

STATE OF WYOMING
DEPARTMENT OF ENVIRONMENTAL QUALITY
UNDERGROUND INJECTION CONTROL PERMIT ISSUED UNDER
WYOMING WATER QUALITY RULES AND REGULATIONS
CHAPTER 16

CLASS V INJECTION WELL (AREA PERMIT)

(X) New Permit Number 10-498
() Modified UIC Facility Number WYS-005-00581
State Subclass 5F2

In compliance with the Wyoming Environmental Quality act (W.S. 35-11-101 through 1104, specifically 301(a)(i) through 301 (a)(iv), Laws 1973, Ch. 250, Section 1) and Wyoming Water Quality Rules and Regulations, Chapter 16.

Applicant: Patriot Energy Resources, LLC
Attn: Brian J. Cree
P.O. Box 7070
Gillette, WY 82717
(307) 686-9488

Patriot Energy Resources, LLC, hereafter referred to as the Permittee, is authorized to operate 32 (thirty-two) injection wells located in Townships 49 and 50, Range 73, of the 6th Principal Meridian, Campbell County (referred to as the "South Kitty Area") for the purpose of enhanced recovery of methane gas from coal according to the procedures and conditions of application 10-498, including the requirements and other conditions of this permit. This permit shall become effective on the date of issuance and is valid for five (5) years.

John Wagner, Administrator
Water Quality Division
Herschler Building, 122 West 25th Street
Cheyenne, WY 82002
(307)-777-7781

Date

John V. Corra, Director
Department of Environmental Quality
Herschler Building, 122 West 25th Street
Cheyenne, WY 82002

Date

Table of Contents

A. Discharge Zone 3

B. Injection Well Locations and Area of Review..... 4

C. CBM Production and Domestic Use Water Supply Wells Within the Area of Review . 6

D. Groundwater Classification 9

E. Authorized Operations 9

F. Hazardous Waste 9

G. Proper Operation and Maintenance 10

H. Entry and Inspection 10

I. Environmental Monitoring Program for Groundwaters of the State 10

J. Requirements for Monitoring Within the Area of Review 12

K. Test Procedures 15

L. Records and Reports 15

M. Permit Actions 16

N. Mechanical Integrity 16

O. Abandonment or Conversion to Water Wells 17

P. Duties of the Permittee..... 18

Q. Signatories Requirement..... 18

R. Noncompliance 19

S. Permit Transfer 19

T. Property Rights 19

U. Severability 20

A. Discharge Zone

The injection zones within the Wyodak coal seam are identified in **Table 1** as follows:

Table 1 (Perforated Zones)

Well Name	Perforated Zones (feet)	Porosity (%)	Thickness (feet)	Maximum Injection (bbls/day)*	Maximum Surface Injection Pressure (psig)*
Barlow Fee 12-33-5073 WY	1029-1079	2	70	800	15
Barlow Fee 14-34-5073 WY	816-880	2	68	1000	15
Barlow Fee 41-32-5073 WY	950-998	2	65	800	15
Bennor Fee 21-3-4973 WY	837-898	2	65	1000	15
Bennor Fee 21-9-4973 WY	883-927	2	55	800	15
Bennor Fee 34-4-4973 WY	911-967	2	63	800	15
Blake Fee 23-3-4973 WY	872-918	2	67	800	15
Brose Fee 43-33-5073 WY	804-849	2	60	1000	15
Fuller Fee 41-33-5073 WY	910-969	2	64	1000	15
Gewecke 14W-2303	790-838	2	50	800	15
Hines 34W-2203	896-949	2	52	800	15
Hines Fee 14-21-5073 WY	937-982	2	50	800	15
Hines Fee 14-26-5073 WY	939-994	2	55	800	15
Hines Fee 32-20-5073 WY	864-914	2	56	800	15
Hines Fee 34-20-5073 WY	932-988	2	53	800	15
Hines Fee 43-20-5073 WY	898-952	2	55	800	15
Hines Fee 43-27-5073 WY	954-1007	2	56	800	15
Jundt Fee 41-9-4973 WY	840-894	2	63	800	15
Lambert Fee 43-29-5073 WY	881-931	2	57	800	15
Nettle Creek Fee 23-28-5073 WY	1031-1083	2	60	800	15
Overbrook Fee 21-10-4973 WY	830-881	2	62	800	15
Stonegate Fee 41-10-4973 WY	875-919	2	61	500	15
Trail Ridge Fee 14-25-5073 WY	773-822	2	55	800	15
Trail Ridge Fee 14-35-5073 WY	743-773	2	60	800	15
Trail Ridge Fee 21-35-5073 WY	893-916	2	55	800	15
Trail Ridge Fee 23-25-5073 WY	804-821	2	52	800	15
Trail Ridge Fee 32-3-4973 WY	816-839	2	60	800	15
Trail Ridge Fee 34-26-5073 WY	809-860	2	55	800	15
Trail Ridge Fee 34-34-5073 WY	800-846	2	51	800	15
Trail Ridge Fee 41-35-5073 WY	751-800	2	50	800	15
Trail Ridge Fee 43-26-5073 WY	851-899	2	56	800	15
Trail Ridge Fee 43-34-5073 WY	790-839	2	57	800	15

* Maximum limits are not to be exceeded during any injection period. Additional perforation zones may be extended within the Wyodak coal seam with the prior written approval of the Department.

