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

Response to Comments
for
The Issuance of an Underground Injection Control (UIC) Permit
for
Seneca Resources Corporation

On June 15, 2017, the U.S. Environmental Protection Agency Region III (EPA or the Region) issued a public notice requesting comment and announcing the opportunity for a public hearing for the proposed issuance of an Underground Injection Control (UIC) permit, PAS2D026BELK, to Seneca Resources Corporation (Seneca) for one Class II-D underground injection well. EPA received various requests for a hearing which it held on July 24, 2017, at the Highland Township Fire Hall located at 115 Pennsylvania Avenue in James City, Pennsylvania. About 30 people attended the public hearing and EPA received oral comments from nine people in attendance at the hearing. At the hearing, EPA extended the public comment period until July 31, 2017, and invited the submission of any additional written comments. In total, EPA received several written comments. During the public comment period, all the information submitted by the applicant was available for review at the Friends Memorial Library located at 230 Chase Street in Kane, Pennsylvania and at the EPA regional office in Philadelphia.

The response to comments which follows, consolidates and provides responses to questions and issues raised by people who sent timely written public comments during the extended public comment period or who provided comments at the public hearing. EPA wishes to thank the public for their informative and thoughtful comments and to thank the people from the Highland Township and the Highland Township Fire Hall that assisted EPA in hosting the public hearing.

1) What does EPA's UIC program have jurisdiction and authority to regulate?

Many people raised concerns about matters that the EPA UIC program under the Safe Drinking Water Act (SDWA) does not have the jurisdictional or regulatory authority to address in the UIC permitting process. Some of the concerns mentioned were the potential for increased truck traffic, damage to the roads, increased noise, the potential for the decrease of property values, and the possibility of surface spills and runoff into nearby streams. Additional public comments which related to proximity to watersheds and streams, wildlife protection, emergency response capabilities, other waste disposal options, other oil and gas operators in the area, environmental impacts from oil and gas production and compensation to the local community, while legitimate, are also outside the UIC permitting process, although other federal, state or local regulations may address them. When making the decision on whether to issue a UIC permit for Seneca, EPA's UIC jurisdiction is limited to determining whether the proposed injection operation

will safely protect underground sources of drinking water (USDWs) from the subsurface emplacement of fluids and will be in compliance with the federal UIC regulations. An USDW, as defined in the UIC regulations at 40 C.F.R. 144.3, is an aquifer or its portion with less than 10,000 mg/l Total Dissolved Solids (TDS) and which currently supplies a public water supply or contains sufficient quantity of ground water to supply a public water supply.

Although the concerns described above may be relevant to residents, unless they are related to the protection of USDWs or compliance with the UIC regulations, EPA is not authorized under the SDWA to address them through the UIC permitting process. Other local, county, state or federal ordinances or regulations may address traffic, road noise, zoning concerns, surface spill prevention and other concerns raised by these commenters.

The UIC permit contains several conditions that address compliance with other local, state or federal laws. Part I.A. of the permit provides that "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, an invasion of other property rights or any infringement of state or local law or regulations." In addition, Part I.D.12 of the permit states, "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." The operator must also receive a permit from the Pennsylvania Department of Environmental Protection (PADEP) prior to initiating construction and operation of the injection well. Therefore, EPA's UIC permit is only one of several authorizations that a permittee may be required to obtain before it is allowed to commence construction and/or operation of the injection well.

2) Do the UIC regulations supersede local land use plans including the Home Rule Charter?

As mentioned in response number (1), EPA requirements do not supersede local, county or state laws or regulations. Some commenters stated that they believe that any permit issued by EPA would be illegal, in light of the Highland Township Home Rule Charter, adopted in November 2016 and which expressly prohibited the disposal of waste from oil and gas operations. Seneca filed a lawsuit in federal district court challenging the validity of that prohibition on federal constitutional and state law grounds. On September 29, 2017, the Federal District Court for the Western District of Pennsylvania held that the prohibition and other related sections of the Home Rule Charter were invalid, unconstitutional, and unenforceable, in part because the court found that the SDWA preempted the Home Rule Charter prohibition. *See Seneca Resource Corp. v. Highland Township*, Memorandum Opinion on Plaintiff's Motion for Judgement on the Pleadings, C.A. No. 16-cv-289 Erie, (WD PA Sept. 29, 2017), at 7-10. Based on the decision of the court, the waste disposal prohibition is no longer applicable.

