

App ID: 109

# Organization & Contact Info

## Cover Letter

Cover Letter File

[cover\\_letter.pdf](#)

## Organization & Contact Info

**Project Director Name**

Roxana Witter, MD, MSPH

**Organization Name**

University of Colorado Denver

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**Organization EIN**  
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## **CEO/Executive Director**

**CEO Name**  
Lora Mihelic, MBA, MA

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## **Financial**

**Financial Contact**  
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**Total revenues for most recently completed audited year \$**  
\$2,089,117,000

**Fiscal Year**  
2009

**Is year-end audit in progress?**  
No

## **Grant Request**

**Estimated total budget request \$**  
150000

**Expected duration of the project**  
15 months

**Program/Project Title**  
Health Impact Assessment of Gas Extraction in Colorado

**Summarize the purpose of your request**  
This project will provide the basis for policy by executing a Health Impact Analysis of gas extraction in Colorado. Assessment and recommendations will address the Comprehensive Drilling Plan in Battlement Mesa, Colorado, but will also provide guidance for other state and local agencies through out the Rocky Mountain region.

## **Hospitals/Universities**

**Division Managing Project**  
Colorado School of Public Health

**Revenues \$**  
15,689,551

**Expenses \$**  
15,689,551

**Fiscal Year**  
2009

# **Project Narrative**

## **Summary**

### **Summary**

The Colorado School of Public Health (CSPH) proposes “Health Impact Assessment of Gas Extraction in Colorado” to provide health information and recommendations to decision-makers regarding plans for natural gas drilling in the residential community of Battlement Mesa, Colorado. CSPH will collaborate with Garfield County Public Health, in conducting a qualitative and quantitative analysis of existing environmental exposure, health and safety data. CSPH will offer decision-makers at state and county levels timely, specific recommendations, allowing them to consider and incorporate health impact considerations in drilling permit decisions. We will continue stakeholder and decision-maker outreach, HIA advocacy, and training of public health professionals in HIA methods. In addition to informing impending decisions in Garfield County, this HIA will

provide baseline information for design of a future prospective exposure and health monitoring study. This HIA will be completed in one year at a total cost of \$150,000. Funding from Pew is vital for establishing a decision-making process free of undue influence from any one stakeholder group.

## Issue

**What proposed policy, program, or project currently under active consideration by a decision-making body (for example, a local, state, or tribal government or agency or legislature) will your HIA inform? What is the connection between the decision and health? To the extent possible at this phase in your project, outline the key relationships between the proposal your HIA seeks to address and the health of the affected community/communities. Is the connection immediately obvious? Can the HIA provide new and important information or insight to improve decision-making?**

Our HIA will inform the Comprehensive Drilling Plan (CDP), the Major Land Use Impact Review (MLUIR), and individual well permit applications being submitted by Antero Resources to drill for natural gas in the residential community of Battlement Mesa, Garfield County, Colorado. A CDP is a voluntary plan offered by an operator to streamline the permit approval process for a large project. The CDP process allows the operator to address individual and cumulative impacts and eliminates repetitive analysis for individual wells. A CDP is reviewed by the Colorado Oil and Gas Conservation Commission (COGCC), which may approve, disapprove or approve with special stipulations. After the CDP is approved, individual well permits must still be obtained from COGCC. Through the MLUIR process, the Garfield County Board of County Commissioners (GCBOCC) may also impose special conditions.

Natural gas exploration and production (E&P) is known to introduce a variety of physical and chemical hazards that may cause adverse health effects with sufficient exposure. Our group completed a white paper and literature review (WPLR) in 2008, outlining potential gas development hazards, exposures, susceptible populations, and health outcomes in Garfield County. The 2008 Saccomanno Institute report documented baseline health status and adverse health outcome trends potentially linked to gas E&P in Garfield County. Preliminary emission measurements in Garfield County and elsewhere suggest that some chemical exposures may impact health. Furthermore, anecdotal reports suggest that large scale “boom and bust” gas E&P in small and rural communities may disrupt community infrastructure. Thus, gas permitting decisions near residential areas have the potential to adversely affect health.

