

# Aquifer Exemptions and Improving the Process: Presentation at the GWPC UIC Annual Conference, Austin, TX

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# Background

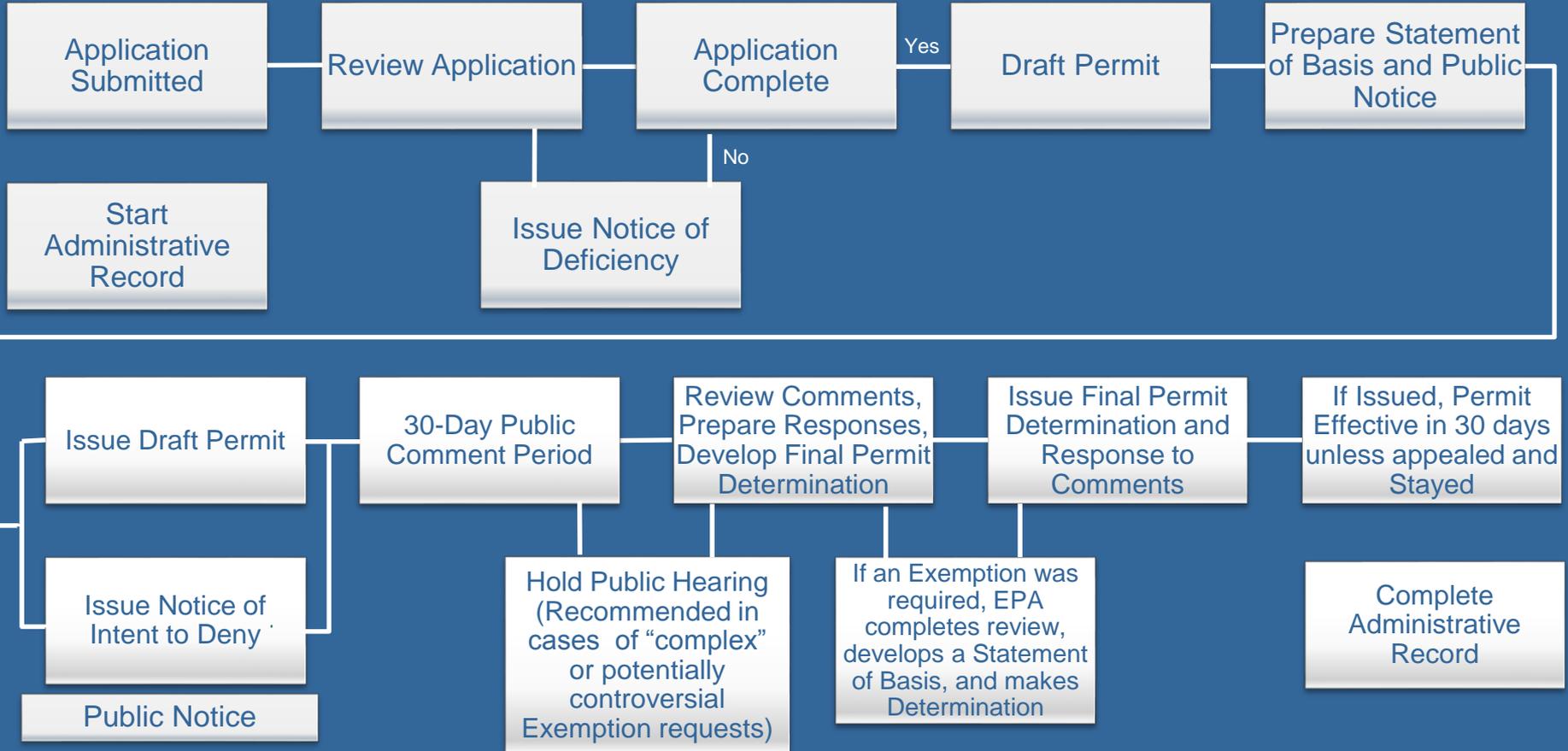
- The Safe Drinking Water Act (SDWA) requires EPA to protect Underground Sources of Drinking Water (USDWs) from contamination caused by underground injection
- Aquifer Exemptions were created to allow injection into an aquifer which otherwise would have been prohibited by the SDWA and UIC program
- Aquifer Exemptions are primarily used to allow mineral, hydrocarbon, or geothermal energy production
- Aquifer Exemptions are considered a program revision and therefore are subject to EPA review and approval
- In approving an Aquifer Exemption, EPA makes a determination that the proposed exemption area is not currently being used as a source of drinking water and will not be used as a source of drinking water in the future

