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

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MEMORANDUM

OFFICE OF WATER

SUBJECT: **Enhancing Coordination and Communication with States on Review and Approval of Aquifer Exemption Requests Under SDWA**

FROM: Peter Grevatt, Director
Office of Ground Water and Drinking Water (OGWDW)

TO: Water Division Directors Regions I – X

I. Introduction

More than four thousand aquifer exemptions have been approved over the history of the UIC program, and the vast majority of these have been straightforward actions that have been completed in a timely manner. There are some aquifer exemption decisions, however, where review of the aquifer exemption request has been considerably more complex, due to specific conditions associated with the proposed exemption. In some cases, these issues have led to protracted discussions between EPA and the states, without a clear path for resolution.

The purpose of this memorandum is to promote a consistent and predictable process for the review of Aquifer Exemption requests under the Safe Drinking Water Act (SDWA).[1] EPA has both a direct implementation role and a state partnership role in reviewing and approving aquifer exemption requests. Over the course of the past year, EPA has participated in discussions with a number of states through a Ground Water Protection Council (GWPC) workgroup to review issues associated with more complex aquifer exemption requests and to make recommendations on steps to improve the review process. Based on these discussions, EPA and the participating states agreed on a number of steps to enhance coordination and communication between EPA Regions and state UIC programs regarding proposed aquifer exemptions, as discussed below.

II. Roles and Responsibilities

EPA is responsible for the final review and approval of all aquifer exemption requests, based on the regulatory criteria in 40 CFR 146.4 [attached]. UIC permit applicants that need an aquifer exemption in order to conduct injection activities typically delineate the proposed exempted area and submit the delineation to the primacy agency, along with information to support a determination under 40 CFR 146.4 that the proposed exemption is appropriate. States or tribes with primacy review the application and, if the information submitted supports a determination that an aquifer exemption is warranted, make a designation, provide for public participation, and submit a request for approval of the exemption to the

[1] The substantive and procedural requirements for aquifer exemptions in connection with Class VI wells are not addressed in this memo.

appropriate EPA regional office. Primacy states and tribes are also responsible for issuing the UIC permit that goes with the aquifer exemption request and are the direct point of contact for the owners or operators requesting the permit and exemption. Where EPA directly implements the UIC program, the applicant submits the request directly to EPA, and EPA reviews the applicant's demonstrations and makes the final determination to approve or disapprove the exemption request.

If the aquifer exemption is a non-substantial program revision, the relevant EPA Region either responds by letter to the primacy state or tribe or, where EPA directly implements the program, to the applicant. If the aquifer exemption is a substantial program revision, notice of approval of the aquifer exemption is published in the *Federal Register* after EPA has provided public notice and an opportunity for public comment and a public hearing. Where EPA directly implements the UIC program, regional offices are also responsible for identifying and designating exempted aquifers or portions of aquifers at the request of a UIC permit applicant, issuing public notices, and issuing any related UIC permits following aquifer exemption approval. Regional Administrators are primarily responsible for approving/disapproving non-substantial aquifer exemption requests, and the Administrator is responsible for approving the request if the exemption is a substantial program revision.

III. Recommended Steps for Facilitating the Aquifer Exemption Review and Approval Process

As indicated above, most aquifer exemption requests have clearly met the regulatory criteria in 40 CFR 146.4, and reviews have been completed in a timely manner. There are some aquifer exemption requests, however, that have proven to be considerably more complex to review. These more complex aquifer exemption requests have not been limited to substantial program revisions; in some cases, non-substantial aquifer exemption requests have proved quite complex as well. Typically, these have involved situations where the proposed exempted area is located adjacent to an underground source of drinking water (USDW) that is currently in use, or where the potential future use of the USDW is unclear. The following steps are recommended to help facilitate the aquifer exemption review and approval process:

a. Each Region should adopt and share the attached aquifer exemption checklist with each of your states. OGWDW, in consultation with the Regions and states, developed the attached checklist to facilitate EPA's aquifer exemption review process and documentation. The checklist will help convey to states, tribes, and UIC permit applicants the typical information needed to facilitate EPA's review of an aquifer exemption request.

b. Regions should document their review and analysis of the information in the checklist in a Statement of Basis or decision memo that should be included in the Agency's record of its final action. The Statement of Basis should include explanations of the factual, technical, and legal bases for the determination. Information collected following the template of the checklist should inform the Statement of Basis.

c. In the case of aquifer exemption requests that are expected to be complex, EPA Regions are encouraged to schedule a discussion with the state UIC program managers as early in the process as possible. These discussions will serve to identify any potential technical issues that require additional attention even before the package has been submitted to EPA for review and approval.

d. Regional UIC program managers are encouraged to elevate significant disagreements on AE requests to senior primacy program managers rather than allowing them to persist at the staff level for extended periods of time. While HQ can offer assistance on specific Regional AE decisions, I anticipate that most technical issues can be resolved at the Regional level.

