

ATTACHMENT 8



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Four Penn Center
1600 John F Kennedy Blvd
Philadelphia, Pennsylvania 19103-2852

STATEMENT OF BASIS

U.S. EPA UNDERGROUND INJECTION CONTROL (UIC)
DRAFT CLASS II-D PERMIT PAS2D702BALL

FOR

PENNECO ENVIRONMENTAL SOLUTIONS, LLC
6608 ROUTE 22
DELMONT, PA 15626

FOR

A project consisting of one Class II-D commercial disposal injection well, for the purpose of injecting fluids produced solely in association with oil and gas production, located in:

Plum Borough
Allegheny County, Pennsylvania

On July 23, 2021, Penneco Environmental Solutions, LLC (“Penneco” or “the Permittee”) submitted a UIC permit application to the U.S. Environmental Protection Agency (“EPA” or the “Agency”), Region 3, for the issuance of a permit that would allow for the conversion and operation of a Class II-D commercial disposal injection well, Sedat #4A, API # 37-003-21644, (hereinafter, “Injection Well”, “Sedat #4A”, or the “Facility”), located in Plum Borough in Allegheny County, Pennsylvania. The coordinates for the Injection Well are: Latitude 40° 31' 36.897" Longitude -79° 42' 39.6972". The application was officially deemed complete on August 5, 2021. The Permittee’s July 23, 2021 submittal with all accompanying attachments is hereinafter referred to in this Statement of Basis as the “Permit Application”.

Pursuant to the federal Safe Drinking Water Act, 42 U.S.C. §§ 300f *et. seq.*, and its implementing regulations, 40 C.F.R. Parts 144 -146, and 40 C.F.R. §§ 147.2350 - 2352, the EPA has developed a federal UIC Program and, through the issuance of permits, is responsible for regulating the construction, operation, monitoring and closure of injection wells that place fluids underground for disposal or enhanced recovery in oil and gas production. Today’s draft permit specifies conditions for Injection Well construction, operation, monitoring, reporting, and plugging and abandonment which are designed to protect and prevent the movement of fluids into Underground Sources of Drinking Water (“USDW”). The Permittee’s UIC project and the draft permit conditions specific to the project are described below:



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Area of Review: Pursuant to the applicable regulations, 40 C.F.R. §§ 144.3 and 146.6(b), the “Area of Review” is an area surrounding the Injection Well for which the applicant must first research, and then develop, a program for corrective action to address any wells that penetrate the injection zone and which may provide conduits for fluid migration during the injection operation at the Facility. Penneco proposed a fixed radius Area of Review of one-quarter mile, which EPA has determined to be acceptable. In support of using a fixed radius Area of Review, EPA has considered the following information provided by the Permittee: survey by Fox and Fox, Inc., conversation with surface landowners, research of Pennsylvania Bureau of Oil and Gas Management’s well records, research of Pennsylvania Geological Survey publications covering the Area of Review, research of United States Geological Survey publications covering the Area of Review, master theses from West Virginia University, and a series of reservoir tests by HFrac Consulting Services. Penneco used the results from the aforementioned research along with topographic and tax maps displaying surface features (such as buildings and streams) to prepare the maps of the Area of Review that are included with the permit application. The Sedat #4A Area of Review is located in the Pittsburgh Low Plateau Section of the Appalachian Plateau physiographic province. Underlying rock types are shale, siltstone, sandstone, limestone, and coal. The Permittee indicated that there are six (6) wells within the Area of Review that penetrate the injection zone, which includes the proposed injection well, Sedat #4A, and the EPA-permitted Sedat #3A injection well. Of the other four (4) wells within the Area of Review, three (3) are active production wells and one (1) well (API # 37-003-00674) has been plugged in accordance with Pennsylvania Department of Environmental Protection regulations. The Sedat #2A well (API #37-003-21222) will be converted into a monitoring well. There are 14 wells within the ½ mile Area of Review that penetrate the Murrysville sandstone. All the wells were cased and cemented through the Murrysville sandstone. If any unplugged/abandoned wells that penetrate the injection zone are found within the Area of Review at a later date, the draft permit requires the Permittee to perform corrective action.

