ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/524-3300

August 31, 2017

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7014 2120 0002 3286 4196

Hamilton County Coal, LLC
Attn.: Larry Bennett, Manager of Engineering
18033 County Road 500E
Dahlgren, IL. 62828

RE: 0650155010 – Hamilton County
Hamilton County Coal, LLC
Permit No. UIC-017-WOR
UIC Log No. UIC-146-TE
UIC Admin Record
Permit Approval

Dear Mr. Bennett:

Enclosed is an Underground Injection Control (UIC) Temporary Emergency Permit issued to Hamilton County Coal, LLC for the above referenced facility located at 18033 County Road 500E, Dahlgren, Illinois. This modified permit is being issued in response to Hamilton County Coal's request for a Temporary Emergency Permit modification, dated August 3, 2017 and received by the Illinois EPA on August 4, 2017 and an addendum dated August 25, 2017 and received on August 25, 2017 via email. This submittal was assigned Log No. UIC-146-TE by the Illinois EPA.

The Illinois EPA previously issued a UIC permit to Hamilton County Coal, LLC, the Permittee, on November 25, 2014 and a subsequent modified permit on January 30, 2015 which allowed for the construction of two Class I non-hazardous waste underground injection control wells at the above referenced facility. Hamilton County Coal completed construction of well WWDW#1 and submitted a Well Completion Report for well WWDW#1, following a review of this report , the Illinois EPA issued a UIC permit authorizing the operation of injection well WWDW#1 on August 1, 2016. Injection well WWDW#1 is used to dispose of groundwater that seeps into the Hamilton County Coal Mine No. 1 from the overlying sandstone formations into a zone beneath the lowermost underground source of drinking water. This groundwater contains high levels chlorides and total dissolved solids.

The enclosed Temporary Emergency Permit is being issued in accordance with Title 35 Illinois Administrative Code (Ill. Adm. Code) Section 704.163 to prevent a substantial threat to the health of: (1) persons near the facility that would occur due to the release of wastewaters that violate state water quality standards, and (2) mine workers resulting from flooding of the mine. This Temporary Emergency Permit will expire on September 1, 2018. The Illinois EPA is

currently reviewing an application to make permanent the modifications approved in this temporary permit.

This UIC Temporary Emergency Permit allows Hamilton County Coal, LLC to modify the annulus protection system for well WWDW #1, as described in their August 25, 2017 application and in accordance with the conditions of this permit. A list of all documents associated with the approved permit application, including approved permit modification requests, is contained in Attachment A of the permit. Attachment 1 of this cover letter identifies the major changes made to the permit in response to this modification request.

Please read the permit closely and pay special attention to the modified permit conditions identified in Attachment 1 to this cover letter. Failure to comply with the terms and conditions of the permit may result in enforcement action being initiated by Illinois EPA for any violations of the requirements of the permit. The issuance of this permit does not relieve the Permittee of the responsibility for obtaining other permits or authorizations required by the Illinois EPA Bureau of Water, Illinois EPA Bureau of Air, Illinois Department of Natural Resources or other federal, state, or local agencies.

This letter shall constitute Illinois EPA's final decision on the subject submittal. The applicant may appeal this final decision to the Illinois Pollution Control Board pursuant to Section 40 of the Act by filing a petition for a hearing within 35 days after the date of issuance of the final decision. However, the 35-day period may be extended for a period of time not to exceed 90 days by written notice from the applicant and the Illinois EPA within the initial 35-day appeal period. If the owner or operator wishes to receive a 90-day extension, a written request that includes a statement of the date the final decision was received, along with a copy of this decision, must be sent to the Illinois EPA as soon as possible.

For information regarding the request for an extension, please contact:

Illinois Environmental Protection Agency
Division of Legal Counsel
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276
217/782-5544

For information regarding the filing of an appeal, please contact:

Illinois Pollution Control Board, Clerk
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, IL 60601
312/814-3620

Work required by this letter, your submittal or the regulation may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. This letter does not relieve anyone from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

If you have any questions regarding the geological and hydrogeologic aspects of this permit, please contact Michael Summers at 217/557-8086. Questions regarding other aspects of this permit should be directed to Kevin Lesko at 217/524-3271.

Sincerely,

Theodore J. Dragovich, P.E. Acting Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

TJD:KL:kl\0650155010-UIC-UIC146-TE-Approval.docx

Attachment: Attachment 1 - Scope of Modification
Underground Injection Control Temporary Emergency Permit

cc: Devan Welch, P.E. – Hamilton County Coal, LLC
Danielle Organ – Hamilton County Coal, LLC
Monte Markley, P.G. Vice President – SCS Aquaterra
Stephanie Hill – SCS Aquaterra

ATTACHMENT 1
SCOPE OF MODIFICATION

Log No. UIC-146-TE

0650155010 – Hamilton County
Hamilton County Coal, LLC
Permit No. UIC-017-WOR

The following is a list of the permit conditions that have been modified in response to permit modification request Log No. UIC-146-TE:

- Condition A.6: Injection Well Construction Details – Added the Annulus Protection System (APS) figures from the permit modification request to the list of well construction details that are contained in Attachment B.

- A.11: Emergency Modification of APS – This condition contains the majority of the requirements for completing the modifications to the APS approved under this permit modification.

- Condition A.12: Withdraw of Temporary Emergency Permit. Hamilton County Coal (HCC) submitted a July 5, 2017 Underground Injection Control Area Permit modification request (Log No UIC-146-M3) on which in part this Temporary Emergency permit is based. This condition requires that HCC submit a permit modification request withdrawing this Temporary Emergency Permit within 30 days of the non-emergency permit to modify the annulus control system UIC Area Permit becoming effective or upon final denial.

- Condition B.2.d: Annulus Protection – The operating requirements for the APS were updated to reflect those approved under this permit modification.

- Condition B.3.b: Continuous Recording Devices – Added the additional recording devices that were approved under this permit modification.

- Condition B.6.b: Content of monthly reports – Added reporting requirements based on revisions to the APS that were approved under this permit modification.

- Attachment B: Well Construction Details: Added Annulus Protection System Figures, Annulus Protection System – General Layout and Annulus Protection System – Piping and Instrument Diagram that were provided in the permit modification request approved under this permit modification.

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1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

Non-Hazardous Class I Well
Underground Injection Control Temporary Emergency Permit

Hamilton County Coal, LLC
Attn.: Larry Bennett, Manager of Engineering
18033 CR 500E
Dahlgren, IL. 62828

Re:	0650155010 – Hamilton County	Issue Date of UIC Permit:	November 25, 2014
	Hamilton County Coal, LLC	Expiration Date of UIC Permit:	December 30, 2024
	Permit No. UIC-017-WOR	Expiration Date of Temporary UIC Permit:	September 1, 2018
	UIC Log No. UIC-146-TE	Effective Date of Temporary UIC Permit:	August 31, 2017
	Administrative Record File		

A Temporary Emergency Permit associated with an Underground Injection Control (UIC) Permit for two non-hazardous waste Class I Underground Injection Control wells (WWDW #1 and WWDW #2) is hereby granted pursuant to Title 35 Illinois Administrative Code (Ill. Adm. Code) Section 704.163, the Illinois Environmental Protection Act and Parts 702, 704, 705, and 730 to Hamilton County Coal, LLC for its facility located at 18033 County Road 500 East, Dahlgren, Illinois. The Illinois EPA previously issued a UIC Area permit to Hamilton County Coal, LLC, the Permittee, on November 25, 2014 and the issued modified permits on January 30, 2015 and August 1, 2016.

The Permittee, Hamilton County Coal, LLC, shall operate well WWDW#1 in accordance with this permit. This permit does not grant the Permittee authorization to construct well WWDW#2. Authorization to begin construction of well WWDW#2 will be granted following the submittal and the written approval by the Illinois EPA of a permit modification described in Condition A.1 of this permit. Wells WWDW #1 and WWDW #2 will dispose of water that is collected from within the White Oak Mine No. 1.

This permit consists of the conditions contained herein (including those in any attachments and appendices) and applicable regulations contained in the Illinois Environmental Protection Act and Title 35 Ill. Adm. Code Parts 702, 704, 705 and 730. The Environmental Protection Act 415 ILCS 5/1 et seq. grants the Illinois Environmental Protection Agency the authority to impose conditions on permits which it issues.

This permit is issued based on the information submitted in the approved permit application identified in Attachment A of this permit and any subsequent amendments (hereafter referred to as the approved permit application). Any inaccuracies found in this information may be grounds for the termination or modification of this permit (see 35 Ill. Adm. Code 702.187 and 702.186) and potential enforcement action.

If you have any questions regarding the geology and hydrogeology aspects of this permit, please contact Michael Summers at 217/557-8086. If you have any questions regarding the other aspects of this permit, please contact Kevin Lesko at 217/524-3271.

Sincerely,

Theodore J. Dragovich, P.E. Acting Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

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4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120
9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

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A. AUTHORIZATION FOR CONSTRUCTION

1. Authorization for Construction. The permit allows for the construction and eventual operation of two non-hazardous wastes Class I Underground Injection wells (WWDW #1 and WWDW #2) at the Hamilton County Coal, LLC facility located at 18033 County Road 500 East, Dahlgren, Illinois.

   a. As documented in a Well Completion Report submitted to the Illinois EPA on August 5, 2015, and assigned Log No. UIC-146-M2, Well WWDW #1 has been constructed in accordance with plans and specification approved by the Illinois EPA. Authorization to operate Well WWDW #1 is contained in Section B of this permit. Well WWDW #1 is located at:

      Latitude: 38° 02' 02.66" Longitude: 88° 27' 16.83"

   b. The Permittee is <u>not</u> authorized to begin construction of well WWDW #2 at this time. Authorization to begin construction of injection well WWDW#2 will be granted following the submittal and approval by the Illinois EPA of a permit modification that provides plans and procedures to obtain information on the fracture pressure of the injection zone for well WWDW #2. The purpose of this permit modification is to facilitate the collection of more precise information on the fracture pressure of the injection zone of well WWDW#2 during construction of the well. Problems encountered during the performance of the Step-Rate Tests conducted on well WWDW#1 prevented the isolation of the upper injection zone of the well. The February 2016 <u>well WWDW #1 Completion Report Supplemental Information</u>, <u>Response to IEPA Specific Comment 2</u>, noted that one of the reasons the isolation of the upper injection zone could not be completed was due to the borehole being excessively washed out and rugose which would prevent the successful seating of an inflatable packer at the top of the Shakopee Formation. It is likely that similar conditions will be encountered at well WWDW #2, and as such, revised plans to collect this information are warranted.

      Upon written approval of the permit modification described above, the Permittee will be authorized to complete construction of injection well WWDW #2 within the area identified in Condition A. 3. The wastewater to be injected into the wells is groundwater that collects within White Oak Mine No. 1.

      Following written authorization for construction of well WWDW #2, the construction shall be performed in accordance with the conditions of this permit, the approved permit application, identified in Attachment A, the Illinois Environmental Protection Act and Title 35 Illinois Administrative Code Sections (Ill. Adm. Code) 702, 704, 705 and 730. In the event of a conflict between the conditions of this permit and the approved permit application, the conditions/requirements of the permit shall supersede the application.

2. Application and Plans. Construction and if later authorized operation of the injection wells and associated monitoring systems shall be conducted in accordance with the terms and conditions of this permit, the approved permit application, and subsequent approved modifications. The approved permit application is identified in Attachment A of this permit.

