

OREGON WATER RESOURCES DEPARTMENT  
OF THE STATE OF OREGON

In the Matter of Aquifer Storage and Recovery    )  
(ASR) Limited License Application #001, City of   )  
Salem, Marion County

FINAL ORDER  
APPROVING RENEWED ASR TESTING

**AUTHORITY**

Oregon Revised Statutes (ORS) 537.534 and Oregon Administrative Rules (OAR) 690-350-0020 establish the process by which an application for ASR testing under an ASR limited license may be submitted and approved. OAR 690-350-0020 describes general provisions for ASR under Oregon law.

**BACKGROUND**

On March 6, 1997, the Department issued ASR Limited License #001 to the City of Salem. That license authorized ASR testing for five years at up to fifteen wells in a Columbia River Basalt aquifer. ASR Limited License #001 was renewed on March 5, 2002; March 7, 2007; June 11, 2012; and again on July 20, 2017. The licensee requested renewal of ASR Limited License #001 on March 24, 2022. Condition 1 of ASR Limited License #001 provides for renewal pursuant to OAR 690-350-0020(5)(c) and describes the following terms for renewal: The limited license may be renewed if the licensee demonstrates to the Director's satisfaction that further testing is necessary and that the licensee complied with the terms of the license.

**FINDINGS OF FACT**

1. On March 24, 2022, the Department received a request to renew ASR LL #001 for a five-year period.
2. On April 25, 2022, the Department determined the renewal request was complete.
3. On May 3, 2022, the Department provided public notice of the application in the Department's weekly public notice. A 30-day comment period followed.
4. The Department received no adverse comments related to the proposed renewal of the ASR limited license.

**APPEAL RIGHTS**

This is an order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

5. The Department sought comments from the Oregon Health Authority Drinking Water Services (OHA) and the Oregon Department of Environmental Quality (DEQ) related to the possible renewal of the ASR limited license. Comments were received from OHA and DEQ supporting the renewal of ASR LL #001.
6. The Department evaluated the renewal request and comments and determined the proposed renewal is consistent with Condition 1 of the ASR Limited License and OAR 690-350-0020(5)(c). The licensee has demonstrated to the Director's satisfaction that further testing is necessary, and that the licensee has generally complied with the terms of the limited license. The request letter presented reasons for the extension (renewal) and provided specific details that addressed compliance with the ASR limited license.

### CONCLUSIONS OF LAW

The request to renew ASR Limited License #001 for five years is consistent with the requirements of ORS 537.534 and OAR 690-350-0020 (5)(c) and Condition 1 of ASR Limited License #001.

This license will expire in five years on \_\_\_\_\_.

### ORDER

Now, THEREFORE, it is ORDERED, ASR Limited License #001 is renewed pursuant to ORS 537.534, OAR 690-350-0020(5)(c), and Condition 1 of the original ASR limited license.

Except as modified by other provisions of this license, the licensee is authorized to pursue the project schedule, monitoring, and other features noted in the accepted ASR testing plan. The plan may be modified and approved pursuant to Condition 6. The project schedule in the ASR testing plan may be reasonably adjusted by the licensee to reflect the license issuance date or other delays. Features of the testing plan are provided in the application documents entitled:

Pilot Testing Work Plan for ASR Limited License #001  
Prepared by GSI Water Solutions, Inc.  
September 21, 2015

ASR testing must provide data and analysis that address the following:

- The appropriate target storage volume
- Loss of stored ASR water and natural water by virtue of ASR activities
- Water quality changes due to ASR activities
- Well construction sufficiency for ASR purposes
- Water level response in the ASR wells, aquifer, springs, and nearby wells
- Accounting of ASR inputs, withdrawals, and storage
- Water quality testing needs
- Well hydraulics at the ASR wells



The licensee may divert up to 11,670 gallons per minute (gpm) from the North Santiam River in the Willamette Basin. The diversion rate shall not exceed the total diversion rate authorized for each source.

