
Basalt Maps Introduction

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To date, the GWMA subsurface geologic mapping effort has focused on the uppermost CRBG units underlying the GWMA, the Saddle Mountains and Wanapum Basalts. Ongoing, and soon to be completed efforts are mapping the next deeperst unit, the Grande Ronde Basalt. Saddle Mountains Basalt and Wanapum Basalt maps are currently included on the website. Grande Ronde Maps will be added as that work is completed. At this time only the top of the Sentinel Bluffs Member of the Grande Ronde Basalt was mapped for this study. Stratigraphic nomenclature of the CRBG Saddle Mountains Basalt

Saddle Mountains Basalt members mapped within the GWMA to-date are, from youngest to oldest, the:

- Ice Harbor Member which consists of up to 4 flows in the GWMA.
 - Elephant Mountain Member which consists of up to 2 flows in the GWMA.
 - Pomona Member which consists of a single flow in the GWMA.
 - Esquatzel Member which consists of a single flow in the GWMA.
 - Asotin Member which consists of a single flow in the GWMA.
 - Wilbur Creek Member which consists of 2 flows in the GWMA.
 - Umatilla Member which consists of up to 2 flows in the GWMA. The Saddle Mountains Basalt is not found everywhere beneath the GWMA. It is most widespread in the southwestern portion of the GWMA (Franklin and Grant Counties) – generally south of the Frenchman Hills. In Adams and eastern Franklin Counties, Saddle Mountains Basalt members occur as intracanyon flows that filled paleoriver channels incised into underlying CRBG units. Wanapum Basalt
- Wanapum Basalt members mapped within the GWMA to-date are, from youngest to oldest, the:
- Priest Rapids Member which consists of up to 3 flows in the GWMA.
 - Roza Member which consists of up to 4 flows in the GWMA.
 - Frenchman Springs Member which consists of up to approximately 15 identified flows in the GWMA. Originally flows of the Wanapum Basalt covered nearly the entire GWMA, except in northern Grant County area where pre-CRBG rocks formed local highlands that were not buried by these flows. The Eckler Mountain Member of the Wanapum Basalt is known to be present in eastern Franklin County, but its distribution has not been mapped. In this area the Eckler Mountain Member is described as consisting of up to 2 flows of the Basalt of Dodge. Due to the lack of available mapping, and the difficulty in distinguishing Eckler Mountain flows from Frenchman Springs Member flows on driller's logs, these 2 flows have been included into the Frenchman Springs Member for this study.
- Data Sources
- The maps produced for this study were built from information found in a variety of data sources describing both surface and subsurface geologic conditions. The largest data source used for the study consists of driller's descriptions of geologic materials encountered during water well drilling. This information is recorded on Water Well Reports (driller's logs). Additional data sources included borehole geologic logs compiled by geologists for various projects, borehole geophysical logs which have been collected for a number of municipal water supply wells and large private irrigation wells, geologic maps compiled for the region and for specific areas, and regional and local geologic cross-sections. Specific entities and agencies from which these materials were collected include:
- Washington Department of Ecology (WADOE): The WADOE Eastern Region office in Spokane, Washington, is the primary source for driller's logs for the GWMA area. Electronic copies of the driller's logs were provided by WADOE as .jpg files on CD ROMs. These driller's log-files were printed and sorted by Township/Range by consulting team staff. FCD staff provided paper copies for most all driller's logs for wells in Franklin County and for all wells used as GWMA water quality sampling locations.
 - U.S. Bureau of Reclamation (USBR): USBR records provided geologist logs for several hundred geotechnical borings and water wells drilled in the region. These records included both copies of original interpreted logs maintained in USBR archives and records.
 - Hanford project files: Consulting team staff had access to personal files and records kept during previous work at the Hanford Site. These files and records include geologist well logs and outcrop logs for a number of locations in, and near, the GWMA. These data are commonly supplemented by geochemical data providing additional information on basalt unit identification.
 - Washington State University (WSU): During the late 1960's and 1970's, the WSU Engineering Department geophysical logged a number of municipal and irrigation water wells located throughout the eastern Washington region. Geophysical logs for wells within the GWMA were identified and served as an additional source of subsurface data for use in this study.
 - Published geologic maps and cross-sections: Available geologic mapping in the GWMA served to provide constraints on geologic unit identification, interpreting geologic unit thicknesses and pinchouts, and determining the presence and magnitude of faults and folds. The majority of the geologic maps used in this study were published by the U.S. Geological Survey or the Washington Division of Geology and Earth Resources. See Appendix A for a complete listing and citations for the geologic maps used in this study. In addition to the data sources listed above, personal files and knowledge provided an important source of information. Mr. Tolan and Mr. Campbell's private data files were used extensively during the project. Dr. Stephen P. Reidel, L.H.G., of Benton City, Washington also contributed geologic logs and information from his personal files that