

Wyoming Department of Environmental Quality  
Water Quality Division  
NPDES Program

STATEMENT OF BASIS  
Major Modification

APPLICANT NAME: Petro-Canada Resources (USA) Inc.

MAILING ADDRESS: 3801 North Highway 14-16  
Gillette, WY 82716

FACILITY LOCATION: Wild Horse Creek Portion of the Kingsbury AMI Unit, which is located in the NENW and NWNW, Section 1, the SWNE, Section 2, the NESE, Section 11, the NWNW, Section 12, the NENE, SENW, SWNE, and NESE, Section 14, Township 50 North, Range 75 West, the NWSE, Section 6, and the SWNE and the NESW, Section 7, Township 50 North, Range 74 West, the SWSE, SENW, and NWNW, Section 2, the NENW and NWSE, Section 3, the NESE, Section 8, the NWSE, Section 9, the SENE, NWSW, And NWSE, Section 10, the SENW, NENW, NWNE, NENE, and SENE, Section 15, the NWSW, SWNW, SENW, SWNE, and SENW, Section 16, the NENE, Section 17, the NWNE, Section 21, the SESE, Section 22, the SWSW, SESW, NESE, SWSE, and SESE, Section 23, the SWNE, SWSW, and NWSE, Section 24, the NWSE, Section 25, the NWNE, NENW, and SWNW, Section 26, the SWNW, Section 27, the NENE, Section 34, the NWNE, SWNE, NESW, SWNW and SESW, Section 35, and the SWNW and SWSW, Section 36, Township 51 North, Range 75 West, Campbell County. The produced water will be discharged to various named on-channel reservoirs (3B), located on various unnamed, ephemeral tributaries (3B) of Sand Draw (3B), Jeffers Draw (3B), Cedar Draw (3B), Montgomery Draw (3B), Scotty Draw (3B), Snell Canyon (3B), and Wild Horse Creek (3B). All of these streams are tributary to the Powder River (2ABWW), via Wild Horse Creek (3B). The permit establishes an irrigation compliance point, located in the SWNE, Section 17, Township 52 North, Range 75 West, on Wild Horse Creek. The permit also establishes a total maximum daily flow limit of 10.19 MGD, and requires that the produced water being discharged by this facility originate in one or more of the following formations: the Wall, Canyon, Lower Anderson, and/or Cook coal seams.

NUMBER: WY0051985

*This permit is being modified to include 32 additional outfalls (032-063), increase the permitted flow rate of the facility from 3.06 MGD to 10.19 MGD, and to allow the permittee to discharge produced water originating in two additional coal seams – the Canyon and Lower Anderson. Originally, the permittee had requested two additional permits in the Wild Horse Creek drainage. As the facilities would have had the same limits and requirements, and shared the same wells, irrigation compliance points, and water quality monitoring stations, the Division and the permittee agreed that modification of the original permit, which was originally advertised in public notice in August, 2004 would better meet the Division's move towards watershed-based permitting*

and allow the permittee to consolidate monitoring and reporting requirements for their development in this drainage. The permit is also being modified to remove effluent limits for total radium<sup>226</sup> and total petroleum hydrocarbons due to changes in WYPDES permitting practices since the time this permit was originally advertised in public notice. Since the original public notice, the original permittee, Prima Oil and Gas Company, has been purchased by another company, Petro-Canada Resources (USA) Inc. This change of ownership is reflected in this major modification.

### **General Facility Description**

This facility is a typical coal bed methane production facility in which groundwater is pumped from a coal bearing formation resulting in the release of methane from the coal bed. The permit authorizes the discharge to the surface of groundwater produced in this way provided the effluent quality is in compliance with effluent limits that are established by this permit. In developing effluent limits, all federal and state regulations and standards have been considered and the most stringent requirements incorporated into the permit. *The EPA Effluent Guidelines and Standards for Oil and Gas Extraction Point Source Category (Part 435, Subpart E)* predate the development of coal bed methane extraction technology; however the technology is similar enough to conventional gas extraction that, in the professional judgement of the WDEQ, this effluent limit guideline is appropriately applied to coal bed methane gas production. The guideline limits oil and grease effluent concentrations to less than 35 mg/l and requires that discharges of produced water be used for agricultural production and/or wildlife propagation. This permit does not cover activities associated with discharges of drilling fluids, acids, stimulation waters or other fluids derived from the drilling or completion of the wells.

