

3 Findings and Recommendations

In this section, we provide over 70 specific recommendations, based on the assessments of the eight areas of concern, to protect the health of the Battlement Mesa residents for the duration of Antero's project.

3.1 Findings and Specific Recommendations from Air Quality Assessment

What we know: Air pollution is a known hazard to the public health. There is sufficient information available to indicate that even with current practices and technologies the natural gas industry produces large amounts of air pollutants. In addition, Antero's recent well development activities on the Watson Ranch pad resulted in short term health impacts. Antero has proposed additional mitigation measures for the project in Battlement Mesa but these mitigations are as yet untested. Further mitigation measures may be needed to reduce the likelihood of health effects. As it stands, the Antero project has the potential to pollute the air and negatively impact the public health in Battlement Mesa. Many information gaps exist.

What we do not know: Currently, there is not enough information to determine whether or not current federal, state, and COGCC regulations and rules are sufficient to protect public health from air pollution resulting from natural gas development and production in high population density areas such as the Battlement Mesa PUD.

To protect the health of Battlement Mesa residents, we recommend the implementation of air pollution prevention measures some of which may be above and beyond those mandated in federal, state, and COGCC regulations and rules as an integral part of Antero's project and the monitoring of air quality and the health of residents in Battlement Mesa to ensure public health is protected throughout Antero's 30-year project.

Prior to approval of the special use permit, we recommend the BOCC require Antero to:

1. Demonstrate that the low emissions flow back technology Antero is developing is effective in reducing air emissions. Antero should pilot test the system and monitor air emissions using EPA methods with detection limits adequate for the assessment of human exposure and prevention of human health effects. An effective demonstration would show that levels of air pollutants, such as benzene, as measured in 24-hour ambient air samples at 350, 500, 1000, 2000, and 3000 feet and in each cardinal direction, from the well pad perimeter, are not higher than those measured at the Battlement Mesa monitoring station. Antero should make all test results publically available on Garfield County's website and/or on a publicly accessible website approved by the Battlement Mesa Community, three months prior to any drilling within the PUD.

2. Disclose all chemicals that will be used on its well pads within the PUD. We recommend Garfield County to keep a list of these chemicals on its website and/or on a publicly accessible website approved by the Battlement Mesa Community.
3. Establish a system for immediate response to odor complaints that includes options for ceasing operations, notification of affected residents, and temporary relocation of residents until the source of the odor is identified and resolved. We encourage Antero to communicate the timing of well completion activities to Battlement Mesa residents, which could allow for voluntary shutting of windows and air intakes or temporary relocation.
4. Submit a quality assurance project plan (also known as a QAPP) to GCPH and GCOG for review and approval for all monitoring specified in these recommendations to assure monitoring information will be adequate for informing public health decisions prior to any activities in the PUD.

As a condition of the special use permit, we recommend that the BOCC require Antero to:

5. Complete the installation of a fully functional water storage facility and water pipeline network prior to any drilling within the PUD to realize the full air pollution prevention benefit.
6. Use permitted tanks rather than a pond at the centralized water storage facility. See recommendations for Water and Soil Assessment for further details of water storage facility recommendations.
7. Use an effective and validated low emissions flow back process for all well completions within the PUD.
8. Route production tank venting emissions through a VOC combustor operated with auto-igniters on all well pads within the PUD.
9. Use vapor recovery technology when available, rather than combustion, to further reduce air pollution.
10. Obtain an emissions permit from CDPHE for each well pad production tank within the PUD, per COGCC rules. The COGCC rules require permitting for production tanks within ¼ mile of an occupied structure with the capacity for 5 tons per year of VOC emissions, which is the case for most of Antero's proposed well pads. Our recommendation may be beyond the COGCC rule at one or two well pads. This recommendation is necessary, however, for the protection of public health because odors have been noticed up to ½ mile from the Watson Ranch pad. The ¼ mile distance in the rule is not based on a health-based air pollution standard, and the permit provides a mechanism for the establishment of inspection and monitoring requirements.
11. Work with GCPH to implement an air monitoring program for all well completion activities within the PUD and at the centralized water storage facility. At a minimum, this program should include collection of 24-ambient air samples and grab samples, real-time VOC monitoring, odor monitoring, and collection of grab samples when odors are noticed.

