

# Geology

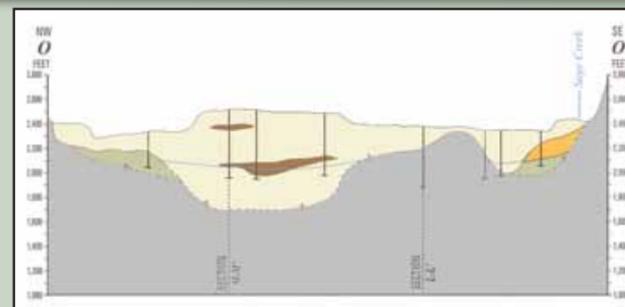
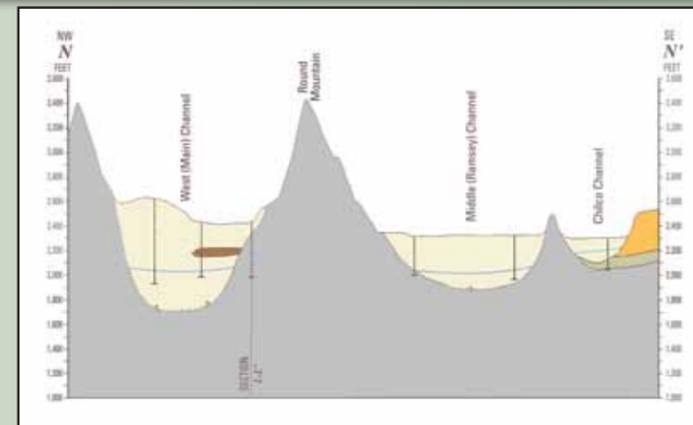
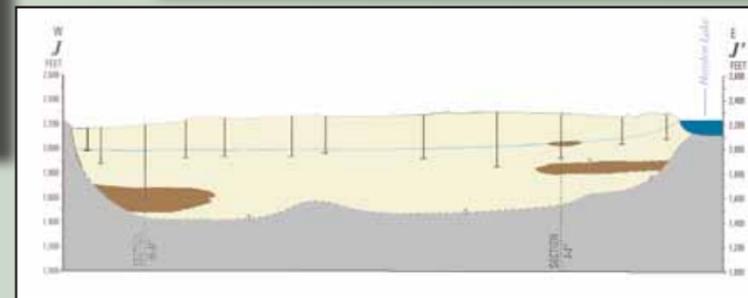
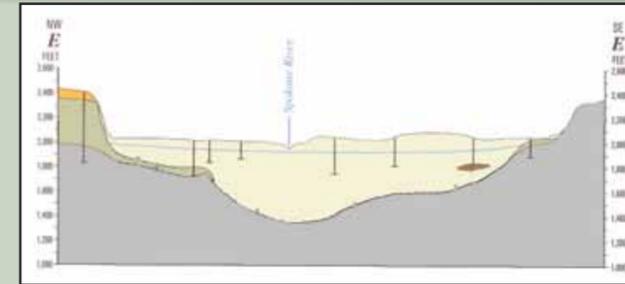
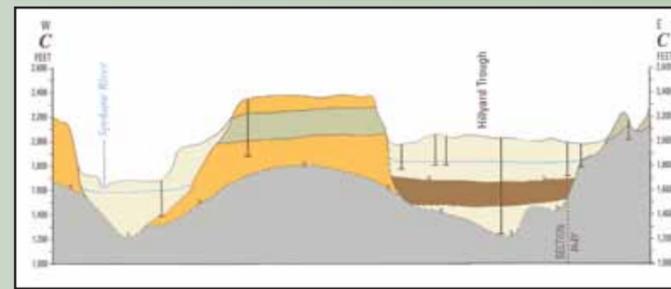
Several geologic regimes come together near and over the Spokane Valley-Rathdrum Prairie Aquifer, creating a richly varied and interesting geologic setting. The geologic history of this area includes ancient mountain building, spectacular basalt lava flows, and some of the largest known glacial outburst floods. The map on the opposite page provides a visual description of the surface geology of the Aquifer area.

Throughout the Idaho Panhandle and the mountains around the Spokane Valley of Washington, the Belt Formations of Proterozoic sedimentary rocks dominate the geologic landscape. These rock formations were named after the Belt Mountains of central Montana, where they were first studied. The Belt Formations of Idaho and Washington consist mostly of mudstones and sandstones in somber shades of gray and brown, along with some pale gray limestone. Ripple marks are preserved in many of the mudstone and sandstone layers of the Belt Formation rocks, indicating these rocks were likely deposited in a shallow marine environment. Throughout northern Idaho the