The permittee has chosen option 2 of the coal bed methane permitting options. Under this permitting option, the produced water is immediately discharged to a class 2 or 3 receiving stream which is eventually tributary to a class 2AB perennial water of the state. The permit establishes effluent limits for the end of pipe, which are protective of all the designated uses defined in *Chapter 1 of Wyoming Water Quality Rules and Regulations*. This may include drinking water, game and non-game fish, fish consumption, aquatic life other than fish, recreation, agriculture, wildlife, industry and scenic value. In addition, the permit establishes an irrigation compliance point. The irrigation compliance point is a designated monitoring location prior to the first downstream point of irrigation diversion/use in Wild Horse Creek from the permitted facility. Effluent limits associated with the irrigation compliance points - SAR = 6 and EC = 2000 micromhos/cm - were determined from a combination of one or more of the following: technical information submitted by the applicant, published scientific literature, credible water quality data that has been through formally adopted quality control/quality assurance review, and best professional judgement. These limits satisfy provisions under *Chapter 1, Section 20 (protection of agricultural water supply) of the Wyoming Water Quality Rules and Regulations*. Effluent limits at the irrigation compliance point located in Wild Horse Creek are in effect year round due to the downstream irrigator's limited ability to divert stream flow away from the fields under irrigation.

The permittee has committed to, and will be required to contain the produced water in on-channel reservoirs. Information submitted by the permittee indicates that the on-channel reservoirs will have sufficient capacity to contain all the effluent under "dry" operating conditions. Discharges from the reservoirs are not permitted except during precipitation events that cause the reservoirs to fill and overtop. In the event discharges from the reservoirs occur, it will be the permittee's responsibility, if requested, to adequately document the circumstances under which reservoir discharges occurred. The permittee has committed that effluent shall not reach the Powder River. However, in the event that such a situation occurs, this permit establishes a monitoring station on the receiving stream prior to the confluence with the Powder River. This station will function to monitor any effluent flows to the Powder River.

## Effluent Limits

Permit effluent limits are based on federal and state regulations and are effective as of the date of issuance. The permit requires that the pH must remain within 6.5 and 8.5 standard units. Effluent limits for total dissolved solids (5,000 mg/l), specific conductance (7500 micromhos/cm), and sulfates (3,000 mg/l) are included to protect for stock and wildlife watering. These limits are based upon *Wyoming Water Quality Rules and Regulations, Chapter 2* and apply to discharges from all permitted outfalls.

The permit also establishes a dissolved manganese limit of 650 µg/l, and a chlorides limit of 46 mg/l. These limits are based on chronic aquatic life standards for class 2AB waters as established in *the Wyoming Water Quality Rules and Regulations, Chapter 1*. The permit also establishes a total barium limit of 1800 µg/l and a total arsenic limit of 7 µg/l, these limits are based on Water Quality Criteria as established in *the Wyoming Water Quality Rules and Regulations, Chapter 1*, for Human Health values. The limits established in this permit for metals and chlorides reflect the application of the antidegradation provisions required under *the Wyoming Water Quality Rules and Regulations, Chapter 1*.

