



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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**MAJOR PERMIT MODIFICATION No. 1
Underground Injection Control (UIC) Permit No. ND22184-08837**

Pursuant to Title 40 of the Code of Federal Regulations, Sections 124.5 and 144.39 of the above referenced Class II UIC Permit, a major modification to this Permit is to be made. Changes made are as follows:

Original Version (December 15, 2011):

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APPENDIX B - LOGGING AND TESTING REQUIREMENTS

Logs

Logs will be conducted according to current UIC guidance. It is the responsibility of the Permittee to obtain and use guidance prior to conducting any well logging required as a condition of this Permit.

A copy of the EPA R6 Pressure Falloff Testing Guideline (Aug 8, 2002), the EPA R8 Temperature Logging For Mechanical Integrity, and the EPA R8 Guideline: Radioactive Tracer Surveys for Evaluating Fluid Channeling Behind Casing near Injection Perforations was emailed to the operator (Don Smith) on May 29, 2011.

WELL NAME: BIG BEND 1-5 SWD

TYPE OF LOG

N-Density

Array Induction/SP/MSFL

CBL/VDL/GAMMA RAY

RATS

TEMP

DATE DUE

Injection Well: Prior to receiving authorization to commence injection.

Injection Well: Prior to receiving authorization to commence injection.

Injection Well: Prior to receiving authorization to commence injection. Operator will provide log and analysis of log data.

Injection Well: If CBL does not show adequate cement behind pipe. Baseline required and every five years thereafter. Operator will provide log and analysis of log data.

Injection Well: A baseline required prior to injection. This log will serve as a baseline for all wells located in Sec 5-T151N-R92W. Operator will provide log and analysis of log data.

Tests

Tests will be conducted according to current UIC guidance. It is the responsibility of the Permittee to obtain and use guidance prior to conducting any well test required as a condition of this Permit.

If the injectate samples analyzed for NORM exceeds the EPA's drinking water MCLs, then the operator and the EPA will collaborate to determine the need for a monitoring plan to better characterize any variability or exceedances.

WELL NAME: BIG BEND 1-5 SWD

TYPE OF TEST	DATE DUE
Pressure Fall-Off Test	Injection Well: Within 180 days injection commences. Operator will provide analysis of test results and the test data.
Braden Head Pressure	Wells requiring monitoring: Pressure data will be collected from the annulus on backside of production casing. Both baseline and weekly monitoring required. Any variances from baseline will be investigated and reported to the EPA within 36 hours.
Injectate Sample	Injection Well: 30 days after injection commences and annually thereafter. The produced water will be tested for chloride, sulfate, sulfide, alkalinity, TDS, specific gravity, specific conductivity and pH.
Braden Head Pressure	Jericho 2-5H-TF, 1-5H, 3-5H; Coyote 1-32H, 2-32H; Hunter 2-8-17H; Baseline Braden Head Pressure and weekly monitoring required. Any variance from baseline will be investigated and reported to the EPA within 36 hours.
Braden Head Pressure	Injection Well: Prior to authorization to commence injection and weekly thereafter. Pressure data to be collected from annulus on backside of production casing. Any variance from baseline will be investigated and reported to the EPA in 36 hours.
Injectate Sample	Injection Well: After four years of injection, a random sample will be collected and analyzed for Method 8260, 8270 (including TIC for both) and Trace Metals (list included with this Appendix).
Injectate Sample	Injection Well: 30 days after injection commences and annually for three years. The sample will be analyzed under all seven methods described in the Permit under the Well Logging and Testing section.
Isolated Injectate Sample	Water Moccasin 4-34H and Diamondback 1-21H: Prior to receiving authorization to commence injection and annually for three years thereafter. The wells will be sampled for Non-Halogenated Alcohol per sampling plan described in the Permit.
Isolated Injectate Sample	Water Moccasin 4-34H and Diamondback 1-21H: Prior to receiving authorization to commence injection and annually for three years thereafter. The wells will be sampled for Semi Volatile Compounds per sampling plan described in the Permit.
Isolated Injectate Sample	Water Moccasin 4-34H and Diamondback 1-21H: Prior to receiving authorization to commence injection and annually for three years thereafter. The wells will be sampled for Volatile Organic Compounds per sampling plan described in the Permit.

Isolated Injectate Sample	Water Moccasin 4-34H and Diamondback 1-21H: Prior to receiving authorization to commence injection and annually for three years thereafter. The wells will be sampled for TPH-DRO and TPH-GRO per sampling plan described in the Permit.
Isolated Injectate Sample	Skybolt 1-24H, Pathfinder 1-9H, Water Moccasin 4-34H, Diamond back 1-21H, Jericho 2-5HTF: Prior to receiving authorization to commence injection. The wells will be sampled once for Trace Metals per sampling plan described in the Permit.
Isolated Injectate Sample	Skybolt 1-24H, Pathfinder 1-9H, Water Moccasin 4-34H, Diamond back 1-21H, Jericho 2-5HTF: Prior to receiving authorization to commence injection. The wells will be sampled once for NORM per sampling plan described in the Permit.
Injection Zone Water Sample	Injection Well: Prior to receiving authorization to commence injection. Sample should be analyzed for geochemical parameters, including trace metals and TDS.
Pore Pressure	Injection Well: Prior to receiving authorization to commence injection and at least once annually thereafter. Operator will provide analysis of results and data.
Step Rate Test	Injection Well: Prior to receiving authorization to commence injection. Operator will provide analysis of test results and raw data.

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is hereby modified to read:

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RATS	Injection Well: If CBL does not show adequate cement behind pipe. Baseline required and every five years thereafter. Operator will provide log and analysis of log data.
TEMP	Injection Well: A baseline required prior to injection. This log will serve as a baseline for all wells located in Sec 5-T151N-R92W. Operator will provide log and analysis of log data.

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Isolated Injectate Sample	Water Moccasin 4-34H and Diamondback 1-21H: Prior to receiving authorization to commence injection and annually for three years thereafter. The wells will be sampled for Volatile Organic Compounds per sampling plan described in the Permit.
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Darcy O'Connor
Acting Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

Date