Underground Sources of Drinking Water (USDW): A USDW is defined by the UIC regulations as an aquifer or its portion which, among other things, contains a sufficient quantity of ground water to supply a public water system and which also contains fewer than 10,000 mg/L (milligrams per liter) Total Dissolved Solids, and which is also not an exempted aquifer. Aquifers in the Area of Review are mainly sandstones of the Conemaugh Group and the Allegheny Group. The thickness of the section from the Conemaugh Group through the Allegheny Group runs in the range of 800 feet below ground surface depending on surface elevation. The Permittee notes that Pennsylvania Geological Survey Water Resource Reports #35 and #37 state water quality is extremely poor beyond 500 feet in depth below ground surface because of moderate to high mineralization of the waters due to high dissolved solids and brine. The established lowermost USDW for the nearby Sedat #3A well (PAS2D701BALL) is approximately 450 feet below ground surface. Taking the elevation difference between Sedat #3A and Sedat #4A into account (-38 feet), EPA has determined that the lowermost USDW at Sedat #4A is calculated at approximately 412 feet below ground surface. Construction of the Injection Well requires the Permittee to install surface casing to a depth of approximately 564 feet and to cement that entire length of casing back to the surface. The Permittee must, among other requirements, also install intermediate casing from the ground surface to an approximate depth of 1,906 feet and cement that intermediate casing back to the surface, and install long string casing from the ground surface to a depth of approximately 1,680 feet and cement that long string casing back to the surface. The Permittee must install in the Injection Well, and inject fluids through, a tubing string which is set on a packer and placed above the injection zone interval at approximately 1,650 feet below ground surface. Both the surface casing and the intermediate casing are required to protect ground-water.

Injection and Confining Zones: Injection of fluids for disposal is limited by the draft permit to the Murrysville sandstone formation in the subsurface perforated interval between approximately 1,740 feet to 1,800 feet below ground surface.

The Murrysville sandstone is approximately 94 feet thick and lies at a depth of 1,706 feet to 1,800 feet below ground surface in the Sedat #4A Area of Review. The lowermost USDW is separated from the injection zone by approximately 1,328 feet. The Sedat #4A well had an original total depth of 3,886 feet below ground surface and will be plugged back to 1,850 feet (approximately 50 feet below the injection zone). Fluid will be injected into a 60 foot section of the Murrysville sandstone through a 2 7/8 inch injection string set on a packer at approximately 1,650 feet in 4 1/2 inch casing cemented to surface and into perforations in the 7 inch casing from 1,740 feet to 1,800 feet below ground surface. The confining zones are the Riddlesburg Shale (Sunbury Equivalent) which overlays the Murrysville sandstone with the Riceville-Oswayo Shale lying underneath as the lower confining zone. The Riddlesburg Shale, serving as the upper confining zone, is composed of laminated shale and siltstone with occasional sandstone and limestone beds. The Riddlesburg Shale is between 80 to 90 feet thick in the Sedat #4A Area of Review. Because of the Murrysville sandstone's thickness, high porosity, and permeability, the formation serves as a gas storage reservoir to the south of the Sedat lease. The Riceville-Oswayo Shale, serving as the lower confining zone, is composed of shale and siltstones. The Riceville-Oswayo Shale is about 30 feet thick in the Sedat #4A Area of Review.

Injection Fluid: The draft permit limits the injection fluids in this well to produced fluids obtained solely in association with oil and gas production. The draft permit also establishes a maximum daily injection volume of 54,000 barrels per month. One barrel of fluid is equal to 42 gallons.

