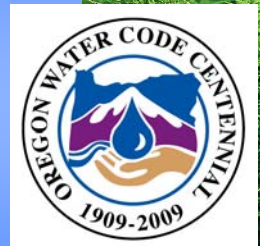


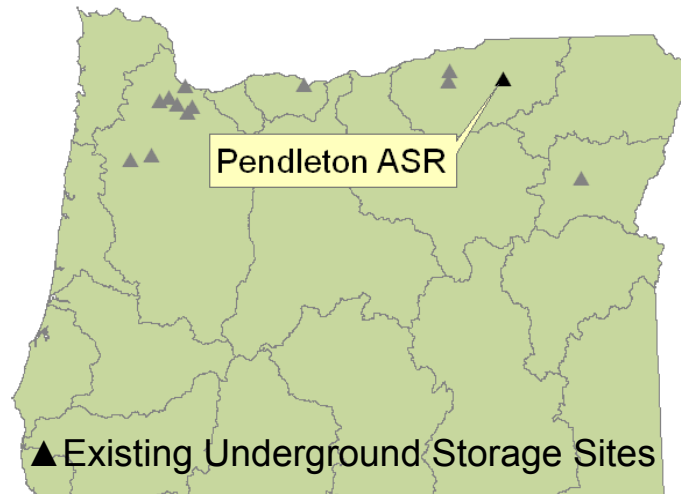


Oregon Underground Storage: City of Pendleton ASR



Project Background

- The City of Pendleton is located in the high desert of Umatilla County, in northeast Oregon.