12. Annually disclose all chemicals and volumes used on its well pads within the PUD and include any chemicals that are VOCs in the air monitoring program. We recommend Garfield County to keep a list of these chemicals on its website and/or a publicly accessible website approved by the Battlement Mesa Community.
13. Implement the system for immediate response to odor complaints that includes options for ceasing operations. Implement a system for notification of affected residents, and temporary relocation of residents until the source of the odor is identified and resolved. We encourage Antero to communicate the timing of well completion activities to Battlement Mesa residents, which could allow for voluntary shutting of windows and air intakes or temporary relocation.
14. Make all air monitoring results within the PUD publically available for posting on the Garfield County website and/or a publicly accessible website approved by the Battlement Mesa Community, no later than 60-days following the collection of samples.
15. Comply with COGCC green completion practices and EPA's natural gas STAR program to reduce VOC emissions to the lowest level technically possible at all well pads within the PUD.
16. Specify where in the PUD Antero will use electric grid power for drilling and/or other operations.
17. Adhere to dust control measures and traffic measures specified in the Special Use Agreement.
18. Establish and implement a plan that ensures all trucks used for its plan within the PUD meet emission standards specified in the Clean Fuel Vehicles (heavy trucks) for the Clean Fuel Fleet Program (CFR Part 88.105-94) to reduce VOC, PAH, and PM emissions. This will reduce air pollution in the PUD.
19. Prevent the idling of trucks on well pads and along roads in the PUD for longer than 10 minutes.
20. Ensure truckloads of dirt, sand, aggregate materials, drilling cuttings, and similar materials are covered to reduce dust and PM emissions.

We recommend that the BOCC:

21. Assign a county inspector to monitor Antero's compliance with the special use permit and that the special use permit contain provisions for regulatory action if Antero is found to be in non-compliance.
22. Assign an independent observer acting on their behalf, to participate in the demonstration of the low emission flow back tank described in recommendation 1. The independent observer would be responsible for confirming sample locations and timing as well as monitoring for odors. The independent observer would collect grab samples if odors are noticed during the demonstration for evaluation of possible short-term peak exposures.

Finally, we strongly encourage Antero to:

23. Use all its best management practices for reduction of air pollution in the PUD during the next phase of drilling and well completions at the Watson Ranch pad and /or other pads outside the PUD, to conduct rigorous air and odor monitoring, and to make all results publically available. This is an ideal opportunity for Antero to show the BOCC and the residents of Battlement that it can effectively control air emissions and address community concerns.

3.2 Findings and Specific Recommendations from Water and Soil Quality Assessment

What we know: Water pollution is hazardous to the public health. Garfield County Oil and Gas studies, EPA studies, and other studies demonstrate that natural gas development and production can release contaminants to domestic water supplies and compromise water quality. Individual circumstances can influence the potential contamination of water. In Garfield County, accidents and malfunctions have been the most common cause of water contamination from natural gas development and production. However, the Mamm Creek Hydrological Study indicates some impacts to groundwater, such as increased levels of chloride and methane, from routine natural gas operations. If a domestic water resource is contaminated, remediation is time and cost intensive and may not restore the water resource to a quality for domestic use.

What we do not know: The hydrogeology in Battlement Mesa has not been characterized and the relationship between groundwater, domestic water supplies, and the Colorado River is not well understood. The extent of the impact of routine natural gas development and production on water quality is not known. Systematic monitoring is needed to verify that ground water is not compromised by routine natural gas development and production operations. Systematic monitoring can also provide early warning if water becomes contaminated.

To protect the health of Battlement Mesa residents and to protect the Battlement Mesa's secondary drinking water source, we recommend the implementation of water and soil pollution prevention measures some of which may be above and beyond those mandated in federal, state, and COGCC regulations and rules as an integral part of Antero's project and the monitoring of water quality and the health of residents in Battlement Mesa to ensure public health is protected throughout Antero's 30-year project.

As a condition of the special use permit, we recommend that the BOCC require Antero to:

1. Disclose all chemicals that will be used on its well pads within the PUD.
2. Characterize the geology and hydrogeology within the Battlement Mesa PUD and the primary and secondary domestic water supplies, according to the specifications in COGCC rule 908.
3. Submit a quality assurance project plan (also known as a QAPP) to GCPH and GCOG for review and approval for all sampling and monitoring specified in these recommendations to assure monitoring information will be adequate for informing public health decisions.