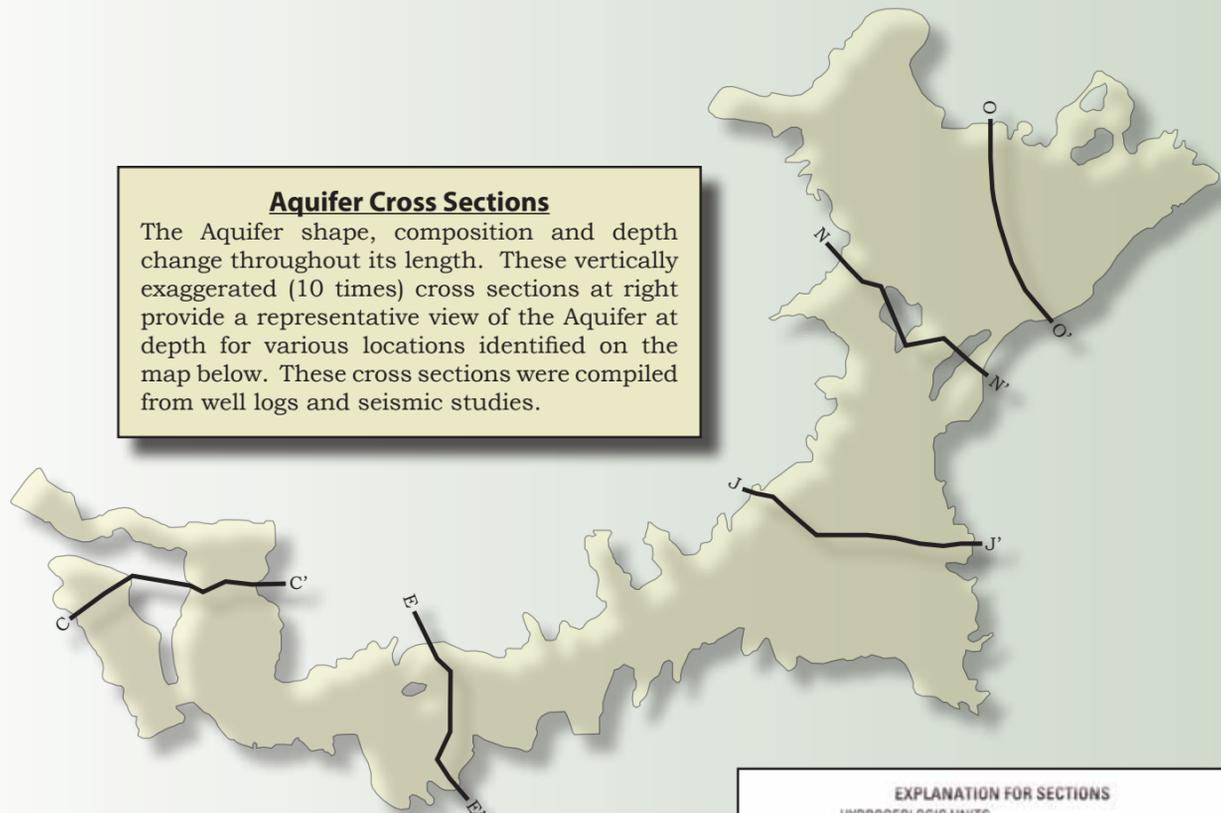
Belt Formations contain intruded layers (or sills) composed of diabase, a black igneous rock with the composition of ordinary basalt. These sills were formed as molten magma squirted between layers of sedimentary Belt rock forming a layer of igneous rock. The Precambrian Belt Formation also contains metal minerals (of silver, lead, and gold) in hydrothermal vein deposits, a valuable resource for the region. The placement of these valuable mineral deposits is associated with the mountain building continental plate collisions that created the Rocky Mountains.

Spokane and Coeur d'Alene are situated on the eastern edge of the Columbia Plateau. Many of the largest basalt flows in the Columbia Plateau erupted about 135 miles southwest of the Aquifer. Extraordinarily fluid lava flows extended northward past the present location of Spokane and into Idaho. The remnants of these flows are found in and around the Spokane Valley. Basalt is a dense dark rock with very fine crystals, and it sometimes has a unique hexagonal (six-sided) column-like appearance. The Columbia basalts in the Spokane-Rathdrum valley were eroded prior to the formation of the Aquifer, and now only the western portion of the Aquifer lies on Columbia basalts.

Cross-Section Vertical Exaggeration X 10



**Aquifer Cross Sections**  
The Aquifer shape, composition and depth change throughout its length. These vertically exaggerated (10 times) cross sections at right provide a representative view of the Aquifer at depth for various locations identified on the map below. These cross sections were compiled from well logs and seismic studies.



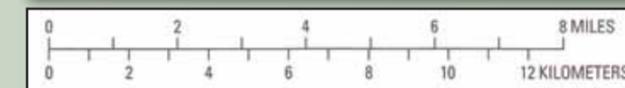
**EXPLANATION FOR SECTIONS**

**HYDROGEOLOGIC UNITS**

- Spokane Valley-Rathdrum Prairie; brown denotes fine-grained layers within aquifer
- Basalt and fine-grained interbeds unit; orange denotes basalt, green denotes fine-grained interbed
- Bedrock unit and undifferentiated deposits

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— WATER TABLE --Approximate position in Spokane Valley-Rathdrum Prairie aquifer (modified from Campbell, 2005)



# Geologic Map Key

