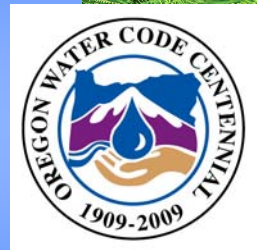


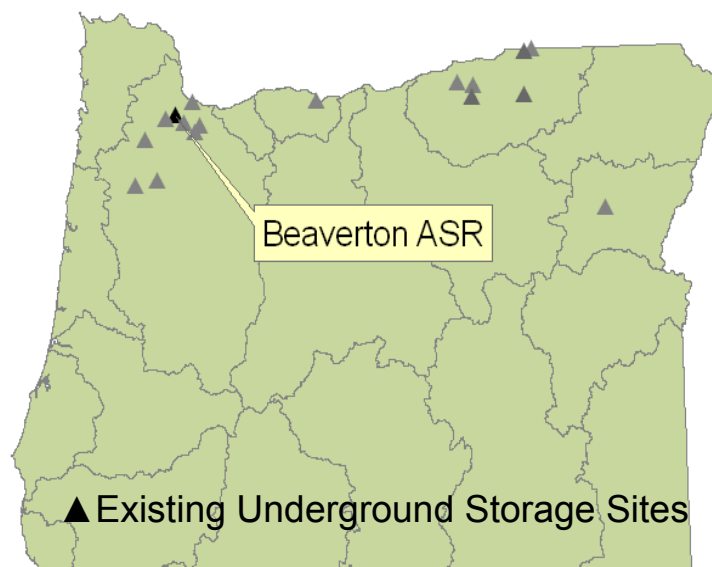


Oregon Underground Storage: Beaverton and Tualatin Valley Water District ASR

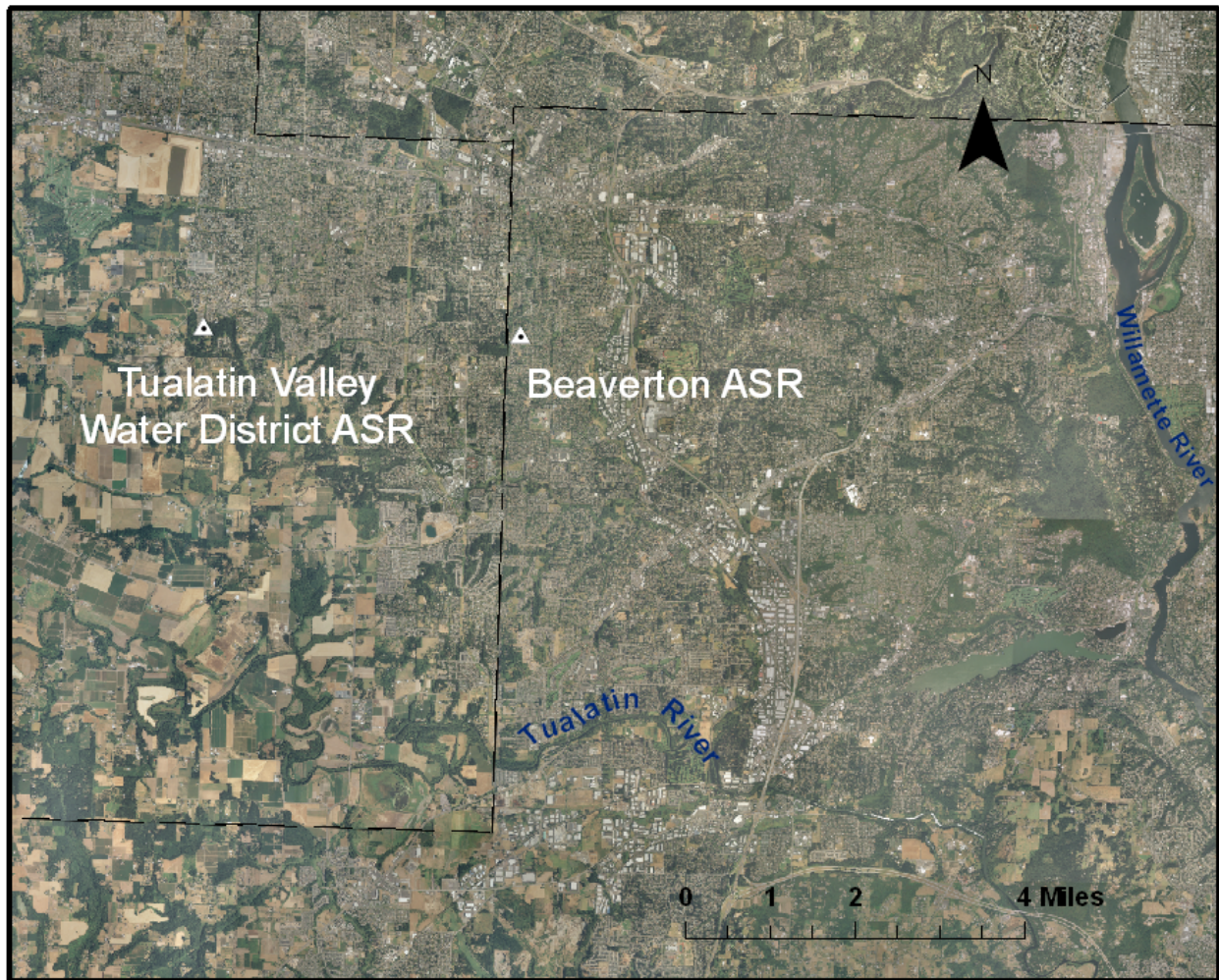


Project Background

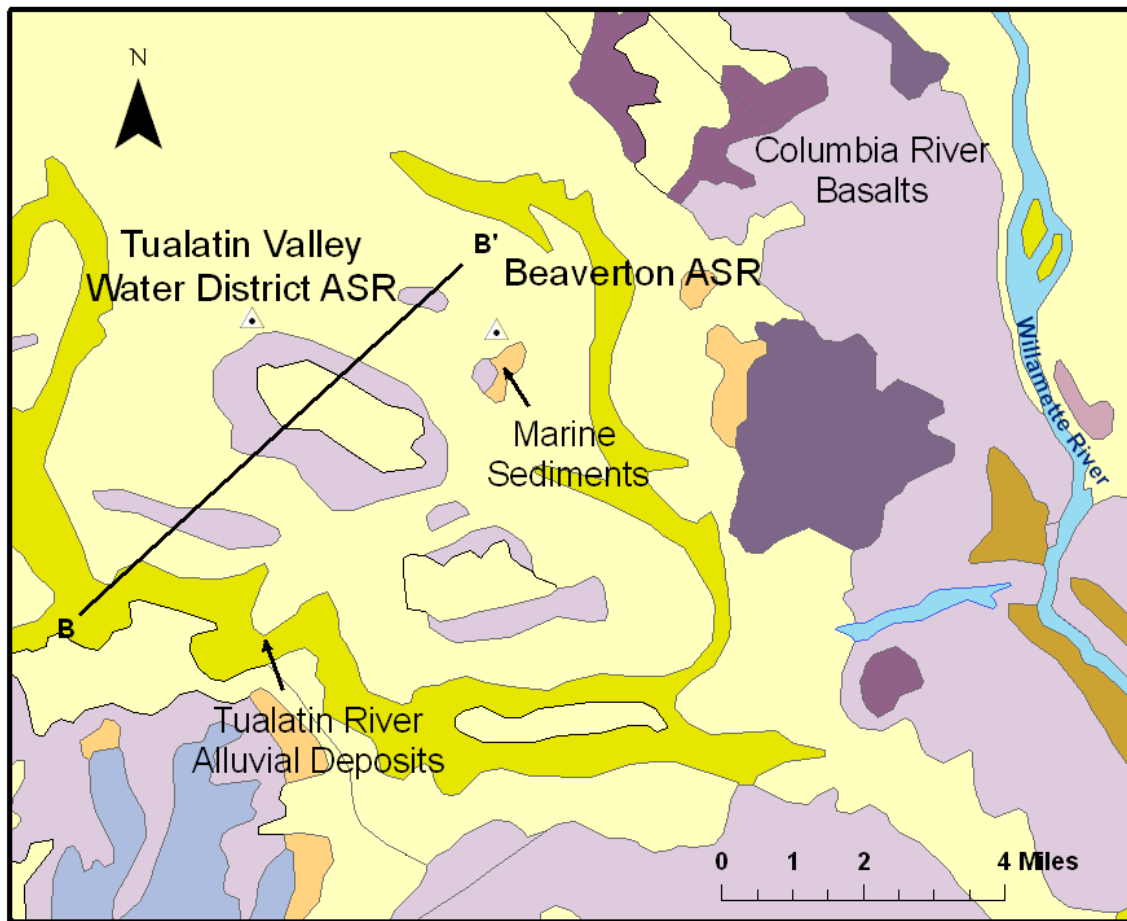
- The City of Beaverton and Tualatin Valley Water District (TVWD) joined forces in the beginning phases of this Washington County municipal ASR project.



- Located in the Willamette Valley, this site receives over 40 inches of precipitation per year, although July through September is generally quite dry. ASR provides supplemental supply during peak demand periods.
- The two entities operate separate ASR wells and testing programs, although they function under the same ASR limited license.
- ASR LL #002 was issued in 1998, and renewed in 2003. There are 10 licensed wells, with 2 currently in use for ASR in Beaverton, in addition to several observation wells. TVWD's ASR project was suspended in its first year of operation, after injection caused a previously undocumented surface seep.