4. Complete the installation of a fully functional water management facility and water pipeline network prior to any drilling within the PUD to decrease potential of contamination of soil and surface water on individual well pads and decrease potential for truck accidents to contaminate surface waters and soils in case of an accident.

Before approval of the special use permit, we recommend that the BOCC require Antero to:

5. Comply with COGCC rule 908, which pertains to non-commercial centralized E&P waste management facilities, for the centralized water storage facility, which will be handling E&P waste (i.e., recycling water used in well completions). One of the best management practices Antero has proposed for its Battlement Mesa project is a centralized water storage pond, which will allow for pit-less drilling on the pads, the recycling of water used in well completions, and reduced potential for water and soil contamination at the well sites. We have recommended that this facility be installed prior to any drilling. COGCC rule 908 requires permitting, a hydrogeological characterization, groundwater, soil, and surface water testing for centralized E&P waste management facilities.
6. Use permitted tanks, rather than a storage pond for water storage at the centralized water storage facility. While tanks are not required by COGCC, the use of tanks reduces the potential for water and pollution that could occur if a pond/pit liner was compromised or if a pond/pit overflowed. Tanks also have the added advantage of reducing air pollution and reducing inadvertent wildlife and pet exposures.
7. Locate the centralized water storage facility be located at least a mile from any residential structure or school as a condition of approval of the special use permit. This is because the water storage facility will be handling E&P waste (i.e. recycled water from well completions).
8. Annually disclose all chemicals and volumes used on its well pads within the PUD and include any chemicals that are VOCs in the water monitoring program as a condition of the special use permit. We recommend Garfield County to keep a list of these chemicals on its website.
9. Install at least one up-gradient and two down-gradient groundwater monitoring wells at each well pad as well as at the centralized water storage facility, in addition to the voluntary water well testing program specified in Antero's best management practices. Antero should also conduct baseline sampling for, at a minimum, the following: all major cations and anions, total dissolved solids, iron, manganese, nitrates, nitrites, selenium, benzene, toluene, ethylbenzene, xylenes, methane, pH, specific conductance, and any chemical identified in the full disclosure of chemicals of potential concern. This monitoring will ensure that drilling, hydraulic fracturing and other operations do not compromise ground water.
10. Conduct monthly monitoring of the well site groundwater wells for the parameters specified in the proceeding recommendation during well drilling and completion activities, followed by annual monitoring for the duration of Antero's project. All results of this monitoring should be made available to the public within 60 days of sample collection and posted on Garfield County's website. If (1) benzene, ethylbenzene, toluene, or xylenes are detected at levels greater than the concentration levels specified in Table 910-1 of the COGCC rules; (2) any cations, anions, metals, or total dissolved solids exceed 1.25 times background

concentrations; (3) methane or any chemical identified as a concern from the full disclosure of chemicals exceeds 1.25 background concentrations; or (4) if pH or specific conductance exceeds the limits specified in COGCC table 910-1, the BOCC should require Antero to remediate as a condition of the special use permit. This type of monitoring is the best way to ensure pollution control measures are effective in protecting the groundwater resource.

11. Conduct baseline soil and surface water testing at all well pad locations and at the location of the centralized water facility for the parameters specified in COGCC Table 910-1, in addition to the wetland/drainage survey and mapping specified in Antero's best management practices
12. Perform monthly monitoring of any surface water bodies that are located within ½ mile of a well pad or the centralized water storage facility using the same parameters specified for the groundwater monitoring during well drilling and completion activities, followed by annual monitoring for the duration of the project. This type of monitoring is the best way to ensure pollution control measures are preventing exposures through contamination of surface water.
13. Conduct soil testing at all well pad locations and at the centralized water facility during reclamation activities. All results of this monitoring should be made available to the public within 60 days of sample collection and posted on a publicly accessible website approved by the Battlement Mesa Community website. If (1) benzene, ethylbenzene, toluene, or xylenes are detected at levels greater than the concentration levels specified in Table 910-1 of the COGCC rules; (2) any cations, anions, metals, or total dissolved solids exceed 1.25 times background concentrations; (3) methane or any chemical identified as a concern from the full disclosure of chemicals exceeds 1.25 background concentrations; or (4) if pH or specific conductance exceeds the limits specified in COGCC table 910-1, the BOCC should require Antero to remediate as a condition of the special use permit. This type of monitoring is the best way to ensure pollution control measures are preventing exposures through contamination of soil.
14. Adhere to COGCC rules 317B, 603, 904, and 908, including provisions in these rules that are at the discretion of the director, and identify any variances or exceptions to these rules and make any variances or exceptions publically available (as posted on Garfield County website and/or a publicly accessible website approved by the Battlement Mesa Community) 2 months prior to submission of the special use permit.
15. Develop and implement plans to ensure removal of mud from vehicles leaving the well pads and access roads to prevent tracking of mud onto Battlement Mesa and Garfield County roads.
16. Adhere to all its best management practices in Appendix E for spill prevention, control, and storm water control, and groundwater and surface water resources.
17. Create a berm for all down gradient well pad perimeters and surface water diversion ditches to prevent pollution of water and soil.
18. Conduct monthly inspection of water and gas pipeline for leaks to prevent water and soil pollution and that the results of the inspections be posted on the Garfield County Website.
19. Immediately Report to GCOG (in addition to COGCC) any spill of one or more barrels. Notification should take place within 24 hours and keep records of spill quantities, clean-up activities and preventive measures taken to avoid future spills. Notification should be immediate if water sources are impacted.