3. Well Locations (35 Ill. Adm. Code 704.162(b)). Area Permit Boundary is the defined as the area in which the approved injection wells may be constructed. This area is identified in Form 4, Figure 4-2 of the approved permit application. A copy of this figure is included in Attachment C of this permit. The coordinates of the approximate center of this area are:

   Latitude: 38.16881° Longitude: -88.61783°

4. Notification of Construction (35 Ill. Adm. Code 704.162). The Permittee must notify the Illinois EPA in writing at least 30 days prior to the date of the planned physical construction of an injection well. The written notification must state that the injection well will be constructed in accordance with the requirements of the Permittee's UIC permit and include a map that includes the approximate location of the injection well to be constructed, any existing injection wells and the Area Permit Boundaries. A completed Illinois EPA General Application for Permit (Form LPC-PA1) form must accompany the notification. This form can be found at the following website:

   http://www.epa.state.il.us/land/regulatory-programs/permits-and-management/forms/pa1.html

5. Injection and Confining Layers. The wastewater will be injected into an injection zone that is located from a depth of approximately 7,750 to 13,000 feet below ground surface (ft-bgs) at the facility. The injection zone is comprised of the geologic formations designated as the St. Peter Sandstone, the Knox Megagroup and Mt. Simon Sandstone formation. The water in the injection zone has been found to be highly mineralized with concentrations of total dissolved solids greater than 200,000 mg/L; the wastewater being injected in to this zone contains up to approximately 12,000mg/l total dissolve solids.

   The confining layer located above the injection zone is present at a depth of approximately 6,700 ft-bsg and is comprised of the Maquoketa Shale. This formation has a thickness of approximately 140 to 200 feet in the vicinity of the facility. The Maquoketa Shale is a formation with low permeability and uniform thickness making it an effective upper confining unit which will limit the upward movement of any injected wastewater.

6. Injection Well Construction Details (35 Ill. Adm. Code 730.112(b)). The well construction details for well WWDW #1 and well WWDW #2 are provided in Attachment B which contains:

   - Injection well schematics;
   - Details of the casing strings used in the construction of each well;
   - Specification for the cementing of each of the casing strings;
   - Tubing and packer specifications;
   - Injection well pumps; and
   - Annulus protection system details.

7. Well Completion Report. The Permittee shall submit a Well Completion Report (Attachment E) upon the eventual completion of well WWDW #2. The report must also include the following:

   a. A description of construction of the well, including driller's log, materials used (i.e., tubing and casing tallies), cement (and other) volumes, appropriate logs and other tests conducted during the drilling and construction.

   b. Test and Logs during Construction. At a minimum, during drilling and construction of the injection well, all tests and geophysical logs listed under 35 Ill. Adm. Code 730.112(d) shall be performed. Additional tests and geophysical logs identified in the approved permit application or required as a condition elsewhere in this permit shall be performed. The results from logs and tests including appropriate evaluations and interpretations of the results shall be included in the Well Completion Report. A descriptive report interpreting the results of the logs and tests that has been prepared by a knowledgeable log analyst shall be included. Reports prepared by log analysts must be signed by the analyst and include his/her phone number.

   c. The Permittee shall collect a representative sample of the injection fluid for analysis in accordance with Condition B.4. An analytical report documenting the results of the analysis shall be prepared and included in the Well Completion Report for well WWDW#2.

   d. A revised Contingency Plan shall be submitted, if necessary, due to changes made during installation of an injection well. The Well Completion Report for well WWDW#2 shall include a revised contingency plan based on the as-built injection well system. The revised plan must include, at a minimum, the following:

      i. A description of the alarm system, including the values for tubing pressure, flow rate and annulus pressure that will trigger alarms;

ii. The action personnel will take in response to alarm conditions;

iii. A description of how operators and other appropriate personnel will be notified of system alarms;

iv. A description of the automatic shutdown of the injection pumps, including the annulus pressure, injection pressure and flow rate that will trigger pumps shut down;

v. Procedures to be followed in the event of injection well or equipment failure; and

vi. A list of the persons designated to oversee well operations in the event of an emergency. Phone numbers and qualifications should be included.

8. Reporting During Well Construction. During drilling and construction of an injection well, a weekly report shall be submitted to the Illinois EPA. The reports should describe the construction completed during the past week and the construction to be completed the following week at the well site. This report should include a list of all tests and logs preformed or to be performed on the well. In addition, a daily update shall be submitted that identifies activities that will be occurring and changes to the scheduled activities. These reports should be submitted electronically to: Kevin.Lesko@Illinois.gov, Michael.Summers@Illinois.gov and Connie.Letsky@Illinois.gov. These reports are exempt from the signatory requirement in Condition H.11.

9. Change During Construction (35 Ill. Adm. Code 704.183). Changes in construction plans during construction must be approved by the Illinois EPA prior to being physically incorporated into the well. In accordance with 35 Ill. Adm. Code 704.264, these changes may be approved as minor modifications.

10. Authorization for Injection. The Permittee shall not commence operation of any newly constructed injection well until they have received writing authorization from the Illinois EPA to do so. Authorization to begin operation of an injection well shall not be granted until:

    a. The Permittee has submitted a Well Completion Report, which includes a permit modification request for authorization to operate the injection well, and other information as required demonstrating that the well has been constructed in accordance with the approved permit.

    b. The Illinois EPA Field Office Section has conducted an inspection of the newly constructed injection well systems to verify the completion of the injection well.

c. The Agency has conducted a review of the Well Completion Report and other information as required by this permit and has determined that the report is complete, i.e., all of the required testing, logging, evaluations and inspections have been conducted in accordance with the approved permit.

d. The information provided demonstrates that the construction and operation of the injection well meets the requirements of the Illinois Environmental Protection Act and Title 35 Illinois Administrative Code Sections (Ill. Adm. Code) 702, 704, 705 and 730.

e. The Permittee establishes financial resources to close, plug, and abandon the underground injection well(s) at this facility as required in Condition H.16 of this permit. The amount of financial assurance to be provided is $425,952.70 per well in 2014 dollars. (35 Ill. Adm. Code 704.189)

11. Emergency Modification of Annulus Protection System

a. Modifications to the Annulus Protection System (APS) must be completed as identified in the August 25, 2017 Emergency Permit Request addendum and the conditions of this permit. Monitoring/recording equipment and devices shall meet the specifications identified the addendum. All equipment, piping and appurtenances shall be fit for the expected operating conditions and shall be installed in accordance with the manufacturers recommendations and/or standard industry practices. The Illinois EPA must be notified, via email as specified in Condition 11.b below, of significant changes to the approved design of the modified APS within 24 hours.

b. Reporting During Modification of the Annulus Protection System. During the period that the modifications to the APS are being completed, including system programing and testing, the Permittee shall prepare a weekly report to be submitted to the Illinois EPA in writing and via e-mail. The reports should describe the activities completed during the past week and the activities to be completed the following week to modify the APS. This report should include a list of all tests and logs preformed or to be performed on well WWDW#1. In addition, a daily update shall be submitted via email that identifies activities that will be occurring and changes to the scheduled activities. The reports that must be submitted electronically shall be sent to: Kevin.Lesko@Illinois.gov, Michael.Summers@Illinois.gov and Connie.Letsky@Illinois.gov. These reports are exempt from the signatory requirement in Condition H.11.

c. The Permittee must notify the Illinois EPA, via email and in writing as specified in Condition 11.b above, at least 48 hours prior to the date when well WWDW#1 is expected to resume injection.

d. The Permittee may resume injection at well WWDW#1 on the date the Permittee specified in the notice required in Condition 11.c above, unless:

   i. the Illinois EPA notifies the Permittee that injection should not resume; or

   ii. the Illinois EPA is notified of a significant change that is made to the approved modified APS after the Permittee provided the notice required in Condition 11.c above. In this case the Permittee shall not resume injection until:

      1. 48 hours after the notice to the IEPA of a significant change to the APS; or

      2. the Illinois EPA notifies the Permittee that injection may resume prior to the 48-hour waiting period.

e. Within 30 days of completing the approved modifications to the APS the Permittee must submit a Modified APS Construction Report that includes:

   i. as-built piping and instrumentation diagrams;

   ii. a description of the monitoring/recording devices installed, including the devices manufacturing specification;

   iii. a description of how the APS is intended to operate, including information on the set points/operational ranges for the system control devices;

   iv. a description of test that were conducted during the initial setup of the to APS control system(s) to dial in the system; and

   v. a list of changes made to the proposed APS during construction.

f. Following a review of the Modified APS Construction Report the Agency reserves the right to issue a modified temporary emergency permit.

g. The Permittee must submit a revised Contingency Plan (see Condition A.7.d) within 30 days of completing the modifications to the APS. The contingency plan must be revised as necessary to address modifications that have been made to the APS.

12. Withdraw of Temporary Emergency Permit. Hamilton County Coal submitted an Underground Injection Control Area Permit modification request, dated July 5, 2017 on which this Temporary Emergency permit is based, in part. This permit modification request was given a log number of UIC-146-M3, by the Illinois EPA. The Illinois EPA will review this application and, if appropriate, prepare a Draft Modified UIC Area Permit for the Hamilton County Coal facility for public comment.

The public notice of a draft decision will begin the administrative process to issue a final determination on the UIC Area Permit. Within 30 days of the modified UIC Area Permit becoming effective or upon final denial, Hamilton County Coal must submit a permit modification request to withdraw this Temporary Emergency Permit as it will have been superseded by the newly issued modified UIC Area Permit.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Authorization for Injection. Well WWDW #1, a Class I non-hazardous waste underground injection well, is authorized to inject fluids in accordance with the conditions of this permit.

2. Operating Requirements (35 Ill. Adm. Code 730.113(a), 704.185)

    a. Maximum injection pressure. The Permittee must insure that the injection pressure at the wellhead does not exceed the maximum allowed injection pressure. The maximum injection pressure for well WWDW #1 is 2,000 pounds per square inch (psi).

    The actual maximum injection pressure for well WWDW #2 will be determined from information collected during completion of the well.

    b. Maximum injection rate. The maximum injection rate for each well is 1,500,000 gallons per day.

    c. Injection Fluid. The wastewaters injected into wells WWDW #1 and well WWDW #2 shall be limited to native groundwater that migrates into the White Oak No. 1 Mine. The source of this native groundwater is the Trivoli Sandstone formation. The groundwater in this formation has been found to contain chlorides at levels up to 12,700 mg/L and total dissolved solids of 22,538 mg/L making it unusable as a source of drinking water.

    d. Annulus Protection. The following conditions shall be met at all times to limit the potential for any unpermitted fluid movement into or out of the annulus of the injection well, except during brief periods during startup and shutdown of injection of wastewater into the well, and when it is necessary due to maintenance of the injection well system:

        i. Minimum Annulus Pressure: The pressure within the annular spacing between the injection tubing and the long string casing (the "annulus") shall be maintained at a minimum pressure of 100 psi above the injection tubing pressure.

ii. Maximum Annulus Pressure: The annulus pressure shall not exceed 2,500 psi.

iii. Annulus/Injection Tubing Pressure Differential: the annulus pressure shall be maintained such that the pressure in the annulus is at least 100 psi greater or less than the injection pressure, except for brief periods during startup and shutdown of injection and during brief, but infrequent, transitional events during active injection.

iv. The annulus between the injection tubing and the long string casing shall be filled with a packer fluid consisting of a mix of fresh water and Baker Petrolite CRW37 fluid or equivalent. The CRW37 fluid contains both corrosion inhibitor and biocide. The fresh water/packer fluid ratio shall be mixed in accordance to the manufacturer's recommendation resulting in a density equal to water.

v. In order to assure proper operation of the annulus protection system during freezing conditions, mineral oil may be added to the annulus protection system to protect the upper portion of the well annulus.

vi. Any changes to the composition of annular fluid shall be reported in the next monthly report submitted to the Permit Section, Division of Land Pollution Control.

vii. The annulus pressure shall be monitored continuously including periods when injection is not being conducted. Monitoring may be discontinued, if necessary, during periods when maintenance is being performed on the well.

e. Annulus injection prohibition. Injection between the outer most casing protecting underground sources of drinking water and the well bore is prohibited.

f. Prohibition of excessive pressure. The Permittee shall not use excessive injection pressure or volumes and cause:

i. new fractures or propagation of existing fractures in the injection zone (except during stimulation),

ii. initiation of fractures in the confining zone,

iii. migration of injected fluids into any underground source of drinking water,

iv. displacement of formation fluid into any underground source of drinking water, or

v. non-compliance with 35 Ill. Adm. Code 730 operating requirements.

g. Injection Zone Stimulation. The Permittee must notify the Illinois EPA at least 30 days before stimulating the injection zone. The injection zone stimulation notification shall include the procedures that will be used for the controlled stimulation.