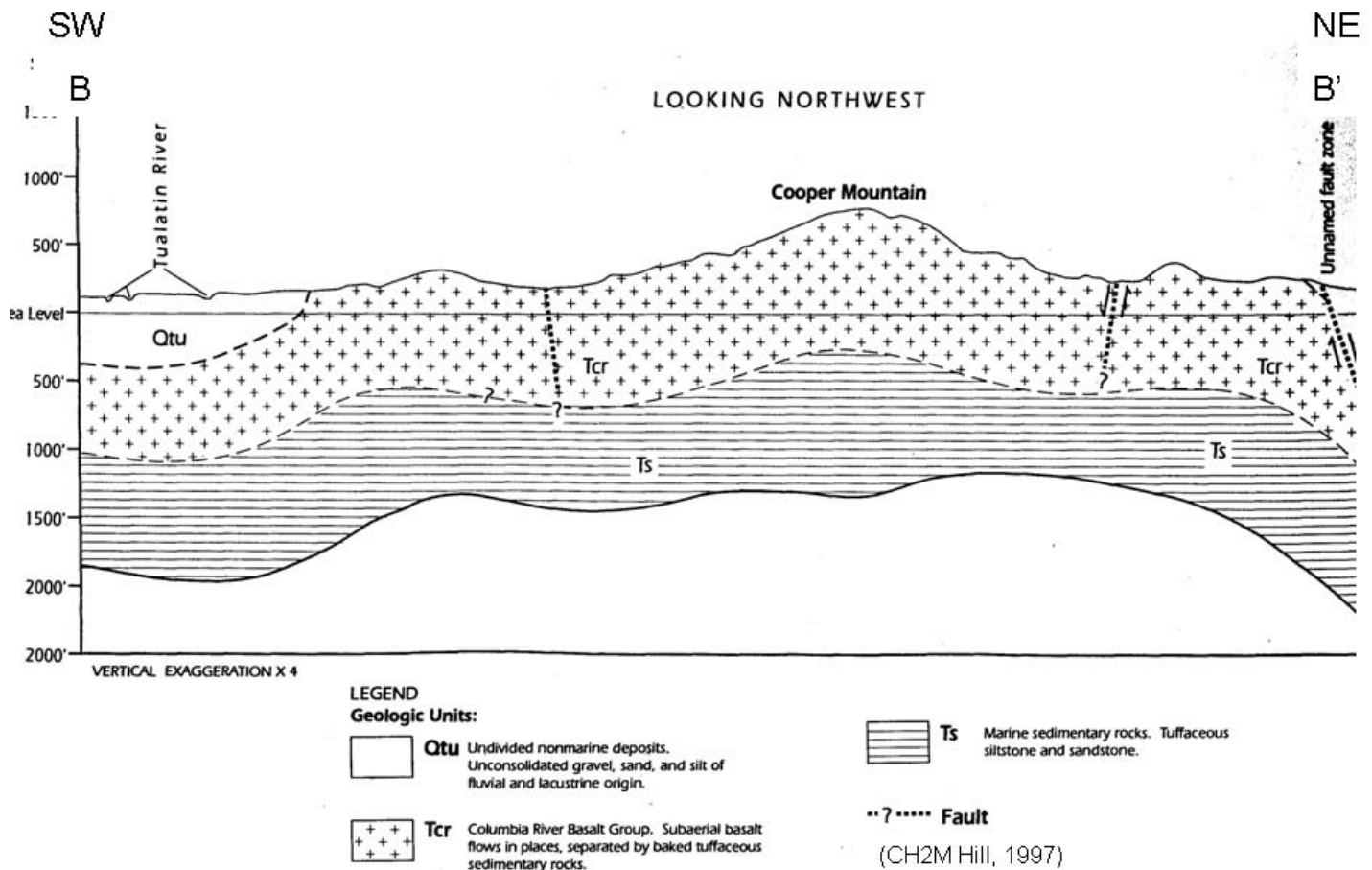
- **Source Water:** The source water for both projects is treated drinking water from the Joint Water Commission's (JWC) Bull Run and Tualatin River supply.



TVWD and Beaverton test ASR in Columbia River Basalt aquifers which are overlain by marine sediments and younger alluvial and lacustrine deposits. The cross-section is delineated by the B-B' line.