IV. Additional background for Approving and Documenting Aquifer Exemptions

The Safe Drinking Water Act (SDWA) directed EPA to establish an Underground Injection Control (UIC) program to prevent endangerment of Underground Sources of Drinking Water (Section 1421(b)(1)). EPA's regulatory approach to aquifer exemptions was promulgated in a 1980 rulemaking. EPA determined that without aquifer exemptions, certain types of energy production, solution mining, or waste disposal would be severely limited. Thus, the regulatory approach that EPA adopted—a broad definition of covered underground waters coupled with a discretionary exemption mechanism—allows the agency to prevent endangerment consistent with the statute while allowing some case-by-case consideration. This approach protects underground sources of drinking water while also allowing underground injection associated with industrial activities including the production of minerals, oil, or geothermal energy. EPA retains the final approval authority over aquifer exemption decisions regardless of state primacy status.

EPA must follow the regulatory criteria at 40 CFR 146.4 in making aquifer exemption determinations. For the EPA to approve an aquifer exemption, the Agency must first find that the state or, where EPA directly implements the UIC program, the applicant, has demonstrated that the aquifer or the portion of an aquifer identified by the state as exempt "does not currently serve as a source of drinking water" (40 CFR 146.4 (a)). EPA has determined that water that currently serves as a source of drinking water includes water that is being withdrawn in the present moment as well as water that will he withdrawn in the future by wells that are currently in existence. EPA's evaluation of this criterion ensures that water from the exempted area of the aquifer "does not currently serve as a source of drinking water" for nearby drinking water wells as required by 40 CFR 146.4(a).

The second exemption criterion requires EPA to determine either that the aquifer cannot now and will not in the future serve as a source of drinking water or that the total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.[2] The regulations at 40 CFR 146.4(b) describe four (4) potential reasons for making the determination that the aquifer cannot now and will not in the future serve as a source of drinking water. One reason (146.4(b)(1)) is that the aquifer is mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated as part of a permit application to contain minerals or hydrocarbons that are expected to be commercially producible. The other reasons relate to practicality of access to water. EPA is continuing discussions with the GWPC workgroup to better define and communicate the type of data and analyses used to support those determinations. EPA Regions will need to document all reasons and factors they considered in a Statement of Basis or decision memo when making the final aquifer exemption decision. As best management practice, EPA will continue to communicate to the states the importance of documenting aquifer exemption analyses and their decision making process.

Robust recordkeeping and management of decision memos and aquifer exemption data is critically important to support informed decisions related to public and private ground water uses for drinking water. Therefore, in addition to the decision memos and records underlying EPA's approval/disapproval

[2] EPA will fully address the criteria 146.4 (b) and 146.4(c) at a later time, after ongoing discussions with GWPC have concluded.

decisions, it is essential that regions maintain standardized, readily available data on all existing aquifer exemptions. Proper recordkeeping and data management at the regional level will help with mapping and geospatial analysis for greater accessibility and comprehension of the exemption data and ensure that potentially affected parties are made aware of the exempted areas. Additionally it will enhance HQ efforts to facilitate a national tracking mechanism for approved exemptions.

Conclusion

Recognizing that EPA's approval of an aquifer exemption request is typically required prior to issuance of a UIC permit, regional UIC programs should establish early communication with the primacy state to inform EPA's review. The Region should start its review with the information provided in the primacy program's designation and approval request. If questions arise or further information is needed to either supplement the request or clarify specific data points related to the proposed exempted aquifer, the Region should work with the primacy program to obtain this information at the earliest opportunity. The Region should also work expeditiously with the primacy program to resolve any disagreements arising from the aquifer exemption process.

While there are other technical and policy issues associated with aquifer exemptions that are not addressed by this memorandum, I hope that the clarity on the review and determination process for aquifer exemptions provided herein, will help the Agency's effort to achieve national consistency and clarify expectations from states and tribes (and potentially owners or operators) on aquifer exemptions. The Agency will continue to work in consultation with states and stakeholders to promote a consistent and predictable process for the review of aquifer exemption requests under the Safe Drinking Water Act (SDWA).

Attachments

40 CFR 146.4: Criteria for Exempted Aquifers

An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water" in § 146.3 may be determined under § 144.7 of this chapter to be an "exempted aquifer" for Class I-V wells if it meets the criteria in paragraphs (a) through (c) of this section. Class VI wells must meet the criteria under paragraph (d) of this section:

(a) It does not currently serve as a source of drinking water; and

(b) It cannot now and will not in the future serve as a source of drinking water because:

(1) It is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.

