Bill Barrett Corporation

May 8, 2007

Ms. Jennifer Zygmunt
WDEQ-WQD
122 West 25th Street, Herschler Building, 4-W
Cheyenne, Wyoming 82002

Re: BBC Dead Horse Creek WY0052299
WYPDES Permit Renewal Application
Bill Barrett Corporation

Dear Ms. Zygmunt,

Bill Barrett Corporation (BBC) respectfully submits the enclosed WYPDES permit renewal application for its BBC Dead Horse Creek Coal Bed Natural Gas (CBNG) facility, currently permitted under WYPDES permit WY0052299. Included in this permit renewal application are the following:

- WYPDES Permit Renewal Application
- Permit Tables 1A and 1B: Outfall Information
- Permit Table 2: Well Information
- Permit Table 3: Reservoir Information
- Permit Table 4: Bonding Information
- Proof of Bonding Documents
- Permit Table Table 5b: Water Balance
- Water Balance Explanation
- Flow Data Table
- Compliance Evaluation
- Representative Water Quality
- WQMS and Permit Application Maps

Under this WYPDES permit, BBC will be producing CBNG water from up to 74 wells and plans to discharge produced CBNG water from 5 outfalls into 7 reservoirs on tributaries to Dead Horse Creek (class 3B) which is tributary to the Powder River. Wells will be shared with outfalls 008, 011, and 012 from WYPDES permit WY0052221. Please see the attached map.

BBC requests that the permitted flow rate be maintained at 1.1 MGD for CBNG water

1901 ENERGY CT
SUITE 170
GILLETTE, WY 82718
P 307.685.4322
F 307.685.3488

EXHIBIT
tabbies 4

discharge. Please see the attached Table 5b which shows this facility's ability to manage the requested flow rate based on annual evaporation and seepage losses associated with the on-channel reservoirs. All CBNG water discharge will be contained in the on-channel reservoirs. BBC requests that water may discharge from upstream reservoirs into the two most downstream reservoirs, January (also known as 35-1) and Dead Horse. No discharge will occur from these reservoirs except in the case of a storm event.

BBC recognizes the presence of downstream irrigation. BBC requests to maintain ICP1 and the associated effluent limits for one year until a new Section 20 can be completed. Since the inception of this permit, no water has reached the ICP.

If you have any questions or comments regarding this renewal application, please feel free to contact me at (307) 685-4322 or at pmcelvery@billbarrettcorp.com; you may also contact Lawrence Boram of CBM Associates, Inc. at (307) 742-4991 or at lboram@cbmainc.com.

Sincerely,

Paul McElvery

Paul McElvery
Water Resources Engineer

/kas

Enclosures: Renewal Documents

cc: Bill Barrett Corp. - File
CBM Associates, Inc. - Laramie

For Agency Use Only
Application Number
WY00_____
Date Received:
_____ (mo/dav/vr)

SUBMIT ONE HARD COPY AND ONE ELECTRONIC COPY

WYOMING POLLUTANT DISCHARGE ELIMINATION SYSTEM

APPLICATION FOR PERMIT TO SURFACE DISCHARGE PRODUCED WATER FROM COAL BED METHANE NEW DISCHARGES, RENEWALS, OR MAJOR MODIFICATIONS

Revised: 06-22-06

PLEASE PRINT OR TYPE ***(Submission of illegible materials will result in return of the application to the applicant)***

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

   ☐ New CBM permit

   ☒ CBM permit renewal Permit number **WY0052299** Expiration Date: **11/30/2007**

   ☐ CBM permit major modification Permit number _____ Expiration Date: _____

2. Identify the river basin in which the discharge will occur:
   ☐ Belle Fourche ☐ Cheyenne ☒ Powder ☐ Little Powder ☐ Tongue

   ☐ Other (identify) _____

3. Select permit option(s): *if more than one option is selected, the applicant must describe which option applies to which outfall.*

   ☐ Option 1A – Discharge is contained within a class 4 water body: Containment within an off-channel pit (class 4C) **OR** containment within a headwater reservoir situated within a class 4 channel and capable of containing all effluent plus up to a 50-year / 24-hour storm event.

   ☐ Option 1B – Discharge is contained within a class 3 water body: Containment within a natural closed basin or playa lake (class 3A) **OR** containment within a headwater reservoir situated within a class 3 channel and capable of containing all effluent plus up to a 50-year / 24-hour storm event.

   ☒ Option 2 – This option includes any on-channel discharge (including discharge into an on-channel reservoir) that does not meet the impoundment requirements specified in options 1A or 1B above.

   If applying for outfalls under Option 2, will discharges from the facility proposed in this application require the use of assimilative capacity credits for salt and sodium in the Powder River?

   ☐ **Yes** ☒ **No All CBNG water discharge will be contained in the on-channel reservoirs. No discharge will occur from these reservoirs except in the case of a storm event.**

4. General Facility Location: **Township(s) 47N Range(s) 74, 75W**

   Immediate Receiving Stream(s) Dead Horse Creek; HUC 10 -1009020205

5. Name of the facility producing the discharge (this is the facility name that will appear on the WYPDES permit) **BBC Dead Horse Creek**

6. Company, Contact Name, mailing address, e-mail address, and telephone number of the individual or company which owns the facility producing the discharge, and the person (consultant) responsible for permit submission.

Company Contact Name **Paul McElvery**	*Consultant Contact Name* **Lawrence Boram**
Company Name **Bill Barrett Corporation**	*Company Name* **CBM Associates, Inc. - Laramie**
Mailing Address **1901 Energy Ct., Ste 170**	*Mailing Address* **920 East Sheridan Street**
City, State, and Zip Code **Gillette , WY 82718**	*City, State, and Zip Code* **Laramie, WY 82070**
Telephone Number **307- 685-4322**	*Telephone Number* **307-742-4991**
E-Mail Address **pmcelvery@billbarrettcorp.com**	*E-Mail Address* **lboram@cbmainc.com**

7. If submitting a major modification or permit renewal, please describe all requested permit modifications (i.e. add 2 outfalls, add 23 wells, move outfall 001 500 feet…):

    1. **Remove outfalls 001, 002, 004, 006, 007, 009, 010, 012, as shown in Table 1A. These outfalls were never constructed.**
    2. **Remove reservoirs 27-1 and 6-2, and add Dead Horse reservoir, as shown in Table 3.**
    3. **Remove 128 wells, as shown in Table 2.**
    4. **Remove ICP2, as shown in Table 1A.**
    5. **Maintain ICP1 and associated effluent limits and monitoring requirements for one year until the completion of a new Section 20.**
    6. **Update Water Quality Monitoring Stations (WQMS) to more accessible locations.**
    7. **Retain permitted flow limit of 1.1 MGD.**
    8. **Raise total radium limits to current basin standards: 60 pCi/L for initial sampling only. Outfalls are over 39 miles from the nearest Class 2 water and no concentration has ever exceeded 0.2 pCi/L.**
    9. **Replace total recoverable aluminum requirements with dissolved aluminum requirements. No detectable concentrations of total recoverable aluminum have ever been measured at these outfalls.**
    10. **As appropriate, raise the total recoverable arsenic limit to the new Water Quality Chapter 1 limit of 10 µg/L.**
    11. **Raise the dissolved chloride limit to current basin standard of 150 mg/L.**
    12. **Update the pH limit to 6.5 - 9.0 s.u..**
    13. **Remove routine monitoring and limit requirements for manganese.**
    14. **Remove initial and routine monitoring and limit requirements for total petroleum hydrocarbons.**
    15. **If applicable for associated permit conditions, remove routine monitoring and limit requirements for sulfate.**
    16. **If applicable for associated drainage, reduce monitoring of alkalinity as CaCO3 and bicarbonate as HCO3 from monthly to semi-annual.**

    ***NOTE:** Major modification applications requesting to increase the permitted flow for a facility will be processed as **RENEWALS**. Major modification applications for permits within six months of their expiration date will also be processed as **RENEWALS.**

8. 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, provide lessee's name and address)

Landowner #4 Name **Nisselius Ranch Company**	*Landowner #2 Name* **Marquiss, Opal E.** **Lessee of BLM land, NENW corner of S12-T47-R75**
Mailing Address **P.O. Box 3006**	*Mailing Address* **P.O. Box 668**
City, State, and Zip Code **Gillette, WY 82717**	*City, State, and Zip Code* **Gillette, WY 82716**

9. For all facilities relying on reservoirs of any type as part of their water management plan, complete the attached Table 5a (for option 1A or 1B facilities) and/or Table 5b (for option 2 facilities). The water budget should demonstrate, considering total projected discharge inflows, natural precipitation, evaporation and infiltration, the amount of the discharge that will be contained within the reservoirs, and the circumstances and volume of effluent that could potentially be discharged. If applying for an Option 1A or 1B permit, the water balance must demonstrate that the containment unit will be adequately sized to contain all projected discharge and storm water runoff from a 50 year, 24 hour storm event.

   Please see the attached Table 5b: Water Balance and Water Balance Explanation. Calculations show the ability of this facility to contain a requested flow rate of 1.1 MGD. BBC requests that water may discharge from upstream reservoirs into the two most downstream reservoirs, January (also known as 35-1) for outfall 003 and Dead Horse for all other outfalls. No discharge will occur from the most downstream reservoirs except in the case of a storm event.

10. For Option 2 facilities with planned reservoir releases to the Powder River, include analyses of expected water quality within the reservoirs. Reservoir water quality analyses must include all constituents, with the appropriate detection limits and units, listed in the table included with question #19 of this application.

    The water management strategy for this facility is full containment of CBNG discharge in reservoirs up to a storm event. There will be no planned reservoir releases to the Powder River.

11. 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 – **There are no off-channel impoundments being used with this facility.**
    - **d.** Reservoirs
    - **e.** Stock tanks – **Stock Tanks are 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
    - **l.** **If proposing to use class 4C off-channel pits,** include footprint outline of the proposed pits. To denote setback distance, include a distance marker from closest side of pit to the nearest water feature, floodplain, or stream alluvium. Identify latitude and longitude in decimal degrees (using a minimum of 6 decimal places) for each end point of the setback distance marker. **Off-channel pits are not being used with this facility.**

      Please see attached permit application map for a, b, d, f, g, h, i, j, and k.

    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)

12. 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.

BBC will construct erosion control structures at the outfall, such as rip-rap and/or geotextile membrane.

13. 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 description of the treatment process.

BBC will direct any discharge onto a rip-rap surface underlain by an impermeable geotextile. This will provide additional aeration to aid in the precipitation and trapping of iron, radium, and other salts from the produced CBNG water. New outfall construction practices are being utilized to maximize aeration and precipitation of iron and radium. Lined treatment paths are being extended to remove iron precipitates.

14. 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.

Outfalls have been or will be constructed at a site designated by the landowner. The site coordinates were obtained by the field personnel using handheld GPS units with accuracies ranging from 15 to 60 feet.

15. Complete the attached Table 1. Provide all the information requested 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. Option 2 permits, except those located in the Belle Fourche or Cheyenne River Basins, must include water quality monitoring station locations. Option 1B headwater reservoir discharges (reservoirs other than playa lakes capable of 50 year, 24 hour stormwater runoff containment) must include flow monitoring station locations. Option 1A and 1B permits must include containment unit monitoring station locations. Information related to reservoirs is only required if the facility's water management plan includes reservoir containment.