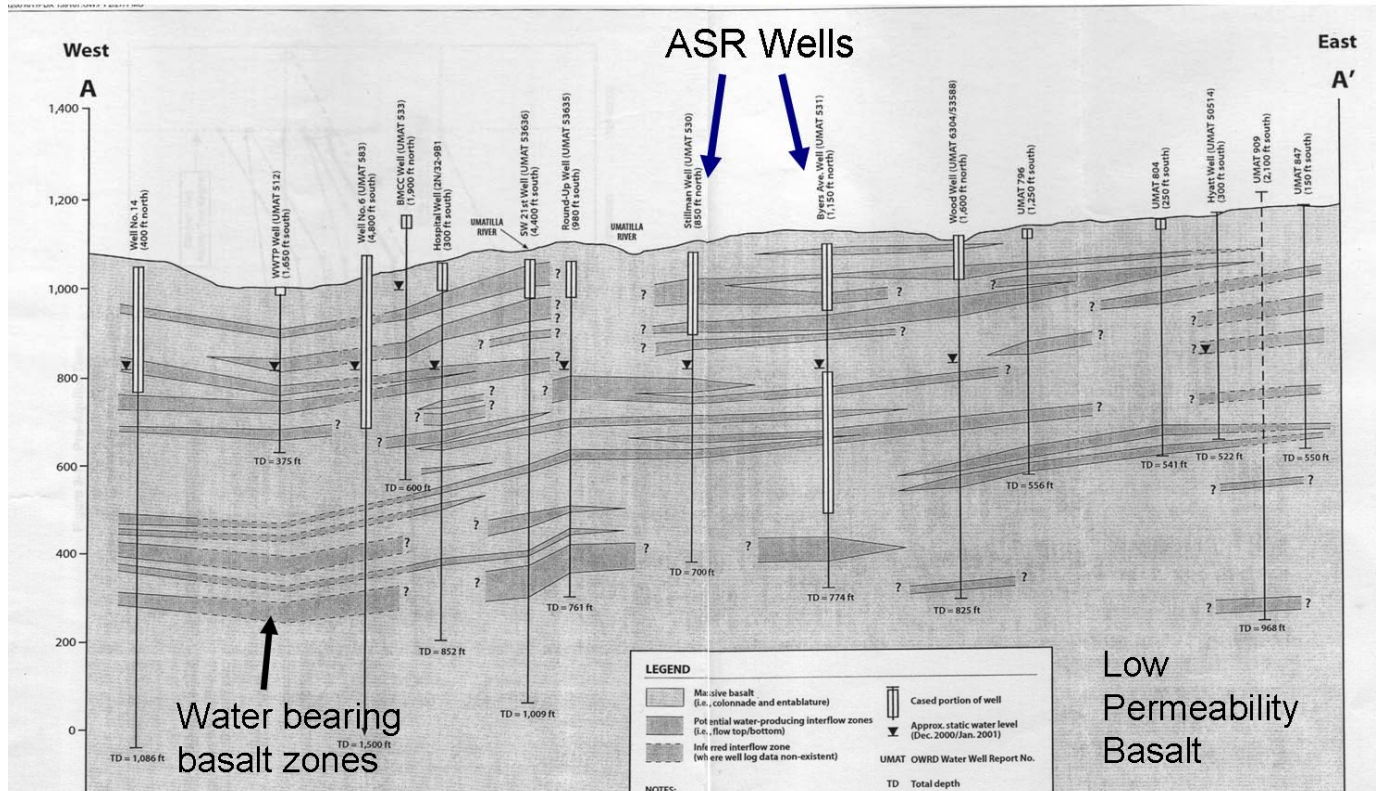


- Pendleton obtained an ASR limited license in 2003.
- **Source Water:** Umatilla River water is processed by microfiltration and chlorination at the city water treatment plant before injection. ASR wells are integrated into the municipal supply system, and controlled from the city water treatment plant. Periods of excess capacity in the treatment plant and distribution system allow injection into the ASR wells, and likewise recovery as needed.



- **Aquifer:** Water is stored in the Columbia River Basalt. This unit is often suitable for ASR because it contains highly permeable interflow zones layered between low permeability sections.

Pendleton ASR Geologic Cross Section

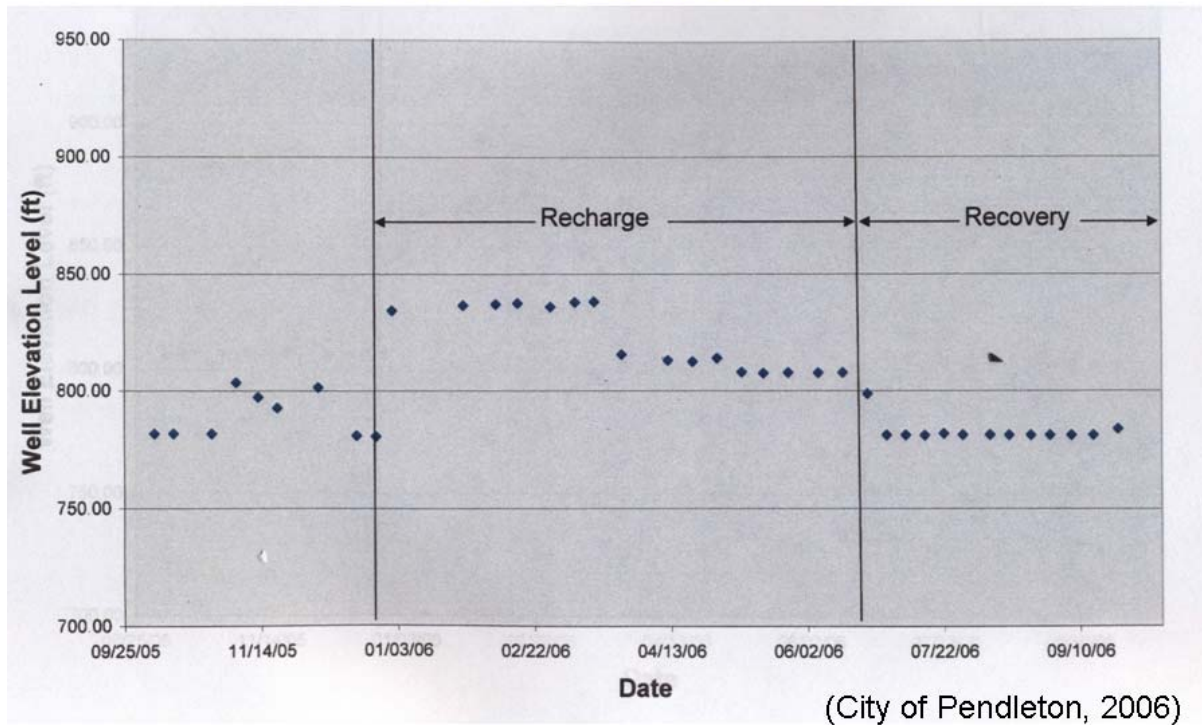


(CH2M Hill, 2002)

