# The City of Beaverton's Basalt-hosted ASR Project: A Successful Case Study

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ABSTRACT

Despite western Oregon's reputation for being "wet", many cities find it increasingly difficult to meet peak water supply demand during the dry summer months. The reasons: minimum stream flow requirements, difficulty in finding suitable above-ground reservoir sites in an urbanized environment, and over-drafting of aquifers. An increasing influx of new residents and businesses has added to increased pressures on peak demand. The City of Beaverton (City) recognized these supply hurdles in the early 1990s and opted to evaluate and test aquifer storage and recovery (ASR) to help offset peaking demand. The Oregon Water Resources Department issued an ASR limited license to the City in July 1998.

The primary source of drinking water for the City includes two river systems in the Coast Range. Water from the Tualatin and Trask Rivers is processed by the Joint Water Commission (JWC) treatment plant and piped to the City for distribution. During the winter months, when the river flows are high, treated water is stored in the basalt-hosted aquifer beneath the City using ASR technology. During the summer months, when river flows are low and minimum stream flow rates are met by releasing stored water from the JWC's coastal reservoirs, treated water banked in the City's ASR system is used to help meet peak demand.

Since 1999, the City has installed three ASR wells hosted in the basalt aquifer. In 2005, the City stored approximately 450 million gallons of treated drinking water using its ASR wells. The three wells can provide up to 6 million gallons per day (mgd) of peaking capacity, which is to 35 percent of the City's summer peak day demand. The City drilled another ASR test well in the southern part of its service area that will provide an additional 1 mgd to meet peak demand.

The City has monitored the dynamic response of the basalt aquifer and collected key water quality data, which show that the City's ASR system has been immensely successful. Key lessons learned include: basalts are suitable storage reservoirs; clogging of the aquifer is a concern, but can be managed; proper design of basalt wells is important; stored water adsorbs radon quickly; disinfection by-products have not been a concern; the native groundwater system has responded positively to ASR; spring creation/reactivation is a concern; use of ASR postpones costly conventional improvements; a detailed cost-benefit analysis, comparing alternative peaking sources, shows that ASR is a cost-effective alternative for the City.