20. Cover all drill cuttings when stored on well pads to prevent wind transport and soil pollution.

We recommend that the BOCC:

21. Assign a Garfield County inspector to monitor Antero's compliance with the special use permit and that the special use permit contain provisions for regulatory action if Antero is found to be in non-compliance of the special use permit.

3.3 Findings and Specific Recommendations from Traffic and Transportation Assessment

What we know: An increase in traffic is associated with an increase in risk for motor vehicle accidents that can involve cars, pedestrians, and bicycles. These accidents can result in severe injury and death and the risk of severe injuries in motor vehicle accidents increases as the speed of traffic increases. Accidents involving heavy trucks have greater potential for death than those involving smaller vehicles. Increased traffic also increases air pollution and noise levels, and decreases quality of life for those living nearby. We know that Antero anticipates increased truck traffic on residential roads for the duration of the 5 year well development period.

What we do not know: We do not know if Battlement Mesa has dangerous traffic spots or the normal pedestrian/bicycle patterns.

Based on these findings, the following are specific recommendations to reduce the potential impact of traffic and transportation.

As a condition of the special use permit, we recommend that the BOCC require Antero to:

1. Install a fully functional water storage facility and pipeline network before any development of well pads in the Battlement Mesa.
2. Develop industrial haul routes outside the PUD to remove natural gas development and production-associated traffic from residential roads prior to any well pad construction within the PUD. Industrial traffic should be diverted from Stone Quarry Road to industrial haul routes at locations where homes are backed along the road.

If industrial haul routes outside the PUD are not constructed then we recommend the following conditions be met:

3. Communicate and coordinate with the local school district to develop a plan for transportation and safety needs of all children going to and from school by car, bus, bicycle and walking during and outside of school zone hours to prevent injury to school children.
4. Enforce truck speed limits to 20 mph within the PUD for all areas for all truck traffic associated with the project to reduce the severity of injury should an accident occur.

5. Mark pedestrian/bike high use routes and establish safe crossing zones where they intersect Battlement Mesa Parkway or other haul routes to alert drivers of potential pedestrians and bicyclers.
6. Install safety measures (ie, signaled cross walks, elevated sidewalks, green space buffers) for pedestrians/bikes where established walking/biking routes overlap/run along haul routes to prevent accidents.
7. Require safe driver training for workers and subcontractors and Antero implement penalty system for unsafe workers, to encourage safe driving.
8. Implement a system to identify and remove unsafe drivers to prevent accidents and injuries.

We recommend that Garfield County:

9. Provide Sheriff's Auxiliary Unit with authority to log speeding and unsafe driving incidents and complaints within the PUD. Information about incidents involving the Antero workers or subcontractors can be provided to Antero, subcontractors and the Sheriff's department so that problems and unsafe conditions can be resolved.
10. Request that the Garfield County Sheriff's Department or other qualified entity review Antero's Traffic Impact Analysis and request feedback on possible safety mitigations and traffic hot spots to ensure the plan is protective of public health.

We recommend that Antero:

11. Consider speed control measures on worker ingress and egress routes within the PUD (ie decreased speed limits, signage, real time speed measurement signs, photo speed ticket vans, speed bumps or other measures) to prevent speeding.

