

**BEFORE THE OIL AND GAS CONSERVATION COMMISSION  
OF THE STATE OF COLORADO**

IN THE MATTER OF THE TERMINATION	)	CAUSE NO. 1
OF COALBED METHANE OPERATIONS IN	)	
THE NORTHERN RATON BASIN,	)	
HUERFANO COUNTY, COLORADO	)	ORDER NO.

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**APPLICATION**

Petroglyph Energy, Inc. ("PGEI"), by and through its undersigned attorneys, petitions the Commission for an order regarding the termination of its coalbed methane ("CBM") operations in the Northern Raton Basin, Huerfano County, Colorado.

**Background**

In June 2007, indications of possible methane migration in the Poison Canyon Formation, a shallow aquifer in the area of PGEI's CBM operations were brought to the attention of the COGCC. On July 10, 2007, COGCC staff met with PGEI to discuss potential threats to public health, safety, welfare, including impacts to domestic water wells, as well as potential mitigation strategies. PGEI agreed to provide water to affected households, install methane detectors in affected residences, assist in surveying water wells in the area for methane, and review operating well records. On July 20, 2007, after further discussions with COGCC staff, PGEI voluntarily and temporarily shut-in 52 CBM wells in the general area of the River Ridge Ranch subdivision.

During August and September, 2007, PGEI and its third party contractor, Norwest Questa Engineering Corporation ("Questa") collected and analyzed data pursuant to a methane investigation, monitoring, and mitigation plan ("MIMMP") developed by Petroglyph, Questa, and the COGCC staff to assess potential migration pathways into, and mitigation methods for, the Poison Canyon Formation and domestic water wells supplied by the aquifer.

On October 16, 2007, the COGCC issued its Order 1C-4 in this matter, pursuant to which PGEI was enjoined from returning to production its CBM wells for a period of 30 days to allow PGEI and the COGCC staff additional time to analyze data and discuss issues related to methane impacts, pursuant to the MIMMP. This order was followed, on November 14, by Order 1C-5, under which PGEI was ordered to cease and desist returning to production its CBM wells until such time as PGEI applies for and receives a public hearing before the Commission and demonstrates to the Commission's satisfaction that it can return its wells to production in a manner that protects public health and safety.

Over the course of the next few months, PGEI continued its activities pursuant to the MIMMP, and on January 15, 2008, the Commission issued its Order 1C-6. Order 1C-6 incorporates Order 1C-5 and, among other things:

- Finds that Petroglyph has endeavored to address the unanticipated migration of gas into the shallow aquifer by (a) voluntarily shutting in 52 gas wells in July, 2007, upon discovery of the methane migration problem; (b) conducting substantial efforts to identify the source of the methane migration, including helicopter and ground surveys, collection of data from impacted water wells, and re-entering a well that was plugged and abandoned by another operator; (c) offering to supply methane detection monitors to impacted homeowners, along with appropriate safety instructions should a methane alarm occur; (d) monitoring impacted domestic water wells and offering to arrange for water delivery service; (e) providing handheld methane detection equipment to local fire departments and supplying such departments with 24-hour emergency contact information; (f) employing hydrology and reservoir engineering consultants to evaluate options for mitigation of the methane migration problem; and (g) cooperating with COGCC staff in investigating the methane migration problem and evaluating mitigation alternatives.
- Finds that time is of the essence in implementing a program of activities to address and remediate the short and long term impacts to public health, safety and welfare that have arisen as a result of unanticipated gas migration into the shallow aquifer.
- Finds that the MIMMP is designed to protect public health, safety and welfare by (a) providing data and information that will enable refined characterization of the shallow aquifer, including the mechanism of gas migration; (b) establishing a barrier to the further migration of gas in the shallow aquifer; and (c) mitigating the presence of gas in the impacted areas of the shallow aquifers, near the outcrop, and elsewhere in the area of investigation where gas seeps occur in both the short and long term by a program of containment and methane removal.
- Finds that implementing the MIMMP in a phased, systematic way may result in the beneficial production of gas as an energy supply, while protecting public health, safety, welfare and the environment.

The MIMMP entails three phases:

1. Phase One – Aquifer data acquisition and characterization; initiation and testing of the methane removal system; baseline data monitoring. This program entails the drilling, completion, testing and operation of a monitor well; three or four methane removal wells; and approximately eight wells designed to create a hydraulic barrier to methane migration in the shallow aquifer. Data acquired by the installation and operation of these wells will be utilized to refine the characterization of the shallow aquifer that has been impacted by gas migration, including a simulation model. The withdrawal and injection of water from the shallow aquifer will be initiated, and the system will be tested and evaluated, along with an associated

methane stripping system. Activities during this phase will also include monitoring of surrounding domestic water wells (including, but not limited to, initial testing within one month of the initiation of Phase One of all water wells within one mile of the outer edge of the hydraulic barrier for dissolved methane), as well as baseline monitoring of gas seeps along the outcrop of the Vermejo coal formation and seeps located elsewhere in the area of investigation, and the development of proposals for mitigating impacts to all aquifers, wells, and seeps outside the hydraulic barrier.