Please see attached Tables 1A and 1B: Outfall Information. Please note that several outfalls and one ICP were removed. Outfalls 003 and 005 are represented in as-built locations.

16. Complete the attached Table 2. Provide all the information requested 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. Please note that wells will be shared with outfalls 008, 011 and 012 on WYPDES permit WY0052221, as shown on the attached map. Also, BBC requests to remove 128 wells from the well list.

17. Complete the attached Table 3. Provide all the information requested in the table for each reservoir proposed for containment of CBM produced water. Specified locations refer to the approximate center of the reservoir. 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. Information related to reservoirs is only required if the facility's water management plan includes reservoir containment.

Please see attached Table 3: Reservoir Information. Please note the removal of two reservoirs and the addition of one reservoir.

18. Complete the attached Table 4. Provide all information requested in the table related to reservoir bonding requirements for each reservoir proposed for the containment of CBM produced water. If proposing any 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. Information related to reservoirs is only required if the facility's water management plan includes reservoir containment.

Please see attached Table 4: Reservoir Bonding.

19. 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 all of the chemical parameters listed in the table below. The sample must be collected from well(s) or outfall(s) within a twenty mile radius of the proposed facility's location, and from the same coal formation(s) and the 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.

Please see the attached lab analysis from outfall 003 of this facility. The analysis includes total recoverable aluminum instead of dissolved aluminum. As the total recoverable aluminum in this analysis is less than 50 ug/L, we can be certain that it meets the dissolved aluminum limit of 750 ug/L.

Sample ID	Sample Date	QTR/QTR	SEC	TWP	RNG	FORMATIONS
DP_WY0052299_003_ET40	02/26/2007	NENW	2	47N	75W	Big George/Wyodak

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, with no contribution from coal seams not being proposed for development at the new facility.
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.

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:

a. detection limits
b. results of each of the chemical parameters at the chemical state given below
c. quarter/quarter, section, township and range of the sample collection location
d. Time and date of sample collection
e. Time and date of analysis for each parameter
f. Analyst's initials for each parameter
g. Detection limit for each parameter as achieved by the laboratory
h. WYPDES permit number and outfall number, where the sample was collected.
i. Origin of produced water (coal seam and legal location of sample collection location)

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. A mixing analysis may be required if the representative water quality analysis from the new coal seam indicates that the inclusion of the new effluent source may result in degradation of existing effluent quality. 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, Dissolved	**50 µg/l**
Arsenic, Total Recoverable	**1 µg/l**

Parameter* (See notes following the table on chemical states)	Required Detection Limits and Required Units
Barium, Total Recoverable	100 µg/l
Bicarbonate	10 mg/l
Cadmium, Dissolved	5 µg/l
Calcium, Dissolved	50 µg/l, report as mg/l
Chlorides	5 mg/l
Copper, Dissolved	10 µg/l
Dissolved Solids, Total	5 mg/l
Fluoride, Dissolved	100 µg/l
Hardness, Total	10 mg/l as $CaCO_3$
Iron, Dissolved	50 µg/l
Lead, Dissolved	2 µg/l
Magnesium, Dissolved	100 µg/l, report as mg/l
Manganese, Dissolved	50 µg/l
Mercury, Dissolved	1 µg/l
pH	to 0.1 pH unit
Radium 226, Total Recoverable	0.2 pCi/l
Radium 228, Total Recoverable**	0.2 pCi/l
Selenium, Total Recoverable	5 µg/l
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Dissolved	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.*

***This parameter is only required for those discharges located within one stream mile of a class 2 water.*

20. 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: Maximum of 78,566 gpd
Rationale: Please see attached the Flow Data Table which contains actual flow data from September 2006 to February 2007.

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

☐ **YES** ☐ **NO Not applicable, this is an existing facility.**

If the answer to question # 21 is yes, answer 21.a. – 21.b below. If no, proceed to question 23.

a. Which constituents?

b. Has this constituent been addressed in the response to question 13?

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

☐ **YES** ☒ **NO**

If the answer to question 22 is yes, answer 22.a. – 22.c. If no, proceed to question 23.

a. Which constituents?

b. Has the exceedance been addressed?

c. Describe how the exceedance was addressed.

23. Is there active irrigation in the drainage downstream of the discharge? *(Please note that this response includes both artificially and naturally irrigated bottomlands as defined in the Draft Agricultural Use Protection Policy for the interpretation and implementation of Chapter 1, Section 20 of the Wyoming Water Quality Rules and Regulations).*

☒ **YES** ☐ **NO**

BBC recognizes the presence of downstream irrigation. BBC requests to maintain ICP1 and the associated effluent limits and monitoring requirements for one year until a new Section 20 can be completed. Since the inception of this permit, no water has reached the ICP.

For more information regarding the active irrigation, please see the Report to Accompany Phillips Petroleum Company NPDES Permit Application for 21 Mile Butte Mankin (West) Plan of Development (#WY0047821) submitted by WWC Engineering, January 2002.

If yes, at a minimum, the WYPDES Program requires submission of the following information:

1. Location(s) of irrigation diversions and/or sub-irrigated acreage;
2. Type(s) of Crops grown under irrigation;
3. Description of Irrigation Practices
4. A topographic map showing irrigated acreage, any structures, ownership of irrigated acreage.

In addition to the minimum information described above, the WYPDES Program may require additional information should the permittee request site-specific effluent limits protective of irrigation uses. Contact the WYPDES Program for more information regarding requirements for site-specific SAR, TDS, and EC limits.

24. Provide name(s) and address(es) for all downstream irrigators between the outfalls and the mainstem.

Irrigator #1 Name **Eric Barlow, Barlow Trust**	*Irrigator #2 Name (Irrigator Per Draft Dead Horse Creek Watershed Permit)* **Tom and Helen Jones, Blue Butte Ranch Partnership, LLC.**
Mailing Address **1625 Buffalo Cut Across Road**	*Mailing Address* **PO Box 58**
City, State, and Zip Code **Gillette, WY 82718-8801**	*City, State, and Zip Code* **Buffalo, WY 82834**

25. Provide a listing of all active permits or construction approvals received or applied for by the applicant for the site described in this permit application in accordance with *Chapter 2, Section 5.T. of the Wyoming Water Quality Rules and Regulations*

1. **Api numbers for wells, see Table 2**
2. **SEO permits for reservoirs, see Table 3**
3. **BLM Water Management Plan for the Beaver Creek POD, November 2004**
4. **SWPPP WYR102635 "Beaver Creek POD"**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am requesting 5 outfalls in this application.

*Printed Name of Person Signing**	*Title*
Paul McElvery	**Water Resources Engineer**
*Signature** Paul McElvery	*Date* 5-11-07

*All permit applications must be signed in accordance with *Section 14, Chapter 2 of the Wyoming Water Quality Rules and Regulations*, "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. Permittees are required to retain records of all data used to complete permit applications in accordance with *Chapter 2, Section 5, Part 5.V.vii of the Wyoming Water Quality Rules and Regulations.*

Mail this application to:

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

Permits issued under the WYDPES Program are subject to an annual 100$ permit fee for as long as permit is active. The annual billing cycle is based on the state's fiscal year from July 1 to June 30. There is no need to pay the fee with the application. All permit fees are invoiced after June 30th of each year.

Table 1A - Outfall Information: WY0052299 - BBC Dead Horse Creek

Desired Changes	Discharge Point (Outfalls) #	Immediate Receiving Stream	Mainstem	Distance to Closest 2AB Channel & Mainstem (Miles)	Quarter / Quarter	Section	Twn (N)	Rng (W)	Nad 83 Latitude	Nad 83 Longitude	County	Reservoir Name and Type
Removed	001	Tributary to Dead Horse Creek	Powder River	37.4	NENE	4	47	75	44.084656	-105.874516	Campbell	Res 27-1 on-channel reservoir
Removed	002	Tributary to Dead Horse Creek	Powder River	37.4	NENW	3	47	75	44.084447	-105.862306	Campbell	Res 27-1 on-channel reservoir
Moved From	003	Tributary to Dead Horse Creek	Powder River	40.75	NENW	2	47	75	44.083296	-105.843387	Campbell	2-1, January (AKA 35-1) on-channel reservoirs
Moved To	003	Tributary to Dead Horse Creek	Powder River	40.75	NENW	2	47	75	44.082831	-105.844545	Campbell	2-1, January (AKA 35-1) on-channel reservoirs
Removed	004	Tributary to Dead Horse Creek	Powder River	40.25	SWSE	2	47	75	44.074662	-105.839434	Campbell	2-1, January (AKA 35-1) on-channel reservoirs
	005	Tributary to Dead Horse Creek	Powder River	42	SWNW	1	47	75	44.080318	-105.827770	Campbell	P1-2, Dead Horse on-channel reservoirs
Removed	006	Tributary to Dead Horse Creek	Powder River	41.74	SWSW	1	47	75	44.072474	-105.826792	Campbell	P1-2 on-channel reservoir
Removed	007	Tributary to Dead Horse Creek	Powder River	41.9	NESE	1	47	75	44.077116	-105.813720	Campbell	Paint (AKA 1-1) on-channel reservoir
	008	Tributary to Dead Horse Creek	Powder River	42.65	NENW	12	47	75	44.070867	-105.822725	Campbell	P1-2, Dead Horse on-channel reservoirs
Removed	009	Tributary to Dead Horse Creek	Powder River	42.07	SWNW	12	47	75	44.067362	-105.827995	Campbell	P1-2 on-channel reservoir
Removed	010	Tributary to Dead Horse Creek	Powder River	42.92	NESE	12	47	75	44.063517	-105.814161	Campbell	P1-1, Paint (AKA 1-1) on-channel reservoirs
	011	Tributary to Dead Horse Creek	Powder River	43.37	SWNW	6	47	74	44.081138	-105.807402	Campbell	Little Red (AKA 6-1), Dead Horse on-channel reservoirs
Removed	012	Tributary to Dead Horse Creek	Powder River	42.7	SENW	6	47	74	44.079793	-105.803841	Campbell	Res 6-2
	013	Tributary to Dead Horse Creek	Powder River	43.27	SWSW	6	47	74	44.072905	-105.809237	Campbell	P1-1, Paint (AKA 1-1), Dead Horse on-channel reservoirs

Desired Changes	Station Name	Station Description	Quarter / Quarter	Section	Twn (N)	Rng (W)	Nad 83 Latitude	Nad 83 Longitude	Notes regarding water quality monitoring station types
Moved From	DPR	Downstream Powder River Water Quality Monitoring Station	NESE	32	50	77	44.256895	-106.147897	—
Moved To	DPR	Downstream Powder River Water Quality Monitoring Station	SWSE	32	50	77	44.256894	-106.147896	—
Maintain for one year	ICP1	Irrigation Compliance Point	SENE	27	48	75	44.110721	-105.852428	
Remove	ICP2	Irrigation Compliance Point	SWNW	27	48	75	44.118391	-105.861688	—
Moved From	TRIB1	Tributary Water Quality Monitoring Station on Dead Horse Creek	NESE	16	50	77	44.256890	-106.147901	—
Moved To	TRIB1	Tributary Water Quality Monitoring Station on Dead Horse Creek	NESE	16	49	77	44.217371	-106.118874	—
Moved From	UPR	Upstream Powder River Water Quality Monitoring Station	SWSW	17	49	77	44.215975	-106.155026	—
Moved To	UPR	Upstream Powder River Water Quality Monitoring Station	SWSW	17	49	77	44.215976	-106.155026	—

Please note that not all station types may be applicable for a particular facility. Additional spaces may be added if necessary. Use the format provided. Please denote reservoir type(s) - on channel, off-channel, playa, headwater Option 1B - in the appropriate column. Please note that reservoir information is not required if reservoir containment is not part of the facility's water management plan - for instance, information about existing "incidental" downstream reservoirs is not required.