In addition, the permit establishes a dissolved iron limit of 1000 µg/l, which is based upon chronic aquatic life standards for class 3B waters greater than one mile from the confluence of a class 2 water, and reflects the application of standards required under *Chapter 1 of the Wyoming Water Quality Rules and Regulations*. All limits described in this section are intended to protect for the above listed designated uses, on both the immediate receiving water and the perennial mainstem, and apply at the end of pipe

The mixing analyses and water balances submitted by the permittee were based upon a maximum daily flow of 10.19 million gallons per day (MGD) from this facility, and water quality representative of groundwater originating from the Wall, Canyon, Lower Anderson, and/or Cook coal seams at this facility. Therefore, the permit establishes a total maximum daily flow limit of 10.19 million gallons per day (MGD), to be calculated as the sum of all discharge from all permitted outfalls, and requires that the produced water being discharged by this facility originate in one or more of the following formations: the Wall, Canyon, Lower Anderson, and/or Cook coal seams.

Water quality information submitted in support of this permit application indicates that this facility has the potential to exceed established permit effluent limits for total barium (1800 µg/l at the end of pipe). In order to prevent violations of the total barium effluent limit, the permittee has committed to, and will be required to install a sulfuric acid injection treatment process to attain compliance with their total barium effluent limit. The permittee will be required to install and have fully operational the sulfuric acid injection treatment process described in their permit application prior to discharge of produced water from this facility. The permittee has submitted documentation verifying the ability of the chosen treatment option to attain compliance with the total barium effluent limit of 1800 µg/l.

This permit originally established a total radium<sup>226</sup> limit of 1 pCi/l and a total petroleum hydrocarbons (TPH) limit of 10 mg/l at the end of pipe. Based upon water quality data collected by WDEQ since the time this permit was originally issued, a permitting approach for establishing total radium limits in coal bed methane permits has been developed. This approach is based upon the distance of the outfall from a class 2 water. The removal of the originally-established total radium<sup>226</sup> limit is based on this permitting approach. In addition, review of discharge monitoring report data for this facility and other CBM facilities in Northeast Wyoming indicates that the maximum reported concentrations for total petroleum hydrocarbons (TPH) in the discharge were well below the water quality standard of 10 mg/l established in *Chapter 1 of the Wyoming Water Quality Rules and*

*Regulations.* Therefore, WDEQ has removed the effluent limit and monitoring requirement for TPH in this permit. Based on evaluation of the available data, it is WDEQ's determination that removing the total radium<sup>226</sup> and total petroleum hydrocarbons limits from this permit conforms to the anti-backsliding requirements established in *Section 402(o).2.B.i of the Clean Water Act.*

### **Irrigation Protection**

In order to monitor and regulate coal bed methane discharge for compliance with Chapter 1, Section 20 (protection of agricultural water supply), effluent limits for sodium adsorption ratio (SAR) and specific conductance are included in this permit. The Wyoming DEQ has determined that an SAR of 6 and a specific conductance of 2000 micromhos/cm are intended to be protective of agriculture use in the Wild Horse Creek drainage. The specific conductance limit of 2000 micromhos/cm is based on the threshold value for alfalfa which is considered to be the most salt sensitive plant irrigated in northeastern Wyoming (*USDA George E. Brown Jr. Salinity Laboratory, Salt Tolerance Database, Grasses and Forage Crops*). There was no data available to characterize EC tolerance of alfalfa specific to the Wild Horse Creek drainage. The SAR limit of 6 was determined to not reduce the rate of infiltration of irrigated soils in the Wild Horse Creek drainage, given the specific conductance threshold referenced above as ascertained from *Figure 3 (page 44) of Agricultural Salinity and Drainage, Hanson et al., 1999 revision*. An SAR limit of 6 and specific conductance limit of 2000 micromhos/cm will also maintain the baseline C3-S1 irrigation suitability category for the Powder River drainage (*see Figure 25, of Diagnosis and Improvement of Saline and Alkali Soils, US Dept. of Agricultural Handbook No. 60, 1954*). Monitoring will be required for flow volume, calcium, magnesium, sodium, bicarbonate, sodium adsorption ratio and specific conductance when flow is present at the irrigation compliance point(s) at any time during the year. This facility is linked to another NPDES permitted facility, WY0051993. The permittee has submitted documentation verifying their ability to contain all estimated CBM discharge between both facilities.

