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**west virginia department of environmental protection**

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Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304  
(304) 926-0450  
(304) 926-0452 fax

Joe Manchin III, Governor  
Randy C. Huffman, Cabinet Secretary  
dep.wv.gov

**UIC Permit**

PENN VIRGINIA OIL AND GAS CORPORATION  
SEVEN SHERIDAN SQUARE, SUITE 200  
KINGSPORT, TN 37660

Dear Applicant:

Enclosed you will find Underground Injection Control Permit Number UIC2D1091433 dated February 23, 2010. Be advised that the duration of the permit is for a period of five (5) years.

Also be advised that all conditions established by UIC Permit Number UIC2D1091433 either expressly or incorporated by reference, must be strictly adhered to. All monitoring forms shall be submitted to the Office of Oil and Gas in the manner and frequency prescribed. The monitoring forms will be compared with the scope of permitted activity to verify compliance.

Please review the permit carefully and be aware of all permit conditions. Compliance of all permit conditions will be strictly enforced.

The operation of this injection well facility in general, including maintenance of all related surface equipment, shall be conducted so as to preclude any unlawful discharge of waste materials into the surface or ground waters of the state.

A handwritten signature in black ink, appearing to read "James Martin".

James Martin  
Chief,  
Office of Oil and Gas

Enclosures as stated

**UIC PERMIT NO. UIC2D1091433  
(RENEWAL)  
WELL NO. LC-19**

**UNDERGROUND INJECTION CONTROL PERMIT  
FOR  
DEPARTMENT OF ENVIRONMENTAL PROTECTION,  
OFFICE OF OIL AND GAS AND DIVISION OF WATER AND WASTE MANAGEMENT  
FOR  
CLASS II DISPOSAL WELL**

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This document consists of the Underground Injection Control (UIC) Permit required by the Department of Environmental Protection, Office of Oil and Gas, and Division of Water and Waste Management. The permittee is allowed to engage in underground injection in accordance with the terms and conditions of this permit based upon an approved UIC Permit.

The Underground Injection Control Permit No. **UIC2D1091433** consists of Forms WW-3A and WW-3B and the terms and conditions below:

1. The underground injection activity authorized by this permit shall not allow the movement of fluid, as per (47CSR13-2.26), containing any contaminant into any subsurface area other than that which is specified and may not cause a violation of any primary drinking water regulation promulgated under 40 CFR Chapter 1, Part 141 or any water quality standard promulgated by the Department of Environmental Protection.
2. This permit is issued in accordance with the provisions of Article 11 and 12, Chapter 22 of the Code of West Virginia and the Legislative Rule 47CSR13.
3. All reports required by this permit shall be submitted to the Office of Oil and Gas with the exception to paragraph 4 below.
4. The following activities require the immediate cessation of facility operations and prompt notification of the Director of Water and Waste Management (47CSR13-13.6.d and 47CSR13-13.12.1.6).
  - a) Any monitoring or other information which indicates that any contaminant has caused or may cause an endangerment to an underground source of drinking water;
  - b) Any non-compliance with a permit condition or any malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water; and
  - c) Any non-compliance which may endanger health and environment.

5. This permit is for authorization of injection of only fluids as defined for Class II wells in 47CSR13-4.2. The fluids to be injected shall only be from those sources listed in the permit application. Additional sources of fluids may be approved upon written request by the permittee.
6. The permit must satisfy the requirements of the Office of Oil and Gas regarding any corrective action needed on all known wells penetrating the injection zone within the area of review.
7. Any production well within a ¼ mile radius of disposal well# 47-109-01433 which does not have cemented production casing shall be plugged immediately upon becoming inactive. Any temporarily inactive well shall be monitored at a frequency and by a method prescribed by the Office of Oil and Gas upon notice by the permittee of such activity. Any well shut-in more than one (1) week shall be considered inactive.
8. The area of review is designated as a 1 / 4 mile radius around the injection project.
9. This permit approves the Weir Formation for injection from 3,540' to 3,578'.
10. The maximum wellhead injection pressure shall be established at 479 PSI.
11. The permittee shall provide for security at the injection facility to guard against illegal or unauthorized dumping and injection at the injection facility.
12. The permittee shall monitor the 2 3/8" X 4 1/2" and 4 1/2" X 8 5/8" casing annuli with pressure sensitive devices or with such a method as approved or required by the Office of Oil and Gas to allow early detection on any leaks from the injection zone or casing. The results of such monitoring shall be reported on Form WR-40.
13. The permittee shall conduct a mechanical integrity test on well at least once every five years per 35CSR4-7.7.b. The permittee must submit a WR-37 Form with each mechanical integrity test along with a copy of any test chart(s). If a mechanical integrity test should fail, the permittee shall cease operation/injection and shut-in the well immediately until repaired or permanently plugged and abandoned per regulation. The well must be repaired or permanently plugged within 90 days of the failure date. If repaired, the well must be re-tested making sure to submit a WR-37 Form to the Office of Oil and Gas. The Office of Oil and Gas shall be notified 24 hours in advance of the re-test date to witness said test.
14. A well head pressure gauge shall be installed and maintained on the injection tubing / casing to facilitate inspection and ensure compliance of maximum injection pressures as approved on Oil and Gas Form WR-37. A daily reading of the injection pressure shall be taken and reported monthly on Form WR-40 to the Office of Oil and Gas.
15. The permittee shall sample and analyze injection fluids upon request by the Office of Oil and Gas at a frequency not to exceed twice a year. Analyses shall cover all parameters listed on Attachment A of this permit. Results of all analyses shall be submitted to the Office of Oil and Gas. Permittee shall submit a letter of explanation for any parameter which exceeds the ranges on Attachment A.