Source water right	Point of Diversion (POD)
Certificate 87959	North Santiam River. SW ¼ NE ¼, Section 13, T9S/R1W, W.M.

The licensee may store up to 1 billion gallons in an aquifer within the Columbia River Basalt Formation. With the approval of individual ASR well testing plans, up to fifteen wells may be authorized. The maximum injection rate for proposed wells is 2,000 gallons per minute (gpm) per well, or further limited by capacity, as shown in the table below. The maximum combined withdrawal rate is up to 13,800 gpm at up to 15 fifteen wells in the following table. The maximum storage duration is five years under this license.

Fifteen ASR wells are authorized at the following locations:

Well Name	Well Log ID	Capacity (gpm)	Well Location (within T8S/R3W W.M.)
ASR #1	MARI 19624	1000	NW ¼ SE ¼, SECTION 10, 730 FEET SOUTH AND 730 FEET EAST FROM C ¼ CORNER
ASR #2	MARI 50075	1800	NW ¼ SE ¼, SECTION 10, 730 FEET SOUTH AND 760 FEET EAST FROM C ¼ CORNER
ASR #3	MARI 53673	2000	NW ¼, SE ¼, SECTION 10, 500 FEET SOUTH AND 375 FEET EAST FROM C ¼ CORNER
ASR #4	MARI 53675	2000	NW ¼, SE ¼, SECTION 10, 360 FEET SOUTH AND 800 FEET EAST FROM C ¼ CORNER
ASR #5	MARI 53674	2000	NW ¼, SE ¼, SECTION 10, 830 FEET SOUTH AND 1100 FEET EAST FROM C ¼ CORNER
ASR #6	MARI 55655	2000	NW ¼, SE ¼, CORNER 10, 250 FEET SOUTH AND 80 FEET EAST FROM C ¼ CORNER
ASR #7	Proposed	2000	SECTION 9, NW ¼ SE ¼, NONE GIVEN
ASR #8	Proposed	2000	SECTION 9, NW ¼ SE ¼, NONE GIVEN
ASR #9	Proposed	2000	SECTION 9, NW ¼ NE ¼, NONE GIVEN
ASR #10	Proposed	2000	SECTION 10, NE ¼ SW ¼, NONE GIVEN
ASR #11	Proposed	2000	SECTION 10, NW ¼ NW ¼, NONE GIVEN
ASR #12	Proposed	2000	SECTION 10, NW ¼ NW ¼, NONE GIVEN
ASR #13	Proposed	2000	SECTION 10, SE ¼ NW ¼, NONE GIVEN
ASR #14	Proposed	2000	SECTION 10, SE ¼ SW ¼, NONE GIVEN
ASR #15	Proposed	2000	SECTION 10, SE ¼ SW ¼, NONE GIVEN

In the event the wells listed above cannot produce the estimated quantities or cannot be built, the licensee may develop wells at the following optional locations to bring about the total authorized production rate and are subject to the same rate limitations as those above:

Opt #1	Proposed	2000	T8S/R3W W.M., Section 9, NW ¼ SE ¼, NONE GIVEN
Opt #2	Proposed	2000	T8S/R3W W.M., Section 9, NE ¼ SE ¼, NONE GIVEN
Opt #3	Proposed	2000	T8S/R3W W.M., Section 9, SE ¼ SE ¼, NONE GIVEN

The ASR testing project shall be operated according to the following conditions, pursuant to OAR 690-350-0020(5). Failure to comply with any of the provisions of this license may result in action including, but not limited to, revocation of the license.