3.4 Findings and Specific Recommendations from Noise, Vibration, and Light Assessment

What we know: Noise can have negative effects on public health yet can vary at the individual level. Background noise levels in most of Battlement Mesa are low. We know that well development activities will last several months for each well pad and that some homes will be proximate to more than one well pad, thus experiencing well development noise for many months. COGCC noise rules do not take into account possible health impacts of noise from extended well development periods. Noise levels associated with well development activities have been measured above levels that are likely to cause health impacts, even though these levels meet COGCC permissible levels. Noise mitigation effectiveness may be in part determined by local topography and meteorology.

What we do not know: We do not know if planned noise mitigation strategies will bring noise levels at residences below which health impacts do not occur. We do not know a single distance from wells that is sufficient to provide protection from noise impacts.

Based on these findings, the following are specific recommendations to reduce the potential impacts to public health from Noise, Vibration, and Light.

As a condition of the special use permit, we recommend that the BOCC require Antero to:

1. Improve sound mitigation to achieve noise levels below 55 dbA in the day and 50 dBA at night during all well development and production activities at the distance of 350 feet from the noise source on the well pad. Require Antero to monitor noise and to use best mitigation technology available to maintain these levels throughout the development period.
2. Require best available noise reduction technology for heavy equipment, including trucks and truck brakes, to reduce noise levels.
3. Develop and implement Community Advisory Board which can address the Battlement Mesa resident's concerns about noise. This can help prevent long-term nuisance noise levels, in cooperation with Battlement Mesa residents and Garfield County. For further details regarding the recommendation for a Community Advisory Board, see recommendation for Community Wellness Assessment.
4. Alert residents of anticipated noise, including time, duration, decibel levels, and machinery to be used to protect public health.
5. Develop industrial haul routes to remove truck traffic from the PUD and away from the homes on Stone Quarry road.

If industrial haul routes are not developed then:

6. Reduce speed limits for trucks within the PUD to 20 miles per hour to reduce noise and vibration levels.
7. Consider installation of traffic noise barriers near the St. John Elementary School and/or Grand Valley Middle School to reduce noise levels at schools if school staff indicates that there are noise impacts at the school.
8. Install permanent/semi-permanent noise mitigation structures (sound walls) along haul routes CR300 and other routes where trucks are anticipated to be passing throughout the development period to reduce noise levels.

3.5 Findings and Specific Recommendations Related to Community Wellness

What we know: A variety of physical and social factors impact the health of a community. Natural gas development can have positive and negative social and community impacts, mostly during the development period. Battlement Mesa saw increases in crime, sexually transmitted disease and school population and a decline in educational environment during the years of natural gas boom in Garfield County. Drug and alcohol abuse are of concern within the natural

gas industry. Citizen concerns reflect the community's previous and current experience with the natural gas industry. Citizens report current decline in social cohesion and community experience and some citizens report health impacts due to these changes. The Antero project will impact outdoor amenities. Impacts to the community will in a large part depend upon how well other concerns, such as air quality, traffic and noise, are mitigated.

What we do not know: We do not know the extent to which the Antero project will support existing and new local business, or the way the one million dollar donation to the community will be used. We do not know what fraction of citizens are currently experiencing decline of quality of life, nor how many are likely to have such concerns once the development period begins. Measurements related to mental health and suicide, substance abuse, lifestyle and social cohesion are not routinely monitored.

Recommendations to Reduce Impacts to Community Wellness

Based on these findings, the following are specific recommendations to reduce the potential impacts to community wellness.

We recommend that Antero, Battlement Mesa Citizens, and Garfield County:

1. Establish a **Community Advisory Board** to facilitate on-going community engagement between Antero, Garfield County officials, Battlement Mesa Company and residents of Battlement Mesa for early identification of impacts to community wellness. A Community Advisory Board can provide direct and frequent interactive communication between these groups. It can provide an ongoing mechanism for citizens to report problems and concerns to Antero and can allow Antero to address concerns in a timely manner. It can also provide feedback to the county regarding success of residential natural gas development. A Community Advisory Board can also provide an opportunity for Antero to apprise the residents of current activities and changes to plans, which can help reduce uncertainty for residents and may decrease anxiety. The Community Advisory Board can also provide input regarding the use of the one million dollar donation to ensure that the use of this money supports community and physical health.