3) EPA should require the operator to find another location for disposal.

EPA does not have the authority to require operators to construct an injection well in any particular geographic location. The location chosen by an operator is based on many factors such as economics, property ownership and accessibility, and geologic suitability. EPA's statutory and

regulatory responsibility is to review each UIC permit application it receives to determine whether USDWs will be protected from the proposed injection well operation and whether the operation will be in compliance with the UIC regulations. Likewise, EPA cannot deny a permit solely because of residents' opposition to the location, if the applicant otherwise meets the requirements of the UIC program.

4) Injection well may pose a risk to my drinking water well or other drinking water supplies. Injection fluids could migrate from the injection formation and contaminate drinking water supplies.

In order to protect USDWs, the UIC regulations at 40 C.F.R. 147.1955(b)(l) require that an injection well surface casing be placed to a depth at least 50 feet below the determined lowermost USDW. Seneca identified the lowermost USDW where the injection well will be located to be at a depth of approximately 400 feet, based on historical drilling log records. Drilling records of the proposed injection well and other nearby production wells within the one-quarter mile radius of the proposed injection well, confirm that drillers were not finding water that would qualify as a USDW below 400 ft. (See Permit Application Appendices D, E and F).

Some commenters were concerned that the drilling of the injection well could affect their drinking water. Sometimes well drilling can initially increase water turbidity and affect water pressure. In this case, the well has already been drilled and includes a surface casing. The surface casing was cemented from the surface to 553 feet below when the well was completed as a gas production well in 2008. This exceeds the regulatory criteria of 40 C.F.R. §§146.22 and 147.1955(b)(1). This depth also satisfies PADEP requirements. Therefore, no turbidity is expected in the conversion of the well from a production well to an injection well. In addition, when well #38282 is converted to an injection well, the 4 ½ inch diameter long string casing will be cemented from a depth of 2335 feet to no less than 100 feet above the top of the injection zone.

Seneca has informed EPA that it has conducted testing of any drinking water well within a half mile of the proposed injection well, where the home owner has provided permission, in order to establish baseline water quality conditions. This will enable documentation of any adverse impacts to the ground water after injection well construction and operation begin.

After the injection well is converted and the long string casing cemented, but before the injection begins, the permittee is required by the permit to submit to EPA a construction completion report providing details about the drilling, completion and testing of the well. The completion report must include the injection well drilling records, logging information, cementing records and mechanical integrity testing information. EPA will review this information to verify that the geological information submitted in the permit application is accurate, and that the injection well was properly constructed, converted and cemented to prevent leaks during operation and fluid movement out of the injection zone through the injection wellbore.

EPA will review the cementing logs to verify proper cementing without voids between the casing and the well bore that could provide a conduit for fluid movement. Also, the required mechanical integrity test must show that there are no internal failures in the tubing, casing or packer installed within the well before injection operations take place. If new information

obtained from the completion report warrants changes to the permit, EPA will modify the permit conditions as appropriate.

Without certain precautions, abandoned wells near an injection well can pose a risk to USDWs by providing a conduit for the migration of fluid out of an injection zone. Therefore, the UIC regulations and the permit impose certain requirements on an injection well operator to protect USDWs from that risk. Specifically, the operator is required to determine whether any abandoned wells exist within a specified area, calculated and defined as the area of review (AOR) around the proposed well, which could pose a threat to USDWs. If abandoned wells are found within a one-quarter mile AOR, the permittee must either perform corrective action, which requires plugging those wells, or use the abandoned wells for monitoring the fluid level rise from the injection formation during operation.

Seneca proposed a fixed radius of one-quarter mile (1320 feet) for the AOR and a maximum injection volume of 45,000 barrels per month. To review the proposed fixed radius, EPA considered past practices at the proposed injection well site and the chemistry of the fluids to be injected. The injection well will be used to inject brine and related fluids into a depleted formation from which large quantities of gas have been extracted, as well as brine similar to that which will be injected. The application also provides information on other wells in the area and on the residents and landowners surrounding the site.