3. Monitoring Requirements (35 Ill. Adm. Code 730.113(b)).

a. Sampling. Grab samples of the injection fluid shall be collected in accordance with Condition B.4.

b. Continuous Recording Devices. Continuous recording devices or their equivalents shall be installed and used to monitor the injection pressure, flow rate, volume, and annulus pressure. Temperature and pH will be monitored weekly. Information from the following continuous recording devices and manually read gauges/devices shall be utilized to monitor the operation of each injection well:

i. Injection pressure gauges - Yokogawa EJA530OE-JDS4N-012EL/FU1/D1(or equivalent) gauge pressure transmitter along with a manual REOTEMP Series PR 35 pressure gauge.

ii. Injection fluid flow meter - Two FLUXUS ADM 5107 flow transmitters with two ultrasonic flow transducers Models M5L7.

iii. Injection fluid volume – Volume is measured and recorded with equipment identified in item iii above and sum registered in the Yokogawa CX2000 data recorder.

iv. pH (weekly) - Yokogawa pH/Temperature Sensors, Models FU24-10-Tl-NPT, with PT1000 temperature elements and dedicated Yokogawa analyzers, Models PH450GA-U/UM/SCT (or equivalent).

v. Temperature - Yokogawa pH/Temperature Sensors, Models FU24-10-Tl-NPT, with PT1000 temperature elements and dedicated Yokogawa analyzers, Models PH450GA-U/UM/SCT (or equivalent).

vi. Casing-tubing annulus pressure gauges - Yokogawa EJA530OE-JDS4N-012EL/FU1/D1 (or equivalent) absolute pressure transmitter along with a manual REOTEMP Series PR 35 pressure gauge.

vii. Casing-tubing annulus flow meter - FLUXUS® F70x Liquid ultrasonic flowmeters (or equivalent) measuring flow into and out of well annulus via transducers located at two separate locations (see Attachment B).

viii. Annulus fluid storage tank (V001) fluid level - VersaLine VL2000 Series open face level transmitter (or equivalent). The Permittee shall record the volume of fluid added or removed from the annulus fluid storage tank V001 to determine if the well annulus is gaining or losing fluid over time.

c. Range of Recording Device and Gauges. All recording devices and gauges shall be capable of recording or reporting values that exceed maximum permitted operating range by a minimum of 20%.

d. Supplemental Monitoring Program. The maximum injection pressure alarm and system shutdown criteria contained in the "Supplemental Monitoring Program," page 4h-19 of the "Well Completion Report" (revised July 2015), shall be revised based on the maximum injection pressure of 2,000 psi specified in Condition B.2.

4. Waste Analysis Plan (35 Illinois Admin. Code 704.187). The Permittee shall follow the written Waste Sampling and Analysis Plan, Form 4e, Permit Item I of the approved permit application, as modified by this permit. A copy of the plan shall be kept at the facility. The Permittee shall collect and analyze the injection fluid in a manner consistent with US EPA publication SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" and "Handbook for Sampling and Sample Preservation of Water and Wastewater," U.S. Environmental Protection Agency EPA-600/4-82-029.

5. Ambient Monitoring (35 Ill. Adm. Code 730.113(d)). The Permittee shall conduct an Ambient Pressure Monitoring Test annually in accordance with the procedures outlined in Form 4e, Permit Item III of the permit application.

6. Monthly Reporting Requirements.

a. Report submittal date. Monthly monitoring reports are due by the 15th day of the month immediately following a reporting period. A reporting period is defined as a calendar month.

b. Contents of monthly reports. The monthly reports shall include:

i. Daily value for total volume injected, net change in well annulus fluid volume, and net change in volume in annulus fluid storage tank (V001).

ii. Daily maximum, and minimum values for annulus pressure, injection pressure, and injection flow rate.

iii. Weekly averages for annulus pressures, injection pressure and flow rate.

iv. The number of times the well is started up during each day

v. Total hours of injection each day

vi. Total volume injected to date

vii. Monthly summary of:

1. maximum, minimum, and average values for annulus pressures, injection pressure, and flow rate.

2. total gallons of fluid injected

3. total number of well startups

4. net change in well annulus fluid volume and net change in volume in annulus fluid storage tank V001.

viii. A copy of the operating charts for the month for:

1. annulus pressure system including:

a. Annulus pressure

b. Annulus meter flow rates into and out of well annulus

c. Annulus meter total flow into and out of well annulus

2. injection pressure

3. Injection flow rate

ix. Results of chemical analyses required by this permit.

c. Other information in monthly reports. The results of any of the following tests or work shall be reported with the second monthly report after completion of the test or work:

i. Periodic tests of mechanical integrity.

ii. Copies of any logs run on the well, submitted with a log analysis.

iii. Any other test of the injection well conducted by the Permittee.

iv. Any well work over.

v. Maintenance performed on monitoring devices or well components.

vi. Changes of gauges, pipes, and other well components and monitoring devices.

vii. Changes in the type of annulus fluid.

viii. Addition or removal of annulus fluid.

ix. Summary of annular fluid level fluctuations.

x. Ambient pressure monitoring results.

d. Illegible reports will be returned to the Permittee and deemed not filed. All graphs and charts must be labeled appropriately.

i. Charts and other information generated from digital/computer data shall provide an accurate representation of the operating condition of the well. The Agency reserves the right to require submittal of tabular paper copies of data, changes in the format and resolution of representative graph(s), and the submittal of digital data to Field Operations Staff and Permit Section Staff for review. The electronic data submitted must be in a format that is useable to said staff, such as tab or comma delimited CSV format or Microsoft Excel format.

e. Report submittal addresses. The cover letter for the monthly report will indicate a copy of the report was submitted to each of the following addresses:

i. Illinois Environmental Protection Agency
Division of Land Pollution Control - #33
Permit Section
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

ii. Illinois Environmental Protection Agency
Division of Land Pollution Control
Field Operations Section
2009 Mall Street
Collinsville, IL 62234

7. Groundwater Monitoring Plan (35 Ill. Adm. Code 730.113) – Based on information submitted by Hamilton County Coal, the Illinois EPA approves the request for a waiver from groundwater monitoring at this time. The approval of this waiver request may be terminated if the Illinois EPA acquires new information regarding the geology in the vicinity of the facility or if new regulations requiring groundwater monitoring are promulgated. If the Illinois EPA terminates the approval of the waiver from groundwater monitoring based on acquisition of new geologic information or promulgation of new regulations, the modification procedures of 35 Ill. Adm. Code Part 702 will be followed.

C. **EFFECT OF PERMIT.** The existence of a UIC permit shall not constitute a defense to a violation of the Environmental Protection Act or 35 Ill. Adm. Code Subtitle G except for development, modification or operation without a permit. Issuance of this permit does not convey property rights or any exclusive privilege. Issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or infringement of state or local law or regulations (35 Ill. Adm. Code 702.181).

The activity authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Any underground injection activity not authorized in this permit or otherwise authorized by permit is prohibited. (35 Ill. Adm. Code 704.122)

Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, or the environment. In the case of disagreement between the conditions of this permit and the application, the permit conditions shall govern.

D. **PERMIT ACTIONS.** This permit may be modified, reissued or revoked during its term for cause set forth in 35 Ill. Adm. Code 702.183 through 702.186. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any permit condition. (35 Ill. Adm. Code 702.146)

E. **SEVERABILITY.** The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit is held invalid, the application of such provision to other circumstances and to the remaining provisions of this permit shall not be affected thereby.

F. **CONFIDENTIALITY.** In accordance with Section 7 of the Illinois Environmental Protection Act and 2 Ill. Adm. Code 1828 allows certain information submitted to the Illinois EPA may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. In addition, justification for the claim must also be made and all requirements of 2 Ill. Adm. Code 1828 must be followed. If no claim is made at the time of submission, the Illinois EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with Board and Agency procedures. (35 Ill. Adm. Code 130) (2 Ill.

Adm. Code 1828) Claims of confidentiality for the following information will not be approved:

1. The name and address of any permit applicant or permittee;
2. The identity of substances being placed or to be placed in landfills or hazardous waste treatment, storage or disposal facilities (including injection wells);

3. Information, which deals with the existence, absence or level of contaminants in drinking water.

G. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. Any person who violates a permit requirement is subject to civil penalties, fines, and other enforcement action under the Safe Drinking Water Act (SDWA) and the Environmental Protection Act.

H. DUTIES AND REQUIREMENTS.

1. Duty to Comply. The Permittee shall comply with all applicable UIC program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by a temporary emergency permit under 35 Ill. Adm. Code 704.163. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and is grounds for enforcement action, permit revocation, modification, or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA). (35 Ill. Adm. Code 702.141 and 35 Ill. Adm. Code 704.181(a)).

2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must submit an application for a new permit at least 180 days before this permit expires. (35 Ill. Adm. Code 702.142)

3. Need to Halt or Reduce Activity. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (35 Ill. Adm. Code 702.143)

4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit. (35 Ill. Adm. Code 702.144)

5. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities, systems of treatment, and controls (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate

funding, adequate operator staffing and training, adequate laboratory and process controls, and appropriate quality assurance procedures. This provision requires the operation of backups, auxiliary facilities, or similar systems used only when necessary to achieve compliance with the condition of the permit. (35 Ill. Adm. Code 702.145)

6. Property Rights. Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (35 Ill. Adm. Code 702.147)

7. Duty to Provide Information. The Permittee shall furnish to the Illinois EPA, within the specified times, any information which the Illinois EPA may request, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Illinois EPA, upon request, copies of records required to be kept by this permit. (35 Ill. Adm. Code 702.148)

8. Inspection and Entry (35 Ill. Adm. Code 702.149). The Permittee must allow an authorized representative of the Illinois EPA, upon the presentation of credentials and other documents, as may be required by law, and at reasonable times, to:

    a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

    b. Have access to and copy any records that must be kept under the conditions of this permit;

    c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

    d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location.

    e. Have access to witness the running of any logs or tests.

