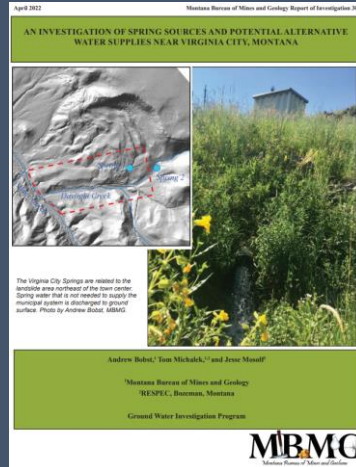


An Overview of the Virginia City Groundwater Investigation

Andy Bobst, Tom Michalek and Jessie Mosolf



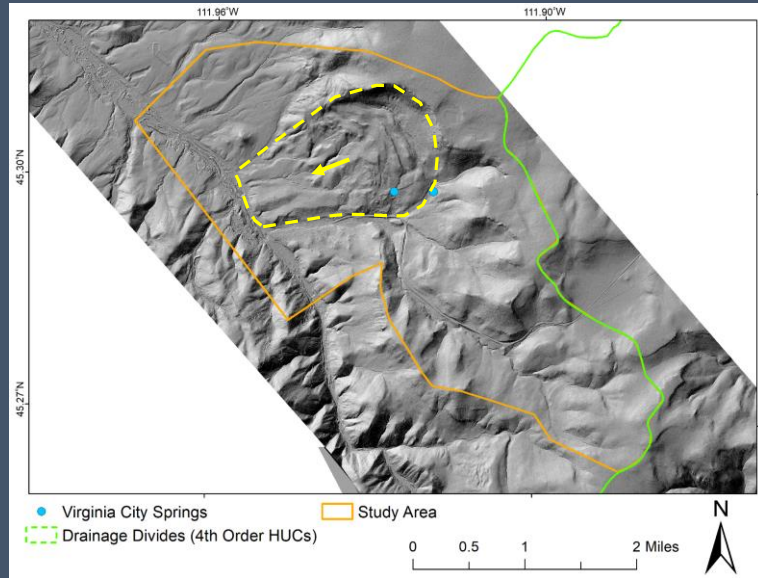
6/2/2022

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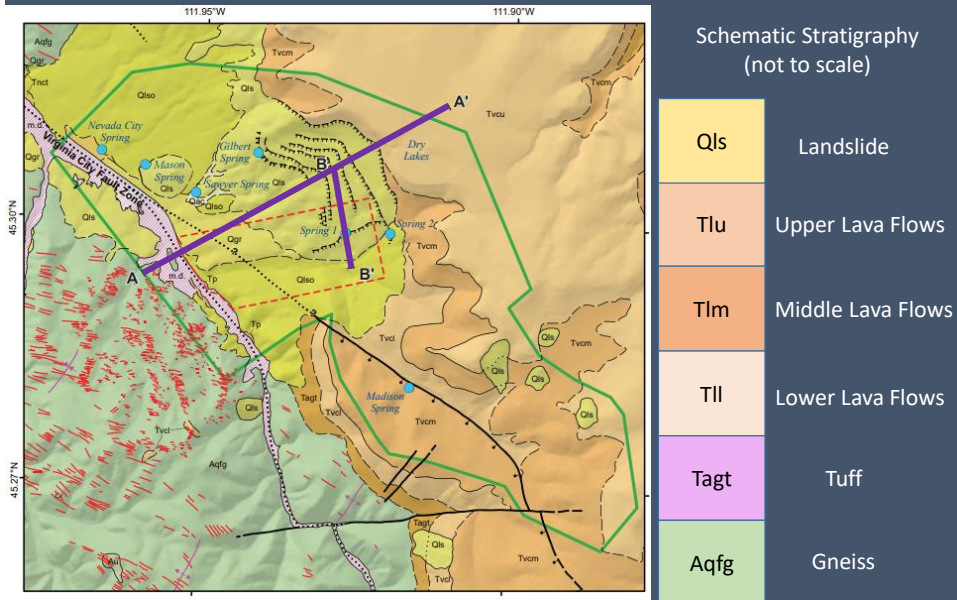
Objectives

1. Understand the sources of Spring 1 and Spring 2.
2. Evaluate the potential impacts of residential and commercial development on Virginia City's springs.
3. Evaluate potential supplemental water sources.

