UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Phone: 800-227-8917
REGION 8
1595 Wynkoop Street
Denver, Colorado 80202-1129
www.epa.gov/region8

Ref: 8WD-SDU

Dear Aquifer Storage and Recovery (ASR) Community:

EPA Region 8 is providing the following responses to questions from the ASR Information Session held on June 12, 2019, at the Centennial Water and Sanitation District Offices in Highlands Ranch, Colorado.

Important to the understanding of the Class V Underground Injection Control (UIC) program is the concept that Class V wells are rule-authorized unless EPA identifies a need to permit a well. For most Class V wells, these determinations are based on inventory information submitted by operators under 40 CFR § 144.26. All Class V operators must submit inventory information to EPA prior to well construction and operation. For Class V ASR wells, EPA typically requests additional information from operators under 40 CFR § 144.27 in written form. The Inventory Information Request for Owners and Operators of Aquifer Recharge and/or Aquifer Storage and Recovery Systems (also known as Inventory Information Request) provides you with examples of the types of information we are seeking for ASR projects. See Enclosure A.

After reviewing the inventory information and any additional information, the EPA may identify a need for an operator to apply for a permit.

I. Permit vs. Authorization by Rule

a. What is the criteria used for determining whether a Class V ASR project will remain rule-authorized vs permitted?

Determining whether an UIC Class V ASR project will remain authorized by rule or will need a permit is determined on a case-by-case basis. The UIC regulations at 40 CFR § 144.25 specify some cases where a permit may be necessary. Most relevant to ASR, 40 CFR § 144.25(a)(3) states that permits may be required when "[t]he protection of USDWs requires that the injection operation be regulated by requirements, such as for corrective action, monitoring and reporting, or operation, which are not contained in the rule."

In general, projects may be authorized by rule if they are not expected to introduce contaminants into and/or degrade an aquifer. Examples are projects which use a water source that originates from snow melt, fresh water surface sources or untreated groundwater. Additionally, the water sources must meet all health-based drinking water standards.

Projects which have the potential to introduce contaminants into and/or to degrade an aquifer will likely need to be permitted. This includes projects where ongoing monitoring is needed to determine whether contaminants are introduced and released. For example, projects which may have a potential to mobilize arsenic or uranium in the aquifer or to introduce a contaminant such

as N-Nitrosodimethylamine (NDMA) into an aquifer will typically be issued a permit. Also, projects that use reclaimed water as a source for ASR will typically be permitted as contaminants may be present in that water source.

b. What is the typical duration of a Rule Authorization? A permit?

A Class V well authorized by rule maintains its authorization until it is properly closed or is issued or denied a permit. See 40 CFR § 144.24(b) & (c).

Permits for a Class V well are effective for a fixed term not to exceed 10 years. (See 40 CFR § 144.36.) The Director may issue any permit for a duration that is less than the full allowable term under this section. The first permits for ASR wells have been issued for a duration of three years. EPA expects to have enough monitoring data within this timeframe to determine if a permit limit for NDMA is needed and whether injection can continue to be authorized in a way that protects USDWs. These permits can be renewed, but this allows EPA to evaluate whether current permit conditions need to be modified after the initial three years.

c. Is it possible to obtain authorization for several wells across one water provider's service area that will be in the same aquifer formation and have the same injectate water?

Yes. If EPA requires a permit for a project, operators may request an individual or area permit for injection. The decision to issue an area permit is discretionary for EPA and must be done consistent with 40 CFR § 144.33.

d. What timeline/schedule does EPA set for itself when permitting an ASR well? Upon submission of the requested information, what is the timeline for the process? A decision?

EPA's goal is to issue permit decisions within one hundred eighty (180) days of receiving a permit application. Region 8 UIC works to complete all pending rule authorization determinations within this same timeframe. Factors that may lead to longer permitting times include incomplete permit applications, slow responses to requests for information, the number of permit applications submitted to EPA at any one time, and the extent of comments received during the public comment period.

e. Does any of the requested information cause an automatic default to a rule authorization vs permit determination? For example, if there is a NDMA detection or if chloramines are used, will the request automatically become a permit process?

All projects are assessed on a case-by-case basis. However, based on the information we have to date, if NDMA is detected in the injectate at or above the reporting limit of 2 ng/L a project with these concerns will typically result in a permit being issued. If NDMA is not detected, a permit may still be required based on water sources and treatment information provided. If chloramines are used, NDMA sampling will typically be required.

f. Has there been a final determination on the quantities of nitrosamines allowed?