9. Monitoring. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (35 Ill. Adm. Code 702.150(a))

10. Records (35 Ill. Adm. Code 702.124; 702.150(b),(c) & 704.181(b))

    a. The Permittee shall keep records of all data used to complete the permit applications and any supplemental information submitted pursuant to 35 Ill. Adm. Code 702.123, and 35 Ill. Adm. Code 704.161 for a period of at least three years from the date the application is signed

    b. The Permittee shall retain records of all monitoring information, including all calibration, maintenance records, original chart recordings for continuous

monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Illinois EPA at any time.

c. Retention of records. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 35 Ill. Adm. Code 704.188 or under Subpart G of 35 Ill. Adm. Code 730, as appropriate. The Owner or Operator shall continue to retain the records after the three year retention period unless the Owner or Operator delivers the records to the Illinois EPA or obtains written approval from the Illinois EPA to discard the records.

d. Records of monitoring information shall include:

i. The date, exact place, and time of sampling or measurements;

ii. The individual(s) who performed the sampling or measurements;

iii. A precise description sampling methodology and handling, including chain of custody procedures;

iv. The date(s) analyses were performed;

v. The individual(s) who performed the analyses;

vi. The analytical techniques or methods used; and

vii. The results of such analyses.

11. Signatory Requirements. All reports, application, or information submitted to the Illinois EPA shall be signed and certified as required in 35 Ill. Adm. Code 702.126. (35 Ill. Adm. Code 702.151)

12. Reporting Requirements.

a. Planned changes. The Permittee shall give written notice to the Permit Section, Division of Land Pollution Control within 15 days of any planned physical alterations or additions as to the permitted facility. (35 Ill. Adm. Code 702.152(a))

b. Anticipated noncompliance. The Permittee shall give advance notice to the Permit Section, Division of Land Pollution Control, of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. (35 Ill. Adm. Code 702.152(b)).

c. Other noncompliance. The Permittee shall report all instances of noncompliance not reported under 35 Ill. Adm. Code 702.152 paragraphs (d), (e) and (f) at the time monitoring reports are submitted. The reports shall contain the information required in 35 Ill. Adm. Code 704.181(d)(2). (35 Ill. Adm. Code 702.152(g))

d. A summary of the reporting dates can be found in Attachment D for information required by this permit. This summary is provided as a convenience and is not necessarily complete, nor is it to be construed as a substitute for actual permit conditions.

13. Corrective Action Requirements (35 Ill. Adm. Code 704.190, 704.193 and 730.107)

a. The Permittee shall notify the Division of Land Pollution Control, Permit Section, in accordance with the notification procedures in Condition H.14, and the injection well(s) shall be immediately shut-in upon:

i. the discovery of upward fluid migration occurring through a previously unknown well bore, or other improperly sealed, completed or abandon wells in the area of review, due to injection of fluid into the Permittee's well(s), and/or;

ii. the discovery of the loss of mechanical integrity of an injection well or;

iii. the discovery of a well failure including, the inability of the Permittee to properly monitor and operate an injection well, as required by the permit, due to the malfunction of equipment or the failure of other well components.

b. In the event of the discovery of a well or wells described in item (a)(i) above, the Permittee must prepare a permit modification request consisting of a corrective action plan describing such steps to be taken to properly plug or seal the wells or wells and/or other actions necessary to prevent movement of fluid into USDWs. A copy of the plugging affidavit(s) filed with the Illinois Department of Public Health and the Illinois Department of Natural Resources, Office of Mines and Minerals, Division of Oil and Gas for wells that are subsequently properly plugged and abandoned must be submitted to the Division of Land Pollution Control, Permit Section.

c. In case of an injection well failure, the Permittee shall implement the contingency plan developed for the injection wells, contained in Appendix 4e-1 of the approved permit application. An investigation of the well failure and plan of action to eliminate the problem must be conducted and the remedial work performed.

The Permittee may be required to submit a permit modification for review and approval by the Illinois EPA prior to implementation of work to investigate and/or repair a well. Remedial work that would likely require the submittal a permit modification request for review and approval prior to implementation includes:

- Alterations to the design of the injection well system; and/or
- Procedures used to investigate and/or repair a well failure that may affect the mechanical integrity of the well.

If a well failure results in an imminent and substantial threat to the health of persons, the Illinois EPA may issue a temporary emergency permit in response to a modification request which describes the steps to be taken to address this threat pursuant to 35 Ill. Adm. Code 704.163.

14. Twenty-four Hour Reporting. (35 Ill. Adm. Code 702.152(f); 704.181(d))

a. The Permittee shall report to the Permit Section, Division of Land Pollution Control, any noncompliance or well activity which may endanger health or the environment including but not limited to the following.

   i. Any monitoring or other information which indicates any contaminant my cause an endangerment to underground sources of drinking water.

   ii. Any noncompliance with a permit condition or malfunction of the injection well system which may cause fluid migration into or between underground sources of drinking water.

   Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

b. A written submission must also be provided to the Permit Section, Division of Land Pollution Control, within 5 days of the time the Permittee becomes aware of the circumstances. The written submission must contain:

   i. a description of the noncompliance problem and its cause;

   ii. the period of noncompliance including exact dates and times;

   iii. if the noncompliance problem has not been corrected, the anticipated time it is expected to continue; and

iv. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance problem.

c. The Permittee shall report, within twenty-four hours, any malfunction that results in the shutdown of the injection well system to the Division of Land Pollution Control. These reports should be submitted electronically to: Kevin.Lesko@Illinois.gov, and Connie.Letsky@Illinois.gov. These reports are exempt from the signatory requirement in Condition H.11. The report should contain:

i. a description of the cause of the shutdown;

ii. a description of the steps taken to bring the well back on-line; and

iii. if the problem has not been corrected, the anticipated time the problem is expected to be repaired.

Hard copies of these reports, as well as a discussion of their content, must be included the monthly reports submitted to the Illinois EPA.

15. Transfer of Permit.

a. Transfers. This permit is not transferable to any person except after notice to the Illinois EPA. The Illinois EPA may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (35 Ill. Adm. Code 702.152(c))

b. Transfer by modification. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified or reissued (under Sections 704.261 through 704.264) to identify the new Permittee and incorporate such other requirements as may be necessary under the appropriate Act. The new owner or operator to whom the permit is transferred must comply with all the terms and conditions specified in such permit. (35 Ill. Adm. Code 704.260(a))

c. Automatic transfers. (35 Ill. Adm. Code. 704.260(b)) As an alternative to transfers under condition 15(b), a UIC permit for a well not injecting hazardous waste may be automatically transferred to a new Permittee if each of the following conditions are fulfilled:

i. The current Permittee notifies the Illinois EPA at least 30 days in advance of the proposed transfer date, described in condition 15(c)(ii) of this section;

ii. The notice includes a written agreement between the existing and new Permittee containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new Permittee;

iii. The notice demonstrates that the financial responsibility requirements of 35 Ill. Adm. Code 704.189 will be met by the new Permittee and that the new Permittee agrees to comply with all the terms and conditions specified in the permit to be transferred under automatic transfer conditions; and

iv. The Illinois EPA does not notify the existing Permittee and the proposed new Permittee of its intent to modify the permit. A modification under this subparagraph may also be a minor modification under 35 Ill. Adm. Code 704.264. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in condition 15(c)(ii).

16. Financial Responsibility. (35 Ill. Adm. Code 704.189) The Permittee shall maintain financial responsibility and resources to close, plug, and abandon all the underground injection wells at this facility in a manner prescribed by the Illinois EPA, and Condition H.23 of this permit.

    a. The Permittee must show evidence of financial responsibility to the Illinois EPA by the submission of a surety bond, other adequate assurance such as financial statements, or other materials acceptable to the Illinois EPA.

    b. The financial documents submitted must be revised and maintained as specified in 35 Ill. Adm. Code 704 and 40 CFR 144.

    c. Construction and/or operation of any injection well(s), and groundwater monitoring well(s) is prohibited unless the Permittee has adequate financial assurance as described in subpart (a) of this condition.

17. Cost Estimates for Plugging and Abandonment. (35 Ill. Adm. Code 702.160; 704.212)

    a. The Owner or Operator must prepare a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment plan as identified in Condition H.23. The cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive. The currently approved cost estimate for plugging and abandonment of <u>each</u> injection well is $425,952.70 (2014 dollars).

    b. The Owner or Operator must adjust the cost estimate for inflation within 30 days after each anniversary of the date on which the first cost estimate was prepared.

The adjustment must be made as specified in paragraphs (i) and (ii) of this condition, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous years.

i. The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.

ii. Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.

c. The Owner or Operator must review the cost estimate whenever a change in the plan increases the cost of plugging and abandonment. The revised cost estimate must be adjusted for inflation as specified in paragraph (b) of this condition.

d. The Owner or Operator must keep the following at the facility during the operating life of the facility:

i. the latest cost estimate prepared in accordance with paragraphs (a) and (c) of this condition and,

ii. the latest adjusted cost estimate prepared in accordance with paragraph (b) of this condition.

18. Incapacity (35 Ill. Adm. Code 702.160; 704.230)

a. An owner or operator shall notify the Waste Reduction and Compliance Section, Division of Land Pollution Control, by certified mail of the commencement of a voluntary or involuntary proceeding under 11 U.S.C. (Bankruptcy), naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in 35 Ill. Adm. Code 704.219 must make such a notification if the guarantor is named as debtor, as required under the terms of guarantee in 35 Ill. Adm. Code 704.240.

b. An owner or operator who fulfills the requirements of 35 Ill. Adm. Code 704.213 by obtaining a letter of credit, surety bond or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy insolvency or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance within 60 days after such an event.

19. Revocation of Permits. (35 Ill. Adm. Code 702.186) The Illinois Pollution Control Board will revoke a permit during its term in accordance with Title VIII of the Illinois Environmental Protection Act or the Illinois EPA will deny permit renewal for the following causes:

a. The Permittee's violation of the Environmental Protection Act or regulations adopted thereunder;

b. Noncompliance by the Permittee with any condition of the permit;

c. The Permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time; or

d. A determination the permitted activity endangers human health, or the environment and can only be regulated to acceptable levels by permit modification or revocation.

20. State Mining Board Permits. Issuance of this permit does not relieve the Permittee of the responsibility of complying with the provisions of Illinois State Mining Board Rules and Regulations and an Act in Relation to Oil, Gas, Coal, and Other Surface and Underground Resources. (Rule II, Illinois Department of Natural Resources, Office of Mines and Minerals, Division of Oil and Gas, Rules and Regulations)

21. False or Omitted Information.

    a. The Permittee shall not make any false statement, representation, or certification in any application, record, report, plan, or other document submitted to the Illinois EPA, the United States Environmental Protection Agency (USEPA), or required to be maintained under this permit.

    b. If, or when, the Permittee becomes aware of a failure to submit any relevant facts in a permit application or incorrect information was submitted in a permit application or in any report to the Illinois EPA, the Permittee shall promptly submit such facts or correct information to the Permit Section, Division of Land Pollution Control within ten (10) days. (35 Ill. Adm. Code 702.152(h))

22. Restriction on Unpermitted Waste. Injection of waste other than those specified in the approved permit application is prohibited. Other fluids may be injected for short periods for purposes of well testing, well stimulation or for the purposes of formation testing provided the Permittee provides notice to the Illinois EPA of these tests in accordance with Condition H.26 (e).