- 1) **Notice Prior to Injection and Recovery.** The licensee shall give notice, in writing, to the watermaster not less than 15 days in advance of either initiating any injection under the license or recovering stored water. The injection notice shall include the license number, the location of the injection source water diversion, the quantity of water to be diverted from that source, the time of injection, and the place of injection. The recovery notice shall include the license number, the location of the recovery well(s), the time of recovery, and the quantity of water to be recovered.
- 2) **Record of Use.** The licensee shall maintain a record of injection and recovery, including the total number of hours and times of injection and recovery and the total metered quantity injected and recovered. The record of use may be reviewed by Department staff upon request.
- 3) **Modification/Revocation.** The Department shall notify the licensee in writing and allow the licensee to respond when considering the following actions:
  - (A) The Director may modify the ASR license for any of the following reasons:
    - (i) to reflect changes in Oregon Health Authority Drinking Water Services (OHA) and Oregon Department of Environmental Quality (DEQ) water quality or treatment standards;
    - (ii) to address needed technological changes as requested by DEQ or OHA to minimize constituents regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-040 (ORS 468B.165);
    - (iii) to address a written request from the applicant for minor adjustments to the authorization in the license.
  - (B) The Director may revoke, suspend or modify the ASR license for any of the following reasons:
    - (i) to prevent or mitigate injury to other water rights, instream water rights, minimum perennial streamflows or aquifer water quality;
    - (ii) to address any other unintended, injurious effects of the ASR activity; or
    - (iii) failure to maintain compliance with all conditions of this license.
  - (C) The Department may offer an additional public comment opportunity consistent with the notice and comment provisions of OAR 690-350-0020 prior to modifying the license.
- 4) **Priority/Protection.** This license does not receive a priority date and is not protected under ORS 540.045. The diversion of water for this ASR testing retains the priority date and protection of the source water rights.
- 5) **Compliance with Other Laws.** The injection of acceptable water into the aquifer as well as its storage and recovery under this license shall comply with all applicable local, state or federal laws. This shall include, but not be limited to, compliance with the Oregon Department of Environmental



Quality's Underground Injection Control registration program as authorized under the Safe Drinking Water Act (40 CFR 144.26). Also, all pilot test discharges to waterways must be covered by a DEQ National Pollution Discharge Elimination System (NPDES) permit.

- 6) **Detailed Testing Plans.** The licensee shall submit a detailed testing plan for each injection well as the project develops. The plan shall include, but is not limited to, water quality and water level monitoring activities, precise well locations and well construction information. The plan shall be sealed and signed by a professional(s), registered or allowed under Oregon law, to practice geology. The licensee shall obtain the Department's approval of a detailed plan before injection testing at any well may begin. The Department may approve, condition or reject a plan. As the project installs new ASR wells, the Department will evaluate the water level monitoring plan's adequacy to describe the project's impact to the aquifer. If the Department determines the monitoring network is insufficient at that time, identification or installation of a dedicated observation well of similar depth and construction to the ASR well(s) will be required before approval of further testing.
- 7) **Well Construction.** Injection and recovery wells shall be continuously cased and continuously sealed into a competent layer directly above the target aquifer. The wells shall meet applicable well construction standards (e.g., OAR 690-200 and OAR 690-210). Following well drilling to total depth, the wells shall be thoroughly developed to remove cuttings and drilling fluids. The licensee or their agent shall consult with a Department Hydrogeologist and the Department's Well Construction and Compliance Section before well completion to obtain approval of the proposed final casing and seal depth. The wells shall be designed to limit the irretrievable loss of injected water to unsaturated zones.
- 8) **Well Tag Condition for Licensee Wells.** Prior to testing, the licensee shall ensure that their wells have been assigned a Department Well Identification Number (Well ID Number). A tag showing the Well ID Number shall be permanently attached to the well. If a well does not have a Well ID Number, the licensee shall apply for one from the Department and attach it to the well.
- 9) **Water Quality Conditions and Limits.**
  - (A) The licensee shall minimize, to the extent technically feasible, practical and cost-effective, the concentration of constituents in the injection source water that are not naturally present in the aquifer;
  - (B) Except as otherwise provided in (C) of this condition, if the injection source water contains constituents regulated under OAR 333-061-0030 (ORS 448.131 and 448.273) or OAR 340-040 (ORS 468B.165) that are detected at greater than 50 percent of the established levels (MCLs or MMLs in the cited rules), the licensee shall employ technically feasible, practical and cost-effective methods to minimize concentrations of such constituents in the injection source water;
  - (C) Constituents that have a secondary contaminant level or constituents that are associated with disinfection of the injection source water may be injected into the aquifer according to the standards established under OAR 333-61-0030 (ORS 448.131 and 448.273);
  - (D) The Department may, based upon valid scientific data, further limit certain constituents in the injection source water if the Department finds that those constituents will interfere with or pose a threat to the maintenance of the water resources of the state for present or future beneficial uses;

