

# PERMITTING REQUIREMENTS FOR BRINE DISPOSAL METHODS

## SUMMARY OF PERMITTING REQUIREMENTS FOR BRINE DISPOSAL METHODS

Managing brine waste is a major consideration for communities and providers contemplating desalination as an option for augmenting their water supply. Permitting requirements that must be met for brine disposal are one aspect of that management. This document briefly summarizes the permits required in Arizona for various brine disposal methods.

### ALL METHODS

In Arizona, all brine disposal methods currently require an **Aquifer Protection Permit (APP)**. APPs are issued and administered by the Arizona Department of Environmental Quality (ADEQ).

This permit is required for owners or operators of facilities that discharge a pollutant directly to an aquifer or to a land surface or vadose zone where there is a reasonable probability that the pollutant will reach an aquifer.

The owner/operator of the treatment plant must demonstrate that the facility is using the Best Available Demonstrated Control Technology (BADCT) for discharge reduction and must demonstrate financial and technical capability.

Permits require that discharges into aquifers must meet Arizona Aquifer Water Quality Standards (AWQS). Alert levels at 80% of the AWQS are built into the APPs. The APP Program has the authority to establish a "narrative" standard for total dissolved solids (TDS), and other contaminants. (BOR, 2006)

The permit is valid for the life of the facility.

#### QUICK FACTS

- In Arizona, all brine disposal methods currently require an Aquifer Protection Permit.
- The owner/operator of the treatment plant must demonstrate that the facility is using the Best Available Demonstrated Control Technology.
- Permits require that discharges into aquifers must meet Arizona Aquifer Water Quality Standards.



Florence Copper Project; Photo Courtesy Pinal Partnership

### DISCHARGE TO A SEWER

An **APP permit** holder may be able to indirectly discharge concentrated waste streams, including brine, through a publicly owned treatment works, such as a sewer, which is common. The permit holder would need to also comply with the requirements of the publicly owned treatment works.

Brine discharge to the nearest wastewater system is only suitable for small volumes into large-capacity wastewater treatment plants, due to the potential impact of the brine's high TDS to the wastewater treatment plant operations.

Brine discharge to a wastewater treatment plant is regulated by the requirements applicable to industrial discharges of the responsible authority. Brine discharge

is limited by the hydraulic capacity of the wastewater collection system and the capacity of the wastewater treatment processes. The salinity tolerance of the wastewater treatment plant must be assessed before discharging the brine from a desalination plant to the sewer.

## DISCHARGE TO A WETLAND

In addition to the APP permit, discharging brine to a wetland could require an **Arizona Pollutant Discharge Elimination System (AZPDES) permit** if the wetland fits the definition of a Waters of the U.S.

The AZPDES Program is under ADEQ. This permit is for municipal, domestic and industrial discharges of pollutants to a surface water that fits the definition of "Waters of the U.S." as described in the Clean Water Act.

Wastewater treatment plants must have an effluent toxicity monitoring program for the protection of aquatic life. (BOR, 2006)

The permit is valid for five years. A renewal permit can be continued past five years if a renewal application is received 180 days before the expiration date of the permit.



Inspectors visit injection wells to ensure protection of drinking water; Photos Courtesy of United States Environmental Protection Agency

## DEEP WELL INJECTION

Deep well injection currently requires both an **Underground Injection Control (UIC) permit** from the U.S. Environmental Protection Agency (EPA) and an **APP from ADEQ**.

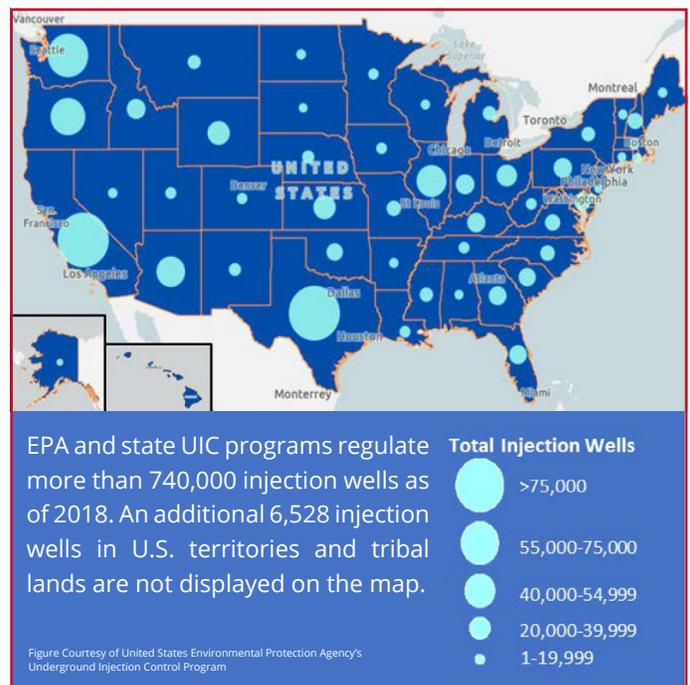
Class I Industrial and Municipal Waste Disposal Wells are used to inject hazardous and non-hazardous wastes

### QUICK FACTS

- Discharging brine to a wetland could require an the Arizona Pollutant Discharge Elimination System permit if the wetland fits the definition of Waters of the U.S.
- Approximately 800 operational Class I wells exist in the United States.
- Brine may be retained in a basin to further concentrate as water evaporates.

into deep, confined rock formations. Class I wells are typically drilled thousands of feet below the lowermost underground source of drinking water (USDW). Approximately 800 operational Class I wells exist in the United States. The geologies of the Gulf Coast and the Great Lakes areas are best suited for these types of wells which is why most Class I wells are found in there.

Every Class I well operates under a UIC permit. Each permit is valid for up to 10 years. Owners and operators of Class I wells must meet specific requirements to obtain a permit. These requirements address the siting, construction, operation, monitoring and testing, reporting and record-keeping, and closure of Class I wells. (USEPA)



Assuming ADEQ obtains primacy from EPA for the UIC program, then **only a UIC permit** through ADEQ would be required for an injection well.

Legislation that **would exempt UIC wells from an APP even before EPA** secures primacy of the program from EPA would likely have been enacted in 2020, if not for the session ending due to COVID. It is anticipated in the upcoming session.

## EVAPORATION POND

Brine may be retained in a basin to further concentrate as water evaporates. Impoundments are "categorical facilities." As such, **they require an APP from ADEQ**.

This Governor's Water Augmentation, Innovation and Conservation Council document has been prepared by the Arizona Department of Water Resources and Arizona Department of Environmental Quality, and summarizes the permits required in Arizona for various brine disposal methods.