



Drilling and Testing of Faulder Well 2

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Regional District of Okanagan-Similkameen
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Outline

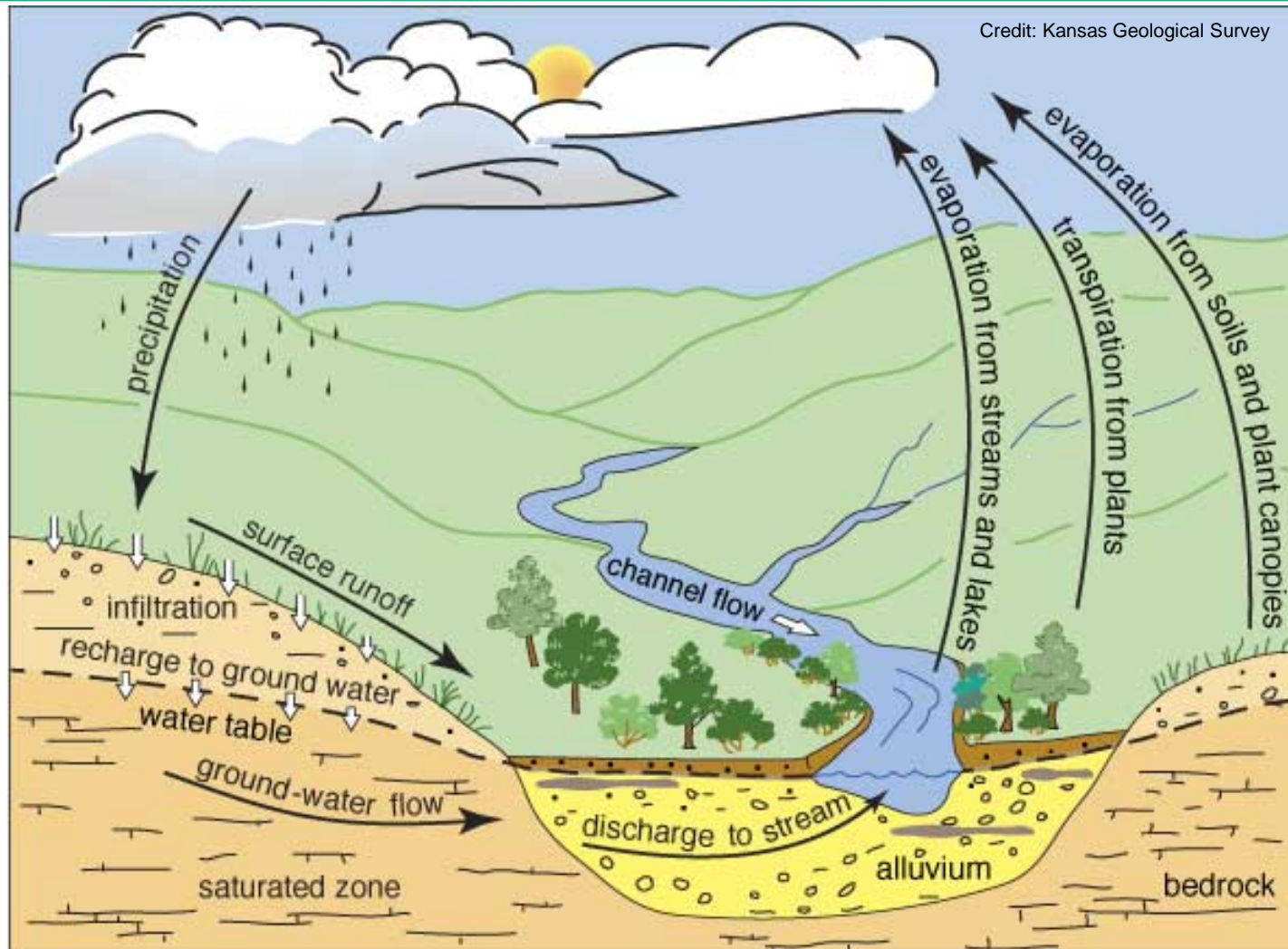
- Hydrogeology Introduction
- Site Setting
- Drilling Well 2 (THE ACTION!)
- Testing and Results





