How does the regulation of Class II disposal wells help to prevent contamination of ground water?

Prior to making a determination regarding an application for permit, Division geologists evaluate each application for compliance with laws and rules. As part of the permit review process, geologists determine the depth of the deepest Underground Source of Drinking Water (USDW) and examine the thickness and nature of confining strata. Confining strata are layers of low-permeability rock that overlie the injection zone and help prevent vertical migration of injected brine.

Geologists ensure the depth of the surface casing complies with laws that establish the depth necessary to extend through and protect all USDWs. A USDW is defined as an "aquifer...that contains a sufficient quantity of groundwater to supply a public water system, and ... contains less than 10,000 milligrams per liter of total dissolved solids." Most groundwater used for public drinking water today contains less than 500 milligrams per liter of total dissolved solids (TDS), and most water that is treated to be used as drinking water contains less than 3,000 milligrams per liter TDS. Therefore, the Underground Injection Control (UIC) Program well construction requirements ensure that even water resources that could be treated and used as drinking water in the future, are protected.

Division geologists evaluate the proposed well construction plan to ensure Class II injection wells are constructed with multiple layers of protection (cemented, steel casing strings) between USDWs, other formations, and the formation where brine is injected. In general, this includes conductor casing to stabilize near surface unconsolidated sediments, surface casing to protect and isolate USDWs, injection casing to isolate the brine in the injection zone and may include additional cemented casing strings for site specific conditions. In addition, injection tubing is set on a packer inside the cemented injection casing. The tubing and packer system allow for a monitored annulus to be the first notice if a mechanical integrity problem develops.

If a permit were to be issued, the Division would require a cement bond log of any cemented casing string below the surface casing to ensure quality and quantity of cement jobs. The Division uses parameters in rule to establish injection pressure limits. The injection pressure rule is designed to ensure fractures cannot be initiated or propagated within the injection zone so injected fluids are confined within the authorized injection zone. Division geologists also evaluate all known wellbores within an "Area of Review" radius surrounding the proposed injection well. Wellbores that pose potential avenues for fluid migration by virtue of their construction or plugging status must be mitigated before injection can be authorized through a process called corrective action. Division inspectors are present to witness and observe the well drilling and construction process to ensure the well is constructed in compliance with the law, rules, and issued permit.

In addition, proposed brine unloading and surface storage plans must comply with applicable rules and approved prior to construction of the surface storage facility. Brine may only be stored in above-ground tanks that have primary and secondary containment equal to 100% of the storage capacity of the tanks plus an allowance for rainfall. Critical components of the surface facility construction are witnessed by a representative of the Division to ensure the approved plan is followed.

If a permit to drill is issued and after the well is drilled and the surface facility constructed, Bobcat Hubbard LLC must apply for a permit to inject. The Division reviews an application for a permit to inject to ensure compliance with all applicable statutes and rules.

Once an injection well is in operation, Division inspectors conduct regular unannounced inspections of each well and facility to ensure injection operations are in compliance with laws, rules, and the operational permit. If a violation is observed, the inspector has the authority to issue a compliance notice requiring the condition to be corrected within a specified timeframe. If circumstances warrant, the Division has other enforcement tools, including the ability to suspend operations.

Why does the plat map have waste pits 130 feet from Little Yankee Run?

Bobcat Hubbard provided a plat map as required by Revised Code 1509.06(A)(12) that require the well location, location of roads, occupied buildings, streams, and other wells to be on the map. If a permit were to be issued, the proposed location of the waste pits will not be authorized, and the company would be required to use a closed loop system to ensure that all drilling fluids would be contained in above ground steel tanks.

How does the regulation of Class II disposal wells help to prevent contamination of the Little Yankee Run?

The Ohio General assembly established a minimum setback requirement from waters of the state in Ohio Revised Code Section 1509.021 (L). That section states: **"**The location of a new well or a new tank battery of a well shall not be within fifty feet of a stream, river, watercourse, water well, pond, lake, or other body of water. However, the chief may authorize a new well or a new tank battery of a well to be located at a distance that is less than fifty feet from a stream, river, watercourse, water well, pond, lake, or other body of water if the chief determines that the reduction in the distance is necessary to reduce impacts to the owner of the land on which the well or tank battery of a well is to be located or to protect public safety or the environment." The proposed location of the Bobcat Hubbard No. 1 well complies with the fifty-foot requirement established in state law. If issued, the permit conditions will require the pipeline from the surface facility to the injection well to be enclosed in a separate pipeline to contain a leak if one was detected.

The Division also requires the company to submit a plan for the surface facility to be utilized for the Class II disposal well. This plan is reviewed by Divisions technical staff to meet standards for the protection of the land and ground and surface waters.

Is this application different from the 2011 application from D&L Energy?

