A Groundwater Model for the Meadow Village Alluvial Aquifer, Big Sky, Gallatin County, Montana

Kirk B Waren[1], James C Rose[1]

[1]Montana Bureau of Mines and Geology

Steady state and transient groundwater flow models are being developed to evaluate how groundwater pumping from the Meadow Village Aquifer in Big Sky, Montana affects the groundwater system and discharge rates in the West Fork Gallatin River. This aquifer, located beneath the Big Sky Golf Course, is the source for five municipal wells that provide water for the Big Sky Water and Sewer District, the primary public water supply for the resort. To construct the model, extensive groundwater and surface water data were collected from 2013-2016. Drilling defined the geometry of the shale that underlies the alluvial aquifer. Groundwater elevations, stream flow and stage monitoring of the West Fork Gallatin River, local weather station data, well pumping volumes, and golf course irrigation data provided information to develop the conceptual model. Groundwater modeling has yielded a more refined understanding of the geometry of the aquifer and its interaction with the West Fork Gallatin River. The models will be useful for water conservation, projecting the effects of increased demands from the aquifer, and guiding management efforts at Big Sky Resort.