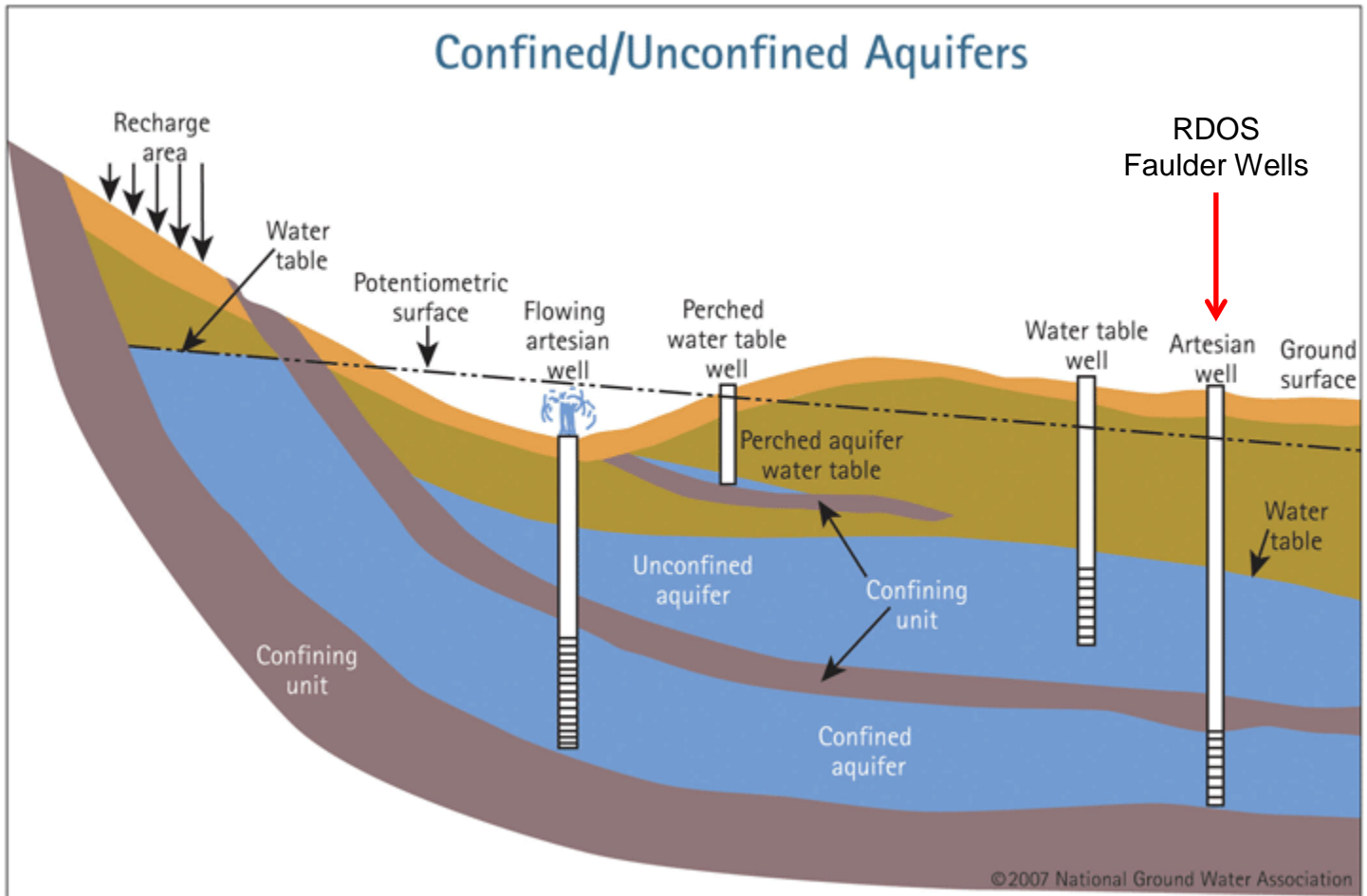
Hydrogeology Introduction

The Water Cycle





Aquifers and Wells