### **Monitoring and Reporting Requirements**

The permit requires daily monitoring on Wild Horse Creek to determine whether water discharged from the outfalls reaches the established irrigation compliance point. Daily monitoring is necessary because the permit establishes different sampling and analysis requirements based on whether the effluent reaches the irrigation compliance point. Once effluent flow at the irrigation compliance point has been documented within a sampling month, then weekly monitoring of flow is required for the month. At the beginning of each calendar month, the frequency will revert to daily until such time as flow occurs at the irrigation compliance point and a sample is collected to represent effluent quality for irrigation compliance point constituents for that month. Effluent samples must be collected on a weekly basis if flow persists at the irrigation compliance point for 24 hours or more. Results are to be reported twice-yearly and if no flow occurs then "no discharge" is to be reported. If flow occurs at the ICP station during a given monthly monitoring period, but this CBM facility did not contribute to that flow, the permittee will report "did not contribute" in the discharge monitoring reports for that monthly monitoring period. Under such circumstances, sampling is not required at the ICP station, and it will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to the flow occurring at the ICP station. If no flow at all occurs at the ICP station for an entire monthly monitoring period, then "no flow" is to be reported on the discharge monitoring reports.

The effluent limits at the ICP are intended to demonstrate compliance with *Chapter 2, Section 20 (protection of agricultural water supply) of the Wyoming Water Quality Rules and Regulations*. If produced water from this facility reaches the ICP and results in a violation of the ICP effluent limits, this action will constitute a violation of this permit, regardless of the cause of the violation (i.e., natural conditions of the stream channel or other

operators in the drainage.) If this facility's effluent does not reach an irrigation compliance point, then monitoring and compliance with the ICP effluent limits are not required.

Violation of the ICP effluent limits may result in enforcement action from the Water Quality Division, termination of the discharge until an acceptable plan to mitigate the violation has been developed and/or other appropriate enforcement action.

The permit requires sampling at a designated tributary water quality monitoring station located on the receiving stream – Wild Horse Creek, and at mainstem water quality monitoring station locations on the Powder River upstream and downstream of the Wild Horse Creek - Powder River confluence. Water quality monitoring stations on the Powder River will be located in the main channel of the Powder River outside of the mixing zone of Wild Horse Creek and the Powder River. Effluent samples at the designated water quality monitoring stations must be collected on a monthly basis and are to be reported semiannually. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: designated water quality monitoring stations identified as TRIB1, UPR, and DPR in Table 1, Part I.B. 13 of the permit below. Monthly water quality samples are to be collected at all three water quality monitoring stations when effluent from this CBM facility reaches the TRIB1 station on Wild Horse Creek. If flow occurs at the TRIB1 station during a given monthly monitoring period, but this CBM facility did not contribute to that flow, the permittee will report "did not contribute" in the discharge monitoring reports for that monthly monitoring period. Under such circumstances, sampling is not required at the three water quality monitoring stations, and it will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to the flow occurring at the TRIB1 station. If no flow at all occurs at the TRIB1 station for an entire monthly monitoring period, then "no flow" is to be reported and samples need not be collected at the three water quality monitoring stations for that monthly monitoring period.

At the designated water quality monitoring stations, monitoring will be required for calcium, magnesium, sodium, sodium adsorption ratio and specific conductance. Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and mainstem.

Results are to be reported twice-yearly and if no discharge occurs at the outfall then "no discharge" is to be reported. The permit also requires that an initial monitoring of the effluent be conducted within the first 60 days of discharge and the results submitted to WDEQ and the U.S. Environmental Protection Agency within 120 days of the commencement of discharge.

### **General Permit Requirements**

Reservoir and/or discharge water is to be released at a rate which does not cause significant erosion to the channel or receiving lands.

There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the discharge cause formation of visible deposits of iron, hydrocarbons or any other constituent on the bottom or shoreline of the receiving water. In addition, erosion control measures will be implemented to prevent significant damage to or erosion of the receiving water channel at the point of discharge.