Table 1B - Outfall Information as Permitted: WY0052299 - BBC Dead Horse Creek

Discharge Point (Outfalls) #	Immediate Receiving Stream	Mainstem	Distance to Closest 2AB Channel & Mainstem (Miles)	Quarter / Quarter	Section	Twn (N)	Rng (W)	Nad 83 Latitude	Nad 83 Longitude	County	Reservoir Name and Type
003	Tributary to Dead Horse Creek	Powder River	40.75	NENW	2	47	75	44.082831	-105.844545	Campbell	2-1, January (AKA 35-1) on-channel reservoirs
005	Tributary to Dead Horse Creek	Powder River	42.00	SWNW	1	47	75	44.080318	-105.827770	Campbell	P1-2, Dead Horse on-channel reservoirs
008	Tributary to Dead Horse Creek	Powder River	42.65	NENW	12	47	75	44.070867	-105.822725	Campbell	P1-2, Dead Horse on-channel reservoirs
011	Tributary to Dead Horse Creek	Powder River	43.37	SWNW	6	47	74	44.081138	-105.807402	Campbell	Little Red (AKA 6-1), Dead Horse on-channel reservoirs
013	Tributary to Dead Horse Creek	Powder River	43.27	SWSW	6	47	74	44.072905	-105.809237	Campbell	P1-1, Paint (AKA 1-1), Dead Horse on-channel reservoirs

Station Name	Station Description	Quarter / Quarter	Section	Twn (N)	Rng (W)	Nad 83 Latitude	Nad 83 Longitude	Notes regarding water quality monitoring station types
ICP1	Irrigation Compliance Point	SENE	27	48	75	44.110721	-105.852428	—
DPR	Downstream Powder River Water Quality Monitoring Station	SWSE	32	50	77	44.256894	-106.147896	—
TRIB1	Tributary Water Quality Monitoring Station on Dead Horse Creek	NESE	16	49	77	44.217371	-106.118874	—
UPR	Upstream Powder River Water Quality Monitoring Station	SWSW	17	49	77	44.215976	-106.155026	—

Please note that not all station types may be applicable for a particular facility. Additional spaces may be added if necessary. Use the format provided. Please denote reservoir type(s) - on channel, off-channel, playa, headwater Option 1B - in the appropriate column. Please note that reservoir information is not required if reservoir containment is not part of the facility's water management plan - for instance, information about existing "incidental" downstream reservoirs is not required.

Table 2 - Well Information: WY0052299 - BBC Dead Horse Creek

Well Number	Change	Well Name	API Number	Coal Seam	Well Depth	Location (QQ, Section, Township, Range)	Discharges to Outfall #*
*AWAO - All wells permitted to discharge to all outfalls							
001	—	Nisselius Ranch Fed 12-6-4774W	49-005-52307	Wyodak	1127	SWNW 6-47-74	AWAO
002	—	Nisselius Ranch Fed 12-6-4774BG	49-005-52310	Big George	1065	SWNW 6-47-74	AWAO
003	—	Nisselius Ranch Fed 14-6-4774W	49-005-52293	Wyodak	1094	SWSW 6-47-74	AWAO
004	—	Nisselius Ranch Fed 14-6-4774BG	49-005-52292	Big George	1097	SWSW 6-47-74	AWAO
005	—	Nisselius Ranch Fed 21-6-4774BG	49-005-52325	Big George	1192	NENW 6-47-74	AWAO
006	—	Nisselius Ranch Fed 21-6-4774W	49-005-52294	Wyodak	1088	NENW 6-47-74	AWAO
007	—	Nisselius Ranch Fed 23-6-4774BG	49-005-52324	Big George	1096	NESW 6-47-74	AWAO
008	—	Nisselius Ranch Fed 23-6-4774W	49-005-52295	Wyodak	1339	NESW 6-47-74	AWAO
009	—	Nisselius Ranch Fed 12-1-4775BG	49-005-52309	Big George	1148	SWNW 1-47-75	AWAO
010	—	Nisselius Ranch Fed 12-1-4775W	49-005-52308	Wyodak	1473	SWNW 1-47-75	AWAO
011	—	Nisselius Ranch Fed 14-1-4775BG	49-005-52322	Big George	1274	SWSW 1-47-75	AWAO
012	—	Nisselius Ranch Fed 14-1-4775W	49-005-52297	Wyodak	1592	SWSW 1-47-75	AWAO
013	—	Nisselius Ranch Fed 21-1-4775W	49-005-52298	Wyodak	1397	NENW 1-47-75	AWAO
014	—	Nisselius Ranch Fed 21-1-4775BG	49-005-52321	Big George	1028	NENW 1-47-75	AWAO
015	—	Nisselius Ranch Fed 23-1-4775BG	49-005-52320	Big George	1214	NESW 1-47-75	AWAO
016	—	Nisselius Ranch Fed 23-1-4775	49-005-52299	Wyodak	1532	NESW 1-47-75	AWAO
017	—	Nisselius Ranch Fed 32-1-4775W	49-005-52300	Wyodak	1473	SWNE 1-47-75	AWAO
018	—	Nisselius Ranch Fed 32-1-4775BG	49-005-52319	Big George	1161	SWNE 1-47-75	AWAO
019	—	Nisselius Ranch Fed 34-1-4775W	49-005-52301	Wyodak	1489	SWSE 1-47-75	AWAO
020	—	Nisselius Ranch Fed 34-1-4775BG	49-005-52318	Big George	1307	SWSE 1-47-75	AWAO
021	—	Nisselius Ranch Fed 41-1-4775W	49-005-52302	Wyodak	1476	NENE 1-47-75	AWAO
022	—	Nisselius Ranch Fed 41-1-4775BG	49-005-52316	Big George	1131	NENE 1-47-75	AWAO
023	—	Nisselius Ranch Fed 43-1-4775W	49-005-52303	Wyodak	1401	NESE 1-47-75	AWAO
024	—	Nisselius Ranch Fed 43-1-4775BG	49-005-52314	Big George	1000	NESE 1-47-75	AWAO
025	—	Nisselius Ranch Fed 12-2-4775W	49-005-52304	Wyodak	1207	SWNW 2-47-75	AWAO
026	—	Nisselius Ranch Fed 12-2-4775BG	49-005-52313	Big George	1315	SWNW 2-47-75	AWAO
027	—	Federal 14-2-4775W	Not Available	Wyodak	est. 1207	SWSW 2-47-75	AWAO
028	—	Federal 14-2-4775BG	Not Available	Big George	est. 1315	SWSW 2-47-75	AWAO
029	—	Nisselius Ranch Fed 21-2-4775W	49-005-52305	Wyodak	1195	NENW 2-47-75	AWAO
030	—	Nisselius Ranch Fed 21-2-4775BG	49-005-52312	Big George	1197	NENW 2-47-75	AWAO
031	—	Federal 23-2-4775BG	49-005-55731	Big George	1275	NESW 2-47-75	AWAO
032	—	Federal 23-2-4775W	Not Available	Wyodak	est. 1207	NESW 2-47-75	AWAO
033	—	Federal 32-2-4775BG	49-005-55732	Big George	1245	SWNE 2-47-75	AWAO
034	—	Federal 32-2-4775W	Not Available	Wyodak	est. 1207	SWNE 2-47-75	AWAO
035	—	Federal 34-2-4775BG	49-005-55733	Big George	1340	SWSE 2-47-75	AWAO
036	—	Federal 34-2-4775W	Not Available	Wyodak	est. 1207	SWSE 2-47-75	AWAO
037	—	Federal 41-2-4775BG	49-005-55734	Big George	1240	NENE 2-47-75	AWAO
038	—	Federal 41-2-4775W	Not Available	Wyodak	est. 1207	NENE 2-47-75	AWAO
039	—	Federal 43-2-4775BG	49-005-55735	Big George	1246	NESE 2-47-75	AWAO
040	—	Federal 43-2-4775W	Not Available	Wyodak	est. 1207	NESE 2-47-75	AWAO
041	Remove	Little Buffalo Fed 12-3-4775W	49-005-57088	Wyodak	5482	SWNW 3-47-75	AWAO
042	Remove	Little Buffalo Fed 12-3-4775BG	49-005-55736	Big George	1452	SWNW 3-47-75	AWAO
043	Remove	Little Buffalo Ranch 14-3-4775BG	49-005-54345	Big George	1385	SWSW 3-47-75	AWAO
044	Remove	Little Buffalo Ranch 14-3-4775W	49-005-53686	Wyodak	1687	SWSW 3-47-75	AWAO
045	Remove	Federal 21-3-4775W	49-005-57087	Wyodak	1782	NENW 3-47-75	AWAO
046	Remove	Federal 21-3-4775BG	49-005-55737	Big George	1320	NENW 3-47-75	AWAO
047	Remove	Little Buffalo Fed 23-3-4775W	49-005-57086	Wyodak	1655	NESW 3-47-75	AWAO
048	Remove	Little Buffalo Fed 23-3-4775BG	49-005-55738	Big George	1360	NESW 3-47-75	AWAO
049	Remove	Little Buffalo Fed 32-3-4775W	Not Available	Wyodak	est. 1614	SWNE 3-47-75	AWAO
050	Remove	Little Buffalo Fed 32-3-4775BG	49-005-55739	Big George	1384	SWNE 3-47-75	AWAO
051	Remove	Little Buffalo Ranch 34-3-4775BG	49-005-54347	Big George	1335	SWSE 3-47-75	AWAO
052	Remove	Little Buffalo Ranch 34-3-4775W	49-005-53679	Wyodak	1614	SWSE 3-47-75	AWAO
053	—	Nisselius Ranch Fed 41-3-4775BG	49-005-52311	Big George	1384	NENE 3-47-75	AWAO
054	—	Nisselius Ranch Fed 41-3-4775W	49-005-52306	Wyodak	1238	NENE 3-47-75	AWAO
055	Remove	Little Buffalo Fed 43-3-4775W	Not Available	Wyodak	est. 1614	NESE 3-47-75	AWAO
056	Remove	Little Buffalo Fed 43-3-4775BG	49-005-55740	Big George	1399	NESE 3-47-75	AWAO
057	Remove	Little Buffalo Fed 12-4-4775BG	49-005-55741	Big George	1380	SWNW 4-47-75	AWAO
058	Remove	Little Buffalo Fed 12-4-4775W	Not Available	Wyodak	est. 1620	SWNW 4-47-75	AWAO
059	Remove	Little Buffalo Ranch 14-4-4775BG	49-005-54364	Big George	1364	SWSW 4-47-75	AWAO
060	Remove	Little Buffalo Ranch 14-4-4775W	49-005-53685	Wyodak	1620	SWSW 4-47-75	AWAO
061	Remove	Little Buffalo Fed 21-4-4775BG	49-005-55742	Big George	1390	NENW 4-47-75	AWAO
062	Remove	Little Buffalo Fed 21-4-4775W	Not Available	Wyodak	est. 1620	NENW 4-47-75	AWAO
063	Remove	Little Buffalo Ranch 23-4-4775BG	49-005-54346	Big George	1377	NESW 4-47-75	AWAO
064	Remove	Little Buffalo Ranch 23-4-4775W	49-005-53684	Wyodak	1627	NESW 4-47-75	AWAO