No. EPA will make decisions case-by-case, based on an assessment of risk to USDWs. Permits issued to date have included a trigger level for NDMA of 7 ng/L. If the trigger level is exceeded in two consecutive quarters, the operator is required to sample for NDMA monthly instead of quarterly. Exceedance of the trigger level may also cause EPA to reopen and modify the permit.

g. Assuming an ASR well is authorized by permit, what are the conditions for the ASR well to be reauthorized by rule?

Whether and how a permitted well may ever be subsequently authorized by rule will be determined on a case-by-case basis. The same criteria listed under question "a" also apply.

h. Under what conditions will EPA accept authorizing ASR wells in whole (or in part) based on other wells, in close proximity, that have already been permitted for ASR?

EPA recommends that all potential ASR operators review Part II. Section B, Requirements for Adding Injection Wells of the attached Meridian Metropolitan District (MMD) Area Permit. There are specific requirements included in the Permit to be followed to add a well. See Attachment A to this letter response.

i. How would a change in source water be handled in an existing system?

EPA recommends that all potential ASR operators review Part II. Section D.7, Addition of a New Water Source of the attached MMD Permit. There are specific requirements to be followed to add new sources of water to an ASR System.

j. Can area permits be shared with/amongst different operators?

No. Issuance of an individual or area permit can only be for injection wells operated by a single owner or operator. If the well is owned by one person but operated by another person, it is the operator's duty to obtain a permit. See 40 CFR sections 144.31(b) and 144.33(a)(3).

EPA will need additional project specific information to address any operator specific issues or questions about a regional ASR project.

k. What are the requirements for ongoing water quality monitoring?

EPA will evaluate each operation on a case-by-case basis. Operators may review the conditions in the MMD Permit to gain a general understanding of monitoring requirements. However, there

may be project specific circumstances which could result in EPA proposing and issuing different

or additional monitoring requirements.

Monitoring requirements for those projects authorized by rule may be required by EPA based on 40 CFR § 144.27.

II. Inventory Information Request

a. Do other EPA Regional offices follow the same inventory information request protocol?

Based on the UIC regulations, all EPA Regions require owners or operators of Class V well(s) to provide inventory information under 40 CFR § 144.26. See the 2nd paragraph of the introduction to this letter for more information.

b. Can a GRWMP (ground water representative monitoring plan) pursuant to EPA Standards be used to assist in securing an area wide permit by demonstrating the common features of the aquifer within the designated area?

EPA considers all data submitted during the application and well operation phases to determine whether the data allows EPA to generally establish one set of requirements for wells across a defined geographic area.

c. Part 1. What is EPA's interest in whether or not the recovered water will be regulated as GWUDI (Groundwater Under Direct Influence of Surface Water)?

Part 2. Is the GWUDI determination relevant if recovered water will already be going through a surface water treatment plant?

CDPHE has primacy for implementing the National Primary Drinking Water Regulations (NPDWRs) in Colorado and will make the determination regarding whether or not the recovered water is regulated as ground water or ground water under the direct influence of surface water. Although EPA is not the lead agency who regulates the recovered water for drinking water purposes, our agency has an oversight role for this work.

CDPHE makes the GWUDI determination on a case-by-case basis. If the recovered water has been adequately treated prior to injection and meets all applicable state and federal primary drinking water regulations, there may be no need to classify the water as GWUDI. There are, however, some cases where the target aquifer isn't a pristine groundwater source. If the target aquifer is classified as GWUDI due to other factors, then the recovered water may also be classified as GWUDI and subject to the Surface Water Treatment Rule requirements.

d. Part 1.: What impacts is EPA interested in being described in EPA's AR/ASR Inventory Information Request?

Part 2. Second bullet under Impacts Analysis: What does EPA mean by surrounding wells? Are these wells within ½ mile, 1 mile, 2 miles, etc.? What type of effects is EPA interested in applicants discussing? Seismicity, water quality, draw down, etc.?

We are interested in information about wells within a 1 mile radius. Seismicity, water quality changes, and movement of fluids out of the proposed injection zone are the impacts that we are most concerned about.

e. What type of chemical analysis would EPA like completed on the core sampling?

Include an analysis for metals and radionuclides. Discuss potential impacts (i.e., compatibility analysis) that may occur as a result of injection activities.

f. Two or more entities are using the same water source. Do they need to submit individual water testing?

A sample should be obtained near the injection point (i.e. near the well head) of each water source for each operator. A sample should also be obtained from the proposed injection zone(s) from each proposed injection well. Operators may share water quality data (treated source water) previously collected from the East Cherry Creek Valley Water System and the Aurora Water System.

g. If a facility is treating with chlorine and not chloramine, will they be required to test for NDMA?

