UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

UNDERGROUND INJECTION CONTROL PERMIT NUMBER VAS2D697BDIC
AUTHORIZATION TO OPERATE A CLASS II-D INJECTION WELL

In compliance with provisions of the Safe Drinking Water Act, as amended, 42 U.S.C. §§ 300f – 300j-11, ("SDWA"), and the SDWA implementing regulations promulgated by the U.S. Environmental Protection Agency at Parts 144 – 147 of Title 40 of the Code of Federal Regulations, this permit authorizes

EnerVest Operating, LLC
809 Happy Valley Drive
Clintwood, Virginia 24228

as the Permittee, to construct and operate a Class II-D disposal injection well, VWD-539572, (hereinafter, "Injection Well" or "Facility") for the purpose of injecting fluids produced solely in association with oil and gas production from EnerVest Operating, LLC ("Permittee"), in accordance with the provisions of this permit. The Injection Well will be located at the Nora Field, Ervinton District, Dickenson County, Virginia, into the Lower Mississippian Weir Sand formation. The coordinates for this Injection Well are: Latitude 37° 04' 13" and Longitude -82° 10' 26".

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit becomes effective.

This permit shall become effective on July 1st, 2019.

This permit and its authorization to inject shall remain in effect until midnight July 1st, 2029.

Signed this 1st day of July, 2019.

Catherine A. Libertz, Director
Water Division

PART I

A. Effect of Permit

EnerVest Operating, LLC ("the Permittee") is authorized to engage in underground injection at the Injection Well in accordance with the conditions of this permit. The Permittee shall not allow underground injection activity, otherwise authorized by this permit, to cause or contribute to the movement of fluid containing any contaminant into any underground source(s) of drinking water (USDW), if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 C.F.R. Part 141 or if it may otherwise adversely affect the health of persons. Any underground injection activity not authorized in this permit or otherwise authorized by rule is prohibited. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Part C of the SDWA, or the imminent and substantial endangerment provisions in Part D of the SDWA or any other common or statutory law for any breach of any other applicable legal duty.

B. Permit Actions

This permit can be modified, revoked, and reissued or terminated for cause or upon request as specified in 40 C.F.R. §§ 144.12, 144.39, and 144.40. Also, the permit is subject to minor modifications as specified in 40 C.F.R. § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the Permittee shall not stay the applicability or enforceability of any permit condition.

C. Severability

The provisions of this permit are severable and if any provision of this Permit or the Permittee's original application, dated July 9, 2008, and later updated on July 23, 2018, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

D. General Requirements

1. Duty to Comply. The Permittee shall comply with all applicable Underground Injection Control ("UIC") Program regulations, including 40 C.F.R. Parts 124, 144-147, and with the conditions of this permit, except to the extent and for the duration that EPA authorizes any noncompliance by an emergency permit issued under 40 C.F.R. 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.

2. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for the 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.

3. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

4. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control 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 security to prevent unauthorized access and operation of the Injection Well, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

5. Duty to Provide Information. The Permittee shall furnish to the Director of the Water Division ("Director"), within a time specified by the Director, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit. If the Permittee becomes aware of any incomplete or incorrect information in the Permit Application or subsequent reports, the Permittee shall promptly submit information addressing these deficiencies. For purposes of this permit, unless otherwise specified herein, reports and information that are required to be submitted "in writing", or in "written" format, may be submitted via fax or via email as a pdf document containing the certification and signature as required under Paragraph I.D.9.

6. Inspection and Entry. The Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

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

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

c. Inspect at reasonable times the Facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by SDWA.

7. Penalties. Any person who violates a requirement of this permit is subject to administrative or civil penalties, fines and other enforcement actions under the SDWA. Any person who willfully violates conditions of this permit may be subject to criminal prosecution.

8. Transfer of Permits. This permit is not transferable to any person except after notice is sent on EPA Form 7520-7 (Application to Transfer Permit), approval is received from the Director, and the requirements of 40 C.F.R. § 144.38 are satisfied. The Director may require modification or revocation of this permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA or under its implementing regulations. The transferee is not authorized to inject under this Permit unless and until the Director notifies the transferee that the transferee is so authorized through issuance of a revised permit identifying the transferee as the permittee.