Yes. In 2011, a permit application at this location was denied as part of an enforcement action taken by the Division under Chief's Order 2013-03. Although the proposed location is the same, this application is new and was submitted by a different company.

Why does Ohio accept Brine from Pennsylvania and West Virginia? Why don't those states dispose of their own brine? Do those states have injection wells?

Pursuant to the Interstate Commerce Clause of the U.S. Constitution, Ohio's General Assembly cannot enact laws that restrict commerce between states. Therefore, the Division also cannot restrict brine from entering from other states. Any registered brine hauler may transport brine in Ohio to be disposed of at permitted injection wells.

Ohio's General Assembly enacted laws (ORC 1509.21, ORC 1509.22, ORC 1509.226) establishing the ways that brine may be disposed of in Ohio. Every state bordering Ohio has class II disposal wells; those states have not outlawed brine injection. However, the number of wells in each state varies.

The U.S. Environmental Protection Agency has determined that Class II disposal wells provide the safest method for disposal of oil field waste fluids. Prior to the underground injection control (UIC) program, the primary method of disposal of brine was surface pits which resulted in numerous water wells being contaminated. Since the inception of Ohio's UIC program and injection of brines through class II disposal wells, no water supplies have been impacted by the proper use of these wells.

Does the local government have control over the siting of class II disposal wells?

Ohio Revised Code 1509.02 states "The division has sole and exclusive authority to regulate the permitting, location, and spacing of oil and gas wells and production operations within the state, excepting only those activities regulated under federal laws for which oversight has been delegated to the environmental protection agency and activities regulated under sections 6111.02 to 6111.028 of the Revised Code." A local government may, however, provide information and comments relevant to whether a permit application satisfies permitting requirements.

What is the notification process to local officials for injection wells?

Ohio Revised Code (ORC) 1509.06(B) establishes requirements for notifications to certain local officials. That section provides: "The chief shall cause a copy of the weekly circular prepared by the Division to be provided to the county engineer of each county that contains active or proposed drilling activity. The weekly circular shall contain, in the manner prescribed by the chief, the names of all applicants for permits, the location of each well or proposed well, the information required by division(A) (11) of this section, and any additional information the chief prescribes. In addition, the chief promptly shall transfer an electronic copy or facsimile, or if those methods are not available to a municipal corporation or township, a copy via regular mail, of a drilling permit application to the clerk of the legislative authority of the municipal corporation or to the clerk of the township in which the well or proposed well is or is to be located if the legislative authority of the municipal corporation or the board of township trustees has asked to receive copies of such applications and the appropriate clerk has provided the chief an accurate, current electronic mailing address or facsimile number, as applicable."

In a defined urbanized area, Revised Code Section 1509.06(A)(9) requires notification of the application be provided to certain local officials. All parties who were required to receive notification received it as required by the Ohio Revised Code.

Does the drilling and construction of an injection well emit odor or noise, who has authority over noise and odor in Ohio?

During the drilling process, the drilling rig and associated equipment will produce noise and may produce odors. If a permit is issued, the Chief has the authority to require noise mitigation measures such as sound barriers to be erected during the drilling process. The Ohio Environmental Protection Agency has authority over any air emissions and therefore, odor complaints.

I am concerned about truck traffic related to this proposed well.

The Ohio General Assembly did not grant authority to the Division to regulate traffic or dust generated from truck traffic associated with an injection well. The Ohio Department of Transportation has regulatory authority of traffic on state routes in Ohio. Township and County roads are regulated by Township and County governments.

Can Class II injection wells cause earthquakes?

Yes, however earthquakes or seismic events associated with Class II injection wells are extremely rare. More than 180,000 Class II injection wells are in operation in the United States, with only a small percentage of these wells being associated with seismic activity. The Division understands the concern with the potential of injection-related earthquakes and has taken proactive steps to protect the citizens of Ohio. As a part of this proactive approach, the Division created an internal seismic program with staff dedicated to monitoring seismic activity in Ohio, created a seismic monitoring network, and promulgated rules that give the Chief clear authority to protect Ohioans from seismicity related to oil and gas activity. Since 2010, the Division has required numerous operators of Class II disposal wells to deploy seismic monitoring instruments near their injection wells as a condition of their permit. The Division of Oil & Gas Resources Management seismic staff monitors approximately 60 seismic instruments that have been installed across the eastern side of the state. These seismic monitors were deployed by the Division, various operators, consultants, the ODNR Division of Geological Survey, and the U.S. Geological Survey. Ohio's seismic monitoring network is the most robust it has ever been statewide, allowing all parties to better understand all seismic activity that occurs in our state.

What factors increase the risk for induced seismicity?

