

PENNACO ENERGY

A Wholly Owned Subsidiary Of Marathon Oil Company

June 19, 2006

RECEIVED
JUN 22 2006

Ms. Kathy Shreve, Senior Environmental Analyst
WDEQ-WQD
122 West 25th Street,
Herschler Building, 4-W
Cheyenne, Wyoming 82002

Re: **LS Draw - Spotted Horse WY0039721 WYPDES Permit Renewal Application**
Pennaco Energy, Inc.

Dear Ms. Shreve,

Pennaco Energy, Inc. (Pennaco) respectfully submits the enclosed WYPDES permit renewal application for its LS Draw - Spotted Horse Coal Bed Natural Gas (CBNG) facility, presently permitted under WYPDES permit WY0039721. This application is being filed under Option 2, "surface discharge to Class 2 or 3 receiving stream of the Powder River or Little Powder Rivers (Class 2ABWW)." Included in this permit renewal application are the following:

- WYPDES Permit Application for CBNG Water Discharge
- Permit Tables 1A and 1B: Outfall Information
- Permit Table 2: Well Information
- Water Balance Calculations with Flow Data Table
- Mixing Analysis
- Compliance Evaluation Letter with Exceedance Summary Table
- Representative Water Quality
- Permit Application Map

Under this WYPDES permit application, Pennaco will be producing CBNG water from up to 47 wells (listed in Table 2) and discharging into unnamed, class 3B, ephemeral tributaries of Spotted Horse Creek through three (3) on-channel outfalls. With this permit renewal application, Pennaco respectfully requests the following:

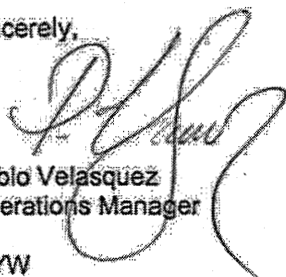
- Update Outfall 001 to its 'as-built' location shown on Table 1A and 1B.
- Retain the permitted flow of 0.13 MGD.
- Raise the dissolved chloride limit to current basin standard of 150 mg/L.
- Update the pH limit to 6.5 - 9.0 s.u.
- Remove routine monitoring and limit requirements for manganese.
- If applicable for associated drainage and permit conditions, remove routine monitoring and limit requirements for sulfate.
- If applicable for associated drainage, reduce monitoring of bicarbonate as HCO_3 from monthly to annual.
- If applicable for associated drainage, reduce monitoring of alkalinity as CaCO_3 from semi-annual to annual.

Pennaco is including two irrigation compliance points (ICPs) in this renewal as water quality monitoring stations to downstream irrigation. Pennaco is aware that according to recent WDEQ changes to water quality requirements associated with agricultural land uses, a "term limit" will be initiated upon the renewal of this application regarding the removal of the ICPs. Additionally, an updated Section 20 evaluation may be submitted by the operator (or in conjunction with multiple operators) within this "term limit" requesting different effluent limits from those issued by the WDEQ for this particular drainage.

The representative water quality accompanying this submittal shows exceedance in total recoverable aluminum, total dissolved iron and radium 226. All three exceedances have been addressed by Pennaco, and steps taken to rectify the conditions are summarized in the attached Exceedance Summary Table.

If you have any questions or comments regarding this renewal application, please feel free to contact David Hill at our Gillette office, at the number and address above or at dhill@marathonoil.com; you may also contact Katie Scott of CBM Associates, Inc. at 307.742.4991 or kscott@cbmainc.com.

Sincerely,



Pablo Velasquez
Operations Manager

/YYW

Enclosures

cc: WDEQ-(2)

Pennaco Energy, Inc. - file
CBM Associates, Inc. - file

SUBMIT IN TRIPLICATE

**WYOMING POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR PERMIT TO SURFACE DISCHARGE PRODUCED
WATER FROM COAL BED METHANE NEW DISCHARGES, RENEWALS, OR
MAJOR MODIFICATIONS**

Revised 12-19-03

FOR AGENCY USE ONLY

Application Number

WY00 _____

Date Received

(mo/day/yr)

PLEASE PRINT OR TYPE

1. Check the box corresponding to the type of application being applied for

☐ New CBM permit

☒ CBM permit renewal

Permit Number **WY0039721**

☐ CBM permit major modification

Permit Number

2. Select a permit option:

☐ Option 1A - complete containment to an off-channel man made unit(s) (Class 4C), no discharge allowed to surface waters of the state outside the containment unit.