The Permit Application includes analyses of the injection fluid that corresponds to the requirements stated in Paragraph II.C.3. in the draft permit. The parameters chosen for sampling reflect not only some of the typical constituents found in the injection fluid, but also in shallow ground water. Should a ground water contamination event occur during the operation of the Injection Well, EPA will be able to compare samples collected from groundwater with the injection fluid analysis to help determine whether operation of the Injection Well may be the cause of the contamination.

Maximum Injection Pressure: To determine the Maximum Allowable Injection Pressure (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 range of specific gravity of the injection fluid that the Permittee expects to encounter during normal operation of the well. The MAIP determined by the formation testing will be reviewed and must be approved by the Director before authorization to inject is granted.

Potential for Seismicity: The SDWA regulations for Class II injection wells do not require consideration of the seismicity of the region, unlike the SDWA regulations for Class I injection wells for the injection of hazardous wastes. See regulations for Class I hazardous injection wells at 40 C.F.R. §§ 146.62(b)(1) and 146.68(f). Nonetheless, because of public concerns about injection-induced seismicity, EPA evaluated factors relevant to seismic activity as discussed below and addressed more fully in [Region 3 framework for evaluating seismic potential associated with UIC Class II permits](#). The final permit will provide that the Permittee shall only inject produced fluids through the Injection Well and into a formation which is overlain by a confining zone free of known open faults or fractures within the Area of Review, as required pursuant to 40 C.F.R. § 146.22.

A report conducted by the *Commonwealth of Pennsylvania Department of Conservation and Natural Resources Bureau of Topographic and Geologic Survey*, [“Earthquake Hazard in Pennsylvania”](#) documents known epicenters found in Pennsylvania. Per the report, there are no documented cases in which the epicenter of an earthquake was traced back to Allegheny County, Pennsylvania. On page 7 of the report, the author states, “The great majority of earthquakes occur along boundaries between tectonic plates. The reason for this is not completely clear, but it appears that stress levels are higher along plate boundaries, and that strain energy builds up more rapidly in those areas. Eastern North America, including Pennsylvania, today is far from the nearest plate boundary – the mid-Atlantic Ridge, some 2,000 miles to the East.”

The United States Geological Survey (U.S.G.S.) as well as the Pennsylvania Bureau of Topographic and Geologic Survey have not recorded and EPA has not been notified of any seismic activity that originated in Allegheny County, Pennsylvania. The U.S.G.S. rates the probability of seismic activity in southwest Pennsylvania with sufficient intensity to cause damage as low. Penneco also contends that the maximum injection pressure is sufficiently below the pressure needed to initiate a fracture or disrupt any unknown faults. The injection rate is also not of a sufficient volume to open or extend any fractures or disrupt any unknown faults in the area. The final permit will include a table of injection pressure limits for each individual specific gravity level of fluid to be injected, the surface Maximum Allowable Injection Pressure (“MAIP”), to prevent the initiation or propagation of fractures that could create conduits for the injected fluid to flow to any existing faults. The MAIP is set at a level less than both the Instantaneous Shut-In Pressure, which is the wellhead pressure immediately after pumps are shut down following a fracture treatment or test, and the fracture pressure in order to prevent the initiation of new, or the propagation of existing, fractures as a result of injection activities. The formula used to calculate the surface MAIP can be found in Paragraph III.B.4. of the draft permit.

Finally, the Permittee submitted a Seismic Monitoring and Mitigation Plan that will provide a continuous record of any seismic and earthquake events. The monitoring equipment and seismometer stations will notify the Permittee, Incorporated Research Institutions for Seismology (IRIS) and the Pennsylvania Seismic Network (PASEIS) via Penn State University of any detections of naturally occurring and manmade seismic occurrences or events at the Penneco facility and vicinity.

Testing, Monitoring and Reporting Requirements: The Permittee is required to conduct a mechanical integrity test (“MIT”) after conversion of the Injection Well. The MIT consists of a pressure test and a fluid movement test. The pressure test will be conducted in order to ensure that the casing, tubing and packer in the Injection Well do not leak. The fluid movement test, which includes case cement record and cement bond log or temperature log reviews, will be conducted to ensure that fluid movement does not occur outside of the injection zone. In addition to the testing described above, additional pressure testing of the casing, tubing and packer will occur every two (2) years and whenever a rework on the Injection Well requires the tubing and packer to be released and reset.