23. Plugging and Abandonment.

    a. The Permittee shall notify the Permit Section, Division of Land Pollution Control, 60 days prior to abandonment of a well. The Permittee must submit significant

changes to the plans for plugging and abandonment 180 days prior to abandonment. (35 Ill. Adm. Code 704.181(e))

b. The Permittee shall plug and abandon the injection well as provided in 35 Ill. Adm. Code 704.188 and 730.110 and in accordance with the schedule and provisions of the approved plugging and abandonment plan. The approved plan is contained in Form 4g, Plugging and Abandonment of the approved permit application, herein incorporated by reference and as modified by conditions of this permit. (35 Ill. Adm. Code 704.188).

c. No later than 60 days after plugging and abandonment of any injection or monitoring well, the Permittee shall submit a plugging report required by 35 Ill. Adm. Code 704.181 (g) to the Permit Section, Division of Land Pollution Control. The report shall be certified as accurate by the person who performed the plugging operation, and shall consist of:

i. A statement that the well was plugged in accordance with the plan most recently submitted to the Illinois EPA; or

ii. A statement defining the actual plugging and explaining why the Illinois EPA should approve such deviation, if the actual plugging differed from the approved plan. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Illinois EPA to require the operator to re-plug the well; and

iii. Copy of well plugging affidavit submitted to the Illinois Department of Natural Resources, Office of Mines and Minerals, Division of Oil and Gas; and the Illinois Department of Public Health.

iv. If the approved plugging and abandonment plan requires a change, a revised plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval. If approved, the revised plugging and abandonment plan shall be incorporated into the approved permit application as a permit modification.

24. Conversion of Wells (35 Ill. Adm. Code 704.181(e)) The Permittee shall notify the Permit Section, Division of Land Pollution Control, 45 days prior to conversion of any well. Plans for conversion must be submitted 180 days prior to actual conversion or abandonment. Injection into converted wells shall not be conducted until the Permittee receives written authorization for injection from the Illinois EPA.

25. Inactive Wells. (35 Ill. Adm. Code 704.188) After cessation of injection for two (2) years, the Permittee shall plug and abandon the well in accordance with Condition H.23 of this permit and 35 Ill. Adm. Code 730.110, unless the Permittee has:

a. Provided notice to the Permit Section, Division of Land Pollution Control; and

b. Described actions or procedures, which are deemed satisfactory to the Illinois EPA, to ensure the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, including mechanical integrity testing, unless waived by the Illinois EPA in writing.

26. Duty to Establish and Maintain Mechanical Integrity (35 Ill. Adm. Code 704.181(h) and 704.190).

a. The Permittee shall establish mechanical integrity as defined in 35 Ill. Adm. Code 730.108 prior to commencing injection.

b. A demonstration of mechanical integrity in accordance with Form 4e, Permit Item III, Mechanical Integrity Tests During Service Life of Well of the approved permit application shall be conducted to ensure the well has integrity during the life of this permit. A descriptive report interpreting the results of all geophysical logs and tests must be prepared by a knowledgeable log analyst and submitted to the Permit Section, Division of Land Pollution Control. This report shall be signed by the analyst and shall include his/her phone number.

c. The Permittee shall demonstrate the absence of significant leaks in the casing, injection tubing, and packer by use of an annulus pressure test to be conducted annually. The annulus pressure test shall be conducted in accordance with procedures contained in Form 4e, Permit Item III of the approved permit application, and the following conditions:

i. The annular space must be completely filled with annular fluid.

ii. A pressure differential between the pressure in the annular space and the injection tubing pressure of at least 100 psi shall be maintained throughout the entire annular space.

iii. Measurements of pressure should be taken at a minimum of every ten minutes.

iv. The well will be deemed to have failed the annulus pressure test if a pressure change of greater than 3% occurs over a one-hour period.

d. The Permittee shall demonstrate the absence of significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore by use of a temperature survey to be conducted biennially.

e. The Permittee will inform the Permit Section, Division of Land Pollution Control, of its intent to conduct pressure test(s), and temperature log(s), plus any additional mechanical tests, logs, or inspections, at least thirty (30) days prior to the demonstration of mechanical integrity. The notice must include the type of test to be conducted; any fluid that will be injected as part of the test; and a demonstration that the fluid will be compatible with the injection well materials and formation that may come into contact with the testing fluid. If a demonstration of this compatibility has previously been submitted, the Permittee may reference the previous submittal.

f. The Permittee shall cease injection if an apparent loss of mechanical integrity, as defined by 35 Ill. Adm. Code 730.108, becomes evident during operation or at the time of the mechanical integrity demonstration. Operation shall not be resumed until the Permittee has complied with the provisions of this permit, and applicable regulations, regarding mechanical integrity demonstration and testing.

g. All gauges used in mechanical integrity demonstrations or in daily operations shall be calibrated according to the procedures of the National Bureau of Standards, initially and at least annually thereafter. A copy of the calibration certificate shall be submitted to the Permit Section, Division of Land Pollution Control on January 15 of each year. In addition, recording devices are to be time synchronized at least quarterly.

h. In addition to the mechanical integrity demonstration required by this permit, the Illinois EPA has the authority to require the Permittee to conduct a demonstration of mechanical integrity of the well at any time well operations, or other information, leads the Illinois EPA to decide an additional mechanical integrity demonstration is necessary. The notice requiring the mechanical integrity demonstration shall be in writing and contain justification for requiring the additional testing.

27. Contingency Plan. The Permittee shall implement the contingency plan in accordance with the plans and methods described in Appendix 4e-2 of the approved permit application.

28. 39i Certification. The Permittee shall submit a 39i certification and supporting documentation within 30 days of any of the following events:

    a. the owner or operator or officer of the owner, or operator, or any employee who has control over operating decisions regarding the facility has violated federal,

State, or local laws, regulations, standards, or ordinances in the operation of waste management facilities or sites; or

b. the owner or operator or officer of the owner, or operator, or any employee who has control over operating decisions regarding the facility has been convicted in this or another State of any crime which is a felony under the laws of this State, or conviction of a felony in a federal court; or

c. the owner or operator or officer of the owner, or operator, or any employee who has control over operating decisions regarding the facility has committed an act of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste.

d. a new person is associated with the owner or operator who can sign the application or who has control over operating decisions regarding the facility, such as a cooperate officer or a delegated employee.

The certification shall describe the violation(s), convictions, carelessness or incompetence as outlined in a, b, or c above and must include the date that a new person as described in d above began employment with the applicant.

The 39i certification and supporting documentation shall be submitted to the address specified below:

Illinois Environmental Protection Agency
Bureau of Land #33
39(i) Certification
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

29. Other Permitting Requirements. The issuance of this UIC permit does not relieve the Permittee of the responsibility for obtaining other permits or authorizations required by the Illinois EPA Bureau of Water, Illinois EPA Bureau of Air, Illinois Department of Natural Resources or other federal, state, or local agencies.

TJD:KL:kl\0650155010-UIC-UIC146-M2-Approval.docx

ATTACHMENT A

APPROVED PERMIT APPLICATION

ATTACHMENT A

APPROVED PERMIT APPLICATION

Document	Dated	Received	Permit Issued
Initial Application - Log No. UIC-146	January 7, 2013	January 7, 2013	Nov. 25, 2014
• Response to Comments	March 10, 2014	March 11, 2014	
• Application Revisions	June 11, 2014	June 11, 2014	
• Application Revisions No. 2	July 21, 2014	July 21, 2014	
Well Design Change – Log No. UIC-146-M1	January 19, 2015	January 20, 2015	January 30, 2015
Well Completion Rep. for WWDW#1 – Log No. UIC-146-M2	August 5, 2015	August 6, 2015	August 1, 2016
• Response to Agency Comments	February 8, 2016	Feb. 10, 2016	
Request for Emergency Permit	August 3, 2017	August 4, 2017	
• Modified Annulus Pressure System	August 25, 2017	August 25, 2017 via e-mail	

ATTACHMENT B

WELL CONSTRUCTION DETAILS

WELL WWDW#1 AND WELL WWDW #2

WELL WWDW#1 ANNULUS PROTECTION SYSTEM DETAILS

Construction Details for Underground Injection Well WWDW #1

Well Location

Well WWDW #1 is located at:

Latitude: 38° 02' 02.66" Longitude: 88° 27' 16.83"

Surface Casing

20 inch diameter, 94 lb./ft., H-40 with Buttress threads, with butt weld float shoe installed on the bottom of casing. Casing is set at approximately 503 feet bgs, approximately 100 feet above the Tivoli Sandstone Member of the Modesto Formation, at the base of the USDW. This casing is design to protect shallower formations and aquifers from the deeper high TDS waters encountered from the Tivoli formation downward.

Cementing: Casing cemented to surface.

- Lead slurry of 630 sacks of Super Lite w/3% Calcium Chloride
- Tail slurry of 360 sacks of common w/3% Calcium Chloride

Intermediate Casing

13 ⅜ inch diameter, 61 lb./ft., K-55, LTC, 8rd with a DV tool at ± 2,602 feet bgs set at a total depth of 3,304 feet bgs.

Cementing: Casing was cemented in two stages.

First Stage:

- Lead slurry of 365 sacks of 35/65 Poz 'A" cement with 1% calcium chloride at 13.7 lb/gal
- Tail slurry 290 sacks of 10/8 FSS (Franklin Salt System) cement with 1% calcium chloride and 0.01% retarder at 14.2 lb/gal

Second Stage:

- Lead slurry 920 sacks of 35/65 Poz "A" cement with 1% calcium chloride at 13.71b/gal
- Tail slurry 50 sacks of 10/8 FSS cement at 14.2 lb/gal

Long String Casing

9 ⅝ inch diameter casing, 47 lb/ft, N-80, buttress threads, 8rd casing. The long string casing was cemented in three stages with two DV tools installed at about 6,968 feet bgs and 4,436 feet bgs within the 9 /3-inch casing. The longstring casing was originally set to a depth of 7,909 feet bgs. However, during installation the last 2 joints of the 9 ⅝ inch casing parted at 7,848 feet bgs. The last 2 joints of casing are present from 7,934 to 8,010 feet bgs. The top portion of the casing passes below the Maquoketa Shall confining zone.

Cementing: Casing cemented to surface in three stages.

First Stage:

- 800 sacks of premium Class H cement with 0.9% potassium chloride and 0.2% retarder at 16.48 lb/gal

Second Stage:

- Lead slurry 850 sacks of 35/65 Poz "W cement at 12.93 lb/gal
- Tail slurry 375 sacks of Class "H" with 3% KCI and 0.1% retarder at16.48 lb/gal

Third stage:

- Lead slurry 1,225 sacks of 35/65 Poz A" cement at 13.3 lb/gal
- Tail slurry 150 sacks of Class "A cement at 14.2 lb/gal

The cementing ticket noted 150 bbls of cement returning to surface on third stage. Second stage had returns to surface but the volume was not noted.

The longstring casing of well WWDW#1was perforated at the following intervals:

- 7,772 - 7,792 feet bgs
- 7,810 - 7,830 feet bgs
- 7,930 - 8,010 feet bgs

Tubing and Packer Specifications

Injection Tubing: 5 ½ inch diameter, 20.0 lb/ft, P-110, 8rd, SRT Chrome Tubing.

Packer: The packer is a D&L Oil Tools ASI-X packer, Part #60395S. It is has an outside diameter of 9⅝ inch by 4-inch internal diameter which has been mechanically set with 25,000 pounds of compression.