The permit application for this well identifies only one abandoned well within the proposed 1/4 mile AOR. That abandoned well has been plugged. According to the plugging record provided, the abandoned well is located approximately 1/4 mile from the proposed UIC well, was only 370 feet deep and did not penetrate the injection formation which is about 2,300 feet deep. Two additional deep gas wells which do penetrate the injection zone, are located on the perimeter of the 1/4 mile AOR, and will be used by the permittee as fluid-level monitoring wells. Well #04384 is located to the north, and well #04406 is located to the northwest of the proposed injection well. The permit requires Seneca to utilize these wells for monitoring the fluid level on a quarterly basis.

There are no public or private drinking water wells identified within the AOR. The closest public water well is about a mile north of the proposed injection well. The closest private water well is located about 1/2 mile northeast of the proposed injection well. Both wells are less than 400 feet deep. The UIC regulations do not prohibit locating Class II injection wells near drinking water wells.

At the location of this injection well, a confining zone approximately 270 feet of continuous shale rock (immediately above the injection formation, the Elk 3 Sand), and numerous other confining zones (consisting of other shale layers) exist between the injection zone and the formations that supply drinking water to shallow wells. It was the confinement of natural gas in the Elk 3 Sand formation that enabled successful production of gas at this location. The natural gas and fluids in the formation were under pressure prior to and during production. The confining zone above the Elk 3 Sand formation kept this natural gas in place. Natural gas did not migrate to the surface on its own from the Elk 3 Sand formation. It required gas production wells to be

drilled into the formation before natural gas could be recovered. The confining zone will similarly prevent fluid movement out of the injection formation.

Furthermore, the permit does not allow the injection pressure to exceed the injection formation's fracture pressure and thereby prevents fracturing that could allow fluid to migrate out of the injection zone. To confirm that the injected fluid remains in the receiving formation, the permit requires continuous monitoring of pressure conditions within the injection well.

5) The fluids being injected into the well are hazardous and/or radioactive. Why can't the brine water be treated and disposed of in another way?

Individual constituents contained within fluid produced from an oil or gas production reservoir could be determined to be toxic, hazardous or radioactive. However, these fluids, when generated in association with oil and gas production, are exempt from hazardous waste regulation under the UIC program because they are not classified as hazardous under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901. In December 1978, EPA proposed hazardous waste management standards that included reduced requirements for several types of large volume wastes. Generally, EPA believed these large volume "special wastes" were lower in toxicity than other RCRA regulated hazardous wastes. Subsequently, Congress exempted the wastes from RCRA Subtitle C pending a study and regulatory determination by EPA. In 1988, EPA issued a regulatory determination that the control of oil and gas exploration and production wastes under RCRA Subtitle C was not warranted, in part because other State and Federal programs, such as the UIC program, effectively manage the disposal of such wastes. Therefore, the UIC program regulates fluids produced in association with oil and gas production activities, but not as hazardous waste. Disposal of these fluids is permissible down Class II brine disposal injection wells.

The public raised the issue that the disposal of these fluids underground is not safe. If managed and operated properly, EPA believes the risk to the environment by injecting fluids deep underground can be considered safer than other methods of disposal, such as allowing them to be discharged into a stream, disposed in a landfill or treated and stored in containment pits or storage tanks. EPA also believes that the reuse or recycling of produced fluid is a sound environmental management practice. Although produced brine can be treated, recycled and reused in the hydraulic fracturing process or for the enhanced recovery of oil, the byproduct of this continued reuse of the produced fluid eventually becomes very concentrated and therefore must still be disposed of in some manner. Public and privately owned wastewater treatment facilities are unable to adequately remove many constituents found in brine, including chlorides and bromides. When these constituents are discharged to streams or rivers they can pose a serious risk to fish and other aquatic organisms living in the stream as well as contribute to serious health effects for people who obtain their drinking water from these streams and rivers. The UIC permitting program is designed to ensure that injection covered by the UIC permits can occur in an environmentally protective manner.