# Timing

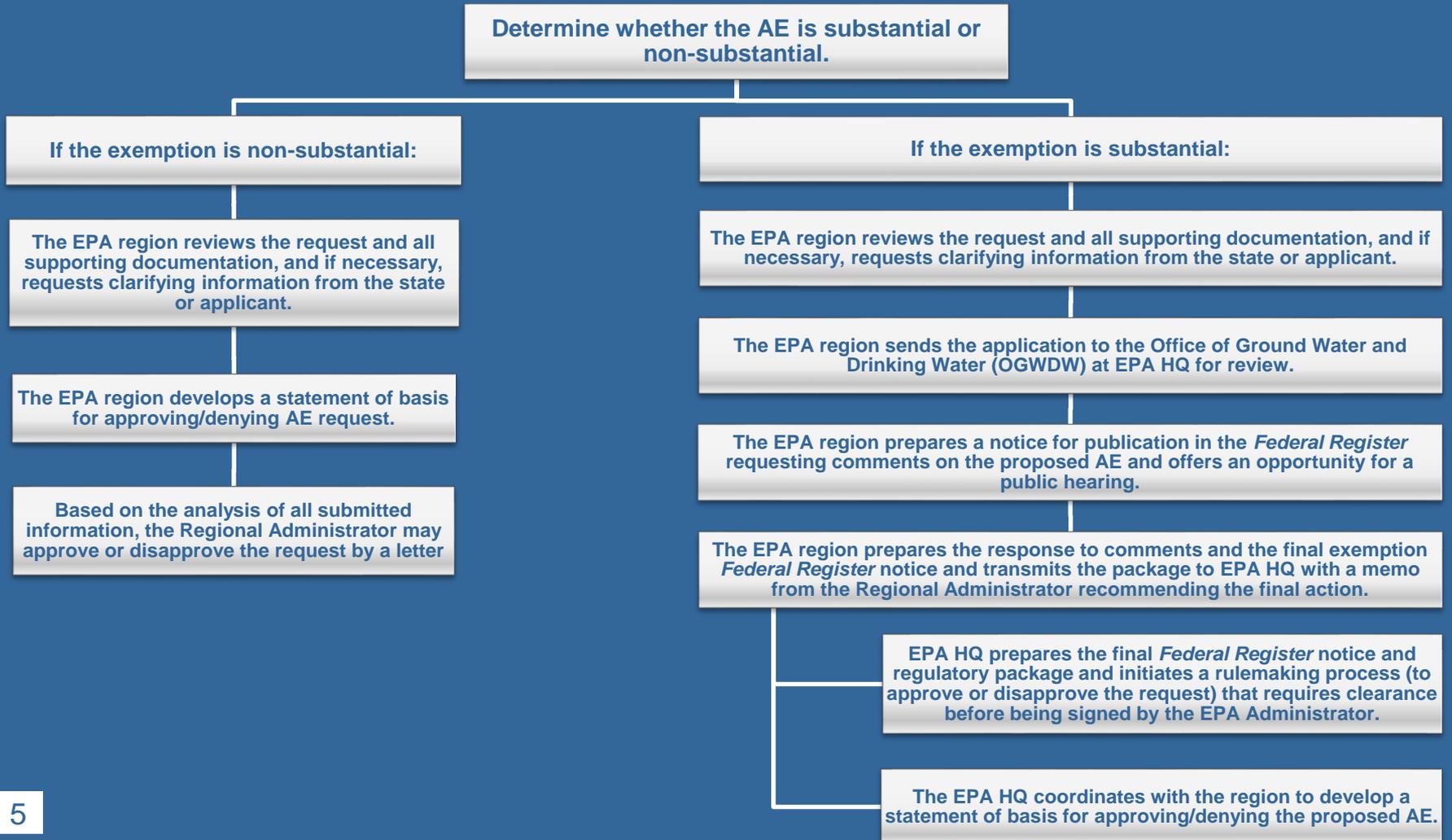
- The UIC regulations allow for Aquifer Exemption requests to be submitted to EPA for a determination either:
  - As part of the State’s submission for primacy of the UIC program; or
  - Subsequent to program approval or promulgation after public notice and opportunity for a public hearing.
- The Director must use the criteria found at 40 CFR 146.4 and in EPA UIC Guidance 34 when making their determination to a request that an Aquifer Exemption be granted
- Upon receipt of an exemption request, EPA compiles and reviews the information used to support the Aquifer Exemption request and may seek additional information from the state and/or other sources
- EPA then documents its evaluation and analysis of the information EPA considered in making the determination to approve or deny the Aquifer Exemption request in a Statement of Basis
- The designation of an aquifer as being exempted is not final until it has been approved by EPA

# Typical UIC Permitting Process

Exemption Required?



# EPA Process of Receiving and Reviewing AE Requests



# When is an Aquifer Exemption considered to be Substantial?

An exemption request is considered to be substantial if it is:

- For an aquifer containing water of less than 3,000 mg/l TDS which is:
  - related to any Class I well; or
  - not related to action on a permit, except in the case of Class II enhanced recovery operations authorized by rule
- All requests for expansions to the areal extent of Class II enhanced oil or enhanced gas recovery aquifer exemptions for Class VI wells

## Factors which may lead to Inconsistency

- Management/Staff turnover or changes
- Understanding of the Aquifer Exemption process and requirements
- Familiarity with a site or area
- Communication
- Records Management
- Changes in outside factors:
  - Water needs/availability
  - Water treatment costs
  - Well drilling costs

## Improving the AE Process

- As early as 2007, UIC program managers had identified the need to provide national consistency and additional clarity on the AE review and determination process.
- EPA HQ engaged regional staff to talk about how AE determination requests were reviewed and processed.
- Process of collecting of existing AE information to be compiled in a database was started by EPA.
- EPA engaged a number of key states in a work group organized by GWPC to help bring greater clarity to the needs and expectations of both parties in dealing with AE requests and determinations.
- As an outcome of those discussions; EPA recently issued a memorandum to its Regional Water Division Directors, along with a checklist for the AE review process.