Yes.

III. Endangered Species Act and National Historic Preservation Act

What criteria is used to determine whether project will need other federal reviews, such as Endangered Species?

The Endangered Species Act and the National Historic Preservation Act are Federal laws that apply to agency actions, including the issuance of UIC permits.

IV. Water Quality Analysis

a. **Are there other unregulated contaminants besides NDMA that are being considered for the baseline parameter list? What other unregulated parameters are being considered?**

There are currently no additional contaminants under consideration for EPA's Region 8 Baseline

Parameter List for Aquifer Recharge and Aquifer Storage and Recovery Systems review beyond what is listed in Appendix G of the MMD Permit.

b. Can other constituents be added after an authorization or permit has been issued?

Yes. If a determination is made that a constituent should be monitored to protect USDWs, EPA may request information about that constituent or modify a permit to include that constituent for monitoring.

c. Has EPA established any specific sampling protocols (i.e., sampling frequencies and parameters) that will be required for injection wells?

EPA recommends that the requirements presented in the MMD Permit be reviewed. If a permit is issued, conditions will likely be similar to those contained in this Permit.

d. What is EPA's process for adding/removing constituents to/from the baseline parameter list? When in the process is the public informed about a constituent being added/removed to/from the list? How is the public informed when the baseline parameter list is changed?

EPA's Safe Drinking Water Act (SDWA) programs are always assessing potential risks to drinking water sources where there are EPA actions affecting groundwater. If EPA makes changes to the constituent list, a letter will be sent to operators.

e. What is the intent on singling out NDMA? How will these results be used in the final determination since an MCL has yet to be determined?

There is not an intent to single out NDMA. EPA's SDWA programs identify constituents that may pose some degree of risk to public health and may endanger the USDWs under EPA approved actions. In this case, it was determined that injection into the Denver, Arapahoe or other aquifers without controls may endanger USDWs. Therefore, Region 8 is monitoring NDMA at ASR sites. The monitoring data EPA will receive will enable the Agency to better assess the risk NDMA poses and its fate in the Denver, Arapahoe and other aquifers for ASR projects. Data will also be used to make a determination regarding future permit conditions and whether or not a change in these conditions is necessary for an operator to continue injection operations.

f. If injectate is untreated water (i.e. mountain water supply, river supply), would the same parameters need to be analyzed as depicted in the baseline parameters list?

Yes.

g. Can EPA remove cyanogen chloride from the baseline parameter list? To date, some ASR operators have not been able to find a commercial lab that can analyze for cyanogen chloride.

EPA has chosen to maintain cyanogen chloride as a constituent on the Baseline Parameter List.

- Cyanide is a toxic substance and has an MCL. If cyanide is present in the source water, there's the potential to form the byproduct cyanogen chloride in the injectate following chloramination. Cyanogen chloride is also a toxic substance and has a drinking water health advisory.
- Testing for cyanogen chloride will be tiered/triggered in the permit requirements. If cyanide is detected in the source water and is alkalized to a pH of 8.5 or greater, then there is no need to test for cyanogen chloride in the injectate following chloramination.
- If cyanide is detected in the source water and not alkalized, an operator will either need to find a laboratory that can test for cyanogen chloride or remove cyanide from the source water prior to chloramination.

h. Can the NDMA spiked sampling requirement be removed as a Bench Scale Test permit condition?

EPA will continue to require Bench Scale testing of NDMA spiked samples until we have enough data to make definitive conclusions on its fate and transport over time. The spiked bench scale NDMA data received so far from the MMD ASR permit shows that NDMA concentrations can increase over time. Future permit conditions for NDMA spiked sampling will be considered on a case by case basis.

V. Testing Conditions in the Permit Template

a. Operators have continuously been informed that the Meridian Metropolitan District (MMD) Permit issued in 2018 would serve as the ASR Permit Model. Why has EPA changed direction?

EPA expects that most of the requirements in the MMD Permit will be retained in future ASR permits EPA will be issuing, but as explained above, permitting actions are issued on a case-by-case basis. While EPA will try and ensure that its ASR permits are generally consistent, we must review data included in the permit application and any other relevant information to make permitting decisions on a site-specific basis. If there are differences, EPA will work with each permittee prior to draft permit issuance to explain them.

Applicants may review the MMD Permit to gain a general understanding of potential conditions that may be included in future permitting actions.

b. Why is EPA requiring pressure testing of ASR well casing to demonstrate Part I (internal) mechanical integrity (MI), which is typically required for deeper Class I and II injection wells?