The wastewater to be disposed of at the well will be injected far below land surface into an existing gas bearing formation similar in nature to where the wastewater was generated. Seneca will periodically sample and characterize the wastewater its injecting as required by the

permit. Injection of fluids other than produced fluids associated with oil and gas production would be in violation of the permit and subject to enforcement action.

6) What are the ongoing requirements for this well to show it is not allowing injection fluid to leak from the well?

Once the injection well is converted, EPA will review the completion report including well construction information, an evaluation of the well logging, casing and cementing, and mechanical integrity testing. EPA reviews the cement bond logs to evaluate whether the well has been properly cemented to prevent injected fluid from flowing through the wellbore outside the casing. The mechanical integrity test involves increasing the pressure in the annulus (the space between the injection tubing and long string casing) to above the operational injection pressure. The pressure must be maintained over a period of 30 minutes for the well to have mechanical integrity. This tests the mechanical integrity of the long string casing, tubing and packer to determine whether there are any leaks. The permit requires mechanical integrity testing be performed every five years and after any repair, modification, and rework of the injection well. If possible leaks are indicated, the test may also include an evaluation of whether fluid movement is occurring outside the casing. Under the terms of the permit, EPA can request the permittee to demonstrate mechanical integrity at any time.

Furthermore, Part II.C.2 of the final permit requires continuous monitoring of the injection well for injection pressure, annular pressure and injected volumes. This will enable the operator, as well as EPA, to determine whether the integrity of the well's long string casing, tubing and packer are compromised over the course of the well's operation. The monitoring will be designed to detect pressure changes. Annular pressure monitoring requires that the well's annulus pressure be set at a positive pressure lower than the injection pressure. If a leak were to develop in the tubing or packer, the annular pressure would increase significantly. If the well experiences a leak in the long string casing, the pressure in the annulus would decrease significantly. Either situation would automatically trigger the well to shut down and cease operating. This would constitute a mechanical integrity failure of the well, and in accordance with Part II.C.6 of the final permit, the operator would be required to cease injection immediately.

Finally, when the operator no longer wants to operate the injection well, it must be permanently plugged and abandoned in accordance with Part II.D.9 and Part III.C of the final permit, which requires that the permittee plug the well in such a manner that plugging does not allow movement of fluids into or between underground sources of drinking water. Since the mid-1980s, several thousand Class II wells in Region III have been successfully plugged in accordance with the regulatory requirements. Seneca has submitted a plugging and abandonment plan on EPA Form 7520-14 which has been approved by EPA and is incorporated into the permit. Seneca's plugging plan is to be accomplished by one of the methods mandated by the UIC regulations at 40 C.F.R. 146.10. This plan is provided in Attachment 1 of the final permit.

7) Seneca must provide financial resources to provide relief for any accidents or drinking water supply contaminations.

Under the UIC regulations, owners and operators of injection wells are required to demonstrate financial responsibility for the purpose of properly plugging and abandoning the injection well when the operation ceases and the well is no longer used for injection. The cost of plugging a well depends, among other things, upon the depth of the well and how the well was constructed. Seneca submitted an estimate of $22,300 from an independent plugging contractor on the cost of plugging the well. EPA Region III reviewed and approved a financial responsibility demonstration submitted by Seneca. See 40 C.F.R. 144.52. Although a separate issue from the financial responsibility required for plugging and abandonment, the public also asked whether the operator is required to set money aside to remediate any contamination of their drinking water if the injection operation fails and allows fluids to migrate into a USDW. The operator is not required to set money aside for ground water remediation. However, EPA does have emergency authorities under the SDWA if endangerment to USDWs should result from injection activities. Section 1431 of the SDWA authorizes EPA to take an action against anyone who causes or contributes to the contamination of a drinking water supply which may present an endangerment to the health of persons using such water supply. Any action brought under Section 1431 of the SDWA can include a requirement that the responsible party provide alternative drinking water to citizens affected by the endangerment.

8) What is EPA's role in inspecting this well during construction and during operation?