# The Checklist

- Developed based on the Aquifer Exemption criteria listed at 40 CFR 146.4 and EPA UIC Guidance 34
- Provides a mechanism for more consistent data collection
- Is not a “one size fit all” document as some information described in it may not apply to all Aquifer Exemption requests
- Helps to ensure that appropriate and adequate information is collected to facilitate EPA review of Aquifer Exemption requests, and documentation of Aquifer Exemption decisions
- Can help manage expectations

# Information Common to all Aquifer Exemption Requests

Applicants requesting exemptions must provide the following general information:

- A topographic map of the proposed exempted area. The map must show the boundaries of the area to be exempted.
- A written description of the proposed exempted aquifer including:
  - Name of formation or aquifer
  - Subsurface depth or elevation of zone
  - Vertical confinement from other underground sources of drinking water
  - Thickness of proposed exempted aquifer
  - Area of exemption (e.g., acres, square miles, etc.).
  - A water quality analysis of the horizon to be exempted.

# EPA Assessment using §146.4(b)(1)

**Regulation Language:** “An aquifer cannot now and will not in the future serve as a source of drinking water because it is mineral, hydrocarbon, or geothermal energy producing or can be demonstrated by a permit application 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.”

An Aquifer Exemption request under this section should discuss:

## For new Class II wells injecting into a producing or previously produced horizon

- Production history of the well if it is a former production well which is being converted
- Description of any drill stem tests run on the horizon, with amount of oil and water produced during the test
- Production history of other wells in the vicinity which produce from the horizon
- Description of the project, if it is an enhanced recovery operation including the number and location of wells

## For Class II enhanced oil recovery well or existing Class III injection well operation

- History of hydrocarbon or mineral production
- To slightly expand an existing well field to recover minerals or hydrocarbons the applicant must show only that the exemption request is for expanding the previously exempted aquifer and state reasons for believing that there are commercially producible quantities of minerals within the expanded area

## For new Class III wells which must demonstrate that the aquifer is expected to contain commercially producible quantities of minerals

- Summary of logging which indicates that commercially producible quantities of minerals are present
- Description of the mining method to be used
- General information on the mineralogy and geochemistry of the mining zone, and
- Development timetable; or nearby projects which produce from the formation proposed for exemption.

## EPA Assessment using §146.4(b)(2)

**Regulation Language:** “An aquifer cannot now and will not in the future serve as a source of drinking water because it is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical.”

The economic evaluation, submitted by the applicant, should include/consider:

- Distance from the proposed exempted aquifer to public water supplies
- Current sources of water supply for potential users of the proposed exempted aquifer
- Availability and quality of alternative water supply sources
- Analysis of future water supply needs within the general area
- Depth of proposed exempted aquifer
- Quality of the water in the proposed exempted aquifer

# EPA Assessment using §146.4(b)(3)

**Regulation Language:** “An aquifer cannot now and will not in the future serve as a source of drinking water because it is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption.”

An Aquifer Exemption request under this section should discuss:

## **Technical considerations:**

- Concentrations and types of contaminants in the aquifer
- Source of contamination
- Whether contamination source has been abated
- Extent of contaminated area
- Probability that contaminant plume will pass the through proposed exempted area
- Ability of treatment to remove contaminants from ground water
- Chemical content of proposed injected fluids

## **Economic considerations:**

- Current water supplies in the area
- Alternative water supplies
- Costs to develop current and probable future water supplies
- Cost to develop a water supply from the proposed exempted aquifer:
  - Well construction costs, transportation costs, water treatment costs
- Projections on future use of the proposed aquifer

## EPA Assessment using §146.4(b)(4)

**Regulation Language:** “An aquifer cannot now and will not in the future serve as a source of drinking water because it is located over a Class III mining area subject to subsidence or catastrophic collapse.”

An Aquifer Exemption request under this section should discuss:

- The proposed mining method and why that method would cause subsidence or catastrophic collapse
- The possibility that non-exempted USDWs would be contaminated due to the collapse should also be addressed

## EPA Assessment using §146.4(c)

**Regulation Language:** “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.”

An Aquifer Exemption request under this section should discuss:

- Information about current water quality and availability
- Current sources of public water supply in the area
- Discussion of the future adequacy of current water supply, including:
  - Population projections
  - Economic projections
- Other available water supply sources and quantity within the area
- Potential technologies for treating contaminant(s)

# Achieving Consistency

- Communication is key.
- Use the checklist to:
  - Help guide discussions;
  - Determine what information will need to be collected/provided;
  - Develop the statement of basis for the determination.
- Manage Records.
- If approved, provide Aquifer Exemption information back to Headquarters.

# Thanks

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