9. Signatory Requirements.

a. The Permittee shall sign all reports required by this permit and other information requested by the Director as follows:

(1) for a corporation, by a responsible corporate officer of at least the level of vice-president;

(2) for a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or

(3) for a Municipality, State, Federal, or other public agency by either a principal executive or a ranking elected official.

b. A duly authorized representative of the person designated in Paragraph a. above may also sign only if:

(1) the authorization is made in writing by a person described in Paragraph a. above;

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated Facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or a position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

(3) the written authorization is submitted to the Director.

c. If an authorization under Paragraph b. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the Facility, a new authorization satisfying the requirements of Paragraph b. of this section must be submitted to the Director prior to or together with any reports, information or applications to be signed by an authorized representative.

d. Any person signing a document under Paragraph a. or b. of this section shall make the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified

personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

10. Confidentiality of Information.

a. In accordance with 40 C.F.R. Part 2 (Public Information) and § 144.5, any information submitted to the Director pursuant to this permit 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. If no claim is made at the time of submission, 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 the procedures in 40 C.F.R. Part 2.

b. EPA will deny claims of confidentiality for the following information:

(1) The name and address of any permit applicant or permittee.

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

11. Reapplication. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit under the authority of 40 C.F.R. § 144.37, the Permittee must submit a complete application for a new permit at least 100 days before this permit expires.

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

PART II

A. General

The Permittee shall sign and certify copies of all reports and notifications required by this permit in accordance with the requirements of Paragraph I.D.9. of this Permit and shall submit such information to the Director at the following address:

Source Water & UIC Section (3WD22)
Drinking Water & Source Water Protection Branch
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103

B. Record Retention

1. The Permittee shall retain records of all monitoring and other information required by this permit, including the following (if applicable), for a period of at least five years from the date of the sample, measurement, report, or application, unless Paragraph II.B.2., below, requires that the Permittee retain such records for a longer period of time. The Director may extend the record retention period at any time. If the Director extends the record retention period, the Permittee shall comply with the new record retention period.

a. All data required to complete the Permit Application form for this permit and any supplemental information submitted under 40 C.F.R. § 144.31;

b. Calibrations and maintenance records and all original strip chart recordings for continuous monitoring instrumentation; and

c. Copies of all reports required by this permit.

2. The Permittee shall retain records concerning the nature and composition of all injected fluids, as required in Paragraphs II.C.4. and II.C.5. of this permit, until at least three years after the plugging and abandonment procedures are complete. The Permittee shall continue to retain these records after the three-year retention period unless the Permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

3. Records of monitoring information shall include:

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

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

c. A precise description of both sampling methodology and the handling (custody) of samples;

d. The date(s) analyses were performed;

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

f. The analytical techniques or methods used; and

g. The results of such analyses.

C. Monitoring Requirements

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The Permittee shall obtain representative sample(s) of the fluid to be analyzed and conduct analysis(es) of the sample(s) in accordance with the approved methods and test procedures provided in 40 C.F.R. § 136.3 and EPA's SW-846 Compendium, or other methods and test procedures otherwise approved by the Director. The

Permittee shall identify in its monitoring records the types of tests and methods used to generate the monitoring data.

2. The Permittee shall continuously monitor and record surface injection pressure, annular pressure, flow rate, and cumulative volume in the Injection Well beginning on the date on which the Injection Well commences operation and concluding when the Injection Well is plugged and abandoned. The Injection Well shall be equipped with automatic shut-off devices which would be activated in the event of a mechanical integrity failure. The Permittee shall compile the monitoring data monthly to complete the Annual Report referenced in the Paragraph II.D.9. of this Permit.

3. The Permittee shall monitor the nature and composition of the injected fluid by sampling, analyzing, and recording the injection fluid for the parameters listed below at the initiation of the injection operation and every two years thereafter, or whenever the operator observes or anticipates a change in the injection fluid.

- pH
- Specific Gravity
- Specific Conductance
- Sodium
- Iron
- Magnesium
- Chloride
- Total Organic Carbon (TOC)
- Manganese
- Total Dissolved Solids
- Barium
- Hydrogen Sulfide
- Dissolved Oxygen
- Alkalinity
- Hardness

The Permittee shall report the results of the monitoring to the Director as provided in Paragraphs II.D.9. and II.D.10.