EPA has direct implementation authority for the UIC program in the Commonwealth of Pennsylvania. Therefore, in addition to permitting, EPA also will be responsible for inspecting the Seneca injection well and enforcement of the permit requirements for the operation of the well. EPA has a team of inspectors, including one full time inspector responsible for inspecting Class II injection wells. At least one EPA inspector will be present at the Seneca Injection Well during construction, witness the well mechanical integrity test after construction, and EPA will at a minimum, inspect the well during operation on an annual basis. EPA also reviews the operator's annual report including continuous monitoring reports of pressure and volumes injected.

9) The company is responsible for self-reporting to EPA. This does not seem like an acceptable way for EPA to be able to ensure that the well operates properly.

The UIC regulations are similar to most other federal regulations in that they require self-monitoring and reporting to a state or federal agency. EPA expects all operators to comply with the regulatory requirements as well as their permit requirements. An operator's failure to comply with the permit, including accurately monitoring and reporting to EPA, would subject the operator to potential civil or criminal penalties or both. EPA inspects every Class II disposal well in Pennsylvania at least annually. EPA's inspection of injection well facilities and review of annual reports help determine operator compliance and supplement self-reporting. Also, as required by the Safe Drinking Water Act, EPA notifies the public of any proposed penalty order and offers the opportunity to comment on such orders. We are not aware of any UIC violations by Seneca.

10) EPA should conduct an environmental impact assessment and address potential impacts on wildlife prior to issuing the permit.

Section 124.9(b)(6) of Title 40 of the C.F.R. establishes that UIC permits are not subject to environmental impact statement requirements of the National Environmental Policy Act ("NEPA"). NEPA requires environmental impact statements (EIS) when undertaking certain major federal actions. However, under the judicial doctrine of functional equivalent, where a federal agency is engaged primarily in examining environmental questions and there are procedural and substantive standards for adequate consideration on environmental issues, the NEPA EIS requirement does not apply. See *In re American Soda, LLP*, 9 E.A.D. 280, 290-291 (2000). The EPA Environmental Appeals Board has concluded that under the functional equivalent doctrine and Section 124.9(b)(6), EPA is not required to prepare an EIS in support of UIC permits.

As part of the public notice process, EPA provides copies of the Statement of Basis and the draft permit to the U.S. Fish & Wildlife, the Nature Conservancy, the PA Fish & Boat Commission, the Pennsylvania Game Commission, and the Allegheny National Forest for their review and comment. No comments were received by any of these organizations. In addition, EPA conducted a search for possible endangered species in the project area and it appears that there were none in Elk County.

11) Seneca had already received a permit for another brine disposal injection well located on the same lease. Will Seneca be allowed to operate both wells simultaneously?

In January 2014, Seneca received UIC permit PAS2D025BELK for injection well #38268. If permit PAS2D026BELK for Seneca injection well #38282 becomes final, Seneca will be authorized to inject into either or both wells. During the permit review, it was determined, based on each well's Zone of Endangering Influence (ZEI), that there is sufficient distance between the two wells and there will be negligible, if any, influence from one well on the other. The ZEI calculates the distance fluid will spread out underground based on injection parameters, assuming injection of the maximum volume for the 10-year period of the permit. Seneca calculated a ZEI for the well #38268, and has applied it to this well because of the proximity and identical geological formation. The ZEI calculation showed that after ten years of operation, the fluid level at the wellbore will not reach the lowermost USDW. Therefore, the operation of one well will not impact the pressure at the other well half mile away. In any case, one of the monitoring wells is located in between the two injection wells and will serve to monitor injection formation pressure in between the wells.

12) There was inadequate public notice of the draft permit and the public hearing. The Kane Republican is a newspaper published in McKean County and is not an appropriate newspaper for public notice of the Seneca permit which covers a project located in Elk County.