We recommend that Garfield County:

2. Review sexually transmitted infection clinic access, outreach and education, with particular attention to in-migrant workforce to reduce spread of sexually transmitted infections within the community.
3. Identify operators and subcontractors that have implemented drug and alcohol free workplace programs and encourage Antero to do so and subcontract to companies that also do so. Provide Antero with contacts to those that educate employers regarding benefits of such programs.

We recommend that Garfield County and Antero:

4. Support baseline and ongoing studies to determine the impact of residential natural gas development on community health and the effects on individual health. This information will provide direct feedback to the Antero-Battlement Mesa project, allowing for improvements in community aspects as the project continues. It will also provide valuable information for other communities experiencing or anticipating residential natural gas development. These studies should include measurements related to lifestyle and social cohesion, education, crime, sexually transmitted infection, mental health and suicide, and substance abuse.
5. Ensure recommendations to mitigate other concerns (air quality, traffic, and noise) are implemented.

Recommendations to Support Benefits to Community Wellness

Based on these findings, the following are specific recommendations to foster the potential benefits to community wellness.

We recommend that Garfield County:

6. Encourage use of local business, especially those that enhance community cohesion, such as local restaurants and coffee shops.
7. Utilize Antero's one million dollar donation to enhance community cohesion.

3.6 Findings and Specific Recommendations from Economic and Employment Assessment

What we know: The Antero project in Battlement Mesa will employ approximately 120-150 people. Some Battlement Mesa residents will benefit directly from the Antero project but most residents will not directly benefit. Natural gas development causes a decline in property value, especially during the development phase of the project and land values partially recover when the development phase of a project ends. The development phase for the Antero project in the PUD is expected to last at least 5 years. Antero's project within the PUD will not likely initiate a boom and bust cycle. Land values effects will be impacted by how well other concerns, such as air emissions, traffic, noise and community wellness, are mitigated.

What we do not know: Specific timelines for development and maintenance activities for the project are not known and this gap contributes to uncertainty. It is not known if the Antero project will impact rental or sales housing demand in Battlement Mesa. It is not known how land values will respond to the 5 year development period or if land values in Battlement Mesa will follow the same patterns as those seen in the Land Values Study.

Recommendations to Reduce Impacts from Economic Effects

Based on these findings, the following are specific recommendations to reduce the potential impacts to property values.

We recommend that before the project starts, the BOCC require Antero to:

1. Require that Antero develop a reasonable and specific timeline for all activities associated with development and maintenance of the wells. Require that Antero communicate changes to the plans at the earliest possible time before any changes in the plans occur. This would address some concerns in the real estate market. If sellers and buyers can *confidently* anticipate the steps and timing of the well development process, the real estate market may react less unfavorably to the project.

We recommend that Antero, Battlement Mesa Citizens, and Garfield County do the following before the Project starts:

2. Establish a **Community Advisory Board** that meets regularly and frequently with Antero (at least every month). Garfield County, citizens, Antero and the Battlement Mesa Company should be a part of this board. The Community Advisory Board can actively interact with Antero to facilitate communication to and from the residents and the county. Establish clear and timely communications methods to facilitate information regarding changes to the timeline and activities. Provide the Community Advisory Board with sufficient powers to allow for resident input, which can demonstrate that residents can voice their concerns.
3. Consider multiple methods of communication to residents regarding development and maintenance activities.

We recommend that Garfield County:

4. Continue to consider public health as a high level priority when judging uses of local government revenues derived from the natural gas development and production to maximize protection of public health.
5. Ensure recommendations to mitigate other concerns (air quality, traffic, noise and community wellness) are implemented.

Recommendations to Support Benefits from Employment Effects

Based on these findings, the following are specific recommendations to foster the potential benefits from employment.

We recommend that Garfield County:

6. Support local educational institutions that provide training for industry related jobs during the development period and retraining for when industry jobs end after the development period.

3.7 Findings and Specific Recommendations Related to Health Care Infrastructure

What we know: The availability of healthcare facilities and professionals affects public health. The level of health insurance in an area affects health care infrastructure. Battlement Mesa has primary care and some specialist services in the community. Specialized and emergency care is at least 20 miles away. It is not expected that health care infrastructure will be impacted by the Antero project to the extent that will impact health of the residents.