Table 2 - Well Information: WY0052299 - BBC Dead Horse Creek

Well Number	Change	Well Name	API Number	Coal Seam	Well Depth	Location (QQ, Section, Township, Range)	Discharges to Outfall #*
*AWAO - All wells permitted to discharge to all outfalls							
065	Remove	Little Buffalo Fed 32-4-4775W	49-005-57663	Wyodak	1770	SWNE 4-47-75	AWAO
066	Remove	Little Buffalo Fed 32-4-4775BG	49-005-55877	Big George	1540	SWNE 4-47-75	AWAO
067	Remove	Little Buffalo Ranch 34-4-4775BG	49-005-54348	Big George	1621	SWSE 4-47-75	AWAO
068	Remove	Little Buffalo Ranch 34-4-4775W	49-005-53683	Wyodak	1621	SWSE 4-47-75	AWAO
069	Remove	Little Buffalo Fed 41-4-4775BG	49-005-55743	Big George	1435	NENE 4-47-75	AWAO
070	Remove	Little Buffalo Fed 41-4-4775W	49-005-57090	Wyodak	1710	NENE 4-47-75	AWAO
071	Remove	Little Buffalo Ranch 43-4-4775W	49-005-53682	Wyodak	1651	NESE 4-47-75	AWAO
072	Remove	Little Buffalo Ranch 43-4-4775BG	49-005-54349	Big George	1380	NESE 4-47-75	AWAO
073	Remove	Marquiss Fed 12-5-4775BG	49-005-57084	Big George	1354	SWNW 5-47-75	AWAO
074	Remove	14-5-4775W	Not Available	Wyodak	est. 1600	SWSW 5-47-75	AWAO
075	Remove	Marquiss 14-5-4775BG	49-005-58629	Big George	1258	SWSW 5-47-75	AWAO
076	Remove	23-5-4775BG	Not Available	Big George	est. 1258	NESW 5-47-75	AWAO
076	Remove	23-5-4775W	Not Available	Wyodak	est. 1600	NESW 5-47-75	AWAO
077	Remove	Marquiss Fed 32-5-4775BG	49-005-57083	Big George	1388	SWNE 5-47-75	AWAO
078	Remove	Marquiss Fed 32-5-4775W	Not Available	Wyodak	est. 1600	SWNE 5-47-75	AWAO
079	Remove	Marquiss 34-5-4775BG	49-005-58628	Big George	1345	SWSE 5-47-75	AWAO
080	Remove	34-5-4775W	Not Available	Wyodak	est. 1600	SWSE 5-47-75	AWAO
081	Remove	43-5-4775W	Not Available	Wyodak	est. 1600	NESE 5-47-75	AWAO
082	Remove	43-5-4775BG	Not Available	Big George	est. 1388	NESE 5-47-75	AWAO
083	Remove	Marquiss Federal 41-6-4775BG	49-005-57601	Big George	1412	NENE 6-47-75	AWAO
084	Remove	Little Buffalo Fed 12-9-4775W	49-005-58438	Wyodak	1673	SWNW 9-47-75	AWAO
085	Remove	Little Buffalo Fed 12-9-4775BG	49-005-55785	Big George	1262	SWNW 9-47-75	AWAO
086	Remove	Little Buffalo Fed 14-9-4775W	49-005-55204	Wyodak	1463	SWSW 9-47-75	AWAO
087	Remove	Little Buffalo Fed 14-9-4775BG	49-005-55203	Big George	1149	SWSW 9-47-75	AWAO
088	Remove	Little Buffalo Fed 21-9-4775BG	49-005-55744	Big George	1282	NENW 9-47-75	AWAO
089	Remove	Little Buffalo Fed 21-9-4775W	49-005-57082	Wyodak	1610	NENW 9-47-75	AWAO
090	Remove	Little Buffalo Fed 23-9-4775W	49-005-55205	Wyodak	1617	NESW 9-47-75	AWAO
091	Remove	Little Buffalo Fed 23-9-4775BG	49-005-55745	Big George	1212	NESW 9-47-75	AWAO
092	Remove	Little Buffalo Fed 32-9-4775W	49-005-57105	Wyodak	1550	SWNE 9-47-75	AWAO
093	Remove	Little Buffalo Fed 32-9-4775BG	49-005-55206	Big George	1232	SWNE 9-47-75	AWAO
094	Remove	Little Buffalo Fed 34-9-4775W	49-005-55208	Wyodak	1456	SWSE 9-47-75	AWAO
095	Remove	Little Buffalo Fed 34-9-4775BG	49-005-55207	Big George	1168	SWSE 9-47-75	AWAO
096	Remove	Little Buffalo Fed 41-9-4775W	49-005-57104	Wyodak	1615	NENE 9-47-75	AWAO
097	Remove	Little Buffalo Fed 41-9-4775BG	49-005-55746	Big George	1295	NENE 9-47-75	AWAO
098	Remove	Big George 43-9-4775BG	49-005-55209	Big George	1229	NESE 9-47-75	AWAO
099	Remove	Little Buffalo Fed 43-9-4775W	49-005-55210	Wyodak	1501	NESE 9-47-75	AWAO
100	Remove	Little Buffalo Fed 14-10-4775BG	49-005-55211	Big George	1272	SWSW 10-47-75	AWAO
101	Remove	Little Buffalo Fed 14-10-4775W	49-005-55212	Wyodak	1552	SWSW 10-47-75	AWAO
102	Remove	Little Buffalo Fed 23-10-4775BG	49-005-55747	Big George	1219	NESW 10-47-75	AWAO
103	—	Little Buffalo Fed 23-10-4775W	49-005-57103	Wyodak	1523	NESW 10-47-75	AWAO
104	—	Little Buffalo Fed 32-10-4775BG	49-005-55748	Big George	1244	SWNE 10-47-75	AWAO
105	—	Little Buffalo Fed 32-10-4775W	49-005-57992	Wyodak	1540	SWNE 10-47-75	AWAO
106	—	Little Buffalo Fed 34-10-4775BG	49-005-55213	Big George	1245	SWSE 10-47-75	AWAO
107	—	Little Buffalo Fed 34-10-4775W	49-005-55214	Wyodak	1535	SWSE 10-47-75	AWAO
108	—	41-10-4775W	Not Available	Wyodak	est. 1535	NENE 10-47-75	AWAO
109	—	41-10-4775BG	Not Available	Big George	est. 1245	NENE 10-47-75	AWAO
110	—	Little Buffalo Fed 43-10-4775W	Not Available	Wyodak	est. 1535	NESE 10-47-75	AWAO
111	—	Little Buffalo Fed 43-10-4775BG	49-005-55749	Big George	1319	NESE 10-47-75	AWAO
112	—	Little Buffalo Fed 14-11-4775BG	49-005-55750	Big George	1283	SWSW 11-47-75	AWAO
113	Remove	Little Buffalo Fed 14-11-4775W	49-005-57102	Wyodak	1596	SWSW 11-47-75	AWAO
114	Remove	Little Buffalo Fed 21-11-4775BG	49-005-55751	Big George	1335	NENW 11-47-75	AWAO
115	—	Little Buffalo Fed 21-11-4775W	Not Available	Wyodak	est. 1596	NENW 11-47-75	AWAO
116	—	Little Buffalo Fed 23-11-4775BG	49-005-55752	Big George	1321	NESW 11-47-75	AWAO
117	—	Little Buffalo Fed 23-11-4775W	49-005-57993	Wyodak	1635	NESW 11-47-75	AWAO
118	—	Federal 12-12-4775BG	Not Available	Big George	est. 1204	SWNW 12-47-75	AWAO
119	—	Federal 12-12-4775W	Not Available	Wyodak	est. 1251	SWNW 12-47-75	AWAO
120	—	Federal 14-12-4775W	Not Available	Wyodak	est. 1251	SWSW 12-47-75	AWAO
121	—	Federal 14-12-4775BG	49-005-57100	Big George	1204	SWSW 12-47-75	AWAO
122	—	Federal 21-12-4775BG	49-005-52323	Big George	1731	NENW 12-47-75	AWAO
123	—	Nisselius Ranch Fed 21-12-4775W	49-005-52296	Wyodak	1251	NENW 12-47-75	AWAO
124	—	Nisselius Ranch Fed 23-12-4775BG	49-005-57099	Big George	1240	NESW 12-47-75	AWAO
125	—	Nisselius Ranch Fed 23-12-4775W	Not Available	Wyodak	est. 1251	NESW 12-47-75	AWAO
126	—	Nisselius Ranch Fed 32-12-4775W	Not Available	Wyodak	est. 1251	SWNE 12-47-75	AWAO
127	—	Nisselius Ranch Fed 32-12-4775BG	49-005-57098	Big George	1265	SWNE 12-47-75	AWAO
128	—						