Seismic events associated with Class II injection wells are rare. However, according to experts, for induced seismicity to occur there needs to be an optimally oriented and critically-stressed fault present near the class II disposal well. Most of the induced seismicity in Ohio results from the release of stress along preexisting faults within the Pre-Cambrian Crystalline Basement. To reduce the risk for induced seismicity, the Division prohibits Class II Disposal wells from penetrating the Pre-Cambrian Crystalline Basement.

In addition to the reduction of risk regarding the injection zone, the Division may require the operator to install and maintain a seismic monitoring network around the injection well.

Why is the State allowing this well to be permitted within 10 miles of Northstar No. 1 injection well? Why is the Bobcat Hubbard #1 allowed to be permitted in the moratorium area?

Following seismic events related to the operation of the NorthStar 1 Class II injection well in late 2011, a moratorium on injection activities within a five-mile radius of the well was imposed. Bobcat Hubbard No. 1 is proposed to be approximately 7 miles to the northeast of the NorthStar No. 1 well and, therefore, is outside that moratorium area. Seismicity concerns are now addressed in the Division's permitting process under its revised rules that have provisions specific to seismicity.

The Division has made significant advancements in addressing seismicity concerns since the Northstar No. 1 events. Among them are the development of the Division's seismic monitoring network and limitations on well depth. In addition, part of the permitting process reviews the proposed location to determine if seismic monitoring will be a requirement.

Ohio's rules governing Class II Disposal Wells (OAC 1501:9-3-07) were updated in January 2022 and strengthened the Division's authority regarding induced seismicity. For any well operating in Ohio, the Division can suspend operations if seismic activity occurs within three miles of the well and require the operator to implement a plan before resuming operations.

Does ODNR know if there is a fault that could cause induced seismicity near the proposed well?

The Division received a comment from the Hubbard Township Trustees that included a mine map with a drawn line labeled as a fault from Youngstown State University Professor Emeritus Ann Harris. This submission did not include any information or explanation as to why this line was drawn or any evidence to demonstrate that a fault may exist at this location. The Division investigated this submission and determined that the drawn line is located approximately 4000 feet to the north of the proposed Bobcat Hubbard No. 1 well location. The Division also reviewed site specific geologic maps prepared by the Ohio Geologic Survey in an effort to identify any faults in the immediate area of the proposed well location and none were identified.

What happens if there is a spill at the injection well?

Incidents such as spills at a class II well or facility are required to be reported to the Division by calling 1-844- OHCALL1 (1-844-642-2551) within 30 minutes of occurrence. The Division is prepared to respond to oilfield incidents with an Emergency Operations and Response team should a spill occur. These individuals are on-call 24 hours a day, 7 days a week, 365 days a year. If a spill occurs, the Division will respond to the site, assess the situation, and ensure the company cleans up the spill. If the operator does not complete necessary remedial action, ODNR has the authority to take further action including issuing orders suspending operations, referring the matter to the Ohio Attorney General's Office to pursue criminal or civil penalties, forfeiting the operator's bond or financial assurance, and possibly revoking the operator's permit depending on the circumstances. In addition, if the operator fails to respond to a spill or other emergency situation at a well, the Division has the authority to enter into emergency contracts to respond and mitigate the emergent situation.

Does the proposed application impact any wetlands? Does ODNR protect wetlands?

The proposed well and facility are located outside of the boundary of any wetlands. Other agencies have the legal authority to protect wetlands such as the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency.

Are water wells near injection wells monitored?

Ohio Administrative Code 1501:9-3-06 requires: "After a permit has been issued but before commencement of drilling a new class II disposal well or converting a well to a class II disposal well, a class II disposal well owner shall provide to the chief results of sampling of water wells within one thousand five hundred feet of the proposed location of the class II disposal well and five hundred feet of any associated pipelines utilized for the injection of brine. The class II disposal well owner shall provide a list and map that identifies the location of each water well sampled." These pre-construction samples serve as a baseline measurement of the water wells quality.

Are population demographics part of the Class II Disposal Well permitting process?

If the permit application meets all regulatory requirements within the Ohio Revised Code and Ohio Administrative Code and any risk of violations that threaten public health or safety or damage to the environment can be addressed by permit terms and conditions, the Division Chief has the obligation to issue the permit.

How many Class II disposal wells are in Trumbull County?

There are 18 active Class II disposal wells in Trumbull County.

Why is there a concentration of injection wells in northeast Ohio?

The location of an injection well is a business decision made by the permit applicant. These wells and facilities are often located near areas of oil and gas production, where geology is favorable for injection, and main transportation routes like interstate highways. All locations proposed in applications are evaluated for compliance with laws and rules applicable to the Division's Class II regulatory authority. The Division does not have the legal authority to prohibit the location of an injection well based solely on the concentration of injection wells in a particular area.