16. All injection lines shall be inspected, maintained, operated and monitored to allow early detection of any leakage and so that the occurrence of leaks will be minimized.
17. The permittee shall fulfill the requirements of the Office of Oil and Gas regarding maintaining financial responsibility and resources to close, plug, and abandon permitted wells. An additional five-thousand dollar performance bond shall be maintained on permitted UIC well #109-01433.
18. The herein-described activity is to be extended, modified, added to, made, enlarged, acquired, constructed or installed, and operated, used and maintained strictly in accordance with the terms and conditions of this permit; with the information submitted with the Permit Application No. **UIC2D1091433** with the plan of maintenance and method of operation thereof submitted with such application(s); and with any applicable rules and regulations promulgated by the Department of Environmental Protection.
19. This permit is issued in accordance with the provisions of Article 11 and 12, Chapter 22, of the Code of West Virginia and Legislative Rule 47CSR13.
20. Failure to comply with the terms and conditions of this permit, with the plans and specifications submitted with the Permit Application No. **UIC2D1091433** and with the plan of maintenance and method of operation thereof submitted with such application(s) shall constitute grounds for the revocation or suspension of this permit and for the invocation of all the enforcement procedures set forth in Article 11 and 12, Chapter 22, of the Code of West Virginia and Legislative Rule 47CSR13.
21. The operation of this injection well facility in general, including maintenance of all unrelated surface equipment, shall be conducted so as to preclude any unlawful discharge of waste materials into the surface or ground waters of this State.
22. The permittee must satisfy the requirements of the Office of Oil and Gas for plugging and abandonment of permitted injection wells in such a manner as to ensure that no fluid movement occurs either from the injection zone into an underground source of drinking water or from one underground source of drinking water to another. If the well is to be taken out of service the permittee shall plug the well within 90 days of the last injection date.

## ATTACHMENT A

### Injection Fluid Analyses Parameters

<u>Parameter</u>	<u>Ranges</u>
PH	>2 – 10
TDS	0 - 265,000 mg/l
TSS	0 - 1000 mg/l
Aluminum	0 - 10 mg/l
Arsenic	0 – 10 mg
Barium	0 – 1500 mg/l
Cadmium	0 – 2 mg/l
Chromium	0 – 1 mg/l
Iron	0 – 1000 mg/l
Lead	0 – 7.5 mg/l
Magnesium	0 – 5000 mg/l
Manganese	0 – 15 mg/l
Potassium	0 – 5000 mg/l
Sodium	0 – 110,000 mg/l
Zinc	0 – 15 mg/l
Surfactants	0 – 10 mg/l
TKN	0 – 25 mg/l
Oil and Grease	0 – 100 mg/l
TOC	0 – 10,000 mg/l
COD	0 – 30,000 mg/l
Acidity	0 – 500 mg/l
Chloride	0 – 250,000 mg/l
Sulfate	0 – 500 mg/l
Cyanide	0 – 1 mg/l
Phenols	0 – 10 mg/l
Calcium	0 – 60,000 mg/l
BNA – Extractables	Trace
Purgeable Aromatics	Trace
Purgeable Halocarbons	Trace
PCBs	<MDL or 50 ppm