EPA has re-evaluated the Part I MI requirements in the MMD Permit and concluded that monitoring ASR well injection pressure vs. rate is not a reliable and easily enforceable means of ensuring internal mechanical integrity. Consequently, EPA is considering other Part I demonstration methods in lieu of pressure testing ASR well casing in its future ASR permit actions.

c. Why is EPA requiring cement bond logging (CBL) for Part II (external) MI?

CBLs are one of two acceptable methods for demonstrating external mechanical integrity to ensure there is no migration of fluid between the well casing and bore hole. The other is submission of well cement records. This is included in the MMD Permit, and EPA expects that it will be included in future ASR permits. This gives ASR operators a choice as to how to show that the well's construction sufficiently protects USDWs.

VI. Other Questions/Comments

All applicants are encouraged to contact our office to discuss any ASR project specific questions/concerns that you may have. Feel free to contact EPA Region 8's ASR Team Lead:

Linda M. Bowling
Environmental Engineer
Underground Injection Control Section
Region 8
Mailcode: 8WD-SDU
1595 Wynkoop Street
Denver, Colorado 80202-1129
(303) 312-6254 phone
(303) 312-7517 fax
Email: bowling.linda@epa.gov

ENCLOSURE A
INVENTORY INFORMATION REQUEST FOR OWNERS AND OPERATORS OF AQUIFER RECHARGE and/or AQUIFER STORAGE AND RECOVERY SYSTEMS

THIS INVENTORY APPLICATION IS SHARED VIA EMAIL ATTACHMENT

ENCLOSURE B
SUMMARY OF APPLICABLE UIC REGULATORY REQUIREMENTS

PART 144 – UNDERGROUND INJECTION CONTROL PROGRAM

Subpart A – General Provisions

40 CFR 144.1	Purpose and scope of part 144
40 CFR 144.3	Definitions
40 CFR 144.4	Considerations under Federal law
40 CFR 144.5	Confidentiality of information
40 CFR 144.6	Classification of wells
40 CFR 144.7	Identification of underground sources of drinking water
40 CFR 144.8	Noncompliance and program reporting by the Director

Subpart B – General Program Requirements

40 CFR 144.11	Prohibition of unauthorized injection
40 CFR 144.12	Prohibition of movement of fluid into underground sources of drinking Water
40 CFR 144.17	Records

Subpart C – Authorization of Underground Injection by Rule

40 CFR 144.24	Class V wells
40 CFR 144.25	Requiring a permit
40 CFR 144.26	Inventory requirements
40 CFR 144.27	Requiring other information

Subpart D – Authorization by Permit

40 CFR 144.31	Application for a permit; authorization by permit
40 CFR 144.32	Signatories to permit applications and reports
40 CFR 144.33	Area permits
40 CFR 144.34	Emergency permits
40 CFR 144.35	Effect of a permit
40 CFR 144.36	Duration of permits
40 CFR 144.37	Continuation of expiring permits
40 CFR 144.38	Transfer of permits
40 CFR 144.39	Modification or revocation and reissuance of permits
40 CFR 144.40	Termination of permits
40 CFR 144.41	Minor modifications of permits

Subpart G – Requirements for Owners and Operations of Class V Injection Wells

40 CFR 144.79	General
40 CFR 144.80	What is a Class V injection well
40 CFR 144.81	Does this subpart apply to me?
40 CFR 144.82	What must I do to protect underground sources of drinking water?
40 CFR 144.83	Do I need to notify anyone about my Class V injection well?
40 CFR 144.84	Do I need to get a permit?

PART 146 – UNDERGROUND INJECTION CONTROL PROGRAM: CRITERIA AND STANDARDS

Subpart A – General Provisions

40 CFR 146.1	Applicability and scope
40 CFR 146.2	Law authorizing these regulations
40 CFR 146.3	Definitions
40 CFR 146.5	Classification of injection wells
40 CFR 146.6	Area of review
40 CFR 146.7	Corrective action
40 CFR 146.8	Mechanical integrity
40 CFR 146.9	Criteria for establishing permitting priorities

Subpart F – Criteria and Standards Applicable to Class V Injection Wells

40 CFR 146.51	Applicability

PART 147 – STATE, TRIBAL, AND EPA ADMINISTERED UNDER GROUND INJECTION CONTROL PROGRAMS

Subpart G – Colorado

40 CFR 147.301	EPA administered program – Class I, III, IV, V wells and Indian lands
40 CFR 147.305	Requirements for all wells