



WASHINGTON STATE DOH – ASR REGULATORY UPDATE

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Overview for today

- Regulatory Framework for ASR in WA overview of Dept of Ecology and DOH roles
- DOH rule highlights
- Future Possibilities
- Wrap-up

What is ASR?

"those projects where the intent is to artificially store water in an underground geological formation through injection, surface spreading and infiltration, or other department-approved method, and to make subsequent use of the stored water."

WAC 173-157-040

Focus for this presentation: drinking water ASR projects with direct injection of water to be stored.

WQ review

Aquifer testing

and WQ

sampling

QAPP

Complete QAPP to address:

-aquifer test

WQ data gaps

by-case basis)

WQ, and WR, with copy

to DOH, as needed)

OCR approves QAPP

before field work.

sampling efforts.

Note additional QAPPs

may be needed for future

-WQ sampling to fill

-modeling (on case-

1) All sampling/testing:

2) QAPP review by OCR,

Underground Artificial Storage and Recovery Reservoir Permit Pre-Application Process

WQ reviews Report

and recommendation

provided

WQ, WR, OCR

DOH review and

recommendation

· WQ Feedback on next

steps and additional

· Identify data gaps and

. OCR and WR provide

non-WO review of

Feasibility study and

identify additional data

ok to proceed to QAPP

Feasibility Study report

data needs from

· DOH check-in

This is a working flow chart for coordination between OCR, WQ and WR Ecology programs during the pre-application period for potential Aquifer Storage and Recovery (ASR) projects with OCR funding agreements.

Note: Written reports in bold yellow highlight. Color coded roles: WQ in green, WR in blue and OCR in orange, DOH in purple



Decide if project

will comply with

WQ Criteria and

WQ feedback to

proponent

Yes

Pre-application meeting with applicant, WQ, WR, OCR, DOH

Pre-Application Form: Proposed source water and water rights

- · Proposed reservoir if known
- Anticipated issues
- AKART anticipated?
- · List of references
- (background reports) · Application approach
- WQ Resources/Guidance:
- Purple Book-Reclaimed
- water guidance AKART/OPI Guidance
- · Groundwater Quality Standards Imp. 9602

WR Resources/Guidance:

- . WR Aquifer Test Guidance
- Applicant to discuss any permit requirements for aquifer testing with WR

General Guidance

- ASR Application Instructions
- · ASR overview Flow chart
- QAPP guidance

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Implementation Plan

Feasibility Study

Report with

- Implementation plan includes steps and timeline to address WAC 173-157-: Conceptual model (-120)
- · Project Operation Plan (-130)
- . Legal Framework (-140)
- EAA (SEPA for full project) (-150) Mitigation Plan (-160)
- · Monitoring plan (-170)

Assess GW quality compliance (WAC 173-200) & other WQ requirements1,

- . Existing WQ data on
- Background² data (8 samples)
- Injection water
- Aquifer matrix (chip samples)
- Numerical Simulation predictions of potential geochemical reactions in aquifer
- · Identify data gaps and next steps

- 1. Refer to WQ Resources Guidance provided at pre-application meeting (ECY publications nos. 15-10-024 and 17-10-035).
- 2. Background groundwater quality conditions must be established according to the procedure defined in the Groundwater Quality Implementation Guidance (ECY Publication no. 96-02, Section 4.2.1.1.3). Background conditions should be used to define criteria for assessing compliance with the Groundwater Quality standards and to determine that the ASR operation is not violating anti-degradation.
- 3. Notes on timing/next steps: WQ issues OPI with ECY Director approval OR denial before a permit decision. Informal feedback to applicant would happen as part of application review and before preliminary permit for pilot testing. (Preliminary permit(s) for pilot testing issue after reservoir application submitted and are based on application.) Reservoir permit includes WQ criteria, monitoring & reporting.
- 4. WQ = Ecology Water Quality Program, WR = Ecology Water Resources Program; OCR = Ecology Office of Columbia River; DOH = WA Department of Health

Aguifer testing and water quality characterization and Geochemical Compatibility Modeling (water-water and rockwater)

Summarize in Data Collection Report

WQ reviews report and recommends additional work

- · Refine predicted geochemical reactions using new data
- · Potential for additional geochemical modeling, as needed
- · OCR, WQ, WR review of final report
- · WQ reviews and recommends additional data collection, if needed
- . Send to DOH for information and review (if DOH requested additional data collection)

Additional aquifer testing & WQ characterization if needed to determine WQ criteria for project compliance

AKART report & Request for OPI determination

AKART report and request for

· AKART and WQ sampling report included in Final compiled feasibility report. Feedback on OPI request and reviewed as part of final compiled feasibility report3

treatment or other measures Yes Reservoir Permit Application Submitted with Final compiled Feasibility

Additional

· Final report compiles all reporting to date in one document. WQ, WR, and OCR review. If part of funding agreement, OCR reviews for agreement deliverable before submittal for permit application

Report

Send copy to DOH for information

V: 06.21.22 Publication #22-12-003

- Dept of Ecology has broad authority and responsibility for regulating waters of the state (quality and quantity). Example: ASR Rules in WAC Chapter 173-157.
- Dept of Health has authority and responsibility for protecting public health by regulating Public Water Systems as they obtain and distribute potable water for drinking and other uses (quality and quantity) – see WAC Chapter 246-290.