Injection Well Pumps

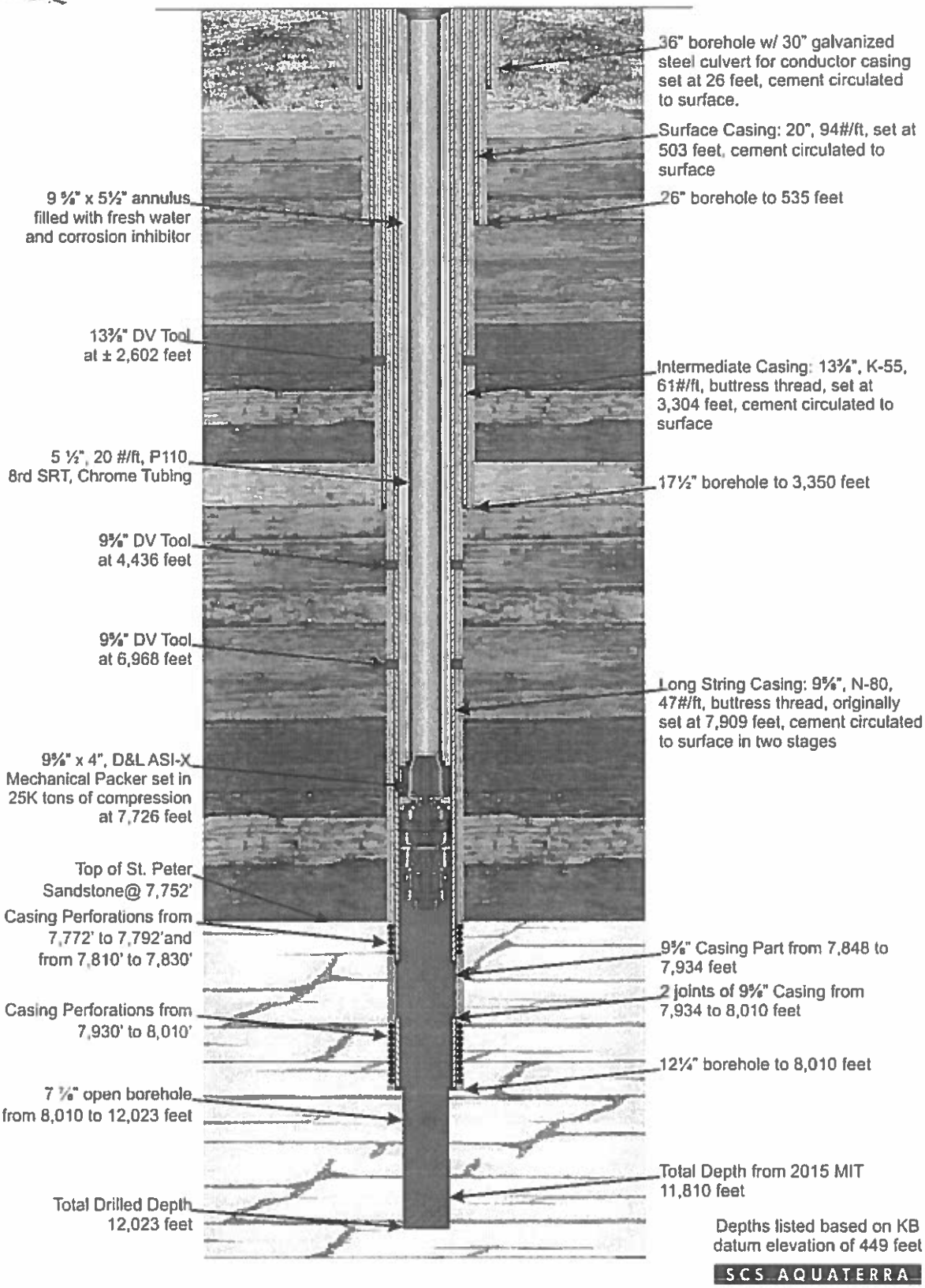
Injection Pumps Information:

- Two (2)— Hauhinco Model EHP-3K 125 Triplex Plunger Pumps, 70-millimeter plunger diameters, 104 gallons per minute (gpm) at 2,470 psi each, with electric pressure unloader valves, one powered by a 200-horsepower electric motor and the other by a 150-horsepower electric motor; and

- One (1) Hauhinco Model EHP-3K 150 Triplex Plunger Pump, 70-millimeter plunger diameter, 125 gpm at 2,470 psi, with an electric pressure unloader valve and powered by a 200-horsepower electric motor.

White Oak Resources
Hamilton County, Illinois
May, 2015

UIC WWDW #1 Schematic (As Built)



Construction Details for the Proposed Underground Injection Well WWDW#2

Surface Casing

20 inch diameter, 94 lb./ft., H-40 with Buttress threads, with butt weld float shoe installed on the bottom of casing. Casing is set at approximately 500 feet bgs, approximately 100 feet above the Tivoli Sandstone Member of the Modesto Formation, at the base of the USDW. This casing is design to protect shallower formations and aquifers from the deeper high TDS waters encountered from the Tivoli formation downward.

Cementing : Casing cemented to surface.

- Lead slurry of 630 sacks of Super Lite w/3% Calcium Chloride
- Tail slurry of 360 sacks of common w/3% Calcium Chloride

Intermediate Casing

13 ⅜ inch diameter, 61 lb./ft., K-55, LTC, 8rd with a DV tool at ± 2,000 feet bgs. Casing will be set at approximately 3,200 BGS, in the upper section of the Ste. Genevieve Limestone. The casing will have a guide shoe on bottom of the first joint and a self-filling check collar on top of the first joint (shoe joint).

Cementing: Casing will be cemented in two stages.

First Stage (~3,200 to 2,000 feet):

- Lead slurry of 360 sacks of Super Lite + 3 % Calcium Chloride
- Tail slurry of 400 sacks of Standard Cement + 0.1% R-1

Second Stage (~2,000 feet to surface):

- Lead slurry of 920 sacks of Super Lite + 3 % Calcium Chloride
- Tail slurry of 50 sacks of Standard Cement + 0.1% R01

Long String Casing

9 ⅝ inch diameter casing, 47 lb/ft, N-80, buttress, 8rd casing with two DV tools installed at ± 7,000 feet and ± 4,500 feet. Casing will pass below the Maquoketa Shall confining zone, and be set at approximately 8,000 feet bgs, immediately above or slightly into the St. Peter Formation upper section of the injection zone.

Cementing: Casing cemented to surface in three stages.

First Stage (~8,000 to 7,000 feet):

- Lead slurry of 185 sacks of 50/50 Pozmix of premium Class "H" cement with 18% salt, 4% bentonite, and 0.25% Air-Out (defoamer).
- Tail slurry of 245 sacks of premium Class "H" cement with 3% potassium chloride

Second Stage (~7,000 feet to 4,500 feet):

- 520 sacks of Super Lite Cement

Third stage (~ 4,500 feet to surface):

- 934 sacks of Super Lite Cement

Tubing and Packer Specifications

Injection Tubing: 5 ½ inch diameter, 20.0 lb/ft, N-80, LTC, 8rd, External Upset (EUE).

Packer: 9 ⅝ inch X 5 ½ inch D&L nickel plated compression packer or equivalent, set at approximately 7,950 feet bgs, immediately above the St. Peter Sandstone, with approximately 100 feet of tailpipe below the packer.

Injection Well Pumps

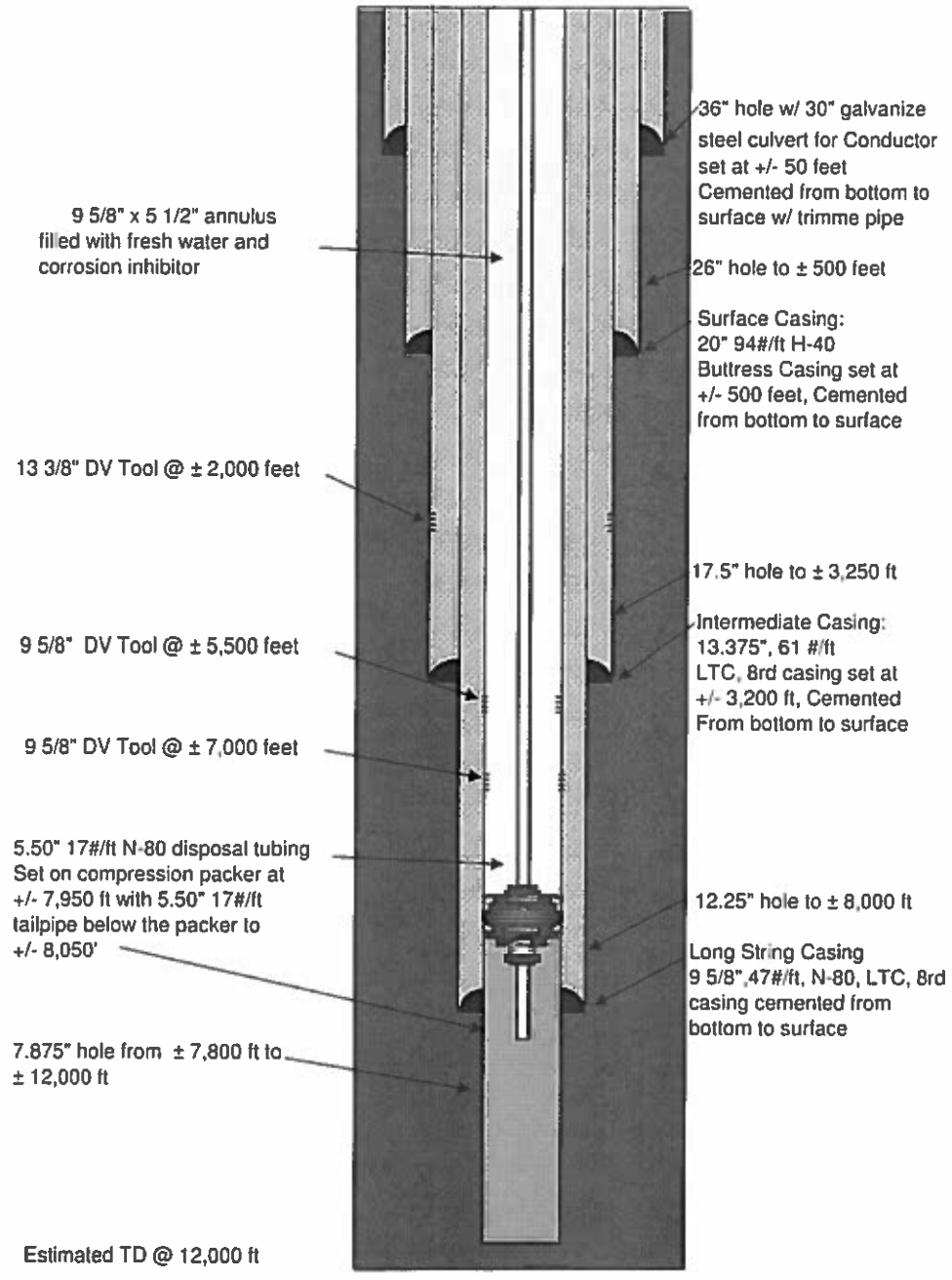
The injection pumps are a triplex plunger type pump manufactured by Hauhinco. Initially, a lower capacity injection pump (Model EHP-3K 60), with an injection rate of 50 gallons per minute will be used until groundwater generation rates increase within the mine. As the volume increases, a larger pump (Model EHP-3K 200) with an injection rate of 200 gallons per minute will be used and additional pumps will be added to meet the required injection rate.