4. The Permittee shall make a demonstration of mechanical integrity in accordance with 40 C.F.R. § 146.8 at least once every five years, after the initial demonstration required by Paragraph III.A.4. Subsequent five-year demonstrations shall be conducted within five years of the date that the previous demonstration was made. In addition to the above requirement, the Permittee shall conduct a mechanical integrity test demonstration on the Injection Well when the protective casing or tubing is removed from the well, the packer is reseated, or a well failure is likely, or as requested by the Director. The Permittee may continue operation of the Injection Well only if the Permittee has demonstrated the mechanical integrity of the Injection Well to the Director's satisfaction. The Permittee shall cease injection operations if a loss of mechanical integrity becomes evident or if the Permittee cannot demonstrate mechanical integrity. The Injection Well shall be equipped with automatic shut-off devices which would be activated in the event of a mechanical failure.

5. All environmental measurements required by the permit, including, but not limited to: measurements of pressure, temperature, mechanical integrity (as applicable), and chemical analyses shall be done in accordance with EPA guidance on quality assurance.

D. Reporting and Notification Requirements

1. Report on Permit Review. Within thirty (30) days of receipt of this permit, the Permittee shall ensure that the person designated pursuant to Paragraph I.D.9. of this permit reports in writing to the Director that he or she has read and is personal familiar with all terms and conditions of this permit.

2. Commencing Injection. The Permittee shall not commence injection until construction or well rework is complete and all of the following conditions have been satisfied, including those as specified in Paragraph III.A. of this permit:

a. The Permittee has submitted notice of completion of construction (EPA Form 7520-18) to the Director;

b. The Permittee has demonstrated to EPA that the Injection Well has mechanical integrity in accordance with 40 C.F.R. § 146.8 and the Permittee has received written notice from the Director that such demonstration is satisfactory; and

c.(1) The Director has inspected or otherwise reviewed the Injection Well and finds it is in compliance with the conditions of this permit; or

c.(2) The Permittee has not received notice from the Director of his or her intent to inspect or otherwise review the Injection Well within 13 days of the date of the notice in Paragraph II.D.2.a. of this permit, in which case, prior inspection or review is waived and the Permittee may commence injection.

d. The Permittee has submitted the formation testing information as required by Paragraph III.B.4.c. to the Director and the Director has given written formal authorization to the Permittee to inject at a prescribed Maximum Allowable Injection Pressure.

3. Twenty-Four Hour Reporting.

a. The Permittee shall report to the Director any noncompliance which may endanger, or has, endangered health or the environment. The Permittee shall provide such report orally to James Bennett, Chief of the Source Water & UIC Section (215-814-6469) or David Rectenwald, Field Inspector for the Source Water & UIC Section (814-827-1952) within 24 hours from the time the Permittee becomes aware of the circumstances. The Permittee shall include the following information in the oral report:

(1) Any monitoring or other information which indicates that any contaminant may endanger, or has endangered an USDW.

(2) Any noncompliance with a Permit condition, or malfunction of the injection system which may cause or has caused fluid migration into or between USDWs, or failure of mechanical integrity test demonstrations.

b. The Permitee shall provide a written submission within five (5) days of the time the Permittee becomes aware of the circumstances described in Paragraph II.D.3. The

written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

4. Anticipated Noncompliance. The Permittee shall give advance written notice to the Director of any planned changes in the permitted Facility or activity which may result in noncompliance with permit requirements.

5. Other Noncompliance. The Permittee shall report all other instances of noncompliance to the Director in writing within ten (10) days of the time the Permittee becomes aware of the circumstances. The reports shall contain the information listed in Paragraph II.D.3., of this permit.

6. Well Rework. If the well is reworked as a result of noncompliance or well failure, the Permittee must complete and submit a Well Rework Record (EPA Form 7520-19) after completing the rework but prior to resuming injection, specifying the procedures used to correct the well failure and the results of the mechanical integrity test performed after the rework.

7. Planned Changes. The Permittee shall provide written notice to the Director as soon as possible of any planned physical alterations or additions to the permitted Facility.

8. Conversion. The Permittee shall provide written notice to the Director thirty (30) days prior to the conversion of the Injection Well to an operating status other than an injection well.