Our HIA will focus in three areas of health concern: exposure to emissions and contaminants in air and water; truck traffic on physical and mental health; intermittent spills, leaks and fires associated with gas E&P. Thus, for example, health consequences to be addressed will include respiratory, cardiovascular, auditory, psychiatric, and injury/motor vehicle-related impacts on susceptible and general populations in the community.

While the connection between gas E&P hazards, exposures and health effects may appear obvious to those trained in public health, these connections are not immediately obvious to COGCC and GCBOCC. These decision-makers have welcomed our HIA, as a means of providing health impact information to help inform immediate and future decisions in Colorado. Because of the gap of information regarding health impact, this HIA will likely serve as a framework for other local, state and regional level decisions.

**Who will be affected by the pending decision? Please describe the importance of the decision to the health of the affected population, in terms of scope and scale.**

The residents of Battlement Mesa (population 4,238) will be immediately impacted by placement of gas well pads and the associated activity within their community. The residents of Parachute (population 1,290, 1.2 miles away) may be impacted by increased truck traffic, air emissions and potential water pollution. Both communities may have increased permanent and itinerant populations with potential exposures and health impacts.

Battlement Mesa is a retirement community, with an increasing population of young families. The Antero project includes 200 gas wells on 10 pads, centralized water treatment facility, covered/lined waste pit, and miles of surface and buried pipeline within a 3200 acre residential community. Preliminary plans indicate that well pads and pipelines will be distributed throughout the community, raising the probability that health impacts may affect the entire community.

Community groups, including Battlement Mesa Service Association (BMSA, the homeowners association) and Battlement Mesa Concerned Citizens (BCC) and Grand Valley Citizens Alliance (GVCA), have expressed concerns about the proximity of drilling near homes, recreational areas and schools. A recent stakeholder meeting revealed health concerns, especially for susceptible populations, associated with: airborne volatile organic compounds (VOCs), diesel and other particulate matter; fracturing fluid, hydrocarbons, and VOCs in soil and water; increased risk of fires, explosions, motor vehicle accidents; and changes in community "livability."

In November 2009, BCC submitted a formal letter to GCBOCC and Garfield County Public Health (GCPH) requesting that health concerns be addressed before drilling begins (attached). The GCBOCC instructed the (GCPH) to prepare proposals for addressing citizen concerns. GCPH approached the Colorado School of Public Health (CSPH) with a request to collaborate on health/exposure studies, beginning with this proposed HIA. There is a desire for us to proceed expeditiously, prior to permit decisions.

## **Plan of Action**

**Who are the key constituents that you will seek to influence through this project (e.g., state or local policy-makers, opinion leaders, reporters)?**

We seek to influence the COGCC and GCBOCC by providing health information and specific recommendations for the CDP, MLUIR and individual permits. The Colorado Department of Public Health and Environment (CDPHE) has consultative responsibility

to COGCC. Thus, we have engaged CDPHE to discuss how HIA can assist in health consultation. We expect to influence other permitting agencies, including county governments, state agencies and the Bureau of Land Management by providing a model for HIA.

The American West has long been a center for energy production and there is general regional acceptance of the benefits of this activity. However, these activities have historically occurred far from population centers, and potential health costs maybe underestimated in our region. Therefore, we seek to be viewed as a balanced source of health information for media, public officials, healthcare providers, environmental organizations, industry, labor, and the general public.

**What stakeholders are important in defining the issue, developing recommendations and pushing for solutions? Describe your plans for engaging stakeholders in the HIA process. How will you obtain their input (e.g., focus groups, community meetings, e-mail or other Web-based communications)? What opportunities will stakeholder groups have to participate in defining the scope of the HIA, analyzing the impacts, or developing recommendations? Describe any support or opposition for the HIA among stakeholders. Note whether any decision-makers requested an HIA or indicated support for including health considerations in their decision; attach and label any letters of support in the File Attachments tab below.**

The stakeholders include the residents and citizen groups of Battlement Mesa and nearby communities, Antero Resources and other operators, GCPH, GCBOCC, the Battlement Mesa Consolidated Metropolitan District (BMCMD, Battlement Mesa Company (BMC) and the Grand River Hospital District (GRHD), CDPHE, and COGCC. We have received across the board interest in HIA from all stakeholders. While stakeholders may have differing perspectives, the broad support reflects the common search for tools to address growing concerns of potentially impacted residents. In addition to attached Letters of Support, other stakeholders, including BMC, GRHD, CDPHE, have indicated support for the HIA, including providing information and data that will allow thorough and accurate assessment/analysis.