What we do not know: The level of health insurance coverage amongst workers in natural gas development and production is not known. The number of Antero workers and families that will utilize medical care in Battlement Mesa is unknown.

Based on these findings, the following are specific recommendations to prepare for the potential impact to the Health Care infrastructure.

We recommend that Garfield County:

1. Monitor which companies, including Antero and subcontracting companies, provide health insurance to employees to determine how the natural gas industry contributes to health care infrastructure.
2. Monitor health care utilization in Garfield County to determine if rates of uncompensated care are associated natural gas industry cycles.
3. Ensure that county revenues continue to meet changes in county services, including public health services.

3.8 Findings and Specific Recommendations from Assessment of Accidents and Malfunctions

What we know: A small number of accidents and malfunctions occur on a regular basis in natural gas development and production. These accidents and malfunctions can have minor to catastrophic consequences and can impact air, water, and soil quality along with the health of workers and nearby residents. Lack of adherence to rules and regulations, as well as regulatory oversight and enforcement increases the likelihood of accidents and malfunctions. While

increased preventive measures and enforcement of regulations can reduce the likelihood of accidents and malfunctions, they cannot ensure that a catastrophic event will not occur in the Battlement Mesa PUD as a result of Antero's project.

What we do not know: We do not know how many accidents and malfunctions will occur in the PUD and we do not know if a catastrophic event will occur in the Battlement Mesa PUD as a result of Antero's project. We do not know if the current setbacks and placements of pads, pipes, and maintenance stations are sufficient to protect residents from catastrophic malfunctions. We also do not know if there are emergency plans in place that adequately address catastrophic incidents.

Based on these findings, the following are some of the specific recommendations to reduce the potential public health impact from accidents and malfunctions.

We recommend that as a condition of the special use permit the BOCC require Antero to:

1. Work with emergency responders in Battlement Mesa (e.g., the sheriff and fire departments) and Battlement Mesa residents to establish a comprehensive emergency response plan that includes notification and communication systems, evacuation routes, plans for evacuating schools, the assisted living facility, and capacity of local emergency responders hospitals, and sheltering in place, accurate maps of pipelines, shut-off valves, and well pads, as well as identifying air intakes at the schools, assisted living facility, and recreation center prior to any activity in the PUD. We recommend that the copies of the emergency response plan be kept at the sheriff department, fire department, all responding hospitals, and on a Garfield County website and /or a publicly accessible website approved by the Battlement Mesa Community.
2. Test the emergency response plan in cooperation with emergency responders by performing a drill prior to any natural gas operations commence in the PUD and annual drills thereafter, as well as annual reviews and updates of the emergency response plan.
3. Annually disclose all chemicals used on its well pads within the PUD and include a list of these chemicals in the emergency response plan.
4. Notify the sheriff and fire department one week prior to well drilling, hydraulic fracturing, flow back, and pipeline pigging activities.
5. Implement the emergency response provisions provided in Antero's best management practices submitted as comments to the September 2010 Draft HIA.
6. Implement the well site and facility security provisions provided in Antero's best management practices submitted as comments to the September 2010 Draft HIA.
7. Adhere to its best management practices for pipelines and all COGCC rules throughout the life of the project as a condition of the special use permit.
8. Institute mechanism for reporting safety concerns, near-misses, and minor incidents to the appropriate designated county agency or department to reduce accidents and malfunctions. Reports of these concerns and incidents should also be made to the Community Advisory Board, along with plans for preventive and corrective actions.

9. Develop an ongoing fire prevention program in coordination with the local fire department's community fire prevention program. This program should include routine inspection and implementation of wildfire mitigation plans (for example, all areas surrounding well pads are kept clear of vegetation that could contribute to spreading).

We recommend that Garfield County:

10. Clearly mark primary and secondary evacuation routes from Battlement Mesa.
11. Perform quarterly tests of emergency notification systems within Battlement Mesa (e.g., sirens and reverse 911).
12. Request the Battlement Mesa fire department to inspect all proposed well pad locations and make recommendations for the prevention of well pad fires spreading from the pads up to relocation of pads and that these recommendations are incorporated into the special use permit.
13. Require all gas pipelines to follow established truck haul routes and allow no gas pipelines through the center of the PUD.
14. Assign a county inspector to oversee and inspect all pipeline construction and maintenance in the PUD.