Have you considered the underground mines near the proposed well site?

Yes, the Division considers underground mines during the application review process and routinely permits wells in areas of historic and active coal mining. Ohio Revised Code 1509.08 and 1509.18 address determinations of whether a well is in a coal bearing township and if a well is drilled within limits of a mining operation. If an underground mine is encountered during construction of a well, the well construction rule requires an additional specialized casing string to be installed. If a permit is issued, this requirement will be part of the listed conditions. In addition, a special permit condition would be added to the permit to notify the operator that they are within an area where abandoned mines occur

and that if a mine is encountered a separate casing string will be required. The Division review of the area revealed that the closest known abandoned mine area is approximately 4,000 feet away.

Is there a risk for sinkholes or subsidence to occur from the drilling and construction of the Bobcat Hubbard No. 1 well?

Drilling and construction of an injection well does not create a risk for sinkholes or subsidence. Areas of subsidence or sink holes are associated with underground collapse due to the removal of material from the subsurface. Underground mining for coal in Trumbull County has occurred since the 1800's. The Division of Geologic Survey has created a map of abandoned underground mines in Trumbull County and has published Open File Report 1941-1 describing and locating underground mines in the county.

An evaluation of the underground mine maps show there are a series of known and unknown extents of underground mining in Hubbard Township, Ohio. These locations are associated with mining operations that predate Ohio's underground mining regulations. As previously stated, if an underground mine is encountered during the drilling operation, a mine casing string would be required to be installed through the mine void to ensure the mine void is isolated. If subsidence occurs at the proposed location which causes damage to the well or surface facility, the Division would suspend operations until the problems are corrected.

If a person believes that they are impacted by subsidence caused by mining operations they can contact the Department of Natural Resources, Division of Mineral Resources Management for assistance.

Is there a minimum setback distance for an injection well from a business or home?

Yes, in urban areas such as Hubbard Township, Revised Code section 1509.021 requires a one-hundred-and-fifty-foot setback from occupied dwellings and a one-hundred-foot setback from a place of resort, assembly, education, lodging, trade, manufacturing, repair, storage, traffic or occupancy of the public. As proposed, the well location is lawful.

What is in brine? And what can lawfully be disposed of at a Class II disposal well?

Brine is defined in Revised Code 1509.01 as, "all saline geological formation water resulting from, obtained from, or produced in connection with exploration, drilling; well stimulation, production of oil or gas, or plugging of a well". The Division randomly collects and analyzes brine samples from haulers unloading at Class II disposal wells and has a sample library of over 200 samples collected and analyzed since 2012. Typically, brine samples collected at Ohio's injection wells and production wells contain concentrations of chloride, sodium, calcium, and magnesium, along with smaller amounts of other ions.

Administrative Code 1501:9-3-07 requires that only brine and other waste substances from oil and gas operations may be injected into a class II disposal well for which a permit is issued under Chapter 1501:9-3 of the Administrative Code.

The Division defined other waste substances in Ohio Administrative Code 1501:9-3-01(Z) as "any nonpotable liquid resulting, obtained, or produced from the exploration, drilling, stimulation, testing, workover, plugging of an oil and gas well or production of oil or gas. "Other waste substances" includes

water that is mixed with brine as a result of an unplanned release and precipitation captured in a containment regulated under Chapter 1509. of the Revised Code and any rules adopted under it or Chapter 1571. of the Revised Code. "Other waste substances" does not include wastes associated with gas processing facilities or pipelines not regulated under Chapter 1509. of the Revised Code and any rules adopted under it or Chapter 1571. of the Revised Code."

How does the brine stay in the injection formations?

Class II disposal wells must have multiple layers of protective steel casings. Each casing is cemented into place. Division inspectors witness the casing installation and cementing operations to ensure compliance with Ohio's well construction requirements. Geologically, the injection zone for the brine fluid is located below multiple layers of confining rock, which keep the fluids contained in the permitted injection zone formations.

What efforts does the Division make to be transparent with its regulation of oil and gas operations?

Ohio's Public Records Act gives Ohioans access to records upon request. The Division exceeds its obligations under the Public Records Act by posting many records, including records relevant to the UIC program, on its website that anyone can access at any time without having to make a public records request. The Division also hosts and maintains an online well locator where anyone with internet access can navigate a map of the state of Ohio with all wells, permitted pads, and unit boundaries. These features can be viewed in the context of many layers such as streams, aerial imagery, roads, property boundaries, and other environmental and public safety information. Records not available online may be requested. There are many ways a public records request may be submitted to the Division. Convenient options include email to oilandgas@dnr.ohio.gov and phone by calling the Division's public information officer at 614-265-6937. The Division handles numerous public records requests every year and is also available to answer questions.