Table 2 - Well Information: WY0052299 - BBC Dead Horse Creek

Well Number	Change	Well Name	API Number	Coal Seam	Well Depth	Location (QQ, Section, Township, Range)	Discharges to Outfall #*
*AWAO - All wells permitted to discharge to all outfalls							
129	—	Little Buffalo Fed 34-12-4775BG	49-005-57097	Big George	1349	SWSE 12-47-75	AWAO
130	—	Little Buffalo Fed 34-12-4775W	Not Available	Wyodak	est. 1251	SWSE 12-47-75	AWAO
131	—	Nisselius Ranch Fed 41-12-4775W	49-005-58004	Wyodak	1533	NENE 12-47-75	AWAO
132	—	Nisselius Ranch Fed 41-12-4775BG	49-005-58003	Big George	1152	NENE 12-47-75	AWAO
133	—	Nisselius Ranch Fed 43-12-4775BG	49-005-58005	Big George	1191	NESE 12-47-75	AWAO
134	—	Nisselius Ranch Fed 43-12-4775W	49-005-58006	Wyodak	1533	NESE 12-47-75	AWAO
135	Remove	Little Buffalo Fed 12-13-4775BG	49-005-57096	Big George	1182	SWNW 13-47-75	AWAO
136	Remove	Little Buffalo Fed 12-13-4775W	Not Available	Wyodak	est. 1220	SWNW 13-47-75	AWAO
137	Remove	Nisselius Ranch Fed 34-13-4775W	Not Available	Wyodak	est. 1220	SWSW 13-47-75	AWAO
138	Remove	Little Buffalo Fed 14-13-4775W	Not Available	Wyodak	est. 1220	SWSW 13-47-75	AWAO
139	Remove	Little Buffalo Fed 14-13-4775BG	49-005-57095	Big George	1258	SWSW 13-47-75	AWAO
140	Remove	Little Buffalo Fed 21-13-4775W	Not Available	Wyodak	est. 1220	NENW 13-47-75	AWAO
141	Remove	Little Buffalo Fed 21-13-4775BG	49-005-57094	Big George	1233	NENW 13-47-75	AWAO
142	Remove	Little Buffalo Fed 23-13-4775BG	49-005-57093	Big George	1197	NESW 13-47-75	AWAO
143	Remove	Little Buffalo Fed 23-13-4775W	Not Available	Wyodak	est. 1220	NESW 13-47-75	AWAO
144	Remove	Little Buffalo Fed 32-13-4775BG	49-005-57603	Big George	1578	SWNE 13-47-75	AWAO
145	Remove	Little Buffalo Fed 32-13-4775W	Not Available	Wyodak	est. 1220	SWNE 13-47-75	AWAO
146	Remove	Fed 34-13-4775BG	-105.81709	Big George	1252	SWSE 13-47-75	AWAO
147	Remove	Little Buffalo Fed 41-13-4775W	Not Available	Wyodak	est. 1220	NENE 13-47-75	AWAO
148	Remove	Little Buffalo Fed 41-13-4775BG	49-005-57091	Big George	1314	NENE 13-47-75	AWAO
149	Remove	Little Buffalo Fed 43-13-4775W	Not Available	Wyodak	est. 1220	NESE 13-47-75	AWAO
150	Remove	Little Buffalo Fed 43-13-4775BG	49-005-57089	Big George	1158	NESE 13-47-75	AWAO
151	Remove	Little Buffalo Ranch 12-14-4775W	49-005-53681	Wyodak	1491	SWNW 14-47-75	AWAO
152	Remove	Little Buffalo Ranch 12-14-4775BG	49-005-54360	Big George	1191	SWNW 14-47-75	AWAO
153	Remove	Little Buffalo Fed 14-14-4775BG	49-005-55763	Big George	1311	SWSW 14-47-75	AWAO
154	Remove	Little Buffalo Fed 14-14-4775W	49-005-57994	Wyodak	1579	SWSW 14-47-75	AWAO
155	Remove	Little Buffalo Fed 21-14-4775BG	Not Available	Big George	est. 1311	NENW 14-47-75	AWAO
156	Remove	Little Buffalo Fed 21-14-4775W	Not Available	Wyodak	est. 1531	NENW 14-47-75	AWAO
157	Remove	Little Buffalo Fed 23-14-4775W	49-005-57995	Wyodak	1631	NESW 14-47-75	AWAO
158	Remove	Little Buffalo Fed 23-14-4775BG	49-005-55764	Big George	1222	NESW 14-47-75	AWAO
159	Remove	Little Buffalo Fed 32-14-4775BG	49-005-55765	Big George	1177	SWNE 14-47-75	AWAO
160	Remove	Little Buffalo Fed 32-14-4775W	49-005-57996	Wyodak	1615	SWNE 14-47-75	AWAO
161	Remove	Little Buffalo Fed 34-14-4775BG	49-005-55766	Big George	1542	SWSE 14-47-75	AWAO
162	Remove	Little Buffalo Fed 34-14-4775W	49-005-57086	Wyodak	1242	SWSE 14-47-75	AWAO
163	—	Little Buffalo Fed 41-14-4775BG	49-005-55756	Big George	1191	NENE 14-47-75	AWAO
164	—	Little Buffalo Fed 41-14-4775W	Not Available	Wyodak	est. 1531	NENE 14-47-75	AWAO
165	Remove	Little Buffalo Fed 12-15-4775W	49-005-55216	Wyodak	1449	SWNW 15-47-75	AWAO
166	Remove	Little Buffalo Fed 12-15-4775BG	49-005-55215	Big George	1169	SWNW 15-47-75	AWAO
167	Remove	Little Buffalo Fed 14-15-4775BG	49-005-55217	Big George	1192	SWSW 15-47-75	AWAO
168	Remove	Little Buffalo Fed 14-15-4775W	49-005-55218	Wyodak	1447	SWSW 15-47-75	AWAO
169	Remove	Little Buffalo Fed 21-15-4775W	49-005-58437	Wyodak	1505	NENW 15-47-75	AWAO
170	Remove	Little Buffalo Fed 21-15-4775BG	49-005-58597	Big George	1200	NENW 15-47-75	AWAO
171	Remove	Little Buffalo Fed 23-15-4775BG	49-005-55219	Big George	1223	NESW 15-47-75	AWAO
172	Remove	Little Buffalo Fed 23-15-4775W	49-005-55220	Wyodak	1511	NESW 15-47-75	AWAO
173	Remove	Little Buffalo Ranch 32-15-4775W	49-005-53680	Wyodak	1509	SWNE 15-47-75	AWAO
174	Remove	Little Buffalo Ranch 32-15-4775BG	49-005-54351	Big George	1199	SWNE 15-47-75	AWAO
175	Remove	Little Buffalo Fed 41-15-4775BG	49-005-55221	Big George	1200	NENE 15-47-75	AWAO
176	Remove	Little Buffalo Fed 41-15-4775W	49-005-55222	Wyodak	1503	NENE 15-47-75	AWAO
177	Remove	State 12-16-4775BG	49-005-54352	Big George	1136	SWNW 16-47-75	AWAO
178	Remove	State 12-16-4775W	49-005-52880	Wyodak	1423	SWNW 16-47-75	AWAO
179	Remove	State 14-16-4775BG	49-005-54353	Big George	1116	SWSW 16-47-75	AWAO
180	Remove	State 14-16-4775W	49-005-52881	Wyodak	1485	SWSW 16-47-75	AWAO
181	Remove	State 21-16-4775W	49-005-52882	Wyodak	1480	NENW 16-47-75	AWAO
182	Remove	State 21-16-4775BG	49-005-52883	Big George	1208	NENW 16-47-75	AWAO
183	Remove	State 23-16-4775BG	49-005-54744	Big George	1124	NESW 16-47-75	AWAO
184	Remove	State 23-16-4775W	49-005-52884	Wyodak	1124	NESW 16-47-75	AWAO
185	Remove	State 32-16-4775BG	Not Available	Big George	est. 1124	SWNE 16-47-75	AWAO
186	Remove	State 32-16-4775W	49-005-52885	Wyodak	1402	SWNE 16-47-75	AWAO
187	Remove	State 34-16-4775BG	49-005-54354	Big George	1157	SWSE 16-47-75	AWAO
188	Remove	State 34-16-4775W	49-005-52886	Wyodak	1421	SWSE 16-47-75	AWAO
189	Remove	State 41-16-4775BG	49-005-53432	Big George	1235	NENE 16-47-75	AWAO
190	Remove	State 41-16-4775W	49-005-52887	Wyodak	1486	NENE 16-47-75	AWAO
191	Remove	State 43-16-4775BG	49-005-54355	Big George	1185	NESE 16-47-75	AWAO
192	Remove	State 43-16-4775W	49-005-52888	Wyodak	1440	NESE 16-47-75	AWAO

Table 2 - Well Information: WY0052299 - BBC Dead Horse Creek

Well Number	Change	Well Name	API Number	Coal Seam	Well Depth	Location (QQ, Section, Township, Range)	Discharges to Outfall #*
*AWAO - All wells permitted to discharge to all outfalls							
193	Remove	Flying T Fed 12-17-4775BG	49-005-57081	Big George	1171	SWNW 17-47-75	AWAO
194	Remove	Flying T Fed 14-17-4775BG	49-005-57080	Big George	1152	SWSW 17-47-75	AWAO
195	Remove	Flying T Fed 21-17-4775BG	49-005-57079	Big George	1140	NENW 17-47-75	AWAO
196	Remove	Flying T Fed 23-17-4775BG	49-005-57078	Big George	1163	NESW 17-47-75	AWAO
197	Remove	Flying T Fed 12-18-4775BG	Not Available	Big George	est. 1191	SWNW 18-47-75	AWAO
198	Remove	Flying T Fed 21-18-4775BG	Not Available	Wyodak	est. 1300	NENW 18-47-75	AWAO
199	Remove	Little Buffalo Fed 32-24-4775W	Not Available	Wyodak	est. 1300	SWNE 24-47-75	AWAO
200	Remove	Little Buffalo Fed 32-24-4775BG	49-005-57602	Big George	1191	SWNE 24-47-75	AWAO
201	Remove	Little Buffalo Fed 34-24-4775W	Not Available	Wyodak	est. 1300	SWSE 24-47-75	AWAO
202	Remove	Little Buffalo Fed 34-24-4775BG	49-005-57077	Big George	1131	SWSE 24-47-75	AWAO

Total Number of Wells: 74

Table 3 - Reservoir Information as Permitted: WY0052299 - BBC Dead Horse Creek									
Changes	Reservoir Name	Reservoir Storage Volume (acre/feet)	SEO Permit #	Location				Geographic Location*	
				Qtr-Qtr	Sec	Township (N)	Range (W)	NAD 83 Latitude	NAD 83 Longitude
Remove	**Res 27-1**	**11.9**	**N/A**	**SWSW**	**27**	**48**	**75**	**44.102964**	**-105.869497**
	January (AKA 35-1)	10	P16296S	NWNE	35	48	75	44.098252	-105.836407
	2-1	16.5	P16432S	NENW	2	47	75	44.084521	-105.841334
	P1-2	12.1	P16429S	NENW	1	47	75	44.082958	-105.824763
	Paint (AKA 1-1)	16.9	31/4/43S	SENE	1	47	75	44.078682	-105.812164
	Little Red (AKA 6-1)	15.5	31/3/43S	NENW	6	47	74	44.082779	-105.805675
Remove	**Res 6-2**	**1.15**	**P25829W**	**SENW**	**6**	**47**	**74**	**44.079584**	**-105.801090**
	P1-1	19.4	P16430S	SESE	1	47	75	44.072149	-105.811675
Add	**Dead Horse**	**17.6***	**P18S**	**NWNW**	**36**	**48**	**75**	**44.096695**	**-105.827627**

* The capacity for Dead Horse is not used in the water balance for calculation of total permitted flow. BBC intends to contain CBNG water in the reservoirs listed on the water balance and occasionally release water into the stream channel between upstream reservoirs and Dead Horse. BBC is utilizing this reservoir primarily as a buffer to keep water from reaching Dead Horse Creek unless in the case of a storm event.