The COGCC and GCBOCC, have indicated they will consider specific and timely HIA recommendations in their decision-making process. Additionally, GCBOCC tasked GCPH to develop proposals for health studies, including HIA. GCBOCC has submitted a Letter of Support.

The scope of this HIA is already informed by stakeholder input, including the BCC letter to the GCBOCC; CDPHE, COGCC, GCBOCC meetings; stakeholder roundtable (minutes attached); GCPH involvement with stakeholders over the last several years; and Saccomanno Institute focus group data. We will use this input to define the exposures and health outcomes to be assessed in the HIA. We will continue stakeholder engagement during analysis, reporting and advocacy stages. This will occur via stakeholder meetings, and web-based communications including posts to GCPH oil and gas website portal and including email.

**Letter of Support #1**

[letter\\_support1.pdf](#)

**Letter of Support #2**

[letter\\_support2.pdf](#)

**Letter of Support #3**

[letter\\_support3.pdf](#)

**Letter of Support #4**

[letter\\_support4.pdf](#)

**Letter of Support #5**

[letter\\_support5.pdf](#)

**Identify partnerships between the applicant(s) and other key stakeholders, describe how each partner organization will contribute to the HIA. Provide any additional letters of support from these partners in the File Attachments tab above.**

Our key partner is GCPH. GCPH will continue to provide local context and contacts; meet with stakeholders as needed; provide environmental data and GIS mapping and support; review and provide input on the scope, analysis and recommendations of the HIA; report and advocate for implementation to the GCBOCC; provide information to local media. Their Letter of Support is attached.

Two Centers in the CSPH, MAP ERC and Center for Public Health Practice (CPHP) will support HIA dissemination and educational programming.

**The Health Impact Project will support each grantee through providing an individualized package of training, mentoring, and technical assistance (TMTA), focused on general HIA methods and process. In addition to this general TMTA, we can provide consultants with specific subject-area expertise. What training or technical assistance, including subject-area expertise, might be required?**

Expertise in communications (i.e. HIA results/recommendations dissemination) and teaching HIA best practices would be helpful.

**To the extent possible at this phase in your project, describe the methods you intend to use in the HIA analysis. What types of research, including literature review, quantitative and/or qualitative methods, modeling or cost-benefit analysis, will be used to conduct the HIA? What is your experience with these methods? Please note that the Health Impact Project does not favor any particular methodology (e.g., quantitative modeling versus descriptive analysis), but any assumptions and limitations must be clearly identified, and the ability of the results to influence decision-makers should be considered.**

Our HIA will be informed by a variety of sources, including: CSPH literature review, previous emission measurements and modeling, fracturing fluid components, Garfield County air and water monitoring data, GIS mapping, baseline health data, CDP traffic,

emergency and waste plans, and water management plans.

Methods for HIA analysis will include qualitative analysis comparing available exposure data to health-based standards, quantitative and qualitative analysis of community health status and qualitative review of traffic, waste, water and emergency management plans. We will use GIS mapping to estimate proximity of emission sites to residences, recreation areas, and schools, and attempt to quantify emission rates and pollutant concentrations at specific locations. Limitations of our analysis will be due to anticipated gaps in hazard information for some compounds as well as meteorology, emission fate and transport assumptions necessary to estimate concentrations at specific distances from sources. It is anticipated that standard risk assessment methods will not be possible due to data gaps, so order of magnitude results will be incorporated where feasible. Part of our process will involve identifying user-friendly data representations and providing recommendations for future measurements or potential interventions. We will place this project into a “logic model” for systematizing our approach to HIA goals, resources (internal and external), activities, short-term and long-term outcomes and, from these, derive our detailed evaluation plan, process measures and specific outcome measures.

**Will the HIA be integrated into a formal decision-making process such as an environmental impact assessment or an agency's deliberative or rulemaking process, or will the HIA be conducted independently?**

Although there is no regulatory mandate for COGCC or GCBOCC to consider HIA recommendations in their decision-making process, both decision-makers have informed us that timely and specific recommendations will be considered and appreciated.

