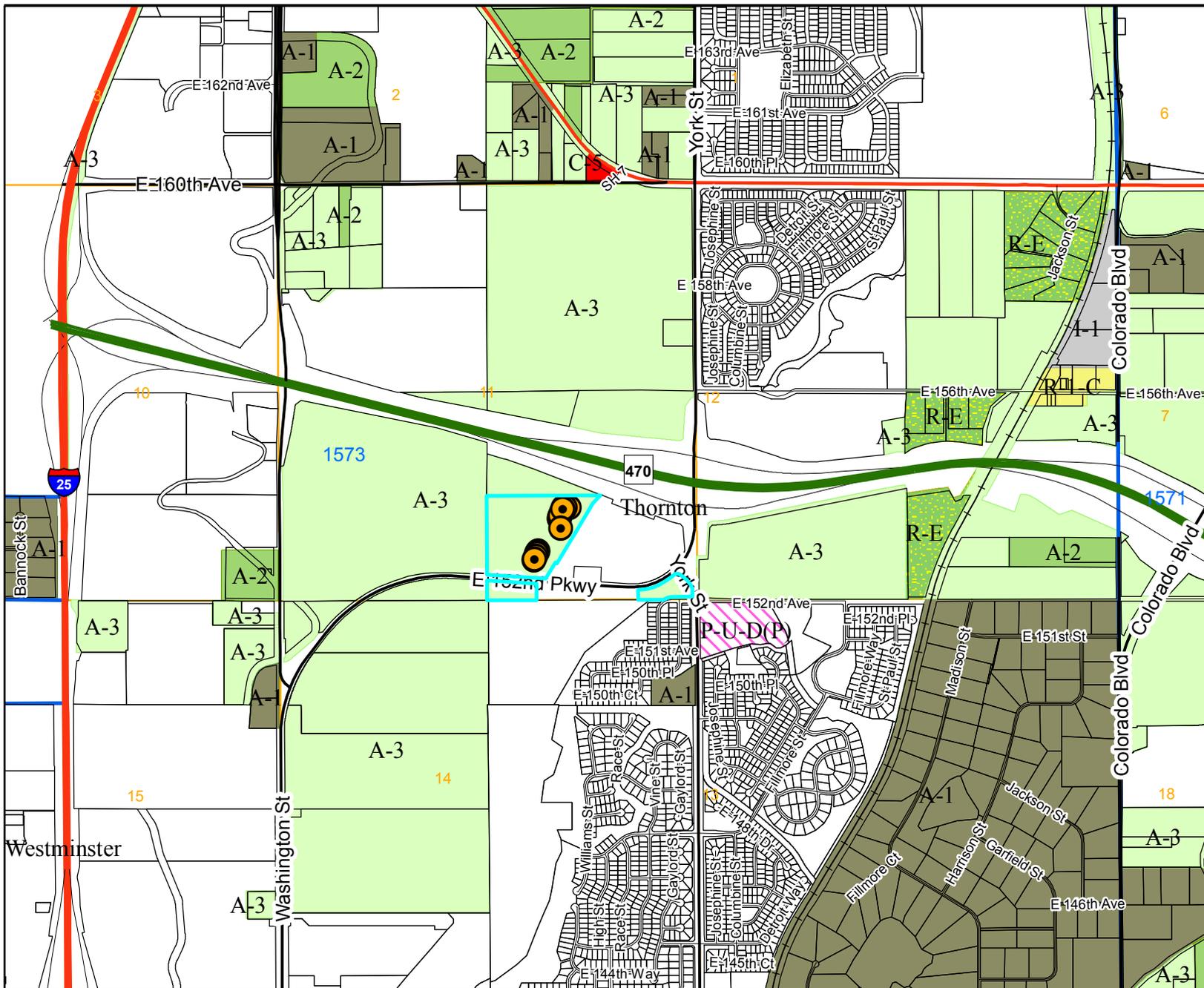
The Assessor's Parcel Number is **0157311400006**

Applicant Information: **WARD PETROLEUM CORPORATION  
215 WEST OAK STREET, SUITE 1000  
FORT COLLINS, CO 80521**

The hearing will be held in the Adams County Hearing Room located at 4430 South Adams County Parkway, Brighton CO 80601. This will be a public hearing and any interested parties may attend and be heard. The Applicant and Representative's presence at these hearings is requested. If you require any special accommodations (e.g., wheelchair accessibility, an interpreter for the hearing impaired, etc.) please contact the Adams County Community and Economic Development Department at 720-523-6800 (or if this is a long distance call, please use the County's toll free telephone number at 1-800-824-7842) prior to the meeting date. For further information regarding this case, please contact the Department of Community and Economic Development, 4430 S. Adams County Parkway, Brighton, CO 80601, 720-523-6800. The full text of the proposed request and additional colored maps can be obtained by contacting this office or by accessing the Adams County web site at [www.adcogov.org/planning/currentcases](http://www.adcogov.org/planning/currentcases).

Thank you for your review of this case.

Christopher LaMere  
Case Manager



**LEGEND**

- ★ Special Zoning Conditions
  - 3 Section Numbers
  - Railroad
  - Major Water
  - Zoning Line
  - Sections
- Zoning Districts**
- A-1
  - A-2
  - A-3
  - R-E
  - R-1-A
  - R-1-C
  - R-2
  - R-3
  - R-4
  - M-H
  - C-0
  - C-1
  - C-2
  - C-3
  - C-4
  - C-5
  - I-1
  - I-2
  - I-3
  - CO
  - PL
  - AV
  - DIA
  - P-U-D
  - P-U-D(P)
  - Airport Noise Overlay

**Ward Petroleum - Ivey Well Pad**  
**USR2016-00006**



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