Table 4 - Bonding Information: WY0052299 - BBC Dead Horse Creek						
		Please check only one "reservoir reclamation volume" box for each reservoir				
Reservoir Name	Reservoir Bonding Authority	Reservoir Reclamation Volume* less than 5000 cubic yards?	Reservoir Reclamation Volume* between 5000 and 10,000 cubic yards	Reservoir Reclamation Volume* greater than 10,000 cubic yards	Reservoir constructed prior to September 1, 2005	Bond Currently posted with bonding authority?
P1-2	BLM	—	—	—	No	Yes
P1-1	BLM	—	—	—	No	Yes
2-1	BLM	—	—	—	Yes	Yes
January (AKA 35-1)	BLM	—	—	—	Yes	Yes
Paint (AKA 1-1)	BLM	—	—	—	Yes	Yes
Dead Horse	WDEQ	X	—	—	Yes	No
Little Red (AKA 6-1)	BLM	—	—	—	Yes	Yes

Fidelity and Deposit Company of Maryland

Home Office: 1400 American Lane, Tower I, Schaumburg, IL 60196

Bond No. LPM4138327; BLM Bond No. WYP000040

RIDER #11

To be attached to and form a part of US/BLM Nationwide Bond, No. LPM4138327 dated the 9th day of January, 2003 issued by the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, as Surety, on behalf of Bill Barrett Corporation, Bill Barrett Properties, Inc. and Bill Barrett Production Co., as Principal, in the penal sum of Five Hundred Fifty-Eight Thousand Three Hundred Forty-Eight & no/100 Dollars ($558,348.00), and in favor of United States of America

In consideration of the premium charged for the above referenced bond, it is hereby agreed that the bond be amended as follows: **The bond is being increased to Seven Hundred Thousand Seven Hundred Ninety-Four & No/100 Dollars ($700,794.00) due to the following additions and eliminations with a net increase of One Hundred Forty-Two Thousand Four Hundred Forty-Six & No/100 Dollars ($142,446.00).**

Bond is increased by Two Hundred Ninety-Six Thousand Seven Hundred Fifty-Eight & No/100 Dollars ($296,758.00) to cover reclamation bonding for water impoundment facilities that receive produced water from coal bed natural gas (CBNG) wells in the Willow Creek POD and Beaver Creek POD . (See attached exhibits "A" and "B" for reclamation estimates).

The bond is decreased by One Hundred Fifty-Four Thousand Three Hundred Twelve & No/100 Dollars ($154,312.00) eliminating the reclamation bonding for water impoundment facilities that received produced water from coal bed natural gas (CBNG) wells in the LX Bar and Mustang II POD. (See attached exhibit "C" for the reclamation estimates).

Provided, however, that the referenced bond shall be subject to all its agreements, limitations and conditions except as herein expressly modified, and further that the liability of the Surety under bond #LPM4138327 and the referenced bond as amended by this rider shall not be cumulative.

This rider shall become effective as of the 30th day of March, 2007.

Signed, sealed and dated this 30th day of March, 2007.

ATTEST: Kristine Pickett

Bill Barrett Corporation

Lynn Boone Henry
VP-Planning & Reserves — Principal

Bill Barrett Properties, Inc.

Lynn Boone Henry
VP-Planning & Reserves — Principal

Bill Barrett Production Co.

Lynn Boone Henry
VP-Planning & Reserves — Principal

J1123

Bill Barrett BCM, LLC

Lynn Boone Henry Principal
VP - Planning & Reserves

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: _____

Sandra J. Shryack, Attorney-in-Fact
Agent for Surety: IMA of KS, Inc.
PO Box 2992, Wichita, KS 67201

ACCEPTED:

_____

US/Bureau of Land Management

J1123

"EXHIBIT B"
ATTACHMENT TO BOND #LPM4137327

Operator	POD Name	NRS	IMPOUNDMENT Name / Number	Sec	TWP	RNG	Qtr / Qtr	BLM Identifier (eg 09-56N-74W-NESW)	Cubic Yds	BLM 11-06-06 Memo where Bond amount equals Volume x $2.50
Bill Barrett	Beaver Creek	CF	6-1	6	47N	74W	NWNW	6-47N-74W-NWNW	3,200	$8,000
Bill Barrett	Beaver Creek	CF	P1-1	1	47N	75W	SESE	1-47N-75W-SESE	4,901	$12,253
Bill Barrett	Beaver Creek	CF	P1-2	1	47N	75W	NENW	1-47N-75W-NENW	6,039	$15,098
Bill Barrett	Beaver Creek	CF	1-1	1	47N	75W	NESE	1-47N-75W-NESE	3,400	$8,500
Bill Barrett	Beaver Creek	CF	2-1	2	47N	75W	NENW	2-47N-75W-NENW	3,253	$8,133
Bill Barrett	Beaver Creek	CF	5-1	5	47N	75W	SWNW	5-47N-75W-SWNW	2,750	$6,875
Bill Barrett	Beaver Creek	CF	5-2	5	47N	75W	NENE	5-47N-75W-NENE	4,883	$12,208
Bill Barrett	Beaver Creek	CF	9-1	9	47N	75W	NWNE	9-47N-75W-NWNE	1,920	$4,800
Bill Barrett	Beaver Creek	CF	9-2	9	47N	75W	SWNE	9-47N-75W-SWNE	1,940	$4,850
Bill Barrett	Beaver Creek	CF	9-3	9	47N	75W	SWNW	9-47N-75W-SWNW	5,624	$14,060
Bill Barrett	Beaver Creek	CF	10-1	10	47N	75W	NWNE	10-47N-75W-NWNE	2,930	$7,325
Bill Barrett	Beaver Creek	CF	10-2	10	47N	75W	SENW	10-47N-75W-SENW	1,670	$4,175
Bill Barrett	Beaver Creek	CF	11-1	11	47N	75W	NESW	11-47N-75W-NESW	4,290	$10,725
Bill Barrett	Beaver Creek	CF	14-1	14	47N	75W	NESE	14-47N-75W-NESE	7,550	$18,875
Bill Barrett	Beaver Creek	CF	35-1	35	48N	75W	NWNE	35-48N-75W-NWNE	4,735	$11,838
								Total		**$147,713**

Power of Attorney
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY

KNOW ALL MEN BY THESE PRESENTS: That the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, corporations of the State of Maryland, by WILLIAM J. MILLS, Vice President, and GREGORY E. MURRAY, Assistant Secretary, in pursuance of authority granted by Article VI, Section 2, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, does hereby nominate, constitute and appoint W. C. COHEN, JR, **Scott T. POST, Richard K. STONE, Bret S. BURTON, Jana M. FORREST, Sandra J. SHRYACK, Tim H. HEFFEL and Erica M. PLUMMER, all of Wichita, Kansas, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety and as its act and deed, **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its office in Baltimore, Md., in their own proper persons. This power of attorney revokes that issued on behalf of W. C. COHEN, JR, Scott T. POST, Richard K. STONE, Bret S. BURTON, Jana M. FORREST, Sandra J. SHRYACK, Emily R. TERHUNE, Tim H. HEFFEL, Erica M. PLUMMER, dated November 2, 2004.

The said Assistant Secretary does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article VI, Section 2, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President and Assistant Secretary have hereunto subscribed their names and affixed the Corporate Seals of the said FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, this 22nd day of June, A.D. 2005.

ATTEST:

FIDELITY AND DEPOSIT COMPANY OF MARYLAND
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY

By:

Gregory E. Murray Assistant Secretary *William J. Mills Vice President*

State of Maryland }
City of Baltimore } ss:

On this 22nd day of June, A.D. 2005, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, came WILLIAM J. MILLS, Vice President, and GREGORY E. MURRAY, Assistant Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and they each acknowledged the execution of the same, and being by me duly sworn, severally and each for himself deposeth and saith, that they are the said officers of the Companies aforesaid, and that the seals affixed to the preceding instrument is the Corporate Seals of said Companies, and that the said Corporate Seals and their signatures as such officers were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski *Notary Public*
My Commission Expires: July 8, 2007

Table 5b: Annual, Twenty-four-hour, Reservoir Water Budget Estimate for Option 2 Facilities

Reservoir(s) can contain all CBM discharge during dry (no precipitation or storm runoff) operating conditions - YES

Calendar Year	Total Number of Wells Discharging to Outfall(s)	Discharge rate per well (gallons per minute)[1]	Total Number of Reservoir(s)	Total All Reservoir(s) Surface Area (acres)	Total All Reservoir(s) Freeboard Capacity (acre feet)[2]	CBM Inflows (acre feet) Total CBM Discharge to Reservoir(s)[3]	Potential Outflows (acre feet) Evaporation[4]	Infiltration[5]	Total Outflow	Water Balance Excess Capacity (All Reservoir(s) Freeboard Capacity) – (Total CBM Inflow – Total Outflow)
2007	41	18.63	6	17.35	19.28	3.38	0.00	0.85	0.85	16.76
2008	42	18.19	6	17.35	7.21	3.38	0.00	0.93	0.93	4.77
2009	49	15.59	6	17.35	7.75	3.38	0.00	0.78	0.78	5.15
2010	55	13.89	6	17.35	6.59	3.38	0.00	0.65	0.65	3.86
2011	59	12.95	6	17.35	11.19	3.38	0.00	0.52	0.52	8.34

FOOTNOTES

[1] Discharge rate per well equals permitted flow rate (1.1 MGD) * (10^6 gallons/ million gallon) / (total wells) / (24hrs/day) / (60 minutes/hr)
[2] Freeboard Capacity is calculated using a CBMA developed water management tool which utilizes well completions schedules, water production decline rates, and reservoir infiltration decline rates. This value reflects the day where the water level in the reservoirs is projected to be at its highest given the projected production rates which are generally less than the permitted rate.
[3] Daily CBM discharge equals (total wells) * (discharge rate per well) * (60 minutes/hr) * (24 hrs/day) * (325851.43 gallons/acre-ft) which equals the permitted flow rate in order to show a worst case scenario.
[4] See attached explanation document for source and formula/rationale for total daily evaporation (all evaporation rates are based on the surface area of the stored volume of CBNG water rather than the entire surface area).
[5] See attached explanation document for source and formula/rationale for total daily infiltration (all infiltration rates are based upon the stored volume of CBNG water rather than the entire capacity).

ADDITIONAL COMMENTS

Total number of contributing wells differs from the total number of wells listed in Table 2 because as the project develops, wells will be brought online as capacity becomes available.
Evaporation rates may equal zero because the most conservative day of the year falls in the winter where evaporation is negligible.

CBM Associates, Inc.
920 E. Sheridan St. • Laramie, WY 82070 • Office: (307) 742-4991 • Fax: (307) 745-1582
GROUNDWATER & SURFACE WATER HYDROLOGY • WATER RESOURCE MANAGEMENT • ENVIRONMENTAL PERMITTING & COMPLIANCE

Infiltration and Evaporation Rates from Reservoirs

Potential infiltration loss rates can be estimated for CBNG containment reservoirs and drainage conveyances based on a series of hydrologic studies conducted by the USGS for small stock ponds in the Powder River region of Wyoming. Pertinent findings of available literature for this region of Wyoming are as follows.

USGS Water Supply Paper 1531. *Hydrology of the Upper Cheyenne River Basin: Part A. Hydrology of Stock-Water Reservoirs in Upper Cheyenne River Basin*, by R.C. Culler, 1961. Fifty-four reservoirs with an average surface area of 2.12 acres were monitored for four years, 1951 - 1954. Reported evaporation and seepage loss rates are shown in Table 1.

Table 1: Evaporation and seepage losses from 1951 – 1954 in the Cheyenne River Basin

Year	Evaporation (feet/month)	Seepage (feet/month)
1951	0.41	1.28
1952	0.38	0.80
1953	0.44	0.76
1954	0.41	0.82

The stock-water reservoirs in the Culler study were typically much older bodies of water than CBM-related reservoirs. A newly constructed CBM-related reservoir should have a much higher seepage rate than the seepage rates of reservoirs addressed in the Culler study, especially if the reservoir bottom was excavated relatively deeply according to standard practice.