Spotlight on DOH rule on Engineering Requirements - WAC 246-290-040:

WAC 246-290-040 Engineering requirements.

- (1) Purveyors shall ensure that all work required to be prepared under the direction of a professional engineer, including, but not limited to, water system plans, project reports, corrosion control recommendation reports, tracer studies, construction documents and construction completion reports, and engineering design review reports for distribution-related submittal exceptions, is prepared under the direction, and bears the seal, date, and signature of a professional engineer:
 - (a) Licensed in the state of Washington under chapter 18.43 RCW; and
- (b) Having specific expertise regarding design, operation, and maintenance of public water systems.
- (2) Exceptions to this requirement are projects identified under WAC 246-290-125 (1)(a) through (d).

Spotlight on DOH rule for Source Approval - excerpt from WAC 246-290-130:

WAC 246-290-130 Source Approval

- Every purveyor shall obtain drinking water from the highest quality source feasible. Every purveyor shall, prior to using a source as a public water supply, obtain approval from the department for:
 - (a) All new sources.
 - (b) Previously unapproved sources.
 - (c) Modifications to existing sources.
- (2) In no case may a purveyor maintain an intake or other connection between a public water system and a source of water not approved by the department.

- Drinking water ASR projects with direct injection into the aquifer: injected water must be potable and have DOH written approval before it goes into the ground.
- DOH Fact Sheet 331-719:



Aguifer storage and recovery (ASR) and Managed aguifer recharge (MAR) are artificial processes or natural processes enhanced by humans that convey water underground. These processes replenish ground water stored in aquifers for beneficial purposes. Although ASR and MAR are often used interchangeably, they are separate processes with distinct objectives. MAR is used solely to replenish water in aquifers. ASR is used to store water, which is later recovered for use.

The objective of MAR is to replenish water in an aquifer. Injecting water into MAR wells can prevent saltwater intrusion into freshwater aquifers and control land subsidence. In contrast, ASR wells are used to store water in the ground and recover the stored water for drinking water supplies, irrigation, industrial needs, or ecosystem restoration projects. The stored water may be recovered from the same well used for injection or from nearby injection or recovery wells. In

- If you can use ASR injection water from an existing DOH-approved source. Very limited DOH involvement in ASR permitting process in this case.
- If the water source is not DOH-approved, we are very happy to work with you through the source approval process including whatever treatment is needed.

- Spotlight on DOH rule for Surface Water Treatment - WAC Chapter 246-290 Part 6:
 - If using surface water as source for ASR injection water, treatment plant must have DOH written approval.
 - Microbial water quality standard are filtration and disinfection treatment techniques, not a numerical MCL.
 - Microbial treatment credit is granted based on filtration and disinfection treatment techniques and operational standards identified in WAC 246-290-660 and -662

Spotlight on Surface Water Treatment Rule (cont'd)

- Surface water treatment operation involves:
 - Daily O&M by a WA state-certified operator
 - Frequent or continuous monitoring of various water quality parameters to verify treatment effectiveness of both the filtration and disinfection components
- Development of a new surface water treatment plant generally can involve a couple of years of detailed raw water characterization and pilot testing of the proposed treatment approach

Future Possibilities

- Ecology is pursuing working with UW Researchers to study virus reduction in basalt aquifers between an injection well and a recovery well, and DOH is participating in the discussions.
- Purpose is to evaluate what factors might be used to one day have a protocol for DOH to be able to assign treatment credit for viruses as water moves in the subsurface if surface water is used for injection.

Future Possibilities

- Assuming the study has favorable results, there are barriers to be overcome DOH to be able to assign treatment credit for viruses:
 - "Aquifer treatment" is not a listed technique that surface water treatment credit may be assigned to in WAC 246-290-660 and -662.
 - How would the required frequent/continuous treatment performance monitoring be addressed in an aquifer setting?

Future Possibilities

- Other Considerations:
 - If nonpotable water is injected, water system should own/control the land between injection and withdrawal wells so no other drinking water wells are installed there.
 - Site-specific modeling and/or tracer studies would likely be needed.

Wrap-Up

- Dept of Ecology and DOH have a process in place to coordinate on drinking water ASR projects in Washington State
- Drinking water ASR projects with direct injection into the aquifer: injected water must be potable before entering the ground and have DOH written approval.

Questions?

Thank you!

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