**How will the HIA results and recommendations to influence the decision process that your HIA addresses? What statutory or regulatory avenues exist for implementing your recommendations? If the applicant is a public agency, describe your role and the role of other key agencies or governmental entities in the decision-making process and your expectations regarding how the HIA recommendations can be implemented. What strategies will you use to ensure that that the public, policy-makers and other key stakeholders understand the HIA results and incorporate the HIA findings into solutions? If your recommendations address legislation, please describe how you will comply with the prohibition on using RWJF funds for lobbying.**

The COGCC and the GCBOCC have indicated that recommendations will be considered and may be integrated as conditions to CDP, MLUIR and/or individual permit approval. CDPHE has also indicated that recommendations to their agency may inform consultation to the COGCC on the CDP. Additionally, CDPHE sees HIA as a potential tool for developing future policy regarding oil and gas development in Colorado. The HIA will fulfill the responsibility of the GCPH, a public agency, in informing the GCBOCC on the Antero development for the MLUIR.

Our open process and outreach to decision-makers and other stakeholders should improve HIA acceptance. CSPH/GCPH will advocate for the HIA recommendations to GCBOCC and COGCC in public and executive level meetings. We will engage the media with

press packets/releases, and interviews. We will make live and web-based presentations to regional stakeholder groups.

We are not addressing legislation.

## **Results and Dissemination**

### **What are the expected deliverables (i.e., reports, policy briefs, media campaigns) and outcomes (i.e., new laws or regulations or policy changes that protect and/or promote health) for this project?**

Deliverables will include: HIA FAQ's, draft and final reports (web-accessible) to all stakeholders; press packets/releases; web-accessible, voice-linked powerpoint presentation summarizing results and recommendations; web-accessible HIA symposium recordings.

Outcomes will include: consideration of HIA recommendations (i.e., air emission mitigation, air and water monitoring, drill pad setbacks, traffic pattern improvements, etc.) by decision-makers; implementation of HIA recommendations and incorporation of health considerations into specific conditions for approvals; adoption of our HIA methodology and recommendations in other gas permitting approval processes in the state and region.

### **How will you measure the success of the HIA?**

Success will be measured by: stakeholder involvement (participation at meetings, conference calls, email) and contribution to recommendations (e.g. feedback and edits to draft HIA documents); implementation of recommendations; proposed prospective exposure and health assessment study results (see attached).

### **What is your plan for publicly communicating HIA results and recommendations? How will you respond to stakeholder input on the scope, results and recommendations of the HIA? What are your plans for public meetings, publications, presentations, or other ways to communicate the results and outcomes of the HIA to a broader audience?**

We have already integrated stakeholder input into the HIA scope. We will solicit further stakeholder input on HIA endpoints after funding notification. We will seek stakeholder input on the draft report/recommendations and revise accordingly, prior to completion of the final report. We will communicate our HIA results via: stakeholder meetings, decision-maker and CDPHE meetings, public GCBOCC meetings, postings on GCPH websites, web-accessible voice-linked powerpoint presentation, and media releases. Postings on CSPH, MAP ERC websites and listserv will inform larger audiences about the HIA.

CSPH will hold a day-long HIA symposium for state and regional public health professionals. We will video-record this symposium and create web-based educational modules for asynchronous learning. Some symposium funds will be used to support

professionals having an interest, but not funds, to attend the conference. MAP ERC will provide technical support/funding for web-based learning modules.

## **Organization Information**

**Why is your organization well situated to do this work, and what expertise do you bring that will allow you to carry out an effective HIA?**

CSPH is an academic institution that advocates for public health, educates current and future public health practitioners and is a trusted resource supporting public health in Colorado and the region. CSPH has institutional experience with community health advocacy, research, toxicology, environmental and occupational exposure assessment, risk assessment, risk communication, and education. CSPH has established academic and public platforms to communicate HIA results, as well as to teach and inform students, community practitioners and the public about the use of HIA.

**What are the qualifications of the people who will do the work? Please attach resumes. Please limit the length of each resume to four pages.**

CSPH faculty and staff bring many areas of expertise:

Dr. Witter is involved in the study of gas development impacts on health and speaks and teaches on this topic at regional conferences. She led the CSPH WPLR.