The following references provide additional guidance:

USGS Water Resources Series No. 47, *Characteristics of Wyoming Stock-Water Ponds and Dike Spreader Systems*, by Verne E. Smith, July 1974. The authors discuss the hydrology of stock-water ponds, evapotranspiration, and seepage. While this study was conducted for stock ponds, the governing concepts are pertinent to CBM water management requirements in small reservoirs.

USGS Water Resources Investigations 82_4105, *Evapotranspiration Rates at Selected Sites in the Powder River Basin, Wyoming and Montana*, by L.W. Lenfest, 1987. This report provides the results of studies at twelve sites where the authors evaluated the effects of alluvial valley width on measured evapotranspiration.

Overall, the above references combined with recent field observations conducted by Hugh Lowham (USGS-retired) provide a reasonably consistent estimate of combined evaporation and seepage losses in newly constructed small reservoirs. Hugh Lowham, P.E., has summarized available data and field observations to yield the following estimates for total loss rates of newly constructed small reservoirs in the Powder River area:

Very small reservoir (2 acre-feet storage volume):	40 gpm
Small reservoir (10 acre-feet storage volume):	80 gpm
Medium, reservoir (20 acre-feet storage volume):	200 gpm
Large Reservoir (200 acre-feet storage volume):	400 gpm

Note that these rates represent ***initial combined evapotranspiration and infiltration losses***. Generally, initial infiltration rates decrease with time as a result of: 1) Gradual deterioration of the soil structure. 2) Partial sealing of the wetted soil profile by the formation of surface crust. 3) Detachment and migration of pore-blocking particles. 4) And swelling of clay particles (Hillel, 2004). Steady-state infiltration rates (I_s) can be estimated by dividing initial loss rate estimates, as shown above, by a factor of 3.

Potential evapotranspiration rates for the Powder River Basin have been estimated from evaporation pan studies. Data for evaporation rates in Wyoming are available online from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westevap.final.html#WYOMING). Mean evaporation rates were obtained from studies conducted during an 81-year period (1925-2005) of four-foot Class A evaporation pans at the Gillette 9 ESE Station. Actual lake evaporation rates can be calculated by multiplying observed pan loss rates by a pan coefficient factor of 0.70 (Viessman and Lewis, 2003). Mean and adjusted evaporation values are shown in the Table 2:

Table 2: Powder River Basin Evaporation Rates

Month	Evaporation Mean (inches)	Adjusted Evaporation Mean (inches)
January	0	0
February	0	0
March	0	0
April	4.52	3.16
May	6.4	4.48
June	7.5	5.25
July	9.88	6.92
August	9.44	6.61
September	6.18	4.33
October	4.36	3.05
November	2.39	1.67
December	0	0
Average	**4.24**	**2.97**
Average/year	**50.67**	**35.47**

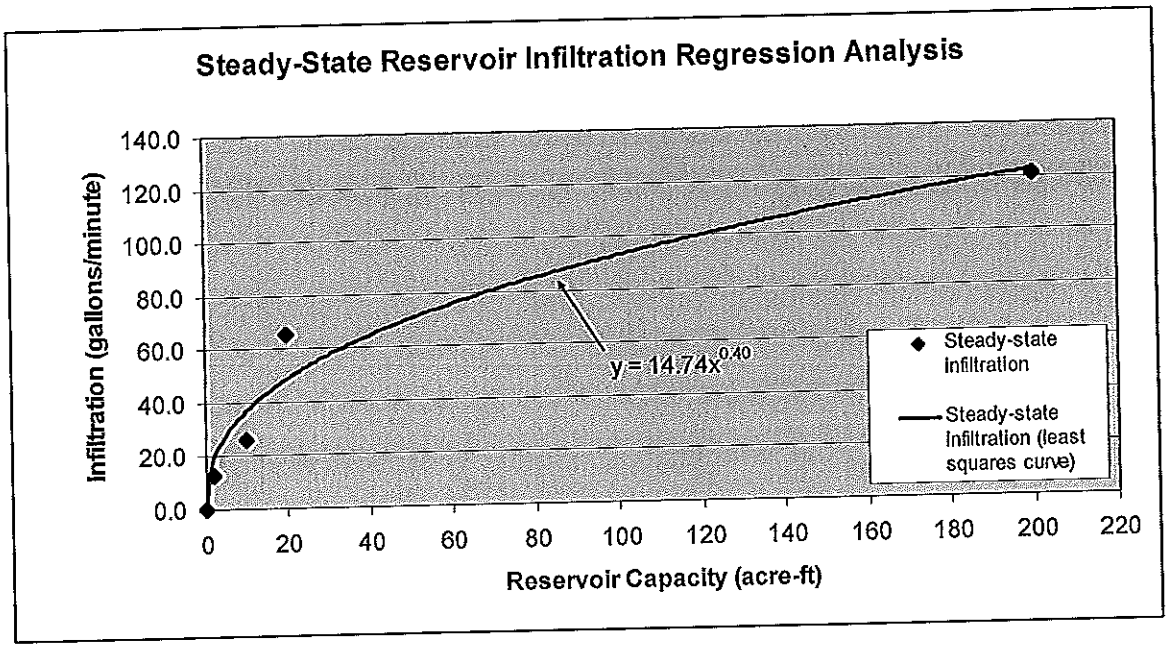
Subtracting average evaporation rates from the Lowham initial total loss rates and dividing by the steady state factor of 3 gives the resulting steady-state infiltration rates, shown below.

Very small reservoir (2 acre-feet storage volume, 0.67 acres of surface area): 12.92 gpm
Small reservoir (10 acre-feet storage volume, 1.36 acres of surface area): 25.84 gpm
Medium, reservoir (20 acre-feet storage volume, 2.49 acres of surface area): 65.15 gpm
Large Reservoir (200 acre-feet storage volume, 20.45 acres of surface area): 120.84 gpm

Curve fitting these data points on a graph yields the following power equation (see graph):

$$y = 14.74x^{0.40}$$

Where y is the steady-state infiltration rate in gallons per minute, and x is the reservoir capacity in acre-ft



While this equation provides a good approximation of predicted reservoir infiltration, it should be noted that all of the studies cited in this paper exhibit highly variable infiltration rates that are due, at least in part, to site-specific variations in geology and soils. Although this variability may not be fully predictable, the inclusion of additional site-specific data should better constrain actual seepage and evapotranspiration losses at a particular location once a new reservoir is constructed and operated.

References Cited:

Hillel, Daniel. 2004. *Introduction to Environmental Soil Physics.* Academic Press, San Diego, CA. pp. 259-262.

USGS Water Resources Investigations 82_4105, *Evapotranspiration Rates at Selected Sites in the Powder River Basin, Wyoming and Montana*, by L.W. Lenfest, 1987.

USGS Water Resources Series No. 47, *Characteristics of Wyoming Stock-Water Ponds and Dike Spreader Systems*, by Verne E. Smith, July 1974.

USGS Water Supply Paper 1531. *Hydrology of the Upper Cheyenne River Basin: Part A. Hydrology of Stock-Water Reservoirs in Upper Cheyenne River Basin*, by R.C. Culler, 1961.

Viessman, Warren Jr., Gary L. Lewis. 2003. *Introduction to Hydrology – 5th ed.* Prentice Hall, Upper Saddle River, NJ. pp. 155

Western Regional Climate Center. Wyoming Monthly Average Pan Evaporation. Retrieved April 6, 2007 from http://www.wrcc.dri.edu/htmlfiles/westevap.final.html#WYOMING

Flow Data Table
BBC Dead Horse Creek
WY0052299
Bill Barrett Corporation

Month	Maximum Monthly Flow Rate (MGD)	Maximum Monthly Flow Rate (gpd)
Sep-06	0.0000	0.0000
Oct-06	0.0000	0.0000
Nov-06	0.0000	0.0000
Dec-06	0.0000	0.0000
Jan-07	0.0786	78,566.40
Feb-07	0.0749	74,894.40
Maximum Monthly Flow Rate	0.0786	78,566
Average Monthly Flow Rate	0.0256	25,577

10 wells producing = **7,856.64 maximum gpd/well**

CBM Associates, Inc.
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GROUNDWATER & SURFACE WATER HYDROLOGY • WATER RESOURCE MANAGEMENT • ENVIRONMENTAL PERMITTING & COMPLIANCE

April 19, 2007

Wyoming Department of Environmental Quality
Water Quality Division
122 West 25th Street
Herschler Building, 4W
Cheyenne, Wyoming 82002

RE: COMPLIANCE EVALUATION for WYPDES Permit Application
Bill Barrett Corporation
Renewal for: BBC – Dead Horse Creek, WY0052299

Dear Water Quality Division,

This letter outlines specific requests for WYPDES permit requirement updates and provides information to address 'Item 22' in the application for a renewal of the above-referenced WYPDES permit.

Specific Requests for WYPDES Permit Updates
In addition to those items referenced on the cover letter of this application, Bill Barrett Corporation requests that this renewal:

- Raise total radium limits to current basin standards: 60 pCi/L for initial sampling only. Outfalls are over 39 miles from the nearest Class 2 water and no concentration has ever exceeded 0.2 pCi/L;
- Replace total recoverable aluminum requirements with dissolved aluminum requirements. No detectable concentrations of total recoverable aluminum have ever been measured at these outfalls;
- As appropriate, raise the total recoverable arsenic limit to the new Water Quality Chapter 1 limit of 10 µg/L;
- 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;
- Remove initial and routine monitoring and limit requirements for total petroleum hydrocarbons;
- If applicable for associated permit conditions, remove routine monitoring and limit requirements for sulfate, and;
- If applicable for associated drainage, reduce monitoring of alkalinity as CaCO3 and bicarbonate as HCO3 from monthly to semi-annual.

Item 22 a, b, and c of WYPDES Application
This permit has not exceeded permit limits and/or water quality standards prior to submission of this application.

Thank you for your consideration. If you have any questions, please feel free to contact me at (307) 742-4991 or clore@cbmainc.com.

Sincerely,
CBM Associates, Inc.