B. Injection Well Locations and Area of Review

The injection wells authorized by this permit are identified in **Table 2** as follows:

Table 2 (Injection Wells - Public Land Survey Locations)

Well Name	Section (¼, ¼)	Section	Township	Range
Barlow Fee 12-33-5073 WY	SWNW	33	50	73
Barlow Fee 14-34-5073 WY	SWSW	34	50	73
Barlow Fee 41-32-5073 WY	NENE	32	50	73
Bennor Fee 21-3-4973 WY	NENW	3	49	73
Bennor Fee 21-9-4973 WY	NENW	9	49	73
Bennor Fee 34-4-4973 WY	SWSE	4	49	73
Blake Fee 23-3-4973 WY	NESW	3	49	73
Brose Fee 43-33-5073 WY	NESE	33	50	73
Fuller Fee 41-33-5073 WY	NENE	33	50	73
Gewecke 14W-2303	SWSW	23	50	73
Hines 34W-2203	SWSE	22	50	73
Hines Fee 14-21-5073 WY	SWSW	21	50	73
Hines Fee 14-26-5073 WY	SWSW	26	50	73
Hines Fee 32-20-5073 WY	SWNE	20	50	73
Hines Fee 34-20-5073 WY	SWSE	20	50	73
Hines Fee 43-20-5073 WY	NESE	20	50	73
Hines Fee 43-27-5073 WY	NESE	27	50	73
Jundt Fee 41-9-4973 WY	NENE	9	49	73
Lambert Fee 43-29-5073 WY	NESE	29	50	73
Nettle Creek Fee 23-28-5073 WY	NESW	28	50	73
Overbrook Fee 21-10-4973 WY	NENW	10	49	73
Stonegate Fee 41-10-4973 WY	NENE	10	49	73
Trail Ridge Fee 14-25-5073 WY	SWSW	25	50	73
Trail Ridge Fee 14-35-5073 WY	SWSW	35	50	73
Trail Ridge Fee 21-35-5073 WY	NENW	35	50	73
Trail Ridge Fee 23-25-5073 WY	NESW	25	50	73
Trail Ridge Fee 32-3-4973 WY	SWNE	3	49	73
Trail Ridge Fee 34-26-5073 WY	SWSE	26	50	73
Trail Ridge Fee 34-34-5073 WY	SWSE	34	50	73
Trail Ridge Fee 41-35-5073 WY	NENE	35	50	73
Trail Ridge Fee 43-26-5073 WY	NESE	26	50	73
Trail Ridge Fee 43-34-5073 WY	NESE	34	50	73

Table 3 (Area Of Review - Public Land Survey Locations)

Section (¼, ¼)	Section	Township	Range
NENW, NWNW	2	49N	73W
NENE, NWNE, NENW, NWNW, SENE, SWNE, SENW, NESE, NWSE, NESW, NWSW, SESE, SWSE, SESW, SWSW, SWNW	3	49N	73W
NESE, NWSE, NESW, SESE, SWSE, SESW, SWSW	4	49N	73W
NENE, NWNE, NENW, NWNW, SENE, SWNE, SENW, SWNW	9	49N	73W
NWNW, NENW, NWNE, SWNE, SENW, SWNW, NENE	10	49N	73W
NENE, NWNE, NENW, SENE, SWNE, NESE, NWSE, NESW, SESE, SWSE, SESW	20	50N	73W
SWNW, NWSW, NESW, SWSW, SESW	21	50N	73W
NESE, NWSE, NESW, SESE, SWSE, SESW	22	50N	73W
NWSW, NESW, SWSW, SESW	23	50N	73W
SWNW, SENW, SWNE, NWSW, NESW, NWSE, SWSW, SESW, SWSE	25	50N	73W
NWNW, SWNW, SENE, NWSW, NESW, NWSE, NESE, SESE, SWSE, SESW, SWSW, NENW	26	50N	73W
NENE, NWNE, NENW, SENE, SWNE, NESE, NWSE, SESE, SWSW, SWSW	27	50N	73W
NWNW, NENW, SWNW, SENW, SWNE, NWSW, NESW, NWSE, SWSW, SESW, SWSE, SESE	28	50N	73W
NENE, NWNE, SENE, SWNE, NESE, SESE, SWSE, NENW, NWSE	29	50N	73W
NENE, NWNE, SENE, SWNE, NESE	32	50N	73W
NWNW, NENW, NWNE, NENE, SWNW, SENW, SWNE, SENE, NESW, NWSE, NESE, SWSE, NWSW, SESE	33	50N	73W
NENE, NWNW, SENE, SWNE, SENW, NESE, NWSE, NESW, NWSW, SESE, SWSE, SESW, SWSW, NWNW	34	50N	73W
NENE, NWNE, NENW, NWNW, SENE, SWNE, SENW, SWNW, NESW, NWSW, SESW, SWSW	35	50N	73W
NWNW, NENW, SWNW	36	50N	73W