White Oak LLC
UIC Permit Application
Hamilton County, Illinois
March 10, 2014

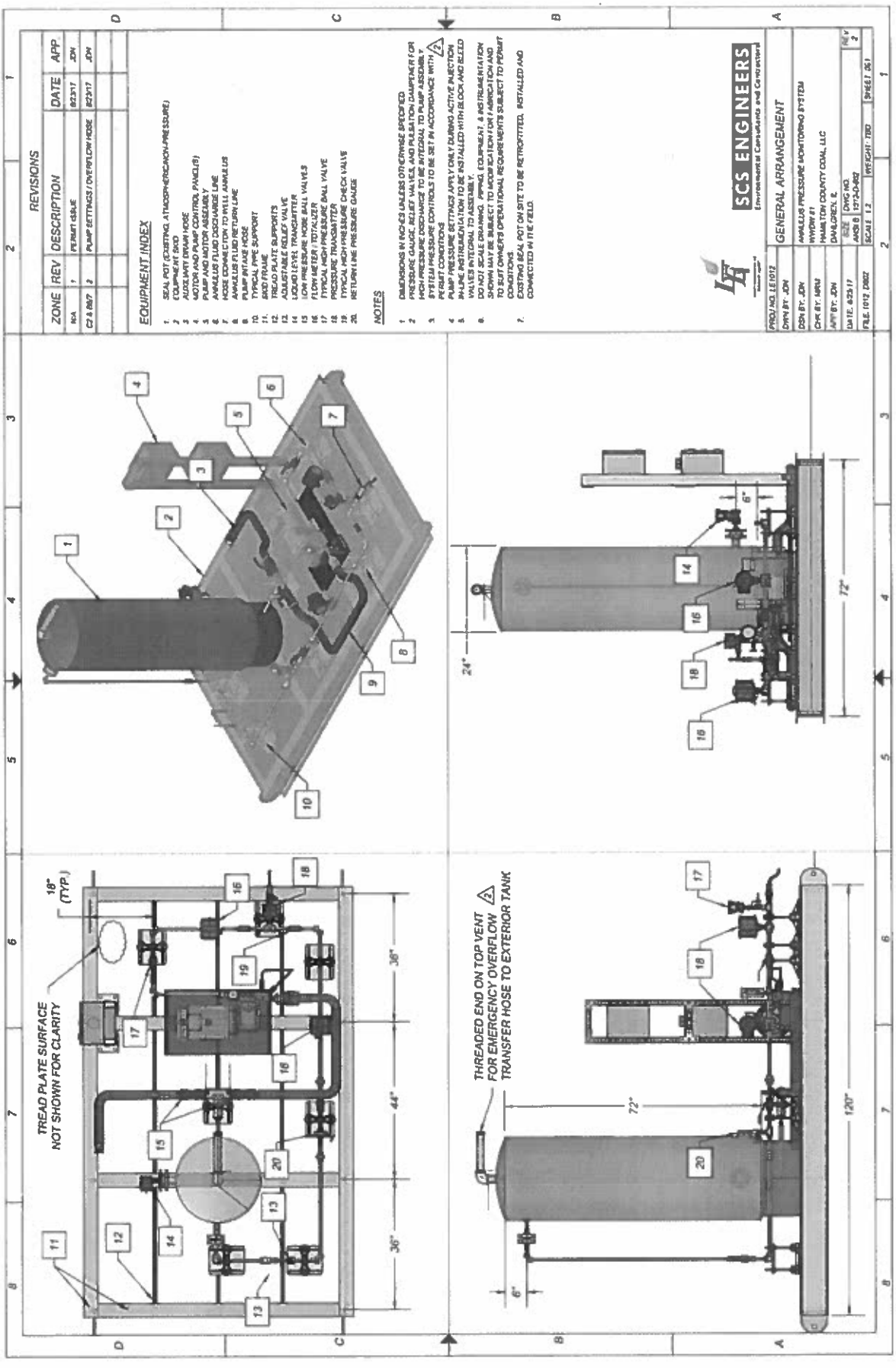
Figure 4b-1

Form 4b- Schematic of Proposed Disposal Well

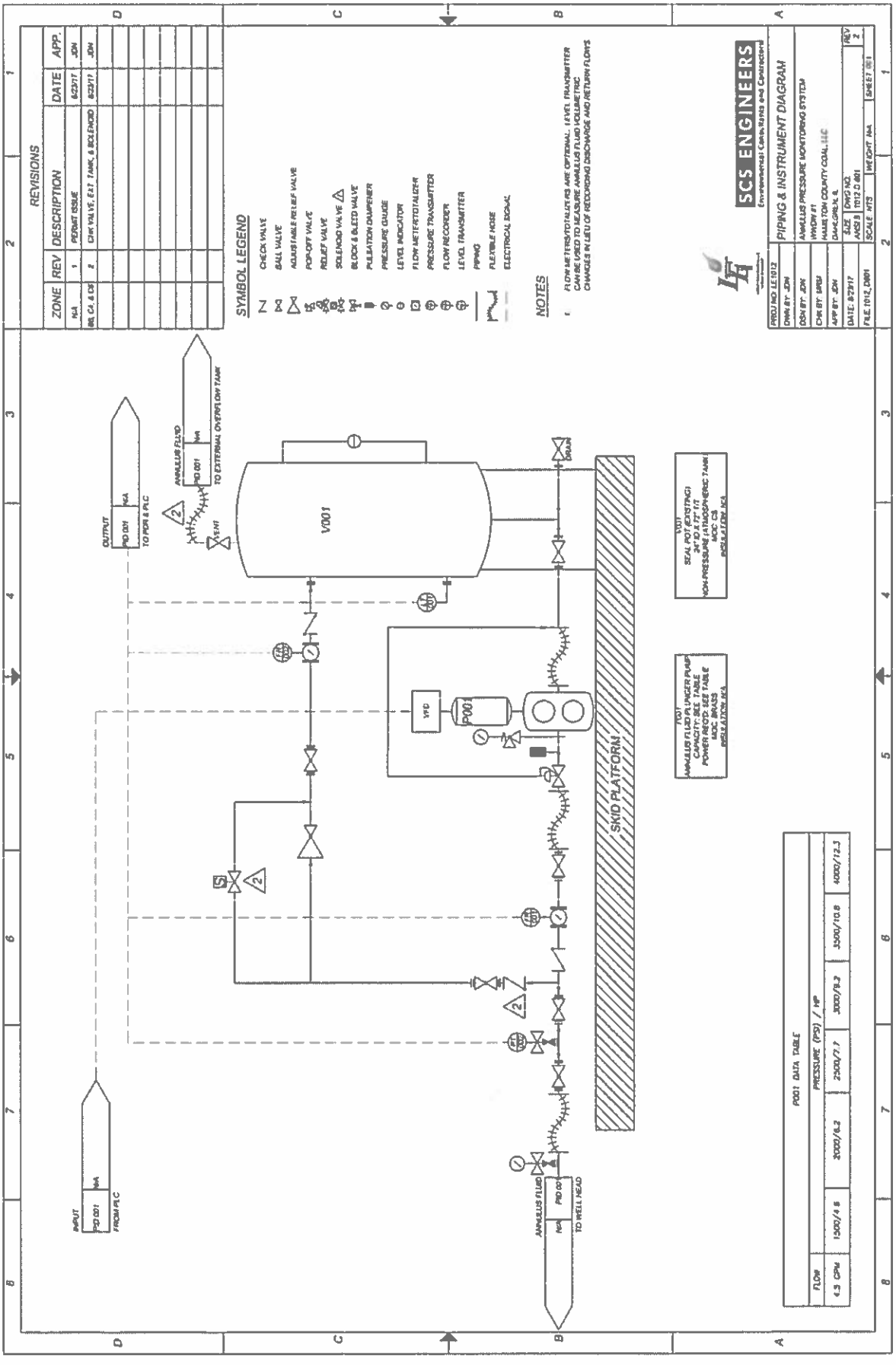
Proposed Well Schematic



Annulus Protection System - General Arrangement

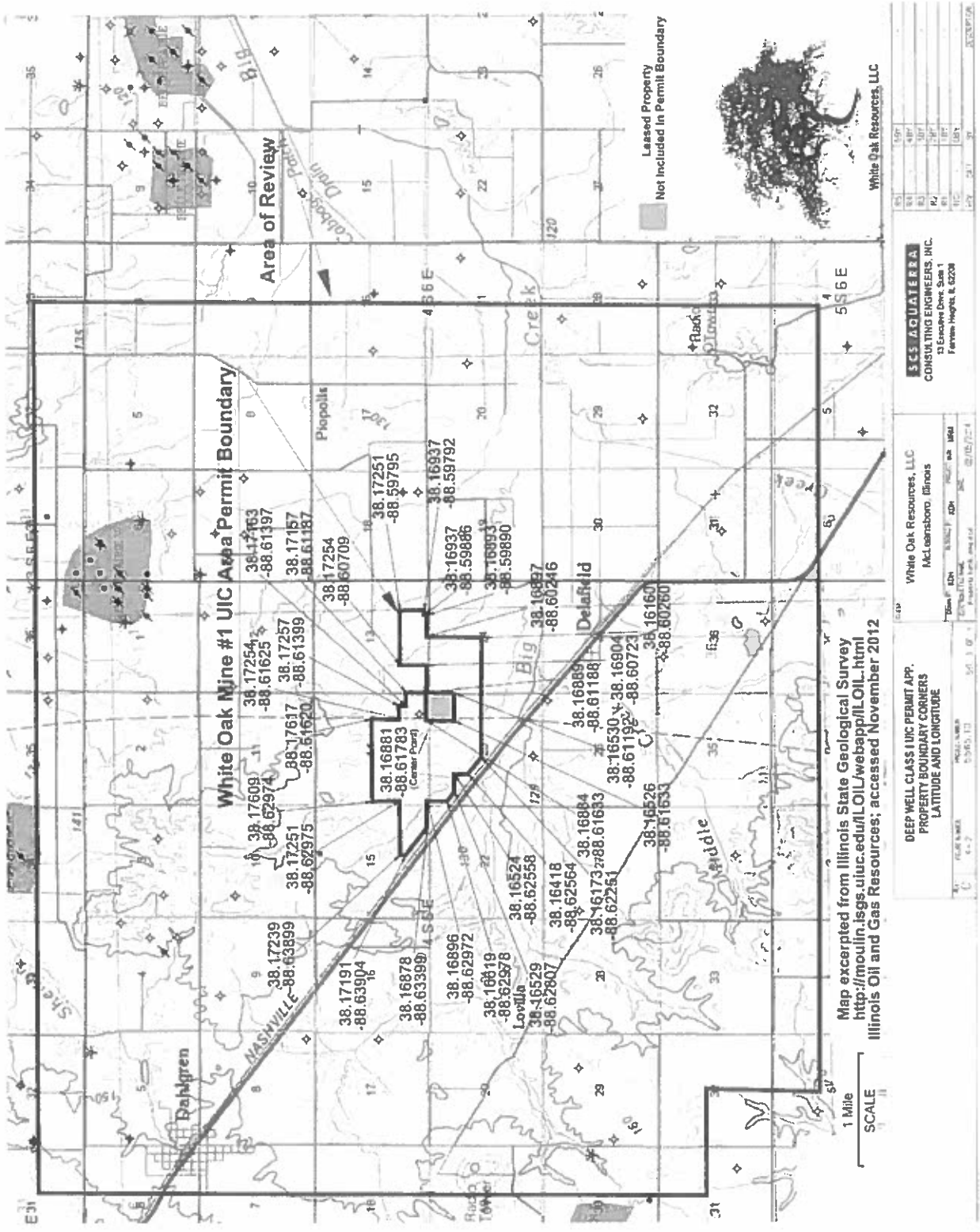


Annulus Protection System - Piping and Instrument Diagram



ATTACHMENT C

AREA PERMIT BOUNDARY MAP


White Oak Mine #1 UIC Area Permit Boundary
Area of Review
Leased Property
Not Included in Permit Boundary
White Oak Resources, LLC
Piopolis
Delafield
Dahlgren
NASHVILLE
Lovilla
Creek
Big
Middle
38.17251
-88.59795
38.16937
-88.59792
38.16937
-88.59886
38.16893
-88.59890
38.16897
-88.60246
38.16160
-88.60260
38.16889
-88.61188
38.16904
-88.60723
38.16530
-88.61192
38.16526
-88.61633
38.16884
-88.61633
38.16173
-88.62251
38.16418
-88.62564
38.16524
-88.62558
38.16896
-88.62972
38.16619
-88.62978
38.16529
-88.62807
38.16878
-88.63399
38.17191
-88.63904
38.17239
-88.63899
38.17251
-88.62975
38.17609
-88.62974
38.17254
-88.61625
38.17257
-88.61399
38.17617
-88.61620
38.16881
-88.61783
(Center Point)
38.17254
-88.60709
38.17157
-88.61187
38.17163
-88.61397
1 Mile
SCALE
Map excerpted from Illinois State Geological Survey
http://moulin.isgs.uiuc.edu/ILOIL/webapp/ILOIL.html
Illinois Oil and Gas Resources; accessed November 2012
DEEP WELL CLASS I UIC PERMIT APP.
PROPERTY BOUNDARY CORNERS
LATITUDE AND LONGITUDE
White Oak Resources, LLC
McLeansboro, Illinois
SCS AQUATERRA
CONSULTING ENGINEERS, INC.

ATTACHMENT D

SUMMARY OF SUBMITTAL DATES

ATTACHMENT D

SUMMARY OF SUBMITTAL DATES

The following is a summary of submittal dates for data required by this permit. This summary is provided to highlight some of the submittals required by this permit. The referenced condition must be consulted for complete details.

Condition	Submittal	Date Due
A.4	Notification of Construction	30 days prior to planned construction.
A.7	Well Completion Report	After completion of injection well
A.7(d)	Revised Contingency Plan	Included with Well Completion Report for WWDW#2
A.8	Weekly Well Construction Reports	Weekly, during construction of injection well
B. 2(d)(v)	Changes to composition of annular fluid used	Next monthly report
B. 2(g)	Procedures for controlled stimulation	30 days prior
B.6	Monthly Operation Reports	15th each month
B. 6(c)	Results of test, maintenance, and changes of equipment	Second monthly report after completion
H.2	Duty to Reapply	180 days prior to expiration
H. 12(a)	Planned Changes	15 days prior to planned changes
H. 13(a)	Corrective Action Requirements by Telephone	24 hours after the discovery
H. 13(a)	Corrective Action Notification by Letter	5 days after the discovery

Condition	Submittal	Date Due
H. 14	Oral Notification of Endangerment of Environmental	Within 24 hours of time of endangerment
H.14	Notification by letter of Endangerment of Environmental	Within 5 days of endangerment
H. 23(a)	Notice of well abandonment	60 days prior to abandonment
H. 23(c)	Certification of Plugging and Abandonment	60 days after plugging
H. 24	Plans for Conversion	180 days prior to actual conversion
H. 24	Notify before Conversion or Abandonment	45 days prior to conversion or abandonment
H. 26(d)	Conduct a Temperature Survey	Biennially
H. 26(e)	Mechanical Integrity Testing	30 days prior to demonstration
H. 26(g)	Gauge calibration	January 15 of each year
H. 28	39i Certification	Within 30 days of any event described in Condition H.28

ATTACHMENT E

WELL COMPLETION REPORT INSTRUCTIONS
AND
WELL COMPLETION REPORT Form 4h

FORM 4h - WELL COMPLETION REPORT INSTRUCTIONS

Use the space provided to indicate the location of each item in the application. The source of all data shall be referenced in the report.

Item I

Indicate the type of permit as either an individual or area permit, including whether it is an emergency, new or renewal request. For renewal requests, provide the permit number of the existing permit. Requests for area permits should indicate the well number and the name of the field in addition to the above information.

Item II

The location of the well is to be provided in the Township-Range-Section System of the Bureau of Land Management of the US Government, Latitude and Longitude coordinates (degrees, minutes, seconds). In addition, include the closest municipality name and county.

Items III, IV and V

Provide the surface elevation, referenced to mean sea level, in both feet and meters.
Provide the depth of the well in both feet and meters.
Provide the static water level, referenced to mean sea level, in both and meters.

Item VI

Provide the demonstrated fracturing pressure, if applicable, in psi or kg/cm2. In addition, include information on the type of test used to determine the fracturing pressure.

Item VII

Indicate whether the well was completed as an open hole, fully cased and perforated, screen and gravel pack or other. If other, please specify.

Item VIII

Attach a schematic or other appropriate drawing of the surface and subsurface details of the well. If the schematic is not attached, please explain.

Item IX. A

Provide the depth interval, in feet, and the corresponding diameter, in inches, of the hole.

Item IX. B

For the annulus protection system, provide the following information:

1. Annular space(s), including the inner and outer diameter;

2. Type of annular fluid;
3. Specific gravity of annular fluid;
4. Coefficient of annual fluid;
5. Packer(s), including;
   - type
   - name and model
   - setting depth, in both feet and meters
6. Indicate if fluid was spotted under the packer, including the type, frequency and quantity
7. Well driller information should include the following information:
   - data on the drilling firm, including name, address and contact person
   - drilling method

Item X