There is no requirement that the newspaper where the public notice is made must be in the same county as the injection well project. Instead, publication is required in a newspaper "within the area affected by the facility or activity" of draft permits for major facilities. 40 C.F.R. §124.10(c)(2)(i). The Kane Republican is published in Kane, Pennsylvania which is in McKean

County. Kane is about three miles north of the location of the proposed Seneca injection well. Prior to the public notice being placed, EPA had inquired with Highland Township about the newspaper of greatest circulation in the area and was informed that would be the Kane Republican. Jim Wolfe, the Highland Township Supervisor, stated at the public hearing that the Kane Republican is the official newspaper for the township. EPA also posted the public notice on its website and notified numerous State and local offices and agencies of the draft permit, including the Pennsylvania Department of Environmental Protection, the Elk County Board of Commissioners and the Highland Township Board of Supervisors.

13) What happens when the permit expires?

The UIC regulations allow Class II permits to remain effective for up to the life of the facility. See 40 C.F.R. § 144.36(a). However, EPA Region III established a more stringent permit condition, limiting this permit to ten years. Before the end of that ten-year period, Seneca may request EPA to reissue the permit by submitting a new application. In that event, EPA will review the history of Seneca's operation, as well as any information on the well obtained during the drilling, and determine whether to reissue the permit. EPA's tentative decision of whether to reissue or deny the permit for an additional term is subject to the same public notification and public comment process as an initial permit.

If Seneca decides not to continue its injection operations at the end of the permit term, it must plug and abandon the well in accordance with the permit requirements, prior to the expiration of the permit.

Federal Underground Injection Control Program
Permit Appeals Procedures

The provisions governing procedures for the appeal of an EPA permitting decision are specified at 40 C.F.R. Part 124.19. (Please note that the changes to this regulation became effective on March 26, 2013. See 78 Federal Register 5281, Friday, January 25, 2013.) Any person who commented on the draft permit, either in writing during the comment period or orally at the public hearing, can appeal the final permit by filing a written petition for review with the Clerk of the EPA Environmental Appeals Board (EAB). Persons who have not previously provided comments are limited in their appeal rights to those points which have been changed between the draft and final permits (there were no changes between the draft and the final permit in this case). Citizens, groups, organizations, governments and the permittee can appeal the permit within this procedural framework.

A petition for review must be filed within thirty (30) days of the date of the notice announcing EPA's permit decision. This means that the EAB must receive the petition within 30 days. (Petitioners receiving notice of the final permit by mail have 3 additional days in accordance with 40 C.F.R. 124.20(d).) The petition for review can be filed by regular mail sent to the address listed below with a copy sent to EPA Region Ill at the address listed below.

Environmental Appeals Board
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue N.W.
Mail Code 1103M
Washington, DC 20460-0001

U.S. Environmental Protection Agency
Region III Ground Water & Enforcement Branch (3WP22)
Water Protection Branch
1650 Arch Street
Philadelphia, PA 19103

See the Federal Register notice cited above or the EAB website:
http://yosemite.epa.gov/oa/EAB Web Docket.nsf/) for how to file with the EAB electronically or by hand delivery.

The petition must clearly set forth the petitioner's contentions for why the EAB should review the permit. The petition must identify the contested permit conditions or the specific challenge to the permit decision. The petitioner must demonstrate the issues raised in the petition had been raised previously during the comment period or at the hearing. If the appeal is based on a change between the draft and final permit conditions, the petition should state so explicitly. The petitioner must also state whether, in his or her opinion, the permit decision or the permit's conditions appealed are objectionable because of:

1. Factual or legal error, or

2. The incorporation of a policy consideration which the EAB should, at its discretion, review.

If a petition for review of this permit is filed, the permit conditions appealed would be deemed not to be in effect pending a final agency action.

Within a reasonable time of receipt of the Appeals Petition, the EAB will either grant or deny the appeal. The EAB will decide the appeal on the basis of the written briefs and the total administrative record of the permit action. If the EAB denies the petition, EPA will notify the petitioner of the final permit decision. The petitioner may, thereafter, challenge the permit decision in Federal Court. If the EAB grants the appeal, it may direct the Region III office to implement its decision by permit issuance, modification or denial. The EAB may order all or part of the permit decision back to the EPA Region III office for reconsideration. In either case, a final agency decision has occurred when the permit is issued, modified or denied and an Agency decision is announced. After this time, all administrative appeals have been exhausted, and any further challenges to the permit decision must be made to Federal Court.