☐ Option 1B - complete containment to a natural closed basin or playa lake (class 3A), no discharge allowed to surface waters of the state outside the basin or playa.

☐ Option 2 - surface discharge to class 2 or 3 receiving stream of the Belle Fourche River or Cheyenne River drainage (class 2ABWW).

☒ Option 2 - surface discharge to class 2 or 3 receiving stream of the Powder River or Little Powder Rivers (class 2ABWW).

☐ Option 2 - surface discharge to class 2 or 3 receiving streams of the Tongue, Clear Creek, or Crazy Woman Creek (class 2AB) - this option requires the permittee to demonstrate that quality of the effluent at the discharge point is equal to or better than the ambient quality of the perennial class 2 receiving water.

3. Name, mailing address, e-mail address, location and telephone number of the individual or company which owns the facility producing the discharge.

Name: **Pennaco Energy, Inc.**
Address: **3601 Southern Drive**
City/State/Zip: **Gillette, WY 82718**
Attention: **David Hill**
Telephone: **(307) 685-5105**
E-Mail: **Dhill@marathonoil.com**

4. Name(s) and mailing address(es) of owner(s) of the surface rights on whose land the discharge occurs (in cases where the land is owned by the state or federal government but surface rights are leased to a private individual, give lessee's name and address).

Please see attached Land Owner List.

5. Name of the facility producing the discharge (this is the facility name that will appear on the WYPDES permit. It is not necessary to name every well contributing to this facility's discharge in this section).

LS Draw - Spotted Horse

6. For Option 1A or 1B permit, attach a water balance that demonstrates, considering total maximum projected discharge inflows, natural precipitation, evaporation and infiltration, that the containment unit will be adequately sized to contain all projected discharge and stormwater runoff from a 100 year, 24 hour storm event. If actual flow rates are available, use the maximum flow rate from all active wells within the previous six months of operation in the water balance.

Not applicable. This is an Option 2 permit.

7. For an Option 2 permit utilizing on-channel reservoirs, attach a water balance and mixing analysis documenting the amount of CBM discharge that, under normal operating conditions, can be contained within the reservoirs, the amount and circumstances under which the reservoirs will discharge, and the expected water quality upon discharge from the reservoirs.

On-channel reservoirs and containment of CBNG produced water is not part of the water management strategy for this facility. However, water balance calculations of CBNG discharge and stream losses are included with this permit renewal to show that CBNG discharge will not reach the Powder River under normal operating conditions. A mixing analysis also accompanies this permit renewal application and demonstrates minimal or no impact to downstream water quality during storm events of various magnitude.

8. Attach a description and a clear, legible, detailed topographic map of the discharging facility. Include the following:

- a. A legend
- b. Well locations
- c. Ponds - None associated with this permit.
- d. Reservoirs - None associated with this permit.
- e. Stock tanks - Not pertinent to the water management strategy.
- f. Discharge points (outfalls)
- g. Immediate receiving streams
- h. Water quality monitoring stations
- i. Irrigation compliance points
- j. Location of nearest downstream irrigator
- k. Section, Township, and Range information

(If any of the above are not applicable please indicate in the description and include a brief explanation as to why the item is not applicable)

Please see attached Permit Application Map for items a, b, f, g, h, i, j, and k.

9. Describe the control measures that will be implemented to prevent significant damage to or erosion of the receiving water channel at the point of discharge.

The outfalls associated with this permit have been constructed on topography that gradually slopes towards the receiving channels. Erosion control structures such as rip-rap and/or geotextiles have been installed where necessary.