The discharge of wastewater and the effluent limits that are established in this permit have been reviewed to ensure that the levels of water quality necessary to protect the designated uses of the receiving waters are maintained and protected. An antidegradation review has been conducted and verifies that the permit

conditions, including the effluent limitations established, provide a level of protection to the receiving water consistent with the antidegradation provisions of Wyoming surface water quality standards.

Self monitoring of effluent quality and quantity is required on a regular basis with reporting of results semiannually. The permit is scheduled to expire on December 31, 2008, which is reflective of the WDEQ's efforts towards watershed permitting and similar expiration dates for all permits within a specific drainage, which will allow for basin-wide analysis upon renewal of the permits in the drainage.

Kathy Shreve  
Water Quality Division  
Department of Environmental Quality  
Drafted: July 26, 2004  
Amended: October 5, 2004  
Redrafted: April 1, 2005

AUTHORIZATION TO DISCHARGE UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, (hereinafter referred to as "the Act"), and the Wyoming Environmental Quality Act,

Petro-Canada Resources (USA) Inc.

is authorized to discharge from the wastewater treatment facilities serving the

Wild Horse Creek Portion of the Kingsbury AMI Unit,

which is located in the

NENW and NWNW, Section 1, the SWNE, Section 2, the NESE, Section 11, the NWNW, Section 12, the NENE, SENW, SWNE, and NESE, Section 14, Township 50 North, Range 75 West, the NWSE, Section 6, and the SWNE and the NESW, Section 7, Township 50 North, Range 74 West, the SWSE, SENW, and NWNW, Section 2, the NENW and NWSE, Section 3, the NESE, Section 8, the NWSE, Section 9, the SENE, NWSW, And NWSE, Section 10, the SENW, NENW, NWNE, NENE, and SENE, Section 15, the NWSW, SWNW, SENW, SWNE, and SENW, Section 16, the NENE, Section 17, the NWNE, Section 21, the SESE, Section 22, the SWSW, SESW, NESE, SWSE, and SESE, Section 23, the SWNE, SWSW, and NWSE, Section 24, the NWSE, Section 25, the NWNE, NENW, and SWNW, Section 26, the SWNW, Section 27, the NENE, Section 34, the NWNE, SWNE, NESW, SWNW and SESW, Section 35, and the SWNW and SWSW, Section 36, Township 51 North, Range 75 West, Campbell County,

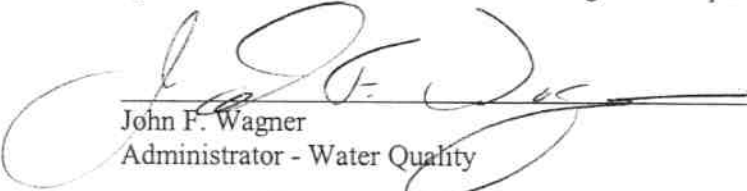
to receiving waters named

various named on-channel reservoirs (3B), located on various unnamed, ephemeral tributaries (3B) of Sand Draw (3B), Jeffers Draw (3B), Cedar Draw (3B), Montgomery Draw (3B), Scotty Draw (3B), Snell Canyon (3B), and Wild Horse Creek (3B). All of these streams are tributary to the Powder River (2ABWW), via Wild Horse Creek (3B),

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II and III hereof.

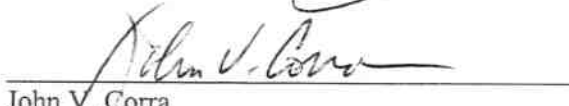
This permit modification shall become effective on the date of signature by the Director of the Department of Environmental Quality.

This permit and the authorization to discharge shall expire December 31, 2008, at midnight .

  
John F. Wagner  
Administrator - Water Quality

Date

6/7/05

  
John V. Corra  
Director - Department of Environmental Quality

Date

6/8/05

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Effective immediately and lasting through December 31, 2008, the quality of effluent discharged by the permittee shall, at a minimum, meet the limitations set forth below. The permittee is authorized to discharge from outfalls(s) serial numbers 001 - 063.