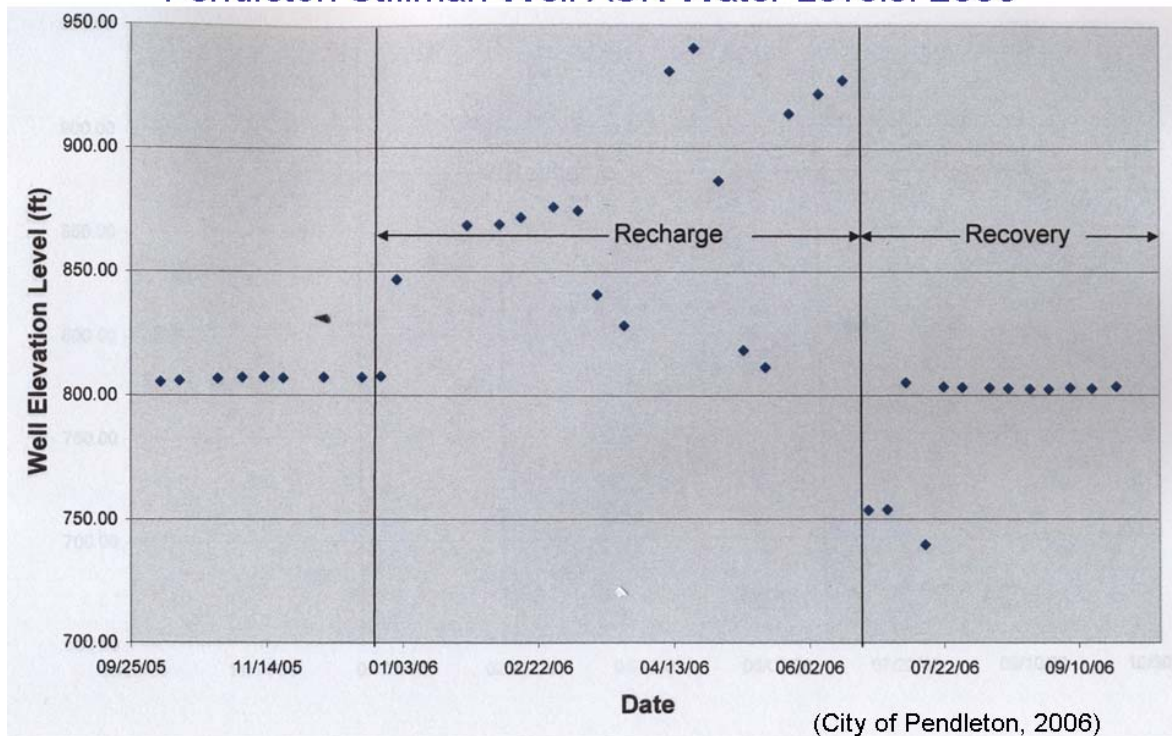
A conceptual model of the geology in Pendleton illustrates the complex basalt and interflow zones that are influenced by ASR wells.

- ASR:** The project injects from 6 to approximately 500 million gallons per year, and recovers up to about 450 million gallons per year through 2 or 3 wells. This project provides supplemental summer water supply to the municipal system. Pendleton ASR has experienced some decrease in well performance attributed to air entrainment in the injected water at one well. This means that air bubbles contained in the injection water adhere to the well or aquifer matrix, decreasing its ability to transmit water.

Pendleton Byers Well ASR Water Levels: 2006



Pendleton Stillman Well ASR Water Levels: 2006



Hydrographs at two Pendleton ASR wells illustrate water level response to recharge and recovery activities.