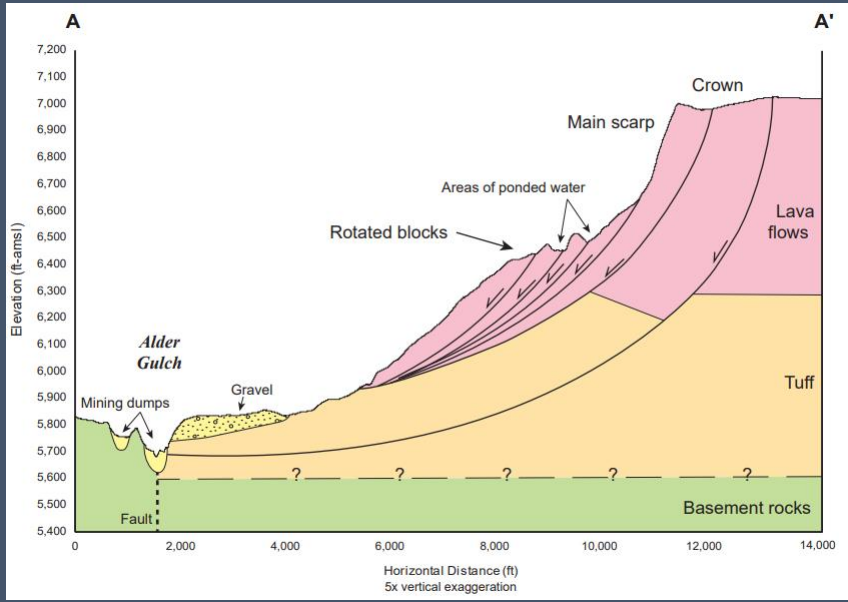
Geomorphology - LiDAR



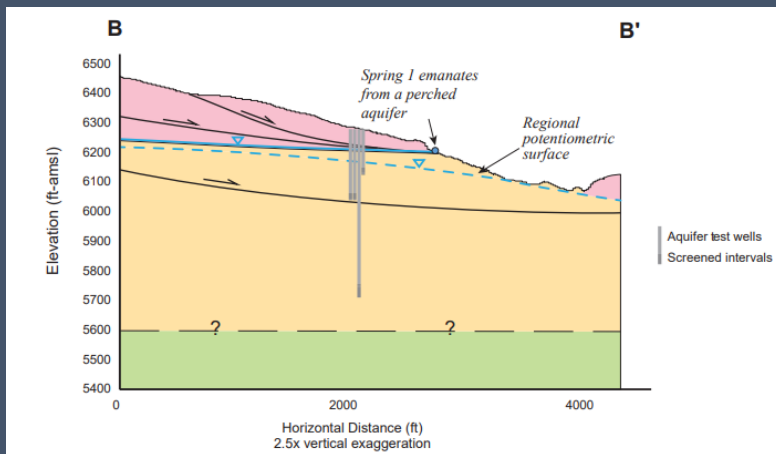
Geologic Mapping (Mosolf, 2021; GM80)