The Permittee will be responsible for continuously monitoring the Injection Well for surface injection pressure, annular pressure, flow rate and cumulative volume from the date on which the Injection Well commences operation and until such date that 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. In addition, Paragraph II.D.3 requires the Permittee to report to the Director, within twenty-four (24) hours, any Permit noncompliance which may endanger, or which has endangered, human health or the environment. The Permittee must submit an Annual Report to the EPA summarizing the results of the monitoring and testing activities required by the permit, including

monthly monitoring records of the injection fluid, the results of any mechanical integrity testing and information identifying any major changes in the characteristics of the injected fluid. The Annual Report must be submitted to EPA by January 31 of each calendar year.

Plugging and Abandonment: The Permittee has submitted a Plugging and Abandonment Plan that will result in an environmentally protective Injection Well closure at the time of cessation of operations. The Permittee will secure a Standby Trust Agreement as well as an Irrevocable Letter of Credit to ensure proper plugging of the Injection Well. The amount of the Standby Trust Agreement and Irrevocable Letter of Credit shall cover the estimated cost to close, plug and abandon the Injection Well and shall be in the amount of at least \$13,397.10. The amount of the Standby Trust Agreement, which is based upon an independent, third-party professional's estimate of the costs associated with the plugging and abandonment of the Injection Well, must also be sufficient to preclude the possibility of abandonment without proper plugging and closure. Authorization to construct and operate the Injection Well will not be given by EPA until financial assurance is in place.

Expiration Date: When issued, a final permit will be in effect for ten (10) years from the date of Director's signature, which includes the proper plugging and abandonment of the Injection Well when operations cease. EPA will conduct an annual review of the Permittee's Injection Well operation. The final permit will contain the same conditions as in this draft permit unless EPA receives information supporting and warranting alternative final permit conditions or actions on this Permit Application.

Additional Information: The Administrative Record for the draft permit is available for public inspection. All information submitted by the Permittee in support of the draft permit, unless deemed confidential, is included in the Administrative Record for the draft permit and is available to the public for review. Copies of the Permit Application, the draft permit, the Statement of Basis, and the Administrative Record index are available for review and inspection on EPA's [website](#). Please direct any questions, comments and requests for additional information to the contact listed below. **The Administrative Record for this action will remain open for public comment until June 29, 2022.**

Tentative Public Hearing: EPA has tentatively scheduled a virtual public hearing on June 28, 2022. An in-person hearing will not take place. The call-in and log-in information for the virtual meeting is listed below:

Call-in Number: (484) 352-3221
Conference ID: 530 160 499#

6:00 PM – 8:00 PM Eastern Standard Time



MS Teams Link: <https://msteams.link/HWTU>

There is no need to register in advance for the virtual hearing. Attendees may utilize MS Teams by calling via telephone, entering the URL into a web browser, or scanning the QR code. During the hearing, callers will receive instructions on how to join the queue to make a comment. The meeting organizer will call on people to deliver their oral comments. Participants who want to supply written or printed materials can do so using the information listed below.

Requests to hold this public hearing must be received via email or telephone to EPA by June 21, 2022. When requesting a public hearing, please state the nature of the issues you propose to raise. EPA

expressly reserves the right to cancel this hearing unless a significant degree of public interest is evidenced by June 21, 2022.

Submit comments or requests for a hearing or for additional information to:

Ryan Hancharick
Water Division (Mail Code: 3WD22)
U.S. Environmental Protection Agency Region 3
Four Penn Center
1600 John F. Kennedy Blvd.
Philadelphia, PA 19103
215-814-3278
R3_UIC_Mailbox@epa.gov