**1.a. Discharges from all outfalls are limited as specified below:**

Effluent Limits

<u>Effluent Characteristic</u>	<u>Daily Maximum Outfall</u>	<u>Daily Maximum Irrigation Compliance Point</u>
Chlorides, mg/l	46	
Dissolved Iron, µg/l	1000	
Dissolved Manganese, µg/l	650	
pH, standard units	6.5 - 8.5	
Specific Conductance, micromhos/cm	7500	2000
Sulfates, mg/l	3000	
Sodium Adsorption Ratio, calculated as unadjusted ratio		6
Total Arsenic, µg/l	7	
Total Barium, µg/l	1800	
Total Dissolved Solids, mg/l	5000	
Total Flow, MGD*	10.19	

\*Total flow is to be calculated as the sum of all discharge from all permitted outfalls. The permit requires that the produced water being discharged by this facility originate in the Wall, Canyon, Lower Anderson and/or Cook coal seams.

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units in any single grab sample.

Effluent limits at the irrigation compliance point are in effect year-round due to the downstream irrigator's inability to divert stream channel flow away from the fields undergoing irrigation.

In order to attain compliance with the total barium effluent limit established in this permit, the permittee has committed to, and will be required to; install a sulfuric acid injection treatment process. The permittee will be required to install and have fully operational the sulfuric acid injection treatment process at each and every outfall prior to discharge of produced water from the outfall.

The permittee may, if so desired, discharge effluent from any authorized well to any permitted outfall, as long as all permit limits and requirements can be met. This facility, as originally permitted, consisted of 31 outfalls and 142 wells. Upon modification, the facility will consist of 63 outfalls and 252 wells.

Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and the mainstem.

Reservoir and/or discharge water is to be released at a rate which does not cause significant erosion to the channel or receiving lands. Water may not be intentionally discharged from the reservoirs. Reservoirs may discharge in response to storm events or upstream reservoir overflow only. Should the reservoirs discharge in response to storm events, such discharges are limited to natural overtopping only. If requested, it will be the permittee's responsibility to adequately demonstrate the circumstances in which reservoir discharge occurred.

There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the discharge cause formation of a visible sheen or visible hydrocarbon deposits on the bottom or shoreline of the receiving water.

All waters shall be discharged in a manner to prevent erosion, scouring, or damage to stream banks, stream beds, ditches, or other waters of the state at the point of discharge. In addition, there shall be no deposition of substances in quantities which could result in significant aesthetic degradation, or degradation of habitat for aquatic life, plant life or wildlife; or which could adversely affect public water supplies or those intended for agricultural or industrial use.

**2. Discharges shall be monitored by the permittee as specified below:**

**a. Monitoring of the initial discharge**

*Because the permittee is planning to include produced water discharges from wells that have not previously been contributors to this facility's effluent, the permittee will be required to resample for initial monitoring constituents described below, and submit the results of these new analyses to the WDEQ. However, if the operator can demonstrate that produced water originating from any well that was not authorized for discharge at this facility prior to the issuance of this major modification has no potential to contribute to the effluent stream at a particular outfall, and the outfall has previously been sampled for all the constituents listed below, the operator is not required to resample and reanalyze that outfall to meet requirements described below, if these results have been previously submitted to the WDEQ.*

Within 60 days of commencement of discharge, a sample shall be collected from each outfall and analyzed for all of the constituents specified below, at the required detection limits. Within 120 days of commencement of discharge, a summary report on the produced water must be submitted to the Wyoming Department of Environmental Quality and the U.S. EPA Region 8 at the addresses listed below. This summary report must include the results and detection limits for each of the constituents listed below. In addition, the report must include written notification of the established location of the discharge point (refer to Part I.B.11). This notification must include a confirmation that the location of the established discharge point(s) is within 1,510 feet of the location of the identified discharge point(s), is within the same drainage, and discharges to the same landowner's property as identified on the original application form. The legal description and location in decimal degrees of the established discharge point(s) must also be provided. After receiving the monitoring results for the initial discharge, the effluent limits and monitoring requirements established in this permit may be modified.