C. CBM Production and Domestic Use Water Supply Wells Within the Area of Review

Table 4 (CBM Production Wells - Public Land Survey Locations)

Well Name	Section (1/4,1/4)	Section	Township	Range
BARLOW FEE 12-33-5073 SM	SWNW	33	50	73
BARLOW FEE 14-28-5073 FX	SWSW	28	50	73
BARLOW FEE 14-28-5073 SM	SWSW	28	50	73
BARLOW FEE 43-32-5073 WY	NESE	32	50	73
BENNOR FEE 12-9-4973 SM	SWNW	9	49	73
BENNOR FEE 12-9-4973 WY	SWNW	9	49	73
BENNOR FEE 14-34-5073 SM	SWSW	34	50	73
BENNOR FEE 14-4-4973 SM	SWSW	4	49	73
BENNOR FEE 14-4-4973 WY	SWSW	4	49	73
BENNOR FEE 23-4-4973 WY	NESW	4	49	73
BENNOR FEE 34-33-5073 SM	SWSE	33	50	73
BENNOR FEE 34-33-5073 WY	SWSE	33	50	73
BENNOR FEE 34-4-4973 SM	SWSE	4	49	73
BENNOR FEE 41-4-4973 WY	NENE	4	49	73
BENNOR FEE 43-4-4973 WY	NESE	4	49	73
BENNOR ST 43-3-4973 WY	NESE	3	49	73
BLAKE FEE 12-3-4973 SM	SWNW	3	49	73
BLAKE FEE 12-3-4973 WY	SWNW	3	49	73
FULLER FEE 14-27-5073 SM	SWSW	27	50	73
FULLER FEE 14-27-5073 WY	SWSW	27	50	73
FULLER FEE 32-33-5073 SM	SWNE	33	50	73
FULLER FEE 32-33-5073 WY	SWNE	33	50	73
GREGERSON FEE 12-10-4973 WY	SWNW	10	49	73
GREGERSON FEE 32-9-4973 SM	SWNE	9	49	73
HAIVALA FED 32-32-5073 WY	SWNE	32	50	73
HAIVALA FED 34-29-5073 WY	SWSE	29	50	73
HINES FED 34-27-5073 WY	SWSE	27	50	73
HINES FED 41-20-5073 WY	NENE	20	50	73
HINES FEE 12-21-5073 SM	SWNW	21	50	73
HINES FEE 12-21-5073 WY	SWNW	21	50	73
HINES FEE 12-26-5073 SM	SWNW	26	50	73
HINES FEE 12-26-5073 WY	SWNW	26	50	73
HINES FEE 12-34-5073 SM	SWNW	34	50	73
HINES FEE 12-34-5073 WY	SWNW	34	50	73
HINES FEE 14-21-5073 SM	SWSW	21	50	73
HINES FEE 14-26-5073 SM	SWSW	26	50	73
HINES FEE 21-20-5073 WY	NENW	20	50	73

