

Draft Battlement Mesa HIA, Revision 1
February 2011

Conducted by
Colorado School of Public Health

Part Two: Supporting Documentation

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Table 1: Identified Stakeholders		
Stakeholder	Acronym	Stakeholder Role
Antero Resources Corporation	Antero	Natural gas operator, proposes development within the planned unit development of Battlement Mesa
Battlement Mesa Concerned Citizens	BMCC	Grassroots citizen group formed in response to the Antero gas project.
Battlement Mesa Company	BMC	Owner of mineral and surface rights in Battlement Mesa.
Battlement Mesa Service Association	BMSA	Home owners association for Battlement Mesa residential communities.
Colorado Department of Public Health and Environment	CDPHE	State health department; has consultative responsibility to the state permitting agency for comment health and environmental concerns, with broad authority to regulate air pollution sources so as to protect air quality, pursuant to the state and federal air quality statutes.
Colorado Oil and Gas Conservation Commission	COGCC	Colorado regulatory and permitting agency. Maintains databases for water quality, spills, and well locations. Databases include federal and tribal lease owners as well as state lease owners. Provides permitting for state lease owners only.
Garfield County Board of County Commissioners	BOCC	Requested county environmental health to develop proposals to respond to citizens health concerns. Have indicated that HIA and health study proposals will satisfy this request.
Garfield County Oil and Gas Department	GCOG	County department that promotes communication and cooperation between industry, residents, the Board of County Commissioners (BOCC), and other government agencies. Investigates and documents citizen complaints, conducts studies, and advises BOCC on oil and gas issues.
Garfield County Oil and Gas Operators	GCOGO	Natural gas companies operating in Garfield County but not involved in the development within the Battlement Mesa PUD (Encana, Williams, Bill Barrett, Noble).
Garfield County Public Health	GCPH	County health agency with environmental health program. Environmental health program directed to respond to citizen concerns and has strong ties to all stakeholder groups. Environmental health program considered a regional leader in health and gas exploration and production.

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Grand River Hospital District	GRHD	Primary hospital and Emergency department provider in Rifle, Colorado (28 miles east of Battlement Mesa) and operator of a primary care clinic in Battlement Mesa.
Grand Valley Citizens Alliance	GVCA	Grassroots community group, loosely tied to the Battlement Concerned Citizens.

Table 2: Stakeholder Meetings		
Date	Location	Groups represented
January 13, 2010	CDPHE, Denver	CDPHE
January 27, 2010	COGCC, Denver	COGCC
February 3, 2010	GCPH, Rifle	BMCC, BMC, BMSA, BOCC, CDPHE, COGCC, GCPH, GVCA, Encana Corporation, Williams Corporation
February 16, 2010	GC Board Chambers, Glenwood Springs	BOCC
April 22, 2010	Antero Field Office, Rifle	Antero Resources
June 15, 2010	Battlement Mesa Fire Station, Battlement Mesa	BMCC, BMC, BMSA, BOCC, CDPHE, COGCC, GCPH, GVCA, Antero Resources, EnCana Corp., Williams Corp
June 24, 2010	CDPHE, Denver	CDPHE

Table 3: Stakeholder Concerns and Questions	
Meeting Date	Concern or Question
<i>Air Pollution/Quality</i>	
February 3, 2010	Will PM10, VOC monitoring be included?
February 3, 2010	Parachute= Battlement Mesa when it comes to air monitoring?
February 3, 2010	Is PM2.5 a greater hazard?
February 3, 2010	Will the air quality assessment include all processes of the well development?
February 3, 2010	Do hydrocarbons evaporate from produced water ponds?
February 3, 2010	Are there BTEX emissions from trucks?
February 3, 2010	Will gathering pipelines with leaks be accounted for?
June 15, 2010	Is there enough water and air baseline data for Battlement Mesa?
June 15, 2010	Have air quality exposures in the summer when swamp coolers are being used? Will air pollution be concentrated indoors?
<i>Water Quality</i>	
February 3, 2010	Is there adequate monitoring of water?
February 3, 2010	How will impacts to the water supply (CO river, surface and spring) be assessed?
February 3, 2010	What if domestic supply is ½ mile from well pad, is it safe?
February 3, 2010	Will emergency wells within the PUD be impacted, are the pads close to the emergency wells?
February 3, 2010	Should the intake on the CO river have gates (like Rifle)?
February 3, 2010	Should real time monitoring instead of 3 month turn around for sampling results be implemented?
February 3, 2010	Can there be a quicker response to water issues?
February 3, 2010	Is there enough water for all needs, including fires?
February 3, 2010	Should there be a drill for potential water shut-down?
June 15, 2010	Will the effect of chemicals on the water supply be included in the study?
June 15, 2010	Will possible contamination of the Colorado River from upstream contamination be considered?
June 15, 2010	Is there enough water and air baseline data for Battlement Mesa?
<i>Drilling and Fracking Chemicals</i>	
June 15, 2010	Will fracking chemicals be considered?
June 15, 2010	How will chemical spills be considered?
June 15, 2010	Why can't Colorado require public release of fracking chemicals like Wyoming?
June 15, 2010	Will you be working with physicians and Grand River Hospital to obtain local data?
<i>Pipeline Safety</i>	
February 3, 2010	Is there a plan to prevent pipeline leaks/ explosions?
February 3, 2010	Does pipeline proximity to buried high voltage power lines pose a risk?
<i>Occupational Hazards</i>	
February 3, 2010	How will the development have social impacts: will it increase domestic abuse? Will workers have health insurance?