Dr. Adgate has experience in exposure and risk assessment of community exposures to VOCs and particulates. He has trained students in risk assessment and has interests in public decision-making and risk communication.

Dr. Newman has experience with development of occupational/environmental health monitoring and assessment programs, toxicology, epidemiology, and environmental health education. Dr. Newman was heavily involved in the CSPH WPLR.

Kenneth Scott, MPH (occupational/environmental health focus), is Community Outreach Director for MAP ERC and has extensive ties in the public health community.

Kaylan Stinson, MSPH is a senior professional research assistant. She has experience in data acquisition/management/analysis; use of web- and video technologies; and preparation of online educational modules. She was a major contributor to the CSPH WPLR.

**Resume #1**

[people\\_resume1.pdf](#)

**Resume #2**

[people\\_resume2.pdf](#)

**Resume #3**

[people\\_resume3.pdf](#)

**Resume #4**

[people\\_resume4.pdf](#)

**Resume #5**

[people\\_resume5.pdf](#)

**What internal or external expertise must you assemble to carry out the work?**

We will work with external database experts from applicable agencies to access and interpret exposure and health databases.

We will form an internal advisory committee, with the responsibilities of reviewing the HIA at planning, analysis, recommendation/report and evaluation stages. Members will include Richard Hamman, MD, DrPH (Dean of CSPH); and Steve Reynolds, PhD and Peter Chen, PhD, both CSPH faculty at Colorado State University.

**Who are the committed partners, and how will the skills and expertise of each partner contribute to your organization's capacity to undertake this HIA? Please attach any applicable partner resumes. Please limit the length of each resume to four pages.**

We have a strong partnership with Garfield County Environmental Health. Jim Rada, Environmental Health Manager, has 30 years experience as an Environmental Health specialist at the county health department level. Mr. Rada has established strong relationships with all stakeholder groups in Garfield County and GCBOCC, brings strong experience with gas operations, local exposure monitoring, and is considered a regional leader on the topic of gas development and health.

**Partner Resume #1**

[partner\\_resume1.pdf](#)

**Partner Resume #2**

[partner\\_resume2.pdf](#)

**Partner Resume #3**

[partner\\_resume3.pdf](#)

**Partner Resume #4**

[partner\\_resume4.pdf](#)

**What previous experience, if any, do the applicant and partner organizations have with HIA?**

CSPH and GCPH do not have formal experience with HIA as a comprehensive tool, but have significant experience with many aspects of the HIA process, including: outreach; exposure/health data acquisition/assessment/analysis; public health advocacy; risk communication.

**What plans, if any, does the applicant have for maintaining or continuing to build an HIA program at the conclusion of the grant, and how would you sustain these efforts?**

CSPH will be in a position to build an HIA program as part of the school, teach HIA methods and consult with other faculty and government agencies on future HIAs. The CSPH CPHP has experience disseminating training to state and regional public health professionals. The MAP ERC is also a platform for consulting and teaching HIA methods. GCPH is anticipating the use of HIA for future development projects within the county and can provide leadership for other counties.

## **Timeline**

**Project Narrative Timeline**

[project\\_narrative\\_timeline.pdf](#)

## **Additional Resources**

**Additional Resources File #1**

[additional1.pdf](#)

**Additional Resources File #2**

[additional2.pdf](#)

**Additional Resources File #3**

[additional3.pdf](#)

**Additional Resources File #4**

[additional4.pdf](#)

**Additional Resources File #5**

[additional5.pdf](#)

## **Project Budget**

### **Budget**

**Please attach the completed revenue worksheet and budget form here.**

[revenue\\_worksheet\\_and\\_budget\\_form.xls](#)

**Please attach the completed budget narrative here.**

[budget\\_narrative.pdf](#)

## **Supporting Documents**

# **Audited Financial Statements**

## **Year 1**

[audited financial statement\\_year1.pdf](#)

## **Year 2**

[audited financial statement\\_year2.pdf](#)

## **Year 3**

[audited financial statement\\_year3.pdf](#)

# **Board List**

**Attach Board List Here**

[board\\_list.pdf](#)

# **IRS Status**

**501 (c)(3) IRS Documentation Letter**

[irs\\_documentation.pdf](#)

**IRS Name Change Document**

[irs\\_name\\_change.pdf](#)

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