9. Annual Report. The Permittee shall submit a written Annual Report to the Director summarizing the results of the monitoring required by Paragraph II.C. of this permit. This report shall include monthly monitoring records of injected fluids, the results of any mechanical integrity test(s), and any major changes in characteristics or sources of injected fluids. The report shall list the additives used in the operation of the well. The Permittee shall complete and submit this information with its Annual Report EPA Form 7520-11 (Annual Disposal/Injection Well Monitoring Report). The Permittee shall submit the Annual Report to the Director not later than January 31st of each year, summarizing the activity of the calendar year ending the previous December 31st.

10. Expedited Reporting of Injection Fluid Analysis. If the Permittee monitors the injected fluid under Paragraph II.C.3. because the Permittee observed or anticipated a change in the injected fluid, the Permittee shall submit the monitoring records to the Director within 30 days of monitoring.

11. Plugging and Abandonment Reports and Notifications.

a. The Permittee shall notify the Director in writing at least 45 days before plugging and abandonment of the Injection Well as described in Paragraph III.C. of this permit. The Director may allow a shorter notice period upon written request.

b. The Permittee shall submit any revisions to the Plugging and Abandonment Plan attached to and incorporated into this permit to the Director no less than 45 days prior to plugging and abandonment on EPA Plugging and Abandonment Form 7520-19. The Permittee shall not commence plugging and abandonment until it receives written approval of the revisions to the Plan from the Director.

c. To the extent that any unforeseen circumstances occur during plugging and abandonment of the Injection Well that cause the Permittee to believe the Plugging and Abandonment Plan should be modified, the Permittee shall obtain written approval from EPA of any changes to the Plugging and Abandonment Plan prior to plugging the Injection Well.

d. Within 60 days after plugging the Injection Well, the Permittee shall submit a Plugging and Abandonment Report to the Director which shall consist of either:

(1) A statement that the Injection Well was plugged in accordance with the EPA-approved plan; or

(2) Where actual plugging differed from the Plugging and Abandonment Plan previously approved by EPA, the Permittee shall provide to the Director an updated version of Form 7520-19, specifying the different procedures used.

e. The Permittee shall ensure that the Plugging and Abandonment Report is certified as accurate by the person who performed the plugging operation.

12. Mechanical Integrity Tests. The Permittee shall notify the Director in writing at least 30 days prior to conducting Mechanical Integrity Testing on the Injection Well.

13. Cessation of Injection Activity. After cessation of injection into the Injection Well for two years the Permittee shall plug and abandon the Injection Well in accordance with the Plugging and Abandonment Plan in Attachment 1, unless:

a. The Permittee provides written notice to the Director that describes actions and/or procedures, including compliance with the technical requirements applicable to the Injection Well, that are necessary to ensure that the Injection Well will not endanger USDWs during any period of temporary abandonment, unless waived, in writing, by the Director.

b. The Permittee receives approval from the Director that the actions and/or procedures described in the notice are satisfactory; and

c. The Permittee implements such EPA approved actions and/or procedures.

E. Mechanical Integrity Standards

1. The Permittee shall maintain the mechanical integrity of the permitted Injection Well pursuant to 40 C.F.R. § 146.8.

2. Request from Director. The Director may, by written notice, require the Permittee to demonstrate mechanical integrity at any time during the term of this permit.

PART III

A. Construction Requirements

1. Confining Zone. Notwithstanding any other provision of this permit, the Permittee shall inject through the Injection Well only into a formation which is separated from any USDW by a confining zone, as defined by 40 C.F.R. § 146.3, that is free of unknown open faults or fractures within the ¼ mile-radius Area of Review, as required by 40 C.F.R. § 146.22.

2. Casing and Cementing. The Permittee shall:

a. ensure the Injection Well is cased and cemented to prevent the movement of fluids into or between USDWs, in accordance with 40 C.F.R. § 146.22;

b. ensure the casing and cement used in the Injection Well are designed for the life expectancy of the well;

c. ensure the Injection Well has surface casing installed from the surface to a depth of approximately 708 feet below ground surface, and cemented back to the surface;

d. ensure the Injection Well has intermediate string casing installed from the surface to depth of approximately 2,041 feet below ground surface, and cemented back to the surface;

e. ensure the Injection Well has long string casing installed from the surface to approximately 5,694 feet, and cemented back to 1,841 feet below ground surface; and

f. install in the Injection Well a tubing string set on a packer installed inside the long string casing and set above the injection zone.