Well Name	Section (1/4,1/4)	Section	Township	Range
HINES FEE 21-27-5073 WY	NENW	27	50	73
HINES FEE 21-28-5073 FX	NENW	28	50	73
HINES FEE 23-21-5073 FX	NESW	21	50	73
HINES FEE 23-26-5073 WY	NESW	26	50	73
HINES FEE 23-34-5073 WY	NESW	34	50	73
HINES FEE 32-20-5073 SM	SWNE	20	50	73
HINES FEE 32-26-5073 WY	SWNE	26	50	73
HINES FEE 32-27-5073 SM	SWNE	27	50	73
HINES FEE 32-27-5073 WY	SWNE	27	50	73
HINES FEE 32-28-5073 SM	SWNE	28	50	73
HINES FEE 32-28-5073 WY	SWNE	28	50	73
HINES FEE 32-29-5073 SM	SWNE	29	50	73
HINES FEE 32-29-5073 WY	SWNE	29	50	73
HINES FEE 32-34-5073 SM	SWNE	34	50	73
HINES FEE 32-34-5073 WY	SWNE	34	50	73
HINES FEE 34-20-5073 SM	SWSE	20	50	73
HINES FEE 41-27-5073 WY	NENE	27	50	73
HINES FEE 41-29-5073 WY	NENE	29	50	73
HINES FEE 41-34-5073 WY	NENE	34	50	73
HINES ST 23-20-5073 WY	NESW	20	50	73
LOMA FEE 12-28-5073 SM	SWNW	28	50	73
LOMA FEE 12-28-5073 WY	SWNW	28	50	73
MOFFITT FEE 21-29-5073 WY	NENW	29	50	73
OVERBROOK FEE 32-10-4973 WY	SWNE	10	49	73
RED ROCK FEE 21-26-5073 WY	NENW	26	50	73
RUDOLPH FEE 23-33-5073 FX	NESW	33	50	73
SPARLING FEE 21-33-5073 WY	NENW	33	50	73
ST 14-3-4973 SM	SWSW	3	49	73
STATE 12-36-5073 WY	SWNW	36	50	73
STATE 14-3-4973 WY	SWSW	3	49	73
STATE 21-36-5073 WY	NENW	36	50	73
TRAIL RIDGE FED 12-25-5073 WY	SWNW	25	50	73
TRAIL RIDGE FED 12-35-5073 WY	SWNW	35	50	73
TRAIL RIDGE FED 23-35-5073 WY	NESW	35	50	73
TRAIL RIDGE FED 32-35-5073 SM	SWNE	35	50	73
TRAIL RIDGE FED 43-35-5073 SM	NESE	35	50	73
TRAIL RIDGE FEE 21-2-4973 WY	NENW	2	49	73
TRAIL RIDGE FEE 32-25-5073 WY	SWNE	25	50	73
TRAIL RIDGE FEE 32-3-4973 SM	SWNE	3	49	73
TRAIL RIDGE FEE 34-25-5073 WY	SWSE	25	50	73

Well Name	Section (1/4,1/4)	Section	Township	Range
TRAIL RIDGE FEE 34-34-5073 SM	SWSE	34	50	73
TRAIL RIDGE FEE 41-3-4973 WY	NENE	3	49	73

Note: The production wells identified in Table 4 are permitted and authorized by the Wyoming Oil and Gas Conservation Commission (OGCC).

Table 5 (State Engineer Office (SEO) Domestic Use Wells - Public Land Survey Locations)

Well Name	Section (1/4,1/4)	Section	Township	Range
P113387W	SWSW	4	49	73
P125644W	SWNE	28	50	73
P135904W	NESE	3	49	73
P155089W	SWSE	3	49	73
P160737W	NWNW	9	49	73
P161050W	SWSE	3	49	73
P16554W	NWNW	9	49	73
P170680W	SWSE	3	49	73
P173191W	SWSE	3	49	73
P183355W	SWNE	28	50	73
P187743W	NWSE	33	50	73
P191521W	NESW	3	49	73
P20854W	NWNW	34	50	73
P22255P	SESE	28	50	73
P30591W	NENE	33	50	73
P31240W	NENE	9	49	73
P33819W	NESW	33	50	73
P33960W	NESE	33	50	73
P38257W	SWSW	4	49	73
P46672W	NENW	33	50	73
P48579W	SESW	28	50	73
P49917W	SESW	4	49	73
P55095W	NENE	27	50	73
P56332W	NWNW	28	50	73
P63229W	SWNW	28	50	73
P63837W	SESW	23	50	73
P64843W	NENW	26	50	73
P65103W	NENW	26	50	73
P67276W	SESW	23	50	73
P70587W	SESW	28	50	73
P87907W	NWSW	23	50	73
P91685W	SESE	28	50	73

Note: The domestic use wells identified in Table 5 are permitted and authorized by the State Engineer's Office (SEO).

D. Groundwater Classification

The groundwater in the Wyodak coal seam of the Fort Union Formation is classified as Class I (Domestic) by use according to Wyoming Water Quality Rules and Regulations, Chapter 8. This classification is assigned because there are several domestic wells within the immediate vicinity utilizing groundwater from the Wyodak coal seam (and Fort Union sand units between and above it) for domestic purposes. Since the ground water is classified as Class I, the water quality of the Wyodak coal seam shall not exceed the permit limits identified in **Table 6** or baseline concentrations as determined from baseline samples (see Section J(2)), whichever is greater.

E. Authorized Operations

According to the application: "The maximum instantaneous total water production rate from the Smith and Wyodak coal seams is 104.1 gallons per minute or approximately 3,570 barrels per day. Over the five (5) year operational period requested by this application, approximately 81% of this total water will be from the Smith, and 19% from the Wyodak." The objective is to recirculate produced water from coal beds (Smith and Wyodak) to stimulate coal bed methane production by encouraging microbial growth within the Wyodak coal seam.

The Permittee may not add any chemical, nutrient restorations, or other amendments to the injectate (e.g. anti-scalants, biocides, or algicides,) without applying for a modification to this permit and obtaining authorization from the Department. The Permittee may petition the Department to include coal bed methane produced water from coal seams other than the Smith and Wyodak into the injectate from this facility, but may not do so without written approval from the Department.

The Permittee is prohibited from injecting into any well until written approval has been provided by the Department.

For operation and maintenance considerations, such as conducting mechanical integrity tests or well workovers, the Permittee may inject more than the indicated maximum injection rate indicated on **Table 1** on a temporary basis with prior written approval from the Department.

The Permittee will be authorized to inject at a maximum surface pressure as indicated in **Table 1**.

F. Hazardous Waste

This permit does not allow for the injection of any hazardous waste as defined in 40 CFR 261.3 and in Wyoming Solid Waste Management Rules and Regulations, Chapter 2. Injection of any substance defined as a hazardous waste, whether hazardous by listing or by characteristic is a violation of this permit.

G. Proper Operation and Maintenance

The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit. The Permittee shall operate and maintain all facilities and systems of treatment and control which are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes mechanical integrity of the wells, effective performance, adequate funding, Permittee staffing and training, and laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

The injection wells covered by this permit shall meet all construction requirements outlined in Wyoming Water Quality Rules and Regulations, Chapter 16, Section 10(p) with the exception of water disinfection and pressure testing the wells to 700 psig.

The Permittee is required to operate in accordance with statements, representations and procedures presented in the complete permit application and supporting documents as accepted and approved by the Administrator. Any modifications which will result in a violation of permit conditions shall be reported by submission of a new or amended permit application and shall not be implemented until a new or modified permit has been issued. Injection into a well may not begin until construction is complete and the permit is approved.

H. Entry and Inspection

The Permittee shall allow the Administrator (upon presentation of credentials and during normal working hours) to enter the premises where a regulated facility is located, or where records are kept under the conditions of this permit and inspect and photograph the discharge and related facilities, review and copy reports and records required by this permit, collect fluid samples for analysis, measure and record water levels, and perform any other function authorized by law or regulation.

I. Environmental Monitoring Program for Groundwaters of the State

General Requirements:

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
2. The Permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of the reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample measurement, report, or application. This period may be extended by request of the Administrator at any time.

3. The Permittee shall use electronic data deliverable (EDD) reporting when required by the Administrator.
4. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The initials or name(s) of the individual(s) who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. The time(s) analyses were initiated;
 - e. The initials or name(s) of the individual(s) who performed the analyses;
 - f. References and written procedures for the analytical techniques or methods used;
 - g. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.
5. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or the approved Sampling and Analysis Plan.
6. The Permittee shall retain all records concerning the nature and composition of injected fluids until five (5) years after completion of any specified plugging and abandonment procedures. The Administrator may require the owner/Permittee to deliver the records to the Administrator at the conclusion of the retention period.
7. The Permittee shall report any noncompliance which may endanger health or the environment within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. The report should include:
 - a. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a usable groundwater of the state;
 - b. Any noncompliance with a permit condition or malfunction of the discharge (injection) system which may cause fluid migration into or between usable ground waters of the state;
 - c. A written submission shall be provided within five (5) days of the time the Permittee becomes aware of the circumstances. This written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
8. The Permittee shall report all instances of noncompliance not reported otherwise, at the time monitoring reports are submitted.
9. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than thirty (30) days following each schedule date.

10. The Permittee shall notify the Department in writing at the earliest opportunity, and verbally no less than 48 (forty-eight) hours prior to conducting workovers on any injection well so that a joint field inspection may be coordinated between both parties.
11. The Permittee shall notify the Department in writing at the earliest opportunity, and verbally no less than 48 (forty-eight) hours prior to conducting the mechanical integrity tests for each injection well.
12. The Permittee shall conduct injection falloff tests for each injection well prior to injection authorized by this permit.

J. Requirements for Monitoring Within the Area of Review

The following is required prior to authorization to inject from the Department:

1. The Permittee shall submit the laboratory analytical results for a pre-operational ground water sample, including Wyoming Water Quality Rules and Regulations **Chapter 8 (Table 1), Dissolved Inorganic Carbon (DIC), and the Carbon 13 isotope of DIC** obtained from the perforated interval within the Wyodak coal seam of all injection wells listed in **Table 1**;
2. The Permittee shall submit the laboratory analytical results for a pre-operational ground water sample, including Wyoming Water Quality Rules and Regulations **Chapter 8 (Table 1), Dissolved Inorganic Carbon (DIC), and the Carbon 13 isotope of DIC** obtained from the perforated interval within the Wyodak coal seam from all production wells listed in **Table 4**;
3. An approved **Sampling and Analysis Plan (SAP)** that describes all equipment and procedures associated with sample collection, laboratory analysis, equipment decontamination, Quality Assurance/Quality Control, sample custody, data reporting, etc. from injection, production, and domestic use water supply wells.

General Requirements:

1. The Permittee shall meter volumes of all water injected into each well.
2. The Permittee shall sample the injected fluid (injectate) and produced water from injection (**Table 2**) and production wells (**Table 4**) according to the schedule (**Table 6**) identified below. All samples reported to the Department shall be unfiltered; turbidity shall not to exceed 20 NTUs unless otherwise approved by the Department. Duplicate, or split samples collected from a minimum of 50% of all injection and production well sample points shall be analyzed by an independent, third-party EPA certified laboratory. All QA/QC samples shall be split for analysis by an independent, third-party EPA certified laboratory. Samples shall be collected such that they are representative of injected and/or produced water without further treatment. As per **Table 6**, quarterly sampling shall be conducted for the first year of operation; sampling frequency may be

reduced to semi-annual sampling with the Department's approval. The following parameters shall be analyzed by the listed methods and reported quarterly into the UIC GEM database:

Table 6 (Injected Fluid and Produced Water Sampling Schedule)

Sampling Schedule	Parameter Analyzed	EPA Analytical Method	Permit limit or UCL*
Quarterly (grab) Jan 1 – Mar 31	Ammonia	350.1, 350.2, 350.3	1.7
	Bromate	300.0	0.01
Apr 1 – Jun 30	Chloride	300.0	250
Jul 1 – Sep 30	Copper	200.7, 200.8, 200.9	1.0
Oct 1 – Dec 31	Dissolved Inorganic Carbon	SW9060	NA
	Carbon 13 Isotope	Varies	NA
	Fluoride	300.0	4.0
	Hydrogen Sulfide	353.4	0.05
	Iron	200.7, 200.9	1.6
	Manganese	200.7, 200.8, 200.9	0.05
	Nitrate	300.0	10.0
	Nitrite	300.0	1.0
	Selenium	200.7, 200.8, 200.9	0.05
	Sulfate	300.0	250
	Total Dissolved Solids	300.0	2,000
	Total Organic Carbon	5310C	NA
	Turbidity	180.1	20 NTU
	Zinc	200.7, 200.8	2.0
	pH	150.2	> 6.5 and < 8.5
	SAR	Calculated	NA
	Injection Volume	Flow meter	see Table 1 (barrels/day/well)
Injection Pressure (max)	Gauge	15 psig	

* All chemical concentrations in this permit are expressed in mg/L unless otherwise noted. pH is always expressed in standard units.

Where baseline water quality may exceed the UCL, the Permittee may petition the Department to modify the UCL for a particular well, or sample point, based upon documentation of baseline sample data from that well, or sample point.

The upper control limit (UCL) cannot be exceeded for any parameter. Exceedance of this value is a violation of this permit and shall require notification under Section L of this permit. Failure to perform and report analyses in accordance with the prescribed schedule and method is also a violation of this permit.

3. No later than thirty (30) days from the date of issuance of this permit the Permittee shall notify and offer all SEO-permitted domestic use well owners within the area of review (**Table 5**) or within ½ (one-half) mile of an injection or production well, whichever is larger, the opportunity to have the Permittee or his representative collect and complete laboratory analyses of ground water samples collected from the owner's well. Within thirty (30) days of receipt of written request from the well owner(s), the Permittee shall collect an initial sample from the owner's well) for laboratory analysis, and semi-annually thereafter, in accordance with **Table 7**, unless the well owner requests in writing that sample collection be discontinued, or the Permittee provides documentation to the Permittee or the Department that access for sample collection has been denied. Samples will be collected over the duration of the permit. Copies of all written documentation described in this section must be provided to the Department in the quarterly report for the reporting period.
4. All samples collected from domestic use water supply wells shall be analyzed by an independent, third-party EPA certified laboratory.
5. Owners of domestic use water supply wells in the area of review, or within ½ (one-half) mile of an injection or production well, whichever is larger, that may be permitted by the SEO after the date of issuance of this permit will be afforded the same opportunity for sample collection and analysis as existing well owners described in this section.
6. Sample results shall be reported to the Department in the UIC GEM database and to the well owner(s) within forty-five (45) days of the sample date.
7. The Permittee shall provide in the quarterly reports a list of all water supply wells that were sampled and contact information for each well owner to include, name, address, and phone number.
8. The Permittee shall provide three (3) annual water quality summary reports to the Department in both hard copy and digital formats. The three (3) reports shall be separate and specific for injection wells, production wells, and domestic use wells. The reports shall contain the following minimum information: injection well names, API numbers, SEO well names, SEO permit numbers, ¼ ¼, Section, Township, Range, water quality sample date, water quality analysis date, detection limits, EPA methods, water quality analytes (sorted alphabetically), water quality results (mg/L), injection volumes, injection pressures, permit limits. Reports shall include explanations of permit compliance or non-compliance. Reports shall include time-series graphs of analyte concentrations on the X-axis and dates on the Y-axis with plots of permit limits superimposed on the X-axis. Other report formats may be submitted with prior approval from the Department. The report shall be due no later than February 14 of each year.
9. The Permittee shall immediately notify the Department of potential issues with either water quality or water quantity presented by a valid State Engineer Office (SEO)

domestic use water well permit holder within the area of review (**Table 5**) or within ½ (one-half) mile of an injection or production well, whichever is larger.

Table 7 (Domestic Use Well Sampling Schedule)

Sampling Schedule	Parameter Analyzed	EPA Analytical Method
Semi-Annual (grab) Jan 1- Jun 30 Jul 1 – Dec 31	Ammonia	350.1, 350.2, 350.3
	Bromate	300.0
	Chloride	300.0
	Copper	200.7, 200.8, 200.9
	Dissolved Inorganic Carbon	SW9060
	Carbon 13 Isotope	Varies
	Fluoride	300.0
	Hydrogen Sulfide	353.4
	Iron	200.7, 200.9
	Manganese	200.7, 200.8, 200.9
	Nitrate	300.0
	Nitrite	300.0
	Selenium	200.7, 200.8, 200.9
	Sulfate	300.0
	Total Dissolved Solids	300.0
	Total Organic Carbon	5310C
	Turbidity	180.1
	Zinc	200.7, 200.8
	pH	150.2
SAR	Calculated	

K. Test Procedures

All samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity and in accordance with an approved Sampling and Analysis Plan. All required analyses shall be conducted in compliance with Wyoming Water Quality Rules and Regulations, Chapter 8, Section 7.

L. Records and Reports

The Permittee shall furnish to the Administrator within a specified time any information which the Administrator may request relating to the operation of the facility, including copies of records required to be kept by this permit. The Permittee shall retain copies of all records and reports required by this permit for a period of three (3) years following permanent well abandonment. After that time, those records shall be delivered to the Administrator for disposal or archive at his discretion. Reports of compliance or noncompliance with, and any progress reports on, interim and final requirements contained in any compliance schedule shall be submitted no later than thirty (30) days following each schedule date. Confirmed noncompliance resulting in the migration of injected fluid into any zone outside the permitted receiver shall be

reported to the Administrator within twenty-four (24) hours, and a written submission (via certified mail) shall be provided within five (5) days of the time the Permittee becomes aware of the excursion. The written submission shall contain: a description of the noncompliance; the period of noncompliance, including exact dates and times, and if the noncompliance has not been controlled, the anticipated time it is expected to continue; and a list of the steps taken or planned to reduce, eliminate, and prevent the recurrence of the noncompliance. Confirmed noncompliance not already reported under this section shall be reported at the time monitoring reports are submitted. The reports shall contain the same information as required by the paragraph above. The Permittee shall notify the Administrator thirty (30) days in advance of any planned alteration, conversion, or abandonment of the wells covered by this permit.

M. Permit Actions

This permit is issued for a period of five (5) years. If the Permittee wishes to continue injection after the expiration date of this permit, he shall apply to the Administrator and obtain a new permit prior to the expiration date of this permit. An expired permit continues in effect until a new permit is issued or the permit is terminated by the Administrator. It shall not be a defense for the Permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit. The filing of a request by the Permittee, or at the instigation of the Administrator, for permit modification, revocation, termination, or notification of planned changes or anticipated noncompliance shall not stay any condition of this permit.

After notice and opportunity for a hearing, a permit may be modified, suspended or revoked in whole or part during its term for cause which includes, but is not limited to any of the following:

1. Violation of this permit;
2. Obtaining a permit by misrepresentation of facts in the application; or
3. Failure of the tubing, casing, cement, or confining layers.

This permit will be reviewed at least once every five (5) years, and may be reviewed more frequently. A permit may be modified at any time as may be required, including for conformity with changes in regulations or standards which occur after the permit was issued. A permit may be modified in whole or part in order to apply more or less stringent standards; or prohibitions for toxic or other substances present in the Permittees' discharge as may be ordered by the Environmental Quality Council.

N. Mechanical Integrity

Mechanical integrity shall be maintained continuously. This facility is different from most CBM injection facilities in that the injectate and the formation water are the same. In addition, the Permittee does not plan to inject above a surface pressure of 15 psig. Many of the proposed injection wells are pre-existing CBM production wells originally permitted by the Wyoming Oil and Gas Conservation Commission, and were not constructed to handle high-pressure re-

injection. Most of the injection wells in this project are not strictly injection wells, and may rotate through several cycles of production and injection in their lifetimes. The existing wells are rated to handle a maximum injection pressure of 300 psig which is below the 700 psig routinely required for mechanical integrity testing of wells permitted via General Permits in the Powder River Basin. Finally, the Wyodak coal seam (receiving formation) has been significantly dewatered during the past 10-15 years from CBM production in the project area. As a result, reservoir pressures in the Wyodak are approximately 25 psig, which allows for the injection of large volumes of water under gravity flow and hydrostatic pressures.

The following wireline Part I mechanical integrity tests are required for each injection well on a five (5) year basis (once in 2011 and once in 2016) as follows:

1. Conduct video logging to assess visual well conditions from top of casing to total depth;
2. Upon completion of video logging, a caliper log shall be run to gauge well diameter and mechanical integrity in both open hole/perforations and cased sections from total depth to top of casing;
3. After completion of video logging and caliper logging, a pressure transducer shall record surface and downhole pressures;
4. Conduct an echometer survey to determine fluid levels within the wellheads;
5. The Permittee may not exceed 15 psig (measured at the surface) injection pressure in the wellbores (unless for testing purposes). The Permittee shall pressure test the casing before injection and at least once every five (5) years. The casing shall be pressure tested up to an indicated surface pressure of 100 psig and held for 30 minutes. A passing test shall show that there is less than 10% pressure loss after 30 minutes at 100 psig. The Department may eliminate the requirement for pressure testing if it determines that wireline methods are adequate by themselves.

O. Abandonment or Conversion to Water Wells

General Requirements:

1. The Permittee shall notify the Administrator at least seven (7) days before conversion or abandonment of the facility.
2. An abandonment report, detailing the compliance with abandonment procedures outlined in the original application for coverage under this general permit, or describing any deviations from the original plan, shall be submitted as soon as practicable after abandonment. The abandonment shall include reclamation of the well site.
3. In no case shall the abandonment procedure be less stringent than that required at the time of abandonment by the Wyoming Oil and Gas Conservation Commission for the abandonment of producing oil wells.

4. Injection wells covered by this permit shall be permanently abandoned or converted to another use within three (3) years after the date when coal bed methane water was last injected unless those wells are converted to water wells.
5. Wells which are to be converted to another use shall be covered by an approved Wyoming State Engineer Office's permit to document that it has been converted to a water well. A copy of this permit shall be submitted to the Department as evidence that the well has been converted.

P. Duties of the Permittee

The Permittee shall give advance notice to the Administrator as soon as possible of any planned physical alteration or additions, other than authorized operation and maintenance, to the permitted facility and receive authorization prior to implementing the proposed alternation or addition. The Permittee shall furnish the Administrator within a reasonable time any information which the Administrator may request to determine whether cause exists for modifying, revoking, or reissuing, or terminating this permit, or to determine compliance with this permit; and to furnish to the Administrator upon request, copies of records required to be kept by this permit. Any modification which may result in a violation of a permit condition shall be reported to the Administrator, and any modification that will result in a violation of any permit conditions shall be reported to the Administrator through the submission of a new or amended permit application. The Permittee shall report all instances where he becomes aware that he failed to submit any relevant facts in the permit application, or where he submitted incorrect information in a permit application or in any report to the Administrator, and shall promptly submit such facts or information.

Q. Signatories Requirement

All reports filed in conjunction with this permit shall contain the following certification:

“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.”

All reports required by this permit and other requested information shall be signed as follows:

For a corporation – by a principal executive officer of at least the level of vice-president;

For a partnership or sole proprietorship – by a general partner or the proprietor, respectively;

For a municipality, state, federal, or other public agency – by either a principal executive officer or ranking elected official; or
By a duly authorized representative for any of the above.

A person is a duly authorized representative only if:

1. The authorization is made in writing by one of the prescribed principals;
2. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
3. The written authorization is submitted to the Administrator.

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to the Administrator prior to or together with any reports or information, to be signed by the new authorized representative.

R. Noncompliance

The Permittee shall comply with all conditions of the permit. Any permit noncompliance constitutes a violation of Wyoming Water Quality Rules and Regulations, Chapter 16 and is grounds for enforcement action, permit termination, revocation, or modification. Noncompliance resulting in a violation shall be reported to the Administrator orally within twenty-four (24) hours, and a written submission shall be provided within five (5) days of the time the Permittee becomes aware of the violation. The written report shall contain the sections specified in Section K of this permit. Any permit noncompliance constitutes a violation of this permit.

The filing of any request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

S. Permit Transfer

Any transfer of this permit shall be accomplished by the submission of the proper forms for permit transfer to the Administrator. Transfer of this permit must first be approved by the Administrator and the Director. No transfer shall be approved unless the proposed Permittee agrees to bring any and all noncompliance issues into compliance with this permit. The Permittee is alone responsible for the operation of the facility covered by this permit. Sale of the facility and subsequent operation of this facility by another is a violation of this permit unless a transfer of this permit has first been accomplished.

T. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege. This permit does not authorize injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

U. Severability

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

END OF PERMIT

DRAFT