2. Phase Two – Initiation of hydraulic barrier and full operation of methane removal system. This program entails injecting water produced from the Vermejo coal formation into the hydraulic barrier wells, pursuant to which Petroglyph is authorized to reactivate up to four of its CBM wells, the selection of which shall be done in consultation with COGCC staff, to obtain the necessary make-up water. Upon establishment of the hydraulic barrier to methane migration, the methane removal system from the shallow aquifer will be put into full operation. Continuous monitoring of water injection rates, downhole pressures, water production and methane removal rates will be conducted. Surrounding domestic water wells will be monitored for any change in methane production, as will the gas seeps along the outcrop and seeps located elsewhere in the area of investigation. In addition, Petroglyph will initiate mitigation of impacts to all aquifers, wells, and seeps outside the hydraulic barrier to the extent deemed necessary by the results of Phase One.
3. Phase Three – Long term methane removal from the Vermejo coal formation; remediation of shallow aquifer, and identification of methane migration pathway. The initiation of Phase Three must be affirmatively approved by the Commission. This program entails reactivation of all 52 Vermejo coalbed methane gas wells, and ongoing monitoring, as outlined for Phases One and Two. It also entails ongoing calibration of the shallow aquifer simulation model, utilizing gas and water production, pressure and chemical data. Upon identification of the methane migration pathway, a plan for closure of such pathway, if technically feasible and economically practicable, shall be developed and submitted to the COGCC staff for approval. In addition, the potential of using produced water from the Vermejo coal formation to mitigate gas seepage along the outcrop will be assessed, as will the potential for installation of a gas collection system at the outcrop.

In support of its Application, PGEI states:

1. PGEI has been engaged in Phases One and Two of the MIMMP since 2008, and has successfully completed the required activities. At this time, PGEI is in the position of having to decide whether to request that the Commission approve the commencement of Phase Three, which includes returning its CBM wells to production.
2. Since 2008, certain changes have occurred in relevant Colorado case law and statutes regarding withdrawal of produced water, as well as with respect to

regulatory parameters for the surface discharge of produced water. These changes entail significant expenditures prior to resuming CBM operations.

3. In addition, PGEI currently has more attractive investment opportunities in other areas of the Mountain West.

4. Accordingly, PGEI has decided to terminate its CBM operations in the Northern Raton Basin.\*

5. PGEI proposes to plug and abandon its CBM wells, as well as certain ancillary wells drilled pursuant to the MIMMP that are under the jurisdiction of the Office of the State Engineer and EPA Region 8, by cementing the wellbores from total depth to surface, thereby isolating the Vermejo coal formation from the Poison Canyon Formation.

6. During this process, which PGEI anticipates to take 6-9 months, PGEI will continue its monitoring activities and monthly reports to the COGCC, and will continue to operate the Phase Two hydraulic barrier and methane removal system in the Poison Canyon Formation.

7. The final CBM well to be plugged and abandoned will be the supply well for the Poison Canyon injection well system, at which point the Phase 2 hydraulic barrier and methane removal system will be shut-down.

8. Surface equipment will be removed, and final reclamation conducted in accordance with COGCC Rule 1004.

9. While there are no specifically-identified interested parties in this matter under the COGCC rules, PGEI has conducted a program of outreach to the homeowners association of the River Ridge Ranch subdivision and surrounding landowners, and to local officials (see press release attached to this application).

10. PGEI agrees to be bound by the oral order of the Commission.

Upon successful conclusion of the above described activities, PGEI requests that, with certain exceptions described below, it be relieved of further obligations pursuant to the MIMMP and Order 1C-6.

(a) Wellhead (or vent) gas composition monitoring (quarterly for 12 months following cessation of Phase 2) of the following wells (or vents):

Houghtling  
Hopke  
Barrett  
Smith  
Bergman

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\* PGEI retains a leasehold position of some 65,000 acres in Huerfano County, and may pursue deeper formations at a future date.

Angely  
Bounds  
Bruington

(b) Water level monitoring (quarterly for 12 months following cessation of Phase 2) of the following wells:

Bruington  
Golden Cycle Land (Goemmer #1)  
Bergman  
Angely

(c) Gas flux follow-up survey (once 8-12 months following cessation of Phase 2) of Seep 643 and Seep 644.

(d) Water Quality follow-up sampling and analysis (frequency and duration to be determined in consultation with COGCC staff) of the Angely water well.

WHEREFORE, PGEI respectfully requests that this matter be set for hearing in June 2011, that notice be given as required by law, and that upon such hearing this Commission enter its order consistent with PGEI's petition as set forth above.

Dated this \_\_\_\_ day of April, 2011.

**BEATTY & WOZNIAK, P.C.**

By: \_\_\_\_\_  
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## VERIFICATION

STATE OF IDAHO )  
 )  
COUNTY OF \_\_\_\_\_ ) SS.

Paul R. Powell, of lawful age, being first duly sworn upon oath, deposes and says that he is Executive Vice President and COO of Petroglyph Energy, Inc. and that he has read the foregoing Application and that the matters therein contained are true to the best of his knowledge, information and belief.

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Paul R. Powell

Subscribed and sworn to before me this \_\_\_\_\_ day of April, 2011.

Witness my hand and official seal.

My commission expires:\_\_\_\_\_

Notary Public