(2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;

(3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or

(4) It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or

(c) The total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system

(d) The areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well may be expanded for the exclusive purpose of Class VI injection for geologic sequestration under § 144.7(d) of this chapter if it meets the following criteria:

(1) It does not currently serve as a source of drinking water; and

(2) The total dissolved solids content of the ground water is more than 3,000 mg/l and less than 10,000 mg/l; and

(3) It is not reasonably expected to supply a public water system.

Aquifer Exemption Checklist

Reviewed by: _____ ***Date*** _____

A- Regulatory Background and Purpose

An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water" in § 146.3 may be determined to be an "exempted aquifer". The aquifer exemption criteria at 146.4 must be met as follows:

- Class I-V wells must meet criteria **146.4(a) and 146.4(b)(1)**; or **146.4(a) and 146.4(b)(2)**; or **146.4(a) and 146.4(b)(3)**; or **146.4(a) and 146.4(b)(4)**; or **146.4(a) and 146.4(c).**
- Class VI wells must meet the criteria **146.4(d)**[1].

Regardless of the AE request or the type of injection activity, in all cases, first and foremost a demonstration that the aquifer or portion thereof does not currently serve as a source of drinking water is the required first step in the process. **EPA must evaluate each AE request to ensure the criteria are met prior to approval. EPA should also document its rationale for approving or disapproving each AE request in its statement of basis and, in case of exemptions that are substantial program revisions, EPA must provide public notice and an opportunity for the public to comment and request a public hearing.**

The purpose of this checklist is to ensure that appropriate and adequate information is collected to facilitate review of AE requests, and documentation of AE decisions. Some information described here may not apply to all AE requests.

B- General Information

AE request received by EPA on _____

Is the aquifer exemption Substantial_____ **Non-Substantial**_____
Describe basis for substantial/non-substantial determination_____
Is the aquifer exemption Complex? (Existence of drinking water wells, populated area ...) _____
Did the state or tribe provide public notice and opportunity for public hearing on the aquifer exemption request (144.7 (b)) Y/N
Were there any public comments? Y/N If yes, identify where they may be located_____
Date(s) of notice(s) published_____, Public meeting(s) held_____, Hearing held _____, any notable findings or pending litigation _____
Describe the notice and comment process and the final decision_____
Describe the basis for the decision to exempt the aquifer or the basis for the decision to withhold or deny approval of the exemptions request_____
Any anticipated issues associated with EPA approval or disapproval of the AE request Y/N_____
Any meetings between EPA/States/Tribes/Operator to discuss issues Y/N list_____

Is the request submitted by a primacy state or tribe? Y/N If yes name the State/Tribe/Agency _____ **Contact:**_____
AE identified by the Primacy State or tribe and submitted for EPA review and final determination on _____

Name of the Owner/operator_____
Well/Project Name:_____ **Well Class** _____
Purpose of injection: _____(mineral mining/oil and gas/other)

Where is the proposed aquifer exemption located? Township, Section, Range, Quarter Section or other method used to identify the area _____ Latitude and longitude information _____County_____ City_____ State_____ Add information about distance to nearest Town, County _____

Name of aquifer or portion of aquifer to be exempted _____

_____

[1] Additional Class VI only requirements in 40 CFR 144.7(d)(1) and (2) apply. This checklist does not address those requirements.

Areal extent of the area proposed for exemption_____

Depth and thickness of the aquifer _____

Discuss the total dissolved solid (TDS) content of the aquifer, including the TDS at the top and bottom of the exempted zone, and the locations and depths of all fluids samples taken. _____

C- Regulatory Criteria

An aquifer or a portion thereof may be determined to be an exempted aquifer for Class I-V wells if it meets the criteria in paragraphs (a) –(c) below. Other than EPA approved aquifer exemption expansions that meet the criteria set forth in 146.4(d), new aquifer exemptions for Class VI wells shall not be issued.

146.4: **( ) (a)** ***Not currently used as a drinking water source*** **and:**

( ) **(b)(1)** It is mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or Class II operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible; or

( ) **(b)(2)** It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical; or

( ) **(b)(3)** It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or

( ) **(b)(4)** It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or

( ) **(c)** TDS is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.