3. Logs and Tests. In accordance with 40 C.F.R. § 146.22(f), the Permittee shall prepare logs and perform tests as follows during the construction or rework of the Injection Well: electric, gamma ray and caliper logs in the open hole, a cement bond, temperature or density log on the surface casing (if cement returns are not achieved), and a cement bond log/variable density log on the long string casing. The Permittee shall submit to the Director, for the Injection Well, cement records, a narrative report that interprets the well log(s) and test results, which specifically relate to the results of the cementing operation, and a detailed description of the rationale used to make these interpretations. The narrative report shall be prepared by a knowledgeable log analyst and submitted to the Director. The Director may prescribe additional logs or waive logging requirements in the future should field conditions so warrant. The Permittee shall complete the formation testing program after construction of the well is complete and submit, to the Director, the information necessary to determine a Maximum Allowable Injection Pressure, as described in Paragraph III.B.4.c.

4. Mechanical Integrity. The Permittee is prohibited from conducting injection operations in the Injection Well until it (i) demonstrates the mechanical integrity of the Injection Well in accordance with 40 C.F.R. § 146 and (ii) receives notice from the Director that such a demonstration is satisfactory in accordance with Paragraph II.D.2. of this permit.

5. Corrective Action. If an abandoned well is discovered within the ¼ mile-radius area of review after injection commences, the Permittee shall stop the injection operations and notify the Director upon discovery. Within five (5) days of such discovery, the Permittee shall submit to the Director for approval a plan for corrective action, consistent with the requirements of 40 C.F.R. Parts 144-147. The Permittee cannot resume injection until the Director approves the plan for corrective action and the Permittee takes the actions specified by the plan as preconditions to resumption of the injection operations.

6. Completion Reports. The results of those activities required in Paragraphs III.A.1-5, of this permit must be summarized and submitted to the Director prior to the commencement of injection operations as part of the completion reports required under Paragraph II.D.2.

B. Operating Requirements

1. Injection Formation. The Permittee shall inject into the Lower Mississippian Weir Sandstone in the subsurface perforated interval between approximately 5,127 feet to 5,183 feet below ground surface.

2. Injection Fluid. The Permittee shall not inject any hazardous waste, as defined by 40 C.F.R. 261, nor any other fluid, other than the fluids produced solely in association with EnerVest Operating oil and gas production activity, and additives necessary to maintain the integrity of the well.

3. Injection Volume Limitation. Injection volume shall not exceed 45,000 barrels per month.

4. Injection Pressure Limitation.

a. The Permittee shall not inject fluid at a pressure which initiates new fractures or propagates existing fractures in the confining zone, as defined by 40 C.F.R. § 146.3 adjacent to USDWs or causes the movement of injection or formation fluids into an USDW.

b. Injection pressure at the surface shall not exceed the Maximum Allowable Injection Pressure (MAIP).

The **MAIP** (measured at the surface) must be calculated using the following equation:

$$\mathbf{MAIP} = [\mathbf{FG} - (0.433 * \mathbf{SG}) * \mathbf{D}]$$

The **FG** must be calculated using the following equation:

$$\mathbf{FG} = [\mathbf{ISIP} + (0.433 * \mathbf{SG} * \mathbf{D})] / \mathbf{D}$$

The values used in the equations are defined as:

"FG" is the fracture gradient in pounds per square inch/feet (psi/ft) on the injection zone. The FG value shall be determined during formation testing during completion of the well as described in Attachment I of the Applicant's permit application.

"SG" is the specific gravity of the injection fluid. The SG for the MAIP calculation should be the highest specific gravity that the Permittee expects to encounter during normal operation of the well. The SG for the FG should be the specific gravity of the fluid used during formation testing

"D" is the true vertical depth in feet. The value for D is the depth of the top open formation.

c. To determine the MAIP, the Permittee shall conduct formation testing and shall submit in writing to the Director the following information prior to commencing injection: Instantaneous Shut-In Pressure (ISIP) data and the highest specific gravity of the injection fluid that the Permitee expects to encounter during normal operation of the well. The Permittee shall calculate the MAIP and FG as described above and submit the calculation to the Director with the formation testing information. The Director will review the information and provide the MAIP in the written authorization to commence injection required under Paragraph II.D.2.d.

5. The Permittee shall inject fluids into the Injection Well through the tubing string installed inside the long string casing. The Permittee is prohibited from injecting between the outermost casing protecting USDWs and the well bore, and also from injecting into any USDW.