Caroline Lo Ré Brewer
Environmental Compliance Professional
dr/CB

CBM ASSOCIATES, INC. ADDITIONAL OFFICES:

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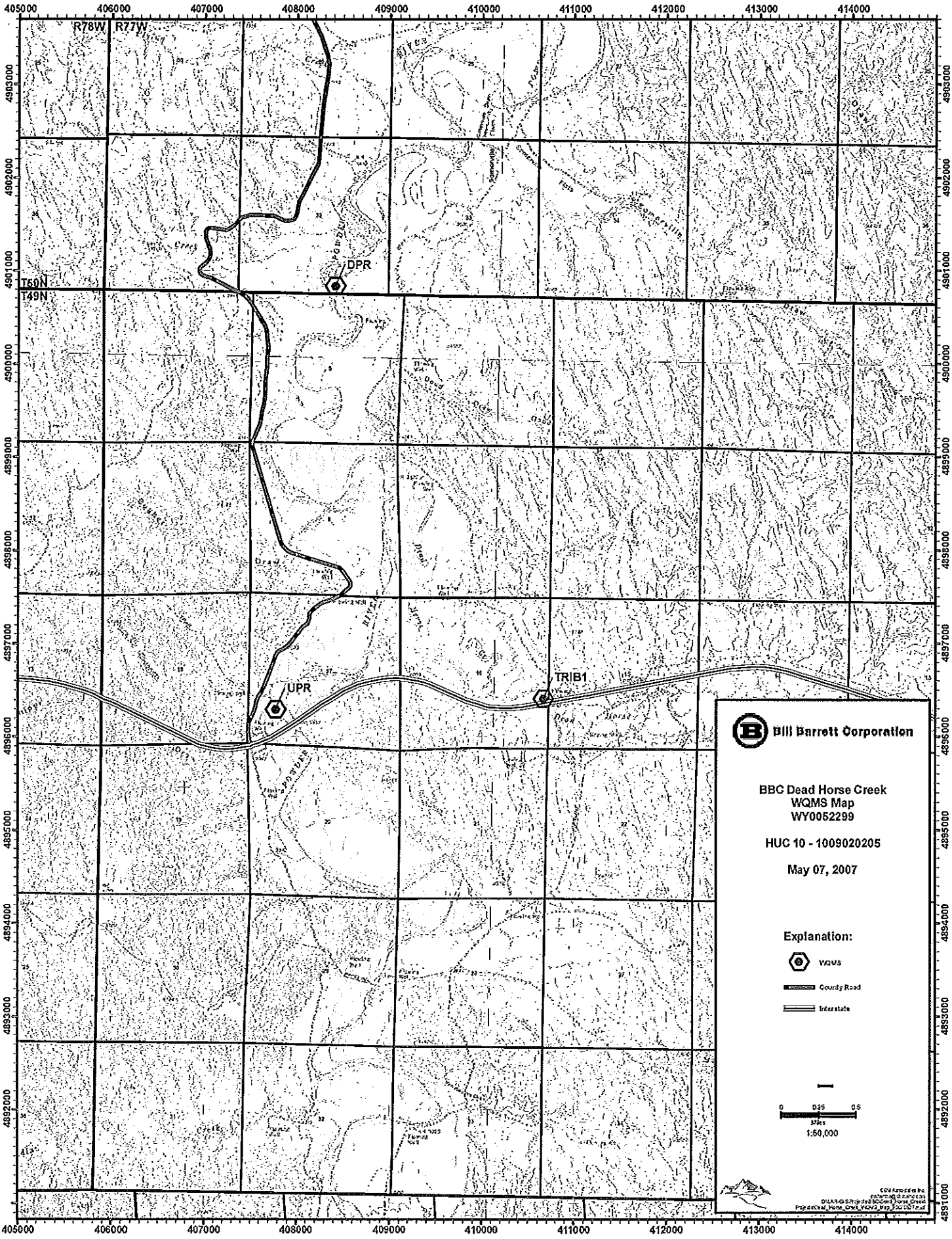
LABORATORY ANALYTICAL REPORT

Client: Bill Barrett Corporation
Site Name: BBC_Dead_Horse_Creek_Option_2
Project: WYPDES
Client Sample ID: DP_WY0052299_003_ET40
Location: NENW_2_47N_75W
Samp FRQ/Type: IN_A_S1_M
Lab ID: G07020501-001

Revised Date: 03/29/07
Report Date: 03/09/07
Collection Date: 02/26/07 10:30
DateReceived: 02/28/07
Sampled By: Lesley Roth
Matrix: Aqueous
Tracking Number: 464023

Analyses	Result	Units	Result	Units	Qualifier	Method	Analysis Date / By
FIELD PARAMETERS							
pH, field	7.47	s.u.				FIELD	02/26/07 10:30 / ***
*** Performed by Sampler							
MAJOR IONS, DISSOLVED							
Bicarbonate as HCO3	1520	mg/L	25.0	meq/L		A2320 B	03/01/07 13:20 / mli
Chloride	7	mg/L	0.20	meq/L		E300.0	03/01/07 23:01 / mli
Fluoride	1.6	mg/L	0.08	meq/L		E300.0	03/01/07 23:01 / mli
Sulfate	<1	mg/L	<0.02	meq/L		E300.0	03/01/07 23:01 / mli
Calcium	39	mg/L	1.95	meq/L		E200.7	03/02/07 07:18 / eli-b
Magnesium	19	mg/L	1.60	meq/L		E200.7	03/02/07 07:18 / eli-b
Sodium	509	mg/L	22.2	meq/L		E200.7	03/02/07 07:18 / eli-b
METALS, DISSOLVED							
Cadmium	<0.1	ug/L				E200.8	03/02/07 01:08 / eli-b
Copper	<1	ug/L				E200.8	03/02/07 01:08 / eli-b
Iron	<30	ug/L				E200.7	03/02/07 07:18 / eli-b
Lead	<2	ug/L				E200.8	03/02/07 01:08 / eli-b
Manganese	22	ug/L				E200.7	03/02/07 07:18 / eli-b
Mercury	<0.06	ug/L				E200.8	03/02/07 01:08 / eli-b
Zinc	<10	ug/L				E200.7	03/02/07 07:18 / eli-b
METALS, TOTAL RECOVERABLE							
Aluminum	<50	ug/L				E200.8	03/02/07 16:20 / eli-b
Arsenic	0.4	ug/L				E200.8	03/02/07 16:20 / eli-b
Barium	1310	ug/L				E200.8	03/02/07 16:20 / eli-b
Selenium	<5	ug/L				E200.8	03/02/07 16:20 / eli-b
NON-METALS							
Alkalinity, Total as CaCO3	1250	mg/L				A2320 B	03/01/07 13:20 / mli
Conductivity @ 25 C	2100	umhos/cm				A2510 B	02/28/07 09:30 / mtb
Hardness as CaCO3	180	mg/L				A2340 B	03/05/07 16:34 / tlc
Sodium Adsorption Ratio (SAR)	16.6	unitless				Calculation	03/05/07 16:35 / tlc
Solids, Total Dissolved TDS @ 180 C	1310	mg/L				A2540 C	03/01/07 10:43 / mli
Total Petroleum Hydrocarbons	<1.0	mg/L				SW1664A	03/07/07 12:20 / wet
RADIOCHEMICAL							
Radium 226	0.2	pCi/L				E903.0M	03/07/07 13:13 / eli-c
Radium 226 precision (±)	0.1	pCi/L				E903.0M	03/07/07 13:13 / eli-c

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.


405000
406000
407000
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413000
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R78W
R77W
T50N
T49N
DPR
UPR
TRIB1
4903000
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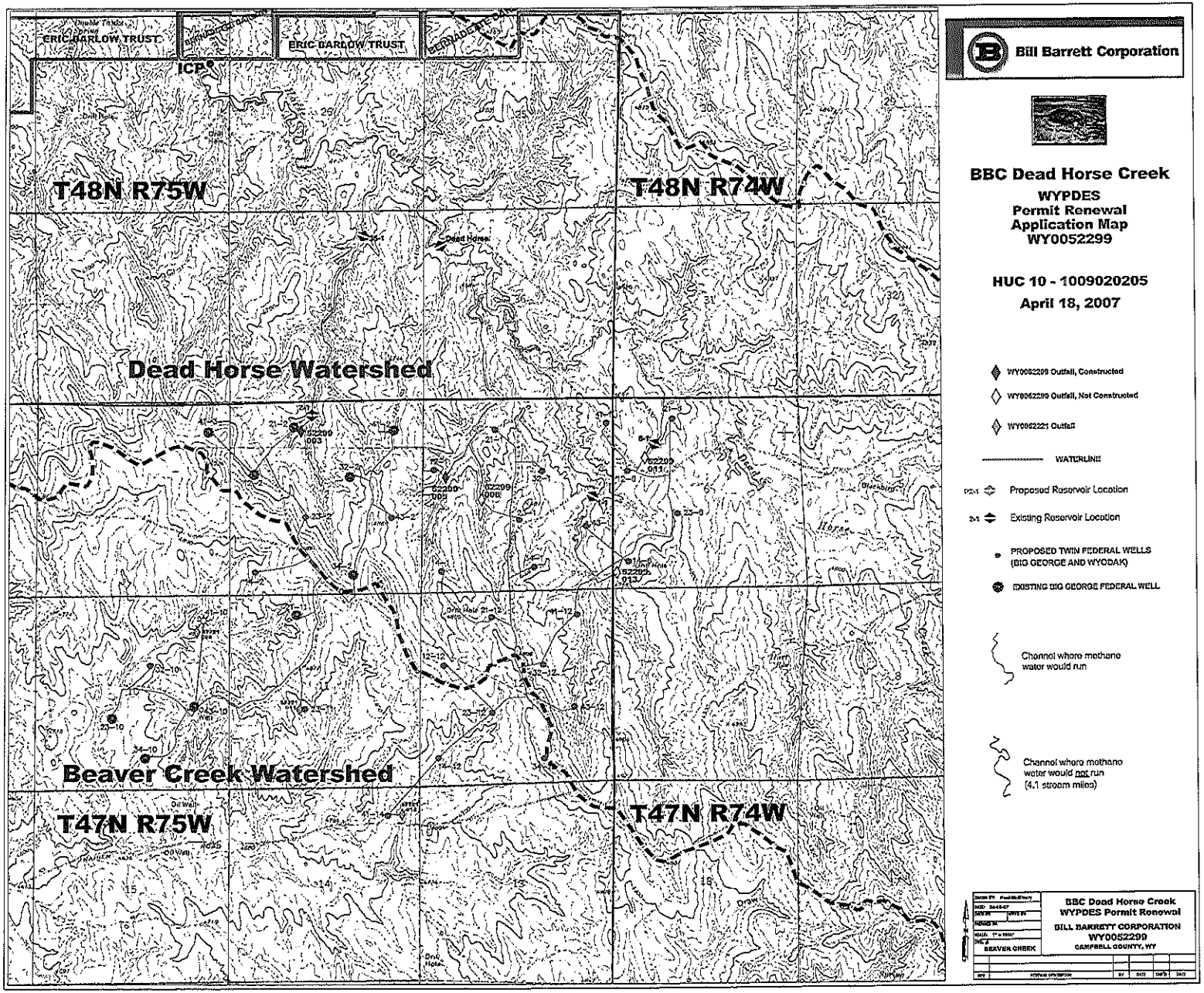
4894000
4893000
4892000
4891000
Bill Barrett Corporation
BBC Dead Horse Creek
WQMS Map
WY0052299
HUC 10 - 1009020205
May 07, 2007
Explanation:
WQMS
County Road
Interstate
0
0.25
0.5
Miles
1:50,000


ERIC BARLOW TRUST
ERIC BARLOW TRUST
BERNADETTE
ICP
T48N R75W
T48N R74W
Dead Horse Watershed
Beaver Creek Watershed
T47N R75W
T47N R74W
Bill Barrett Corporation
BBC Dead Horse Creek
WYPDES
Permit Renewal
Application Map
WY0052299
HUC 10 - 1009020205
April 18, 2007
WY0052299 Outfall, Constructed
WY0052299 Outfall, Not Constructed
WY0052221 Outfall
WATERLINE
Proposed Reservoir Location
Existing Reservoir Location
PROPOSED TWIN FEDERAL WELLS (BIG GEORGE AND WYODAK)
EXISTING BIG GEORGE FEDERAL WELL
Channel where methane water would run
Channel where methane water would not run (4.1 stream miles)
BBC Dead Horse Creek
WYPDES Permit Renewal
BILL BARRETT CORPORATION
WY0052299
CAMPBELL COUNTY, WY
BEAVER CREEK