UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 27 2013

OFFICE OF WATER

Mr. Mark Thomasson
Director, Division of Water Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road, Mail Station 3500
Tallahassee, Florida 32399-2400

Dear Mr. Thomasson:

Thank you for your interest in clarifying EPA's regulations as they apply to the injection and storage of water in underground formations for later withdrawal and use. This practice, known as aquifer storage and recovery, or ASR, can be used to provide water for a number of purposes. This letter addresses the need for public water systems experiencing water shortages to store treated drinking water underground for later use as a source of drinking water.

The EPA applauds Florida's efforts to account for existing and alternative water supplies in its regional water supply planning. As population growth, land use changes and changes in local climatic weather patterns impact water supplies in many areas of the country, innovative water management tools will be increasingly important to sustain water availability. We recognize that using ASR to conserve water that would otherwise be lost can be an important component of a long-term water management strategy.

A particular challenge to the safe use of ASR in some parts of the country, including Florida, is that the underground formations available for drinking water storage contain minerals that can be mobilized when in contact with injected water. For example, in Florida, arsenic is present in the sulfide-bearing minerals in the carbonate formations used for storing water underground. The oxygen in injected water can cause the arsenic to move from the formation into the ground water. This letter describes how Florida can apply the Underground Injection Control program (UIC) requirements to ASR wells used by public water systems when mobilization of arsenic is a concern.

Safe Drinking Water Act and Underground Injection Control Regulations

When Congress passed the Safe Drinking Water Act (SDWA), a stated goal was "to protect not only currently-used sources of drinking water, but also potential drinking water sources for the future" (H.R. Report No. 1185, 93rd Congress, 2nd Session, 1974). SDWA requires that the EPA establish a UIC program to prevent "endangerment" as described in SDWA Section 1421(d)(2):

> *Underground injection endangers drinking water sources if such injection may result in the presence in underground water...of any contaminant, and if the presence of such contaminant may result in such systems not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons.*

To implement this section of the SDWA, the EPA developed regulations that generally prohibit injection that causes fluid movement into a underground source of drinking water (USDW). Thus, the EPA regulations provide that "*No owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulations . . . . or may otherwise adversely affect the health of persons.*" (40 CFR §144.12(a) and §144.82(a)). Any state that has been approved by the EPA to administer a UIC program in lieu of a federal program must implement its programs in accordance with this provision. (40 CFR §145.1(f) and §145.11(a)(6)).

In most cases, ASR wells are regulated as Class V wells. The Class V provisions allow the Director some discretion in addressing fluid movement under limited circumstances. 40 CFR §144.12(c) indicates that:

> *For Class V wells, if at any time the Director learns that a Class V well may cause a violation of primary drinking water regulations under 40 CFR part 142, he or she shall: (1) Require the injector to obtain an individual permit; (2) Order the injector to take such actions (including, where required, closure of the injection well) as may be necessary to prevent the violation. For EPA administered programs, such orders shall be issued in accordance with the appropriate provisions of the SDWA; or (3) Take enforcement action.*

Additionally, 40 CFR §144.84(b)(1) defines circumstances in which permits or other actions are required for Class V wells including when "*You fail to comply with the prohibition of fluid movement standard in §144.12(a) and described in §144.82(a)*". In this case, the regulation states that "*you have to get a permit, close your well, and/or comply with other conditions determined by the UIC Program Director in your State or EPA Region.*"

Note that these regulations apply only to Class V wells. Any wells that could be classified as Classes I-IV or VI must not be permitted under Class V regulations even if the injection is also for the purpose of storing water for future use as drinking water.[1]

<u>Application of UIC Regulations to Class V ASR wells</u>

As the EPA understands it, Florida plans to prevent and control arsenic liberation through methods such as selection of injection locations, water cycling, limiting the injection rate and degasification. We recognize, however, that this can be challenging given local geologic conditions and that there may be cases in which a drinking water facility is operating an ASR injection well under a permit to store water in anticipation of drinking water shortfalls and there is evidence that the injection causes arsenic in the formation to be released. The UIC Class V regulations as described above (40 CFR §144.12(c) and §144.84(b)(1)) provide authority for the UIC Program Director to issue a permit for a UIC well that does not meet the prohibition of fluid movement provision in §144.12(a). Should the UIC Program Director choose not to close the well, 40 CFR §144.84 allows the Director to address individual situations such as those in Florida on a case-by-case basis by requiring a permit that would prevent endangerment as described in SDWA 1421(d)(2). Accordingly, Florida could decide in some cases that it is appropriate

[1] For example, in Florida, fluids injected under the authority of the *UIC Requirements for Class I Municipal Disposal Wells in Florida* must be permitted as Class I, regardless of the end use of the injected fluid (40 CFR §146.15). In another example, any fluid brought to the surface in connection with oil or natural gas production or injected for the purposes of enhanced recovery must be permitted as Class II (40 CFR §144.6).

for those ASR wells to remain open under permits with conditions designed to protect public health and maximize protection of the USDW.