Table 3: Stakeholder Concerns and Questions	
Meeting Date	Concern or Question
<i>Occupational Hazards Continued</i>	
February 3, 2010	How does worker schedules impact families?
February 3, 2010	Will the health of workers on rigs be included?
February 3, 2010	What are the mental health impacts?
February 3, 2010	If economic security is tied to gas jobs, will fear of loosing a job prevent workers from speaking up about health problems? Grand Valley Citizens Alliance gets input from workers that wish to remain anonymous.
<i>Concerns of Industry</i>	
February 3, 2010	There is misinformation that drives fear. The health study will relieve the misinformation.
February 3, 2010	The industry will partner with local fire department.
February 3, 2010	Industry hopes to make Battlement Mesa to be a better place.
<i>Concerns about Research and the HIA</i>	
February 3, 2010	Hope that HIA will not be “inconclusive”
February 3, 2010	What is the difference between probability vs. predictability: What does probability mean?
February 3, 2010	How are acute vs. chronic diseases defined? This needs to be communicated.
February 3, 2010	Will the HIA include information on healthy individuals? Balanced picture of the community
June 15, 2010	Is there a formula that will tell us that the hazards are too high?
June 15, 2010	Will analysis be comparing results to other areas in Colorado such as Denver and Grand Junction?
June 15, 2010	Will illnesses be captured even if a resident goes to a hospital outside of Garfield County?
June 15, 2010	How will gaps in health outcomes be addressed?
June 15, 2010	Will there be another public meeting prior to the release of the draft report?
June 15, 2010	Be aware that the population has been trending to younger age groups during the 2000-2010 time period.
<i>Community Concerns</i>	
February 3, 2010	What will the impacts on county services be? Will there be more or less services? services Will there be an increase in STD’s and other “social” diseases
February 3, 2010	Will the development impacts on education? Will class size be affected?

Table 3: Stakeholder Concerns and Questions	
Meeting Date	Concern or Question
February 3, 2010	Will there be adequate affordable housing? Sometimes there is not enough, sometimes too much.
<i>Additional Exposures/Impacts</i>	
February 3, 2010	Will decreased property value be included in the assessment?
<i>Additional Exposures/Impacts Continued</i>	
February 3, 2010	Will decreased aesthetics of the community be included?
February 3, 2010	Are set backs adequate to protect health?
February 3, 2010	Will other stressors including light, noise, traffic be considered?
February 3, 2010	Will concern include skin, respiratory, vertigo?
February 3, 2010	Will there be motor vehicle accidents and related injury and death?
February 3, 2010	What kind of impacts will fracking have?
February 3, 2010	Will remote frac'ing with high pressure pipelines be dangerous?
February 3, 2010	How will changing landscape and changing resident demographics be included?
February 3, 2010	Will a boom and bust cycle occur? We are now in a bust and the food banks drying up.
February 3, 2010	What are the impacts to health services and other community services in BM?
February 3, 2010	How will post drilling, post spill reclamation be handled?
February 3, 2010	What will be done with cuttings? Will they be buried onsite?
February 3, 2010	Will the sites be contaminated and be unsuitable for future use?
June 15, 2010	Will vibration be considered along with noise?
June 15, 2010	Have exposures to herbicides and dust been considered?
June 15, 2010	Will fires on the well pad be considered?
June 15, 2010	Will you consider all O&G activity in close proximity to the PUD? The project should expand beyond the PUD.
June 15, 2010	Mental health and social issues are important impacts.
<i>Outside Agencies</i>	
June 15, 2010	Does EPA have any interest in the work being done? What other studies have been done or are being conducted?
June 15, 2010	What role does Pew Charitable Trust play in the HIA?

Table 4: Estimated Annual Emissions from Trucks

Contaminant	Emissions During Five Year Well Development Period	Emissions During Subsequent 20 - 30 Years of Well Production and Operations
PM (tons/year) ¹	0.26 to 0.75	0.05 to 0.12
Nitrogen dioxide (tons/year) ²	0.35 to 0.45	0.068
Carbonyls (tons/year) ³	0.063 to 0.082	0.012
Alkanes (tons/year) ⁴	0.05 to 0.064	0.0097
PAHs (tons/year) ⁵	0.14 to 0.18	0.027

¹assuming a PM emission rate of 0.64 to 1.4 grams per mile⁹⁷, a fuel efficiency of 5.5 miles per gallon of diesel, and 10 miles within the PUD per trip

²assuming a nitrogen dioxide emission rate of 0.84 grams per mile⁹⁸, a fuel efficiency of 5.5 miles per gallon of diesel, and 10 miles within the PUD per trip

³assuming a carbonyl emission rate of 0.15 grams per mile⁹⁸, a fuel efficiency of 5.5 miles per gallon of diesel, and 10 miles within the PUD per trip

⁴assuming an alkane emission rate of 0.121 grams per mile⁹⁹, a fuel efficiency of 5.5 miles per gallon of diesel, and 10 miles within the PUD per trip

⁵assuming a PAH emission rate of 0.0.338 grams per mile⁹⁹, a fuel efficiency of 5.5 miles per gallon of diesel, and 10 miles within the PUD per trip

The transportation and traffic assessment discusses the number of expected truck trips that were used to estimate the annual emissions from Antero's projected heavy truck activity. The estimated emissions are based on the period of time during which trucks are moving and do not include emissions created during idling and emissions from diesel powered generators. Each of the proposed truck routes is near at least one Battlement Mesa housing area³².