- (E) The licensee shall be in compliance with treatment requirements and performance standards for source water identified in OAR 333-061-0032;
- (F) If during the course of ASR testing, a constituent regulated under OAR 333-061-0030 (ORS 448.131 and 448.273) or OAR 340-040 (ORS 468B.165) is detected above the 50 percent level prescribed in condition (9)(B) or the 100 percent level prescribed in condition (9)(C), the licensee shall immediately stop injection activities upon receipt of lab data and notify the Department within five days. Injection may recommence after constituent levels return to acceptable levels pursuant to (B) or (C) of this condition; and,
- (G) The licensee shall minimize to the satisfaction of OHA the use of water from the infiltration gallery at the North Santiam River as a source of injection water.
- 10) **Water Quality Monitoring.** The licensee shall sample and analyze injection, receiving and recovered water as described in the currently approved testing plan.
- 11) **Water Quality Sampling.**
- (A) ASR Activities Outside Woodmansee Park. Prior to initiating ASR testing outside Woodmansee Park, the licensee shall submit a detailed testing plan for each injection well as the project develops. The licensee shall obtain Department approval of a detailed plan before injection testing at a well may begin. The Department may approve, condition or reject a proposed plan.
- (B) ASR Activities Inside Woodmansee Park. The following provisions apply to ASR activities that are located inside Woodmansee Park as they are considered to be a single system. The licensee shall sample and analyze injection, receiving, and recovered water as described in the currently approved pilot test work plan. The licensee shall submit an updated pilot test work plan as new ASR wells are added to the project. The licensee shall obtain Departmental approval of the updated pilot test work plan before injection testing at a new ASR well may begin. The Department may approve, condition, or reject the pilot test work plan.
- 12) **Water Level Monitoring.**
- (A) The licensee shall monitor water levels in wells in the manner described in the currently approved testing plan.
- (B) Transducer data shall be verified with quarterly manual measurements if an e-tape can be lowered past obstructions to the water level. In the event a pump is pulled, or in the case of a newly drilled project well, the well shall be equipped with an unobstructed, dedicated measuring tube pursuant to Figure 200-5 in OAR 690-200.
- 13) **Streamflow Monitoring.** If the licensee increases the ASR storage volume beyond the maximum tested ASR storage volume to date, stream flow monitoring will be implemented during that ASR cycle. The licensee shall monitor stream flow in July, August, and September on Croisan, Clark, and Pringle Creeks according to the current, accepted ASR testing plan. This monitoring shall seek to detect base flow which may be the result of leakage of stored water. Conditions may preclude some monitoring events since certain flows may be strongly influenced by rainfall events.
- 14) **Recovery.** The amount of stored water available for recovery is based on the following factors:



- (A) Available stored water is determined on a well-by-well basis.
- (B) The following two-step accounting method applies to each annual cycle:
- (i.) The licensee may recover up to 95 percent of the quantity injected during the same water year.
- (ii.) At the end of each water year, 95 percent of the storage account balance is carried over to the next year. The storage account balance consists of the sum of water not recovered within the water year and water carried over from previous testing cycles.
- (C) Any water withdrawn from an ASR well identified in this license shall first be debited against the quantity available in the aquifer by virtue of ASR storage. When the ASR storage is depleted at an ASR well, any water withdrawn from an ASR well shall be considered a draft of natural groundwater, thereby requiring separate or additional authorization. At no time does this license authorize withdrawal of more water than was credited by injection.
- (D) The availability of stored water is a running account that is subject to determination at any time.
- 15) **Use of Recovered Water.** The licensee shall use recovered water for the purposes described in the appropriate source water authorization.
- 16) **Annual Reporting.**
- (A) Except as otherwise noted, the licensee shall provide the Department a written report of the results of ASR testing for the previous water year by February 15th. The first report shall be due in February and include results from water year 2022. Annual reports shall be sealed and signed by a professional(s) registered or allowed, under Oregon law, to practice geology. The report shall:
- Include the data collected during the water year
  - Analyze those data to show the ASR project impacts on the aquifer
  - Evaluate loss of stored ASR water and natural water by virtue of ASR activities
  - Indicate the testing and development progress made under the terms of the license
  - Account for the injection of stored water, withdrawals of stored and natural water, and the storage account balance at the ASR well(s)
- (B) The licensee shall provide the following to the Department:
- (i.) Submission of any and all hydrogeologic data collected and reports developed for the project, including, but not limited to, cuttings analysis, video logs, geophysical logs, aquifer tests, and step tests.
- (ii.) Submission of digital water level data for all ASR wells and any other wells measured in conjunction with the project (in a Department specified format), including annual report data.
- (iii.) Submission of annual reports with locations and elevations for all project wells (actual locations of built wells and proposed locations for proposed wells) and locations and elevations for all non-project wells that have been used for collecting water levels or other

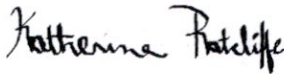
data pertinent to the project (in a Department specified format).

(iv.) Notification in the annual report of any changes in well construction.

(v.) Associating all project well data with the Department Well Identification Number (Well ID Number), the Department Well Log ID, if available, and the project Well Name.

- 17) **Protection for Existing Users.** In the event of conflicts with existing appropriators, the licensee shall conduct all testing to mitigate the injurious effects. In addition, the licensee shall cooperate with the efforts of the Department to protect existing water rights and the water quality of existing users that rely upon the receiving aquifer and the injection source water.
- 18) **Other Measures.** The licensee shall take additional measures, as appropriate, to address ASR-related issues such as landslide activation, seepage, streamflow increases, interference with nearby wells, aquifer storage limitations, and water quality protection. Further, the licensee shall notify the Department upon resolution of such issues. The licensee shall resolve these issues prior to submittal of an ASR permit application.
- 19) **Access.** The licensee shall allow reasonable access to ASR facilities to the watermaster and other state officials with an oversight role in this ASR project.
- 20) **Carryover Storage.** At the end of testing under this license, the licensee shall provide an accounting to the Department of the residual stored water based on the methods of determination given in this license. The Department shall consider this residual for carryover to a permanent ASR permit based on information which discloses the aquifer's ability to retain stored water.
- 21) **License Renewal.** The license may be renewed if the licensee demonstrates to the Director's satisfaction that further testing is necessary and that the licensee complied with the terms and conditions of the license.
- 22) **Expiration Date.** This modified license expires five years from the date of issuance of this Final Order.

Dated at Salem, Oregon on SEP 02 2022



Katherine Ratcliffe  
Water Rights Section Manager  
for Thomas M. Byler, Director  
Water Resources Department

This order was produced by Jen Woody and Phil Marcy. If you have questions about the Department or any of its programs, please contact our Customer Service Group at 503-986-0911 (Press 2 for Water Rights). Address all other correspondence to: Groundwater Section, Oregon Water Resources Department, 725 Summer St NE, Suite A, Salem OR 97301-1266, Fax: 503-986-0902.