Consistent with the goals of the SDWA, in a situation where Florida determines ASR to be the best option to improve long term sustainability of drinking water resources despite arsenic mobilization, a permit could be used to prevent endangerment as described in SDWA 1421(d)(2) if it includes conditions to prevent any pathway for human consumption of waters that exceed the Maximum Contaminant Level (MCL) for arsenic, without relying solely on treatment of drinking water by the public water system before supplying water to customers. The UIC regulations protect underground sources of water, not merely the supply of water delivered by a public water system. In this context, the EPA expects that when arsenic is mobilized in a USDW through ASR activities, in order to satisfy the goals and requirements of the SDWA and the UIC regulations, the permitted conditions would encompass a suite of activities to minimize the mobilization, limit the spatial extent of any potential contamination, and protect public health.

Additionally, in balancing the use of ASR for drinking water management with the potential for USDW contamination, a guiding principle should be that the burden of public health protection should not be transferred from the public water system to another user of the USDW (either in the storage zone or downgradient). Water withdrawn beyond the area of control of the owner/operator of the ASR system should not need treatment to address the contamination caused by ASR. A user of the USDW other than the public water system operating the injection well should not have access to the impacted area of the aquifer as a water source. This may be accomplished by implementation of "site access controls" such as institutional controls, property interests, ordinances restricting use, rules that restrict well construction within the impacted area, implementation of setbacks in the state's water well construction rules or similar measures that will control access to contaminated groundwater.

Class V ASR Permit Conditions

When a Class V permit is issued, it must contain certain conditions applicable to all permits (see 40 CFR §144.51 and §145.11(a)(19)) and any additional conditions as determined by the UIC Program Director in the state or EPA Region with primacy authority. The EPA recommends that when Florida decides to issue a permit because arsenic mobilization is a factor in drinking water ASR projects, conditions in the UIC permit should be designed to meet the goals described above. Conditions should ensure that injected water only be withdrawn by the public water system that injected it, because that entity is aware of the situation, is accountable for the presence of arsenic, and as a public water system must comply with other regulations under the SDWA. For example, Florida could use one or more of the "site access controls" described above to assure that there are no public or private users of the USDW where arsenic mobilization is a concern, other than the public water system operating the ASR well. This would also prevent the burden of public health protection from being transferred to any entity other than the ASR operator responsible for the injection.

Permit conditions should require practices designed to reduce arsenic mobilization and minimize the area within which potential arsenic mobilization could occur. Florida is at the forefront of developing the kinds of tools that can minimize the extent of any potential arsenic mobilization. These tools include degasification pretreatment, consistent operation to maintain constant volume, and full recovery of injected water when necessary. To ensure effectiveness, these controls should include requirements for monitoring wells and triggers to define circumstances where further protective action is needed.

Conclusion

This letter explains how SDWA and the UIC regulations allow States to address water shortages and at the same time protect the quality of future water supplies. It provides a solution for public water systems experiencing water shortages who wish to use ASR. By clarifying how to permit ASR wells so that they may be used to augment drinking water supplies while at the same time protecting USDWs, the EPA is addressing a critical need for Florida and others facing water shortages.

As the state agency with primacy authority to permit UIC Class V wells, the Florida Department of Environmental Protection has the discretion to make site specific determinations. This discretion includes whether or not to issue a UIC permit and what conditions should be included in the permit, provided determinations are consistent with the SDWA, applicable EPA UIC regulations and approved state programs.

The EPA recognizes the value of ASR as a tool to maintain the availability of water now and in the future and appreciates the emphasis Florida has given to trying to resolve this complex issue. The EPA believes that ASR is a viable option to enhance the long-term sustainability of drinking water supplies as long as adequate steps are taken to address potential mineral mobilization caused by injection. We look forward to continued collaboration with the State of Florida in ensuring safe drinking water now and in the future.

Sincerely,

Peter Grevatt, Director
Office of Ground Water and Drinking Water