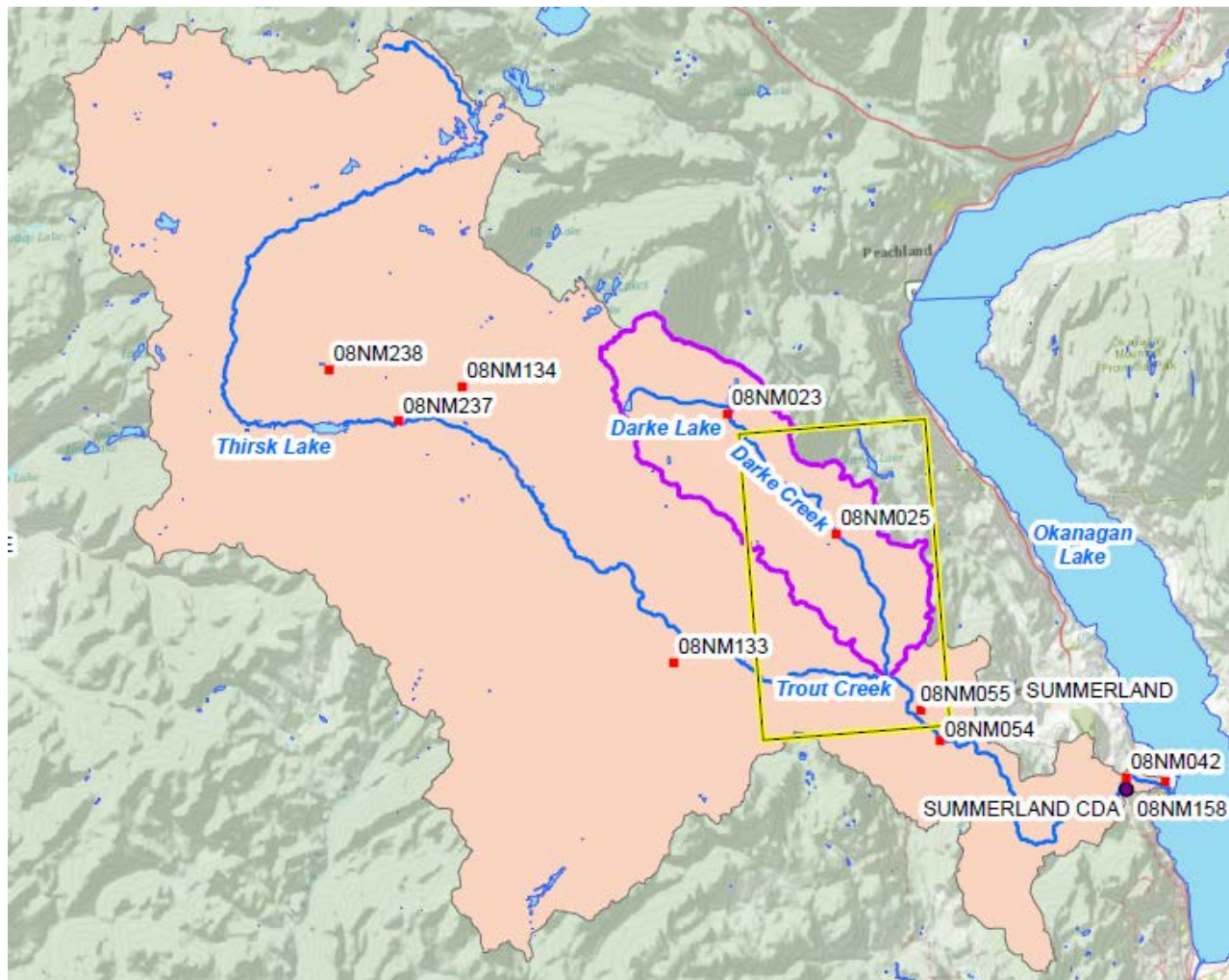




Site Setting

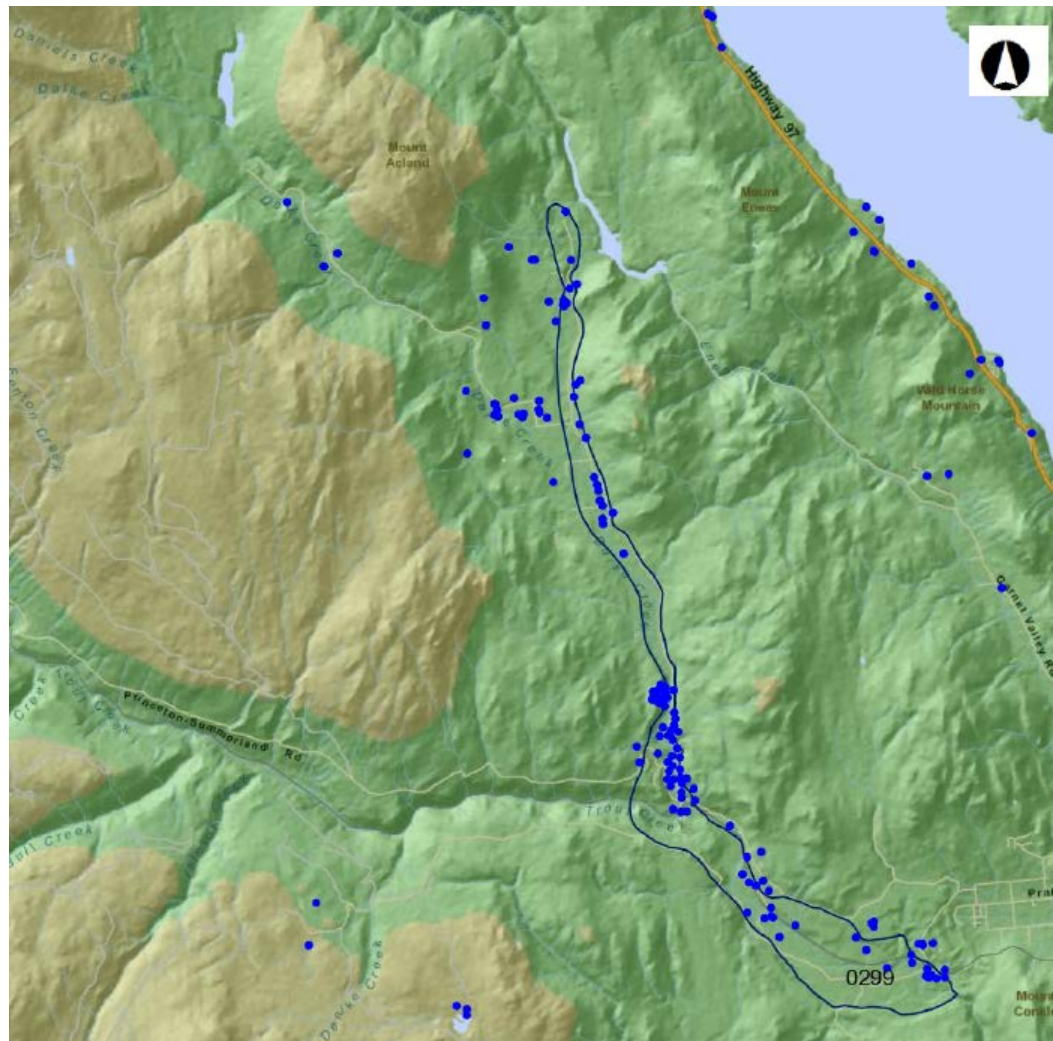


Watersheds





Aquifers and Wells



0 1.93 3.86 km
1: 95,000

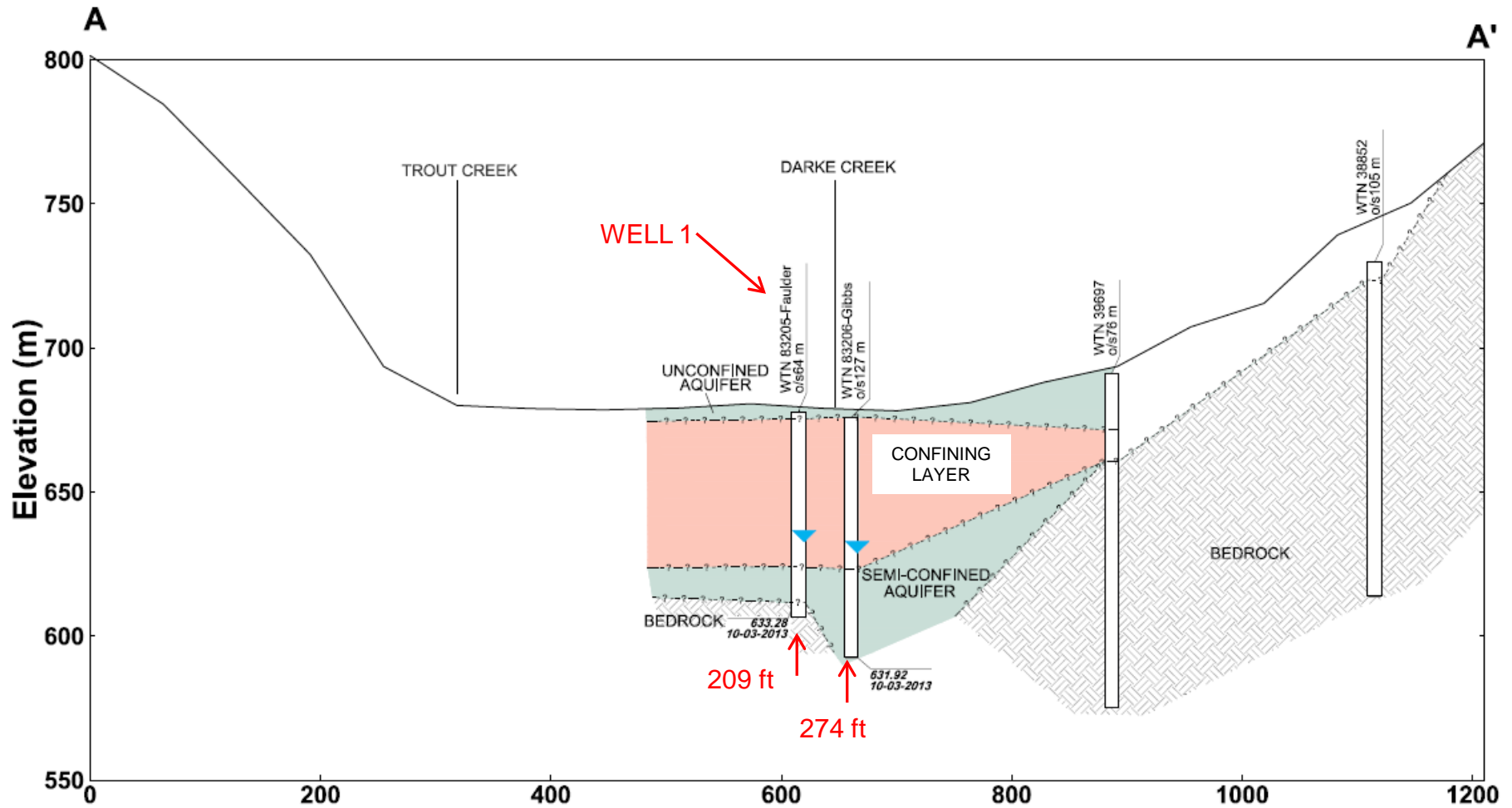


Faulder Hydrogeology - Cross Section SW-NE



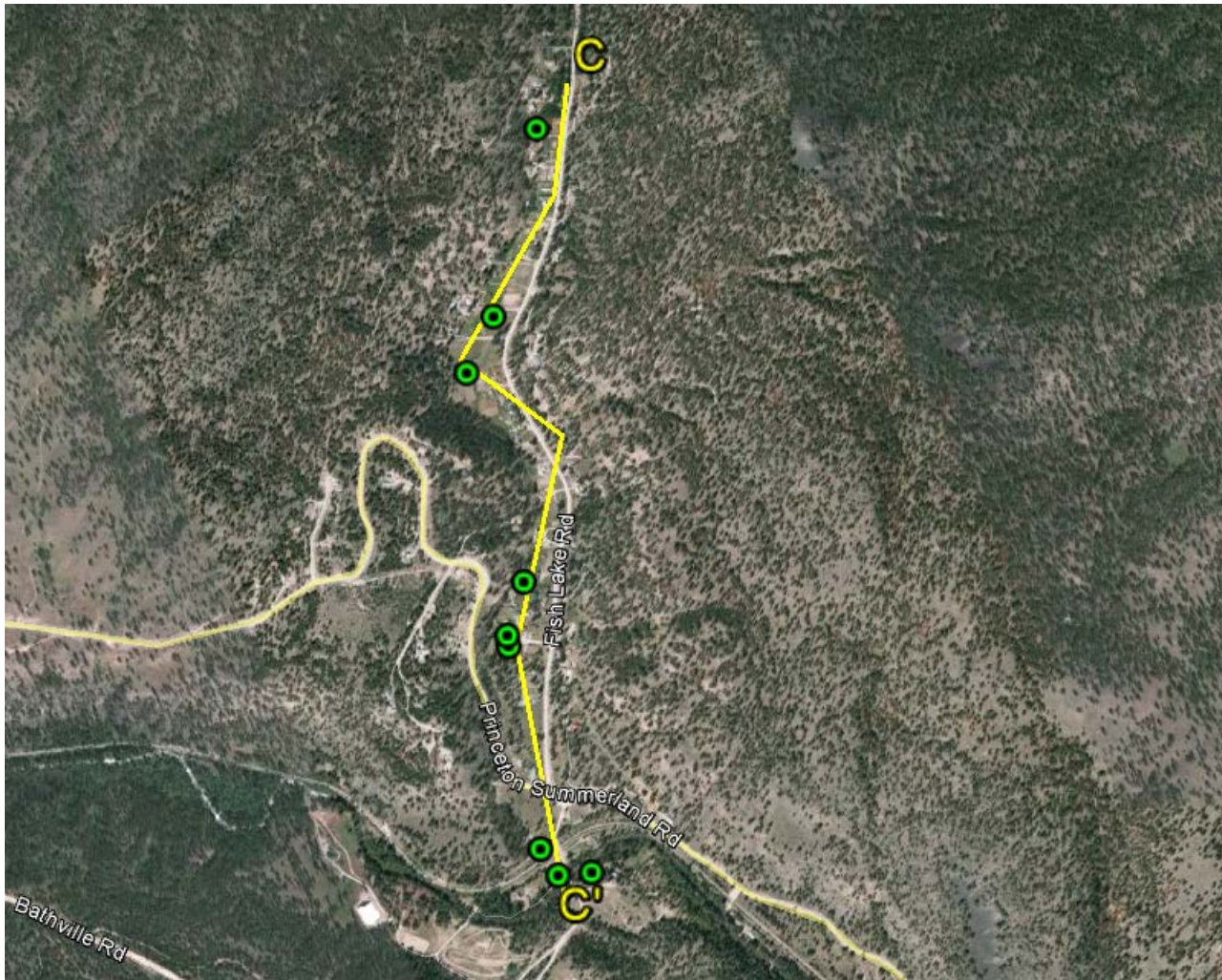


Faulder Hydrogeology - Cross Section SW-NE



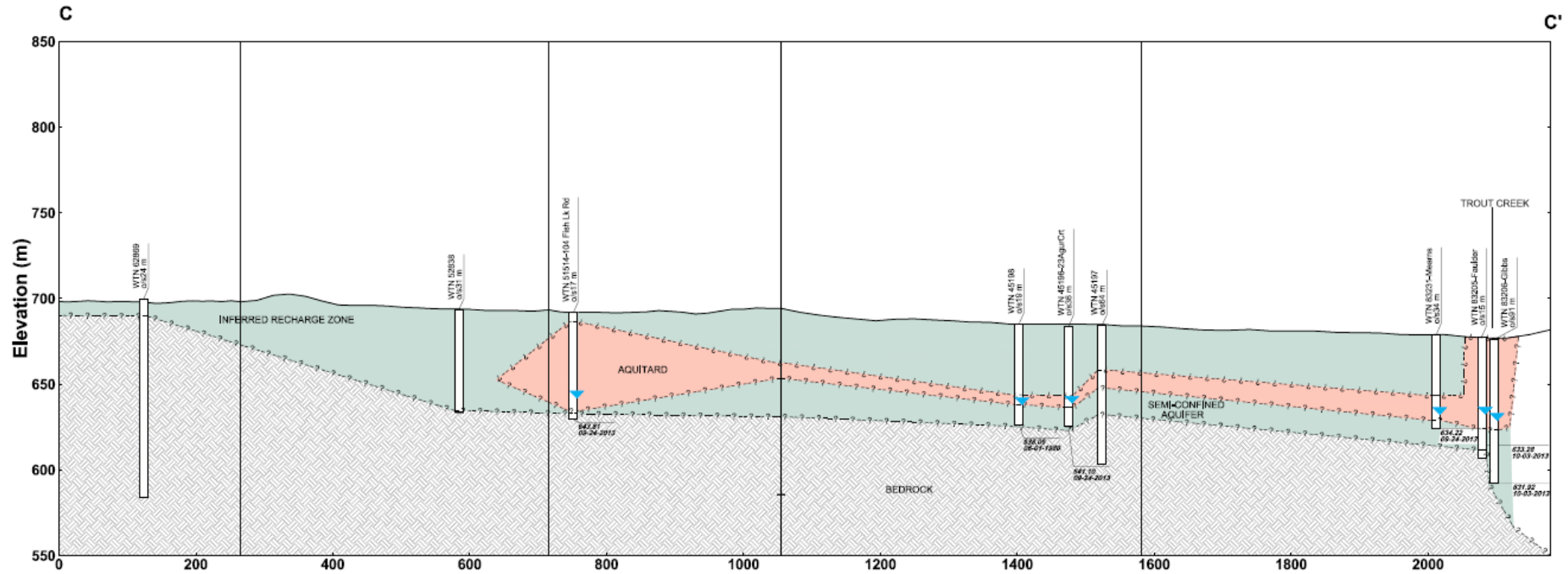


Faulder Hydrogeology - Cross Section N-S