( ) **(d)** *The areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well may be expanded for the exclusive purpose of Class VI injection for geologic sequestration under § 144.7(d) if it does not currently serve as a source of drinking water; and the TDS is more than 3,000 mg/l and less than 10,000 mg/l; and it is not reasonably expected to supply a public water system.*

1- Demonstration that the aquifer or portion thereof does not currently serve as a source of drinking water per 146.4(a)

Describe the proposed exempted area and how it was determined:_____

_____

TDS:_____ **Top:**_____ **Bottom:**_____

Lithology: _____

Permeability: _____ **Porosity:** _____ **Groundwater flow direction:** _____

Upper and Lower Confining Zone(s) and description of vertical confinement from USDWs:

_____

Oil or mineral production history:_____

Are there any public or private drinking water wells within and nearby the proposed exempted area for which the proposed exempted portion of the aquifer might be a source of drinking water Y/N If yes, list all those wells

_____

- *Include*: pertinent map(s) visually showing the areal extent of exemption boundary, depth and thickness of the aquifer proposed for exemption, all known subsurface structures such as faults affecting the aquifer, and each of the inventoried water well locations by well # or owner name.
- *Include*: Table of all inventoried water wells showing: Well Name/#, Owner, (Private/Public), Contact information, Purpose of well (Domestic, Irrigation, Livestock, etc.), depth of source water, name of aquifer, well completion data, age of well (if known), and the primary source of well data (Applicant/State/Tribe/EPA).
- *Include*: Map showing the areal extent of exemption boundary, all domestic water wells considered potentially down gradient of the exemption and hydraulically connected to the exemption. If wells are deemed horizontally and/or vertically isolated from the exemption, this should be foot noted on the Table as well. Use arrow(s) to indicate the direction and speed of GW in the aquifer proposed for exemption.

- Describe the evidence presented in the application and/or methodology used to conclude GW direction and speed when relevant.
- *Include*: any source water assessment and/or protection areas and designated sole source aquifers located within the delineated area.

What is the appropriate area to examine for drinking water wells? Although guidance 34 says it should be a minimum of 1/4 mile, the determination of the appropriate area is on a case by case basis. Describe area and give a rationale.

Are there any public or private drinking water wells or springs capturing (or that will be capturing) or producing drinking water from the aquifer or portion thereof within the proposed exemption area? Y/N*

- Evaluate the capture zone of the well (s) in the area near the proposed project (i.e., the volume of the aquifer(s) or portion(s) thereof from within which groundwater is expected to be captured by that well).
- A drinking water well's current source of water is the volume (or portion) of an aquifer which contains water that will be produced by a well in its lifetime. What parameters were considered to determine the lifetime of the well?

_____

- (*) If the answer to this question is Yes, therefore the aquifer currently serves as a source of drinking water.

2- Demonstration that the aquifer or portion thereof is mineral, hydrocarbon or geothermal energy producing per 146.4(b)(1)

Did the permit applicant for a Class II or III operation demonstrate as part of the permit applicotion that the aquifer or portion thereof contains minerals or hydrocarbons that, considering their quantity and location are expected to be commercially praducible? Did the permit applicant furnish the dota necessary to make the demonstration as required by 40 C.F.R. 144.7(c)(1) and (2)? Summarize this demonstration and dato _____

- Include narrative statement, logs, maps, data and state issued permit.
- If the proposed exemption is to allow a Class II enhanced oil recovery well operation in a field or project containing aquifers from which hydrocarbon were previously produced, commercial producibility shall be presumed by the Director upon a demonstration of historical production having occurred in the project area or field. Many times it may be necessary to slightly expand an existing Class II operation to recover hydrocarbons and an aquifer exemption for the expanded area may be needed. If the expanded exemption for the Class II EOR well is for a well field or project area where hydrocarbons were previously produced, commercial producibility would be presumed.
- For new or existing Class II wells not located in a field or project containing aquifers from which hydrocarbons were previously produced, information such as logs, core data, formation description, formation depth, formation thickness and formation parameters such as permeability or porosity shall be considered by the Director, to the extent available.
- Many Class II injection well permit applicants may consider much information concerning production potential to be proprietary. As a matter of policy, some states/tribes do not allow any information submitted as part of a permit application to be confidential. In those cases where potential production information is not being submitted, EPA would need some record basis for concluding that the permit application demonstrates that the aquifer contains commercially producible minerals or hydrocarbons. For example, the permit application may include the results of any R & D pilot project. In this case, the applicant should state the reasons for believing that there are commercially producible quantities of minerals within the expanded area. Also, exemptions relating to new or existing Class II wells not located in a field or project containing aquifers from which hydrocarbons were previously produced should include the following types of information:
  - a- Production history of the well if it is a former production well which is being converted.
  - b- Description of any drill stem tests run on the horizon in question. This should include information on the amount of oil and water produced during the test
  - c- Production history of other wells in the vicinity which produce from the horizon in question.
  - d- Description of the project, if it is an enhanced recovery operation including the number of wells and there location.