Include copies of all logs unless the logs have previously been submitted to the Agency. If the logs have been previously been submitted, indicate the date(s) the logs were submitted.

Item XI. A

Provide the following information for each of the casing strings used:

- depth interval in feet
- outside diameter in inches
- inside diameter in inches
- weight in pounds per foot
- grade, API
- design coupling
- coupling outside diameter in inches
- thermal conductivity BTU, ft.hr.degrees F

Item XI. B

Provide the following information for the injection tubing:

- type/grade, API
- outside diameter in inches
- inside diameter in inches
- weight in pounds per foot
- joint specification
- depth interval in feet
- thermal conductivity BTU, ft.hr. Degrees F
- maximum allowable suspended weight based on joint strengths of injection tubing
- weight of injection tubing string (axial load) in air

Item XI. C

Provide the following cementing information for each casing string:

- depth interval in feet
- type/grade
- additives
- quantity in cubic yards
- circulated, yes or no
- thermal conductivity BTU

Item XII

Provide the following information for all filters and injection pumps:

- location
- type
- name
- model number
- capacity (g.p.m.)
- pore size in microns

Item XIII

Revised copies of the form(s) are required following construction to account for any changes from the proposed well construction using actual data obtained during construction.

Item XIV

Provide the results of detailed testing on the compatibility of the injection fluid with each of the listed items at expected bottom hole pressures and temperatures. Include a discussion on corrosiveness, reactivity and by products of the injection fluid and formation fluids and minerals and well components expected to come in contact with the injected fluids.

Item XV

Attach a list of any changes in recording devices, specifying the location, name and model, mechanical or electrical if applicable, continuous or non-recording, and whether the gauge exceeds the maximum operating range by 20% from the devices approved in the approved permit, including:

- injection pressure gauges
- casing-tubing annulus pressure gauges
- flow meters
- pH recording devices
- temperature

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT APPLICATION

FORM 4h - WELL COMPLETION REPORT

USEPA ID NUMBER _____
IEPA ID NUMBER _____
WELL NUMBER _____

I. Type of Permit
Individual: _____
Emergency _____
New _____
Renewal _____
Permit Number _____
Area: _____
Number of well _____
Name of Field _____
Emergency _____
New _____
Renewal _____
Permit Number _____

Location in Application

_____ II. Location, see instructions
_____ A. Township-Range-Section
_____ B. Latitude/Longitude
_____ C. Closest Municipality
_____ III. Surface Elevation
_____ IV. Well Depth
_____ V. Static Water Level
_____ VI. Demonstrated Fracturing Pressure, if applicable
_____ VII. Injection Well Completion
_____ VIII. Well schematic or other appropriate drawing of surface and subsurface construction details
_____ IX. Well Design and Construction
_____ A. Well hole diameters and corresponding depth intervals
_____ B. Annulus Protection System
_____ 1. Annular space, ID and OD
_____ 2. Type of annular fluid(s)
_____ 3. Specific gravity of annular fluid
_____ 4. Coefficient of annular fluid

_____ 5. Packer(s)
_____ a. Setting depth
_____ b. Type
_____ c. Name and model
_____ 6. Description of fluid spotting frequency, type and quantity
_____ 7. Information on well driller used for construction of this well
_____ X. Tests and Logs
_____ A. During Drilling
_____ B. During and after casing installation
_____ C. Demonstrate mechanical integrity prior to operation
_____ D. Copies of logs and tests listed above
_____ E. Description of well stimulation
_____ XI. Well Design and Construction
_____ A. Casings, see instructions
_____ 1. Conductive casing
_____ 2. Surface casing
_____ 3. Intermediate casing(s)
_____ 4. Long string casing
_____ 5. Other casing
_____ B. Injection Tubing, see instructions
_____ 1. Maximum allowable suspended weight based on joint strength
_____ 2. Weight of injection tubing string (axial load) in air
_____ C. Cement, see instructions
_____ 1. Conductive casing
_____ 2. Surface casing(s)
_____ 3. Intermediate casing
_____ 4. Long string casing
_____ 5. Other casing
_____ XII. Surface Facilities, see instructions
_____ A. Filters(s)
_____ B. Injection pump(s)
_____ XIII. Hydrogeologic Information
_____ A. Revised UIC Form 4a
_____ B. Revised UIC Form 4d using actual data on injection formation
_____ C. Revised UIC Form 4g
_____ D. Copy of well completion report submitted to the Department of Natural Resources (Formerly Mines and Minerals)
_____ E. Copy of any plugging affidavits on injection well filed with Department of Natural Resources

_____ XIV. Injection Fluid Compatibility, see instructions
_____ A. Compatibility with injection zones fluid
_____ B. Compatibility with minerals in the injection zone
_____ C. Compatibility with minerals in confining zone

_____ D. Compatibility with injection well components
_____ 1. Injection tubing
_____ 2. Long string casing
_____ 3. Cement
_____ 4. Annular fluid
_____ 5. Packer(s)
_____ 6. Well head equipment
_____ 7. Holding tank(s) and flow lines
_____ E. Full description of compatibility of injection fluid with items A through D

_____ XV. Monitoring Program, see instructions
_____ A. Injection pressure gauge(s)
_____ B. Casing-tubing annular pressure gauge(s)
_____ C. Flow meter(s)
_____ D. pH recording device(s)
_____ E. Temperature

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 managed 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.

_____ _____
Name & Official Title Phone Number

_____ _____
Signature Date Signed

TJD:KL:kl\0650155010-UIC-UIC146-M2-Approval.docx