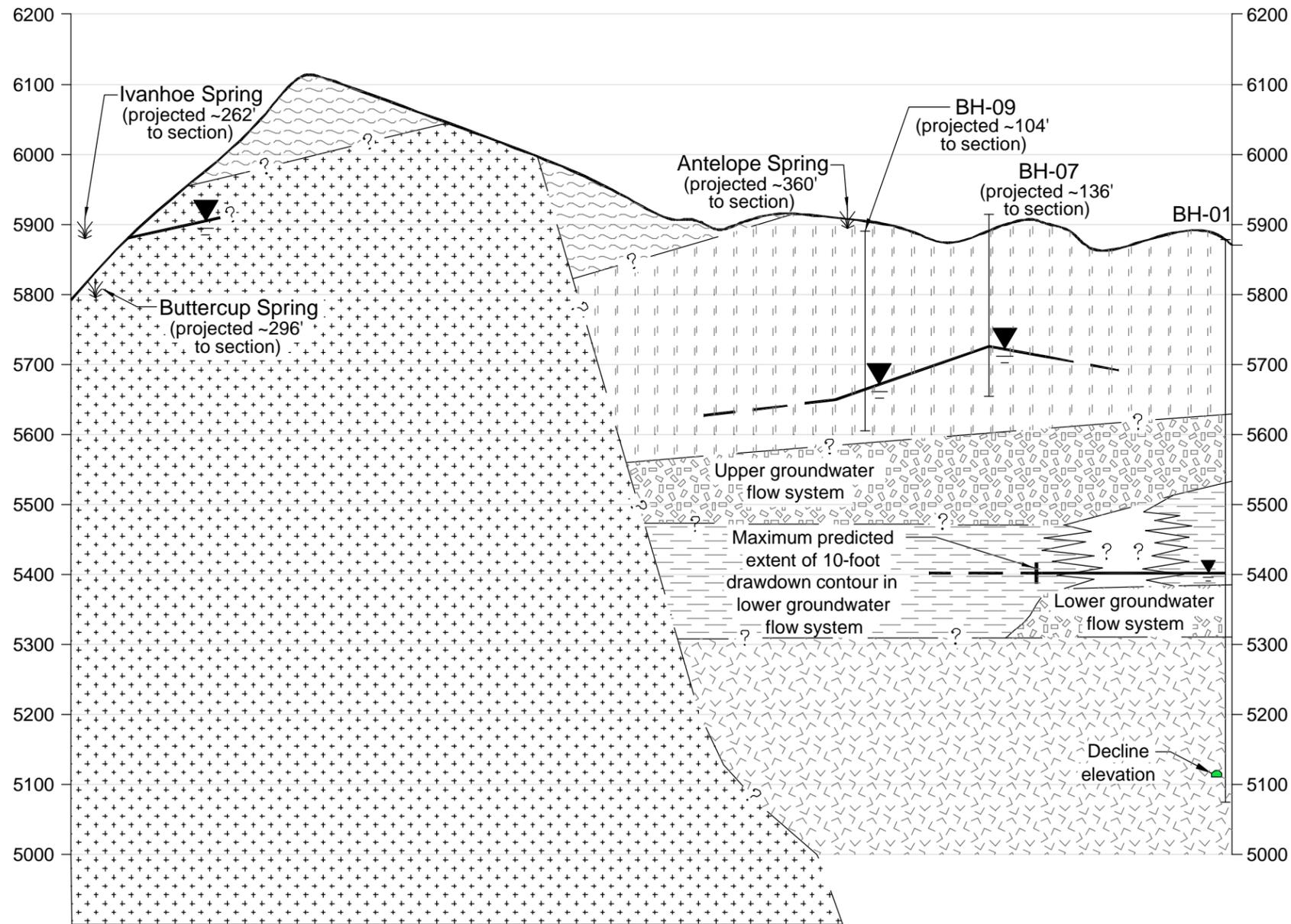


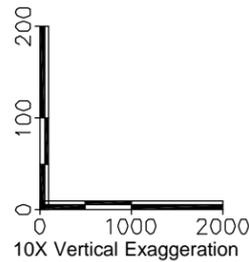
Explanation

- Carlin Formation
- Big Butte Rhyolite
- Upper Tuff
- Basaltic Andesite
- Clay Zone/Lower Tuff (from exploration and piezometer drilling)
- Valmy Quartzite
- Water table in Tertiary Volcanic units
- Potentiometric surface in Valmy Formation
- Unproven Boundaries



No effects to Buttercup and Ivanhoe Springs because:

- The elevations of Ivanhoe and Buttercup springs, and hence the minimum elevation of the aquifer supplying the springs, are between 5800 and 5900 feet above mean sea level, which is approximately 500 feet above the piezometric surface of, and distinct from, the regional groundwater system at this location;
- The elevations of Ivanhoe and Buttercup springs are over 400 feet higher than the lower groundwater flow system in the area of the proposed decline, and 100 to 200 feet higher than the upper groundwater system identified at BH-07 and BH-09, indicating that the aquifer supplying the two springs is distinct from the aquifer system in the project area;
- Discharge at Ivanhoe and Buttercup springs occurs from a flow breccia capped by a glassy lava flow originating from the rhyolite flow dome of Big Butte, suggesting that the groundwater supplying Ivanhoe and Buttercup springs is released precipitation storage from the upper portion of Big Butte and/or the surrounding rhyolite dome complexes;
- There is a distance of approximately three miles from proposed decline to Ivanhoe and Buttercup Springs, including over one mile across the dense, relatively impermeable rhyolite flow dome of Big Butte;
- Projected groundwater extraction rates are limited, and the modeled 10-foot drawdown contour (within the regional aquifer) does not extend as far as Big Butte; and,
- A hydraulic boundary condition (i.e., aquitard) exists between the Valmy Formation and the overlying Tertiary volcanic units, resulting from the clay-rich nature of the contact zone, that would prevent dewatering effects in the Valmy Quartzite (regional aquifer) from being transmitted to the groundwater flow system in the volcanic units.



**FIGURE 9
HYDROGEOLOGIC
CROSS-SECTION**

DATE DRAWN: 2/05/04 LAST REVISED: 2/11/04