C. Plugging and Abandonment

1. The Permittee shall plug and abandon the Injection Well in accordance with the EPA-approved plugging and abandonment plan in Attachment 1.

2. The Permittee shall plug and abandon the Injection Well in such a manner that fluids shall not move into or between USDWs.

D. Financial Responsibility

1. The Permittee shall continuously maintain financial responsibility and resources to close, plug, and abandon the Injection Well in accordance with 40 C.F.R. § 144.52(a)(7) in the amount of at least $35,000. The Permittee shall not construct, rework, or operate the Injection Well until it establishes the financial responsibility for the Injection Well.

2. The Permittee must provide a Performance Surety Bond and Standby Trust Agreement prior to operating the well assuring the plugging costs for the Injection Well. The Permittee shall not substitute this Surety Bond with an alternative demonstration of financial responsibility, unless the Permittee has previously submitted evidence of that alternative demonstration to the Director and the Director notifies it that the alternative demonstration of financial responsibility is acceptable. The Director may require the Permittee to submit a revised demonstration of financial responsibility if the Director has reason to believe that the original demonstration is no longer adequate to cover the costs of plugging and abandonment.

3. The Permittee shall continue to demonstrate and maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in the manner required herein until:

a. The well has been plugged and abandoned in accordance with an approved plugging and abandonment plan pursuant to 40 C.F.R. §§ 144.51(o), 146.10, and 146.92, and submitted a plugging and abandonment report pursuant to § 144.51(p); or

b. The well has been converted in compliance with the requirements of 40 C.F.R. § 144.51(n); or

c. The transferor of a permit has received notice from the Director that the owner or operator receiving transfer of the permit, the new permitee, has demonstrated financial responsibility for the well.

4. Insolvency of Financial Institution. In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as a trustee or the institution issuing the financial mechanism to issue such an instrument, the Permittee must immediately notify the Director and submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such an event.

ATTACHMENT 1

PLUGGING & ABANDONMENT PLAN

OMB No. 2040-0042 Approval Expires 11/30/2014

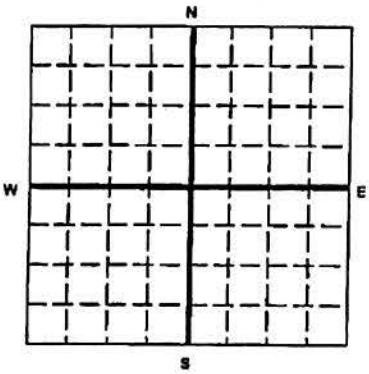
EPA

United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Class II-D Injection Well VWD-539572 Nora Field, Ervinton District, Dickenson County, VA	EnerVest Operating, LLC 300 Capitol Street, Suite 200, Charleston, WV 25301

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
VA	Dickenson	

Surface Location Description

1/4 of ___ 1/4 of ___ 1/4 of ___ 1/4 of Section ___ Township ___ Range

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ___ ft. frm (N/S) ___ Line of quarter section and ___ ft. from (E/W) ___ Line of quarter section.

TYPE OF AUTHORIZATION

- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name #906889 (Tract T-428)

WELL ACTIVITY

- [ ] CLASS I
- [x] CLASS II
  - [x] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number VWD-539572

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
16	42.05	511	511	19
11 3/4	32	708	708	15
8 5/8	24	2041	2041	11
5 1/2	15.5	5694	3894	7 7/8

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- [x] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [ ] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	5.0	8.2	8.2				
Depth to Bottom of Tubing or Drill Pipe (ft	4905	1800	300				
Sacks of Cement To Be Used (each plug)	12.7	33.9	101.6				
Slurry Volume To Be Pumped (cu. ft.)	17.1	45.7	137.2				
Calculated Top of Plug (ft.)	4805	1700	Surface				
Measured Top of Plug (if tagged ft.)							
Slurry Wt. (Lb./Gal.)	14.8	14.8	14.8				
Type Cement or Other Material (Class III)	Class A	Class A	Class A				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To
5127	5183	Projected Weir	Perforated Interval

Estimated Cost to Plug Wells

$35,000

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)	Signature	Date Signed
James McKinney, Senior VP & General Manager		10/16/2018

EPA Form 7520-14 (Rev. 12-11)