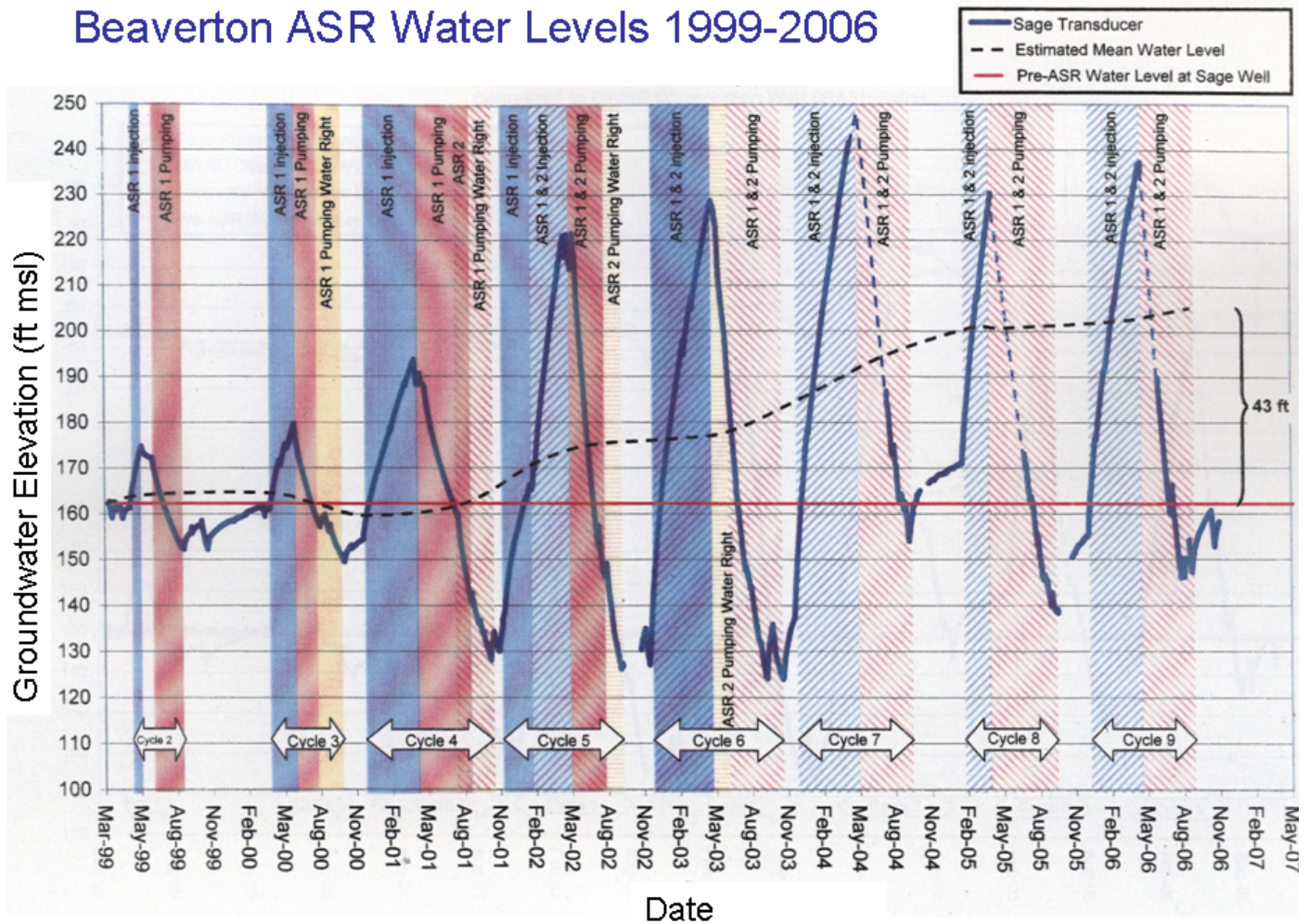
- Aquifer:** Both sites store drinking water in Columbia River Basalt interflow zones, primarily in the Grande Ronde Basalt. It is greater than 1,000 ft thick in the Beaverton area, and often contains permeable layers between more massive flow centers. These interflow zones provide a suitable storage zone, because they are often confined above and below by less permeable layers, but allow water to move horizontally into the aquifer.

Geologic Cross Section of the Beaverton and TVWD area



- **ASR:** Beaverton realized significant savings by storing low-cost winter surface water underground for summer withdrawal. The City began ASR testing in 1999, and has injected from 1.7 to approximately 400 million gallons per year. Recovery ranges up to 365 million gallons per year.
- TVWD began testing in the year 2000. At the Schuepbach Well, the utility injected about 11 million gallons in the first year of testing, but curtailed the project after the first year due to the development of a surface seep. TVWD plans to test ASR at the Grabhorn Well beginning in late 2007.

Beaverton ASR Water Levels 1999-2006



(GSI Water Solutions, 2007)

Progressive injection and recovery cycles at Beaverton have resulted in a residual rise in head at the ASR well and at nearby observation wells.