10. Describe the control measures that will be implemented to achieve water quality standards and effluent limits. If proposing to utilize a treatment process, provide a detailed description of the treatment process, including, but not limited to: Water quality analyses demonstrating the effluent quality before and after treatment; waste stream volumes and planned method of disposal; aquatic life toxicity data for any chemicals being used in the treatment process; description of how the chemicals will be handled at the facility and the potential for any impacts to waters of the state in the event of a spill; and diagrams of the facility indicating the water treatment path. Additional sheets and diagrams may be attached.

No active water treatment is planned. However, passive treatment methods such as aeration and settling may be implemented where necessary to reduce concentrations of trace metals.

11. Outfall locations must be established as part of a preliminary field reconnaissance survey using GPS or conventional survey equipment and documented in Table 1. Please document the type of equipment used, the expected accuracy of your measurements, and a brief rationale for locating the outfalls at the requested sites below.

Outfall locations were selected based on topography and landowner needs. The site coordinates were obtained by field personnel using handheld GPS units with accuracies ranging from 15 to 60 feet.

12. Complete the attached Table 1. Provide all the information in the table for each proposed discharge point or monitoring point. If proposing changes (a major modification) to an existing facility, clearly indicate the desired changes on the table. Additional tables may be attached. Use the format provided.

Please see attached Tables 1A and 1B: Outfall Information. Table 1A highlights the requested modifications while Table 1B summarizes the outfall and water quality monitoring station locations following the requested alterations.

13. Complete the attached Table 2. Provide all the information in the table for each well associated with this proposed discharge authorization. If proposing changes (a major modification) to an existing facility, clearly indicate the desired changes on the table. Additional tables may be attached. Use the format provided.

Please see attached Table 2: Well Information. There are no modifications to the well list for this renewal.

14. Provide the results of water analyses for a sample collected from a location representative of the quality of the water being proposed for discharge for the 25 chemical parameters listed below. The sample must be collected from a well or wells within at least a twenty mile radius of the proposed facility's location, and from the same coal formation(s) and same approximate depth(s) as proposed in this application. If filing an application for a permit renewal or modification, the representative sample must be collected from the facility being proposed for renewal or modification. Explain why this sample is representative of the produced water to be discharged.

Samples from co-mingled coal seams are acceptable as long as the sample(s) meet the following criteria:

- A. all of the coal seams being proposed for development are represented in the co-mingled sample,*
- B. the ratio of each coal seam's contribution is approximately the same in the sample and the proposed development,*
- C. documentation is provided to verify the criteria listed in A. and B.*

Please refer to the following sample identification table and the corresponding lab analyses attached for representative water quality.

SAMPLE ID	SAMPLE SOURCE	QTR/QTR	SEC	TWP	RNG	FORMATION
DP WY0039721 001 TP	Outfall 001	SESE	19	56	75	Canyon, Cook & Wall

The analyses must be conducted in accordance with approved EPA test procedures (40 CFR Part 136). Include a signed copy of your lab report that includes the following:

- detection limits
- results of each of the 25 chemical parameters at the chemical state given below
- quarter/quarter, section, township and range of the sample collection location
- time and date of sample collection
- time and date of analysis for each parameter
- Analyst's initials for each parameter
- Detection limit for each parameter as achieved by the laboratory
- WYPDES permit number and outfall number, where the sample was collected
- Origin of produced water (coal seam)

If more than one coal seam is being proposed for development, the permittee must submit a lab analysis and complete information characterizing water quality from each coal seam being proposed for development. If the permittee is proposing to include discharges from a coal seam not previously developed at this facility, the permittee must submit a lab analysis and complete information characterizing water quality from the new coal seam being proposed for development. Analyses must be provided in the units listed below.