<u>Parameter*</u> (See notes following the table on chemical states)	<u>Required Detection Limits and Required Units</u>
Alkalinity, Total	1 mg/l as CaCO <sub>3</sub>
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, Dissolved	50 µg/l, report as me/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
Hardness, Total	10 mg/l as CaCO <sub>3</sub>
Iron, Dissolved	50 µg/l
Lead, Dissolved	2 µg/l
Magnesium, Dissolved	100 µg/l, report as me/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	0.2 pCi/l
Selenium, Total Recoverable	5 µg/l
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Dissolved	100 µg/l, report as me/l
Sodium, Dissolved	100 µg/l, report as mg/l
Specific Conductance	5 micromhos/cm
Sulfates	10 mg/l
Zinc, Dissolved	50 µg/l

**TOTAL:** Value is expressed in terms of total recoverable metal in the water column.

**NOTE:** Except for aquatic life values for metals and where otherwise indicated, the values given refer to the total recoverable (dissolved plus suspended) amount for each substance. For the aquatic life values for metals, the values refer to the dissolved amount.

**DISSOLVED:** Value is based on the dissolved amount which is the amount that will pass through a 0.45 µm membrane filter prior to acidification to pH 1.5 - 2.0 with nitric acid.

Initial monitoring reports are to be sent to the following addresses:

Planning and Targeting Program, 8ENF-PT  
 Office of Enforcement, Compliance, and Environmental Justice  
 U.S. EPA Region 8  
 999 18th St., Suite 300  
 Denver, CO 80202-2466  
 and

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

**b. Routine monitoring End of Pipe – 001-063**

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies. The first routine monitoring for the time frame during which the monitoring of initial discharge occurs will, at a minimum, consist of flow measurements for the duration of the six-month monitoring time frame. Monitoring will be based on semi-annual time frames, from January through June, and from July through December.

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Bicarbonate (mg/l)	Once every six months	Grab
Dissolved calcium (mg/l)	Monthly	Grab
Dissolved calcium (me/l)	Monthly	Grab
Chloride (mg/l)	Annually	Grab
Dissolved Iron (µg/l)	Annually	Grab
Dissolved Manganese (µg/l)	Annually	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
pH (standard units)	Once Every Six Months	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (unadjusted)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Sulfate (mg/l)	Annually	Grab
Total Alkalinity (mg/l)	Once Every Six Months	Grab

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Total Arsenic (µg/l)	Annually	Grab
Total Barium (µg/l)	Annually	Grab
Total Flow - (MGD)	Monthly	Continuous

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At the outfall of the final treatment unit which is located out of the natural drainage and prior to admixture with diluent waters.

**c. Irrigation Compliance Points – ICPI**

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies when water discharged from any permitted outfall reaches any irrigation compliance point. Irrigation compliance point limits and requirements are in effect year-round due to the downstream irrigator's limited ability to divert flow in the stream channel away from the fields undergoing irrigation.

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Dissolved Calcium (mg/l)	Monthly	Grab
Dissolved Calcium (me/l)	Monthly	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (calculated as unadjusted ratio)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Flow (MGD)	Monthly	Instantaneous

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: at the irrigation compliance point which is located as follows: in the SWNE, Section 17, Township 52 North, Range 75 West, on Wild Horse Creek.

The permit requires daily monitoring of the irrigation compliance point described above to determine whether water discharged from the outfalls reaches the established irrigation compliance point. Daily monitoring is necessary because the permit establishes different sampling and analysis requirements based on whether the effluent reaches the irrigation compliance point. Once effluent flow at the

irrigation compliance point has been documented within a sampling month, then weekly monitoring of flow is required for the month. At the beginning of each calendar month, the frequency will revert to daily until such time as flow occurs at the irrigation compliance point and a sample is collected to represent effluent quality for irrigation compliance point constituents for that month. Effluent samples must be collected on a weekly basis if flow persists at the irrigation compliance point for 24 hours or more. Results are to be reported twice-yearly and if no flow occurs then "no discharge" is to be reported. If flow occurs at the ICP station during a given monthly monitoring period, but this CBM facility did not contribute to that flow, the permittee will report "did not contribute" in the discharge monitoring reports for that monthly monitoring period. Under such circumstances, sampling is not required at the ICP station, and it will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to the flow occurring at the ICP station. If no flow at all occurs at the ICP station for an entire monthly monitoring period, then "no flow" is to be reported on the discharge monitoring reports.

