

Brine Management: Are Arizona Regulations up to the Challenge?

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Water Supply/Demand

Strategic planning and action have long been practiced in Arizona to ensure there are sufficient and sustainable water supplies for Arizona's long-term economic stability.

Current supplies are meeting demand. There is no crisis.

However, a look forward projects a long-term imbalance between available supplies and projected demand over the next 100 years of up to 3 MAF.

-Arizona's Next Century: A Strategic Vision for Water Supply Sustainability (ADWR, January 2014)

Previously unutilized/underutilized water sources may be part of Arizona's future water supply portfolio.

So, what about using more brackish/reclaimed water?

AZ not currently intentionally accessing its brackish water resources on any

AZ reuses a great amount of reclaimed water, but increasing salt in raw water/waste stream is impacting quality and limiting use without advanced treatment

Examples: Palo Verde Nuclear Generating Station, golf courses

RO – currently the only widely used feasible treatment technology

RO creates a concentrated brine waste stream that must be properly managed

Some AZ Obstacles to Brine Management

Obvious, but...AZ doesn't have ready access to an ocean

Brine discharges to waters of the US are not feasible

Discharges to treatment plants impact reclaimed water quality

Lined evaporation impoundments becoming infeasible/too expensive

Option: Deep well injection...but with more obstacles

Aquifer reclassification – possible, but very difficult.

Deep well injection of desal brines:

May be technically and economically feasible:

AZ does have deep aquifers where it could physically take place

AZ does have deep aquifers already containing saline groundwater

But will Arizona's Aquifer Protection Permit (APP) program allow it?

A Question:

Can ADEQ issue protective permits under APP for deep well injection of brine concentrate and hold true to the letter and spirit of the law?

All aquifers are classified for “drinking water protected use” regardless of water quality.

Discharges may not cause a pollutant to be present in an aquifer which impairs existing or reasonably foreseeable uses of the water.

Paradox: AZ has aquifers it is protecting for drinking water use that are too brackish to drink without treatment.

Deep Well Injection a Viable Option?

- Carefully explore APP options within existing legal framework
- Not without precedent: ADEQ already has considerable experience permitting injection of pollutants directly to aquifers for other purposes:
 - recharge of reclaimed water
 - sulfuric acid injection for in-situ copper recovery
 - brine and hydrocarbon fluids at salt body storage facilities
 - CO₂ injection for sequestration testing
- Use APP pollutant control technology provisions to develop injection criteria that will ensure drinking water protection?

Next Steps?

- Convene stakeholders group to:
 - analyze statutes and rules with respect to deep well injection
 - examine potential control technology criteria:
 - minimum injection depth
 - injection to zones of existing high salinity groundwater
 - injection well technology (drilling, casing, testing, etc.)
 - monitor well technology and monitoring requirements
 - review other state's best practices (e.g., Texas' UIC General Permits for deep well injection of desal brine)

Questions?



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