Parameter* (See notes following the table on chemical states)	Required Detection Limits and Required Units
Alkalinity, Total	1 mg/l as CaCO ₃
Aluminum, Total Recoverable	50 µg/l
Arsenic, Total	1 µg/l
Barium, Total	100 µg/l
Bicarbonate	10 mg/l
Cadmium, Dissolved	5 µg/l
Calcium, Total	50 µg/l, report as meq/l
Calcium, Total	50 µg/l, report as mg/l
Chlorides	5 mg/l
Chlorides	5 mg/l
Copper, Dissolved	10 µg/l
Dissolved Solids, Total	5 mg/l
Hardness, Total	10 mg/l as CaCO ₃
Iron, Dissolved	50 µg/l
Lead, Dissolved	2 µg/l
Magnesium, Total	100 µg/l, report as meq/l
Magnesium, Total	100 µg/l, report as mg/l
Manganese, Dissolved	50 µg/l

Parameter* (See notes following the table on chemical states)	Required Detection Limits and Required Units
Alkalinity, Total	1 mg/l as CaCO ₃
Mercury, Dissolved	1 µg/l
pH	to 0.1 pH unit
Radium 226, Total	0.2 pCi/l
Selenium, Total Recoverable	5 µg/l
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Total	100 µg/l, report as meq/l
Sodium, Total	100 µg/l, report as mg/l
Specific Conductance	5 micromhos/cm
Sulfates	10 mg/l
Zinc, Dissolved	50 µg/l

*Discharges into drainages other than the Powder River geologic basin may require analysis of additional parameters, please contact the WDEQ for a separate list.

15. For new facilities, provide the expected (estimated) flow volume from each well in gallons per day, and provide the rationale behind the flow volume estimate. For existing facilities, provide actual flow data from all wells within the last six months.

Flow: 1,654.67 gpd/well.

Rationale: The above flow rate is based on actual facility production volumes measured in the second semester of 2005. Flow data for the second semester of 2005 is included in the Water Balance Calculations. Pennaco requests that the original permitted flow of 0.13 MGD be retained for this renewal. The Water Balance Calculations show that CBNG discharge will not reach the ICPs nor the Powder River under normal operating conditions.

16. For applications for new facilities, are any of the required chemical constituents in the laboratory analysis present in concentrations above Wyoming Water Quality Standards?

Not applicable. This is an existing facility.

☐ Yes ☐ No

If the answer to question # 16 is yes, answer 16.a – 16.b below. If no, proceed to question 18.

a. Which constituents?

b. Has this constituent been addressed in the response to question 10?

17. For applications for existing facilities, has the facility ever exceeded permit limits or water quality standards?

☒ Yes ☐ No

If the answer to question # 17 is yes, answer 17.a - 17.c below. If no, proceed to question 18.

a. Which constituents?

Dissolved iron (Fe), total radium 226 (Ra 226), and total recoverable aluminum (Al)

b. Has the exceedance been addressed?

Yes

c. Describe how the exceedance is being addressed

Please refer to the attached Exceedance Summary Table which outlines sampling, mitigation, and compliance activities for the above constituents.

18. Is there active irrigation, (including but not limited to irrigation of cultivars or flood irrigation) in the drainage of the discharge?

☒ Yes

☐ No

If the answer to question #18 is yes, then documentation demonstrating one of the following must be provided:

- A. Effluent will meet SAR and specific conductance (EC) values that are equal or of better quality to ambient values in the mainstem or highest quality receiving stream; or
- B. Demonstrate that a higher level of EC and SAR at the point of irrigation diversion can be tolerated by irrigated soils and crops without a significant reduction in crop yield and soil quality permeability.

This information should include, but is not limited to the following:

- a. Location and description of irrigated crop land between the discharge points and mainstem, including maximum local tolerance thresholds to SAR, EC, and sodium of each crop.
- b. Description of irrigation practices including when and how frequent irrigation occurs.
- c. Soil characteristics for each area where irrigation occurs which includes: Classification of soils and soil type (i.e. sandy loam, clay, etc.), Composition of soils (% clay, silt, sand), Type of soils, texture and permeability.
- d. Baseline soil parameters in all actively irrigated areas which includes soil SAR, EC, Na, Mg, Ca, permeability, and exchangeable sodium percentage (ESP).
- e. Determine the maximum SAR and EC of water that can be applied to the least tolerant and most sensitive identified irrigated soil type and crop, which would not result in a short and/or long-term reduction in soil infiltration/permeability or yield.
- f. Provide the location (township, range, section, quarter/quarter and lat/long coordinates) of point(s) upstream from the first downstream point of irrigation diversion/use between the outfalls and mainstem and/or provide the location(s) of the irrigation diversion/use that requires the least flow to operate.
- g. An evaluation that demonstrates the proposed discharge will be in compliance with Section 20, Chapter 1 of the Wyoming Water Quality Rules and Regulations.
- h. If necessary to protect irrigated crops and/or soils, describe changes that must be made in traditional irrigation practices to protect downstream irrigation activities.
- i. A monitoring plan, if necessary to gauge changes in water/soil quality and make adjustments before substantial reduction in crop production and soil permeability would occur.
- j. Citations of reference for all the above information must be provided.

For question 18a-j, please refer to the following:

- Devon Energy's #WY0049212 Section 20 Evaluation for West Spotted Horse.
- October 2001 crop information - on file with WDEQ, extracted from personal communications with Dale Shaay, or visual reconnaissance in conjunction with the Three Horses project - latter references are taken from the "References for Establishment of SAR/EC Limits in the Powder River, Little Powder River, Tongue River, Belle Fourche River, and Cheyenne River Basins," created by the WDEQ.
- "Section 20 Evaluation - Spotted Horse Creek, north of Highway 14/16 Campbell County, Wyoming," dated September 20th, 2000, prepared by Applied Hydrology Associates Inc., Denver, Colorado.

19. Name(s) and address(es) of all downstream irrigators between the outfalls and mainstem must be provided.

Please see attached Downstream Irrigator List.

20. Section 40 CFR Part 435 Subpart E requires that the permittee document agricultural and wildlife uses of produced water. Provide documentation that the produced water will be used for agriculture or wildlife during periods of discharge. Agriculture and wildlife use includes irrigation, livestock watering, wildlife watering and other agricultural uses. Agricultural and wildlife use documentation includes (but is not limited to) a certified letter from a landowner(s), a formal written statement from a state, federal or local resource management agency, or a formal written statement with supporting documentation from a natural resources or environmental professional accompanied by the credentials of the natural resources or environmental professional. Agriculture and wildlife certification must be submitted for each outfall's discharge, and must have original signatures.

An Agriculture/Wildlife Use Statement is no longer required per Chapter 2, Appendix H(a)(i), Wyoming Water Quality Rules and Regulations.

I (CEO or other authorized person) certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief, such information is true, complete, and accurate. I am requesting 3 outfalls in this application.

Pablo Velasquez

Printed Name of Person Signing*

Signature

Operations Manager

Title*

Date

*All permit applications must be signed in accordance with 40 CFR Part 122.22, "for" or "by" signatures are not acceptable.

Section 35-11-901 of Wyoming Statutes provides that: Any person who knowingly makes any false statement, representation, or certification in any application ... shall upon conviction be fined not more than \$10,000 or imprisoned for not more than one year, or both.

Mail this application to:

WYPDES Permits Section
Department of Environmental Quality/WQ
122 West 25th Street, Herschler Building, 4W
Cheyenne, WY 82002

Please include unique footer information on each page of this application and on all supporting documentation using the following format:

Company Name: Year/Month/Day/NEW, MOD, RENEWAL/10 Digit HUC Code/Permit # (if a modification or renewal) or Application # (from this particular company) for that particular day

Land Owners

West, William and Marjorie
628 SA Road
Arvada, WY 82831
307-736-2237

Downstream Irrigators

Creswell, Robert W
Pee Gee Ranch
5802 15th Street N.
Arlington, VA 22205

Pritchard, Gordon
PeeGee Ranch
1255 Lower Powder River Road
Arvada, WY 82831
307-736-2327

West, William and Marjorie
628 SA Road
Arvada, WY 82831
307-736-2237

Odegard, Duane D.
6090 Hwy 14-16
Arvada, WY 82831
307-736-2245