The effluent limits at the ICP are intended to demonstrate compliance with *Chapter 2, Section 20 (protection of agricultural water supply) of the Wyoming Water Quality Rules and Regulations*. If produced water from this facility reaches the ICP and results in a violation of the ICP effluent limits, this action will constitute a violation of this permit, regardless of the cause of the violation (i.e., natural conditions of the stream channel or other operators in the drainage.) If this facility's effluent does not reach an irrigation compliance point, then monitoring and compliance with the ICP effluent limits are not required.

Violation of the ICP effluent limits may result in enforcement action from the Water Quality Division, termination of the discharge until an acceptable plan to mitigate the violation has been developed and/or other appropriate enforcement action.

**d. Water Quality Monitoring Stations TRIB1, UPR, DPR**

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies. Monitoring will be based on monthly time frames, and reported semiannually.

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Dissolved Calcium (mg/l)	Monthly	Grab
Dissolved Calcium (me/l)	Monthly	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (calculated as unadjusted ratio)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Flow* (MGD)	Monthly	Instantaneous

\*The permittee is only required to monitor and report flow at the tributary monitoring station on Wild Horse Creek (TRIB1). The permittee is not required to monitor or report flow data at the mainstem water quality monitoring stations (UPR and DPR), see Table 1 at the end of Part I for location descriptions.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: designated water quality monitoring stations identified as TRIB1, UPR, and DPR in Table 1 of the permit below. Established water quality monitoring stations on the mainstem are to be located outside the mixing zone with the tributary and the mainstem. Monthly water quality samples are to be collected at all three water quality monitoring stations when effluent from this CBM facility reaches the TRIB1 station on Wild Horse Creek. If flow occurs at the TRIB1 station during a given monthly monitoring period, but this CBM facility did not contribute to that flow, the permittee will report "did not contribute" in the discharge monitoring reports for that monthly monitoring period. Under such circumstances, sampling is not required at the three water quality monitoring stations, and it will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to the flow occurring at the TRIB1 station. If no flow at all occurs at the TRIB1 station for an entire monthly monitoring period, then "no flow" is to be reported and samples need not be collected at the three water quality monitoring stations for that monthly monitoring period. At the designated water quality monitoring stations, monitoring will be required for calcium, magnesium, sodium, sodium absorption ratio and specific conductance. Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and mainstem.

## **B. MONITORING AND REPORTING**

### **1. Representative Sampling**

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and approval by the permit issuing authority.

### **2. Reporting**

Results of initial monitoring, including the date the discharge began, shall be summarized on a Monitoring Report Form for Monitoring of Initial Discharge and submitted to the state water pollution control agency at the address below postmarked no later than 120 days after the commencement of discharge.

Results of routine end of pipe, irrigation compliance point, and water quality station monitoring during the previous six (6) months shall be summarized and reported semiannually on a Discharge Monitoring Report Form (DMR). If the discharge is intermittent, the date the discharge began and ended must be included. The information submitted on the first semiannual DMR shall contain a summary of flow measurements and any additional monitoring conducted subsequent to the submittal of the initial monitoring report. When required, whole effluent toxicity (biomonitoring) results must be reported on the most recent version of EPA Region VIII's Guidance for Whole Effluent Reporting. Monitoring reports must be submitted to the state water pollution control agency at the following address postmarked no later than the 15th day of the second month following the completed reporting period. The first report is due on August 15, 2005.