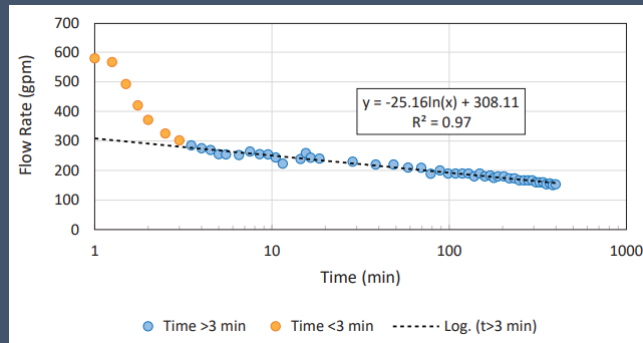
Schematic Cross Sections



Schematic Cross Sections

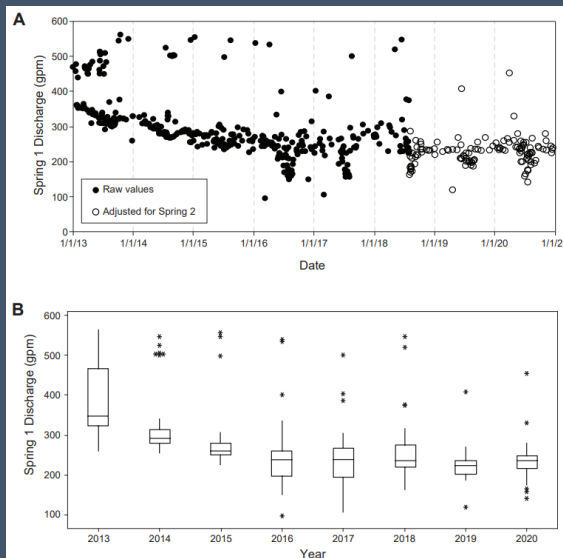


Spring 1 Flow Rates – 6.6 hr Test

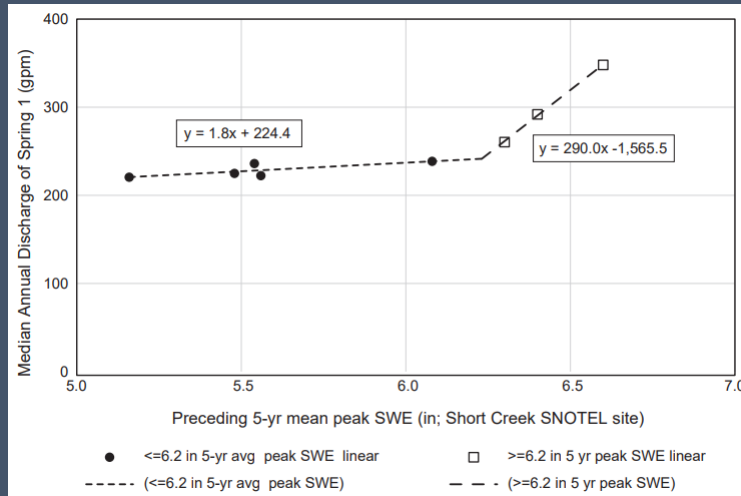


- Flows from 579 to 150 gpm during a single tank-filling cycle.
- Logarithmic decline with time

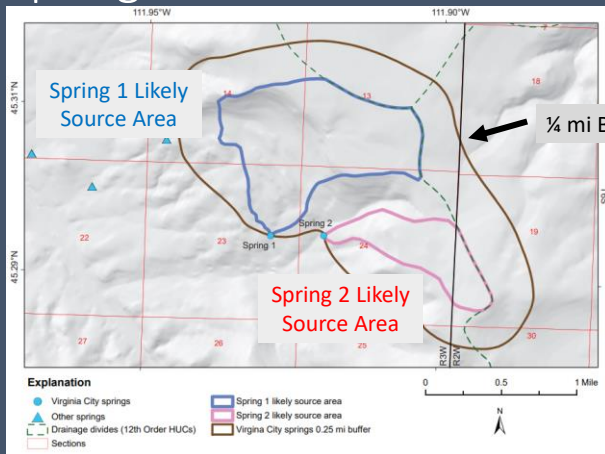
Spring 1 Flow Rates - Based on Water Operator Records



Spring 1 Flow Rates - Median annual flow vs. 5-yr average peak snowpack



Spring Source Areas



Based on geomorphology, geology, and locations of other springs

Spring 1
 Source area = 548 acres
 20" of precipitation per year
 ~35% of precipitation to get 200 gpm

Spring 2
 Source area = 206 acres
 20" of precipitation per year
 ~24% of precipitation to get 50 gpm

Susceptibility of Spring 1 and Spring 2 to Domestic or Commercial Development

- Perched Springs, so generally separate from regional flow systems that would be pumped by wells
- Spring 1 has storage in fracture zones, and pumping from those zones could decrease flows
- Fed by infiltration through fractured bedrock, so susceptible to infiltration of septic effluent, and spills

Supplemental Water Supplies Physical Availability

- Madison Spring ~ 30 gpm
- Gilbert Spring ~ 50 gpm
- Alder Gulch ~ 150 gpm
- Well in Alder Gulch Alluvium ~120 gpm
 - More speculative