For Class III wells, the Director must require an applicant to furnish data necessary to demonstrate that the aquifer is expected to be mineral or hydrocarbon producing and the Director must consider information contained in the mining plan for the proposed project, such as a map and general description of the mining zone, general information on the mineralogy and geochemistry of the mining zone, analysis of the amenability of the mining zone to the proposed mining

method, and a time-table of planned development of the mining zone. Information to be provided may also include: a summary of logging which indicates that commercially producible quantities of minerals or hydrocarbons are present.

3- Demonstration that the aquifer or portion thereof is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical per 146.4(b)(2)

Is the aquifer or portion thereof situated at a depth or locotion which makes recovery of water for drinking water purposes economically or technologically impractical? _____

- List evidence in the application showing how this demonstration was made.
- EPA consideration of an aquifer exemption request under this provision would include information related to: The availability of less costly and more readily available alternative supplies, the adequacy of alternatives to meet present and future needs, and costs for treatment (including cost of disposal of treatment residuals) and or development associated with the use of the aquifer.
- The economic evaluation, submitted by the applicant, should consider the above factors, and these that follow:

1. Distance from the proposed exempted aquifer to public water supplies.
2. Current sources of water supply for potential users of the proposed exempted aquifer.
3. Availability, quantity and quality of alternative water supply sources.
4. Analysis of future water supply needs within the general area.
5. Depth of proposed exempted aquifer.
6. Quality of the water in the proposed exempted aquifer.

4- Demonstration that the aquifer or portion thereof is too contaminated per 146.4(b)(3)

Is the aquifer or portion thereof proposed for exemption so contaminated that it would be economically or technologically impractical to render that water fit for human consumption _____

- List evidence in the application showing that the area to be exempted is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption.
- Economic considerations would also weigh heavily in EPA's decision on aquifer exemption requests under this section. Unlike the previous section, the economics involved are controlled by the cost of technology to render water fit for human consumption. Treatment methods can usually be found to render water potable. However, costs of that treatment may often be prohibitive either in absolute terms or compared to the cost to develop alternative water supplies.
- EPA's evaluation of aquifer exemption requests under this section will consider the following information submitted by the applicant:

(a) Concentrations, types, and source of contaminants in the aquifer.
(b) If contamination is a result of a release, whether contamination source has been abated.
(c) Extent of contaminated area.
(d) Probability that the contaminant plume will pass through the proposed exempted area.
(e) Ability of treatment to remove contaminants from ground water.
(f) Current and alternative water supplies in the area.
(g) Costs to develop current and future water supplies, cost to develop water supply from proposed exempted aquifer. This should include well construction costs, transportation costs, water treatment costs, etc.
(h) Projections on future use of the proposed aquifer.

5- Demonstration that the aquifer or portion thereof is located over a Class III well mining area subject to subsidence or catastrophic collapse per 146.4(b)(4)

Is the aquifer ar portion thereof proposed for exemption locoted over a Class III well mining area subject to subsidence or cotastrophic collapse?

- List evidence in the application showing that the area to be exempted is located over a Class III well mining area subject to subsidence or catastrophic collapse_____

- Discuss the mining method and why that method necessarily causes subsidence or catastrophic collapse. The possibility that non-exempted underground sources of drinking would be contaminated due to the collapse should also be addressed in the application.

6- Demonstration that the aquifer or portion thereof has TDS more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system per 146.4(c)

Is the TDS of the aquifer or portion thereof proposed for exemption more than 3,000 and less than 10,000 mg/l?_____

Is the aquifer proposed for exemption or portion thereof not reasonably expected to supply a public water system?____

- Identify and discuss the information on which the determination that the total dissolved solids content of the ground water in the proposed exemption is more than 3,000 and less than 10,000 mg/l and the aquifer is not reasonably expected to supply a public water system.
- Include information about the quality and availability of water from the aquifer proposed for exemption. Also, the exemption request must analyze the potential for public water supply use of the aquifer. This may include: a description of current sources of public water supply in the area, a discussion of the adequacy of current water supply sources to supply future needs, population projections, economy, future technology, and a discussion of other available water supply sources within the area.

7- Demonstration that a Class II aquifer exemption may be expanded to Class VI per 146.4(d) *(Refer to additional requirements in EPA's regulations for Class VI aquifer exemptions for this demonstration)*

May the areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well be expanded for the exclusive purpose of Class VI injection for geologic sequestration under § 144.7(d)?_____

- List evidence in the application showing an existing Class II operation associated with AE that is being converted into Class VI_____