1) Date: October 27, 2009

2) Operator's Well No. LC-19

3) API Well No.: 47 109 01433  
State County Permit

4) UIC Permit No. 2D1091433

109-6-547

5) WELL TYPE: Liquid Injection X / Gas Injection (not storage) \_\_\_\_\_ / Waste Disposal \_\_\_\_\_ /  
6) LOCATION: Elevation: 2148 Watershed: Crane Fork  
District: Oceana County Wyoming Quadrangle Pilot Knob  
7) WELL OPERATOR: Penn Virginia Oil & Gas Corporation 8) DESIGNATED AGENT Bryant Bowman  
Address Seven Sheridan Square, Suite 200 Address P.O. Box 6  
Kingsport, TN 37660 Alum Creek, WV 25003  
9) OIL & GAS INSPECTOR TO BE NOTIFIED 10) DRILLING CONTRACTOR  
Name Barry Stollings Name N/A  
Address P.O. Box 1228 Address \_\_\_\_\_  
Chapmanville, WV 25508  
11) PROPOSED WELL WORK Drill \_\_\_\_\_ / Drill deeper \_\_\_\_\_ / Redrill \_\_\_\_\_ / Stimulate \_\_\_\_\_  
Plug off old formation \_\_\_\_\_ / Perforate new formation \_\_\_\_\_ Convert \_\_\_\_\_  
Other physical change in well (specify) Renew UIC Permit  
12) GEOLOGIC TARGET FORMATION Weir Depth 3540 Feet (top) to 3578 Feet (bottom)  
13) Estimated Depth of Completed Well, (or actual depth of existing well): 4261 Feet  
14) Approximate water strata depths: Fresh 110', 660' Feet Salt None Feet  
15) Approximate coal seam depths: 275' - 278', 303' - 307', 592' - 596', 734' - 737'  
16) Is coal being mined in the area? Yes \_\_\_\_\_ No X  
17) Virgin reservoir pressure in target formation 700 psig Source Data from wells in field  
18) Estimated reservoir fracture pressure 2407 psig (BHFP) 0.68  
19) MAXIMUM PROPOSED INJECTION OPERATIONS: Volume per hour 50 BBL Bottom hole pressure 2300 PSI  
20) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES Gas Field  
Brine; No Additive Anticipated  
21) FILTERS (IF ANY) \_\_\_\_\_  
22) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL \_\_\_\_\_  
23) CASING AND TUBING PROGRAM \_\_\_\_\_

None  
**RECEIVED**  
Office of Oil & Gas

None

**RECEIVED**

Office of Oil & Gas

PACKERS NOV 05 2009

WV Department of  
Environmental Protection

Kinds, Tension

[illegible]

24) APPLICANT'S OPERATING RIGHTS were acquired from UMC Corporation  
by deed \_\_\_\_\_ / lease \_\_\_\_\_ / other contract X / dated January 1, 1995 of record in the  
Wyoming County Clerk's office in Book 010 Page(s) 147

1000040042  
\$ 500

WW-3A  
10/07



1) Date: October 27, 2009  
2) Operator's Well No. LC-19  
3) API Well No.: 47 - 109 - 01433  
State County Permit  
4) UIC Permit No. 2D1091433

**STATE OF WEST VIRGINIA**  
**NOTICE OF LIQUID INJECTION OF WASTE DISPOSAL WELL WORK PERMIT APPLICATION**  
**FOR THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS,**

5) Surface Owner(S) To Be Served	7) (a) Coal Operator
(a) Name <u>Pocahontas Land Corporation</u>	Name <u>Patriot Coal Company</u>
Address <u>P.O. Box 1517</u>	Address <u>600 Laidley Tower</u>
<u>Bluefield, WV 24701</u>	<u>Charleston, WV 25324</u>
(b) Name _____	7) (b) Coal Owner(S) With Declaration Of Record
Address _____	Name <u>Pocahontas Land Corporation</u>
(c) Name _____	Address <u>P.O. Box 1517</u>
Address _____	<u>Bluefield, WV 24701</u>
6) Inspector <u>Barry Stollings</u>	7) (c) Coal Lessee with Declaration Of Record
Address <u>P.O. Box 1228</u>	Name <u>Eastern Associated Coal Corporation</u>
<u>Chapmanville, WV 25508</u>	Address <u>800 Laidley Tower</u>
Telephone <u>304-552-4194</u>	<u>Charleston, WV 25324</u>

**RECEIVED**

Office of Oil & Gas

**TO THE PERSONS NAMED ABOVE: You should have received this form and the following documents**

- (1) The Application For A Liquid Injection or Waste Disposal Well Work Permit on Form WW-3(B), which sets out the parties involved in the drilling or other work;
- (2) The plat (surveyor's map) showing the well location on Form WW-6; and
- (3) The Construction and Reclamation Plan on Form WW-9 (unless the well work is only to plug a well), which sets out the plan for erosion and sediment control and for reclamation for the site and access road.

WV Department of  
Environmental Protection

The date proposed for the first injection or waste disposal is Permit Renewal October 20 09.

THE REASON YOU HAVE RECEIVED THESE DOCUMENTS IS THAT YOU HAVE RIGHTS REGARDING THE APPLICATION WHICH ARE SUMMARIZED IN THE "INSTRUCTIONS" ON THE REVERSE SIDE OF THE COPY OF THE APPLICATION [(FORM WW-3(B))] DESIGNATED TO YOU. HOWEVER YOU ARE NOT REQUIRED TO TAKE ACTION AT ALL.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a Well Work Permit with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to a well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, the plat, and the Construction and Reclamation Plan have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of the mailing or delivery to the Chief.

The person signing this document shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator Penn Virginia Oil & Gas Corporation  
Address Seven Sheridan Square, Suite 200  
Kingsport, TN 37660  
By: James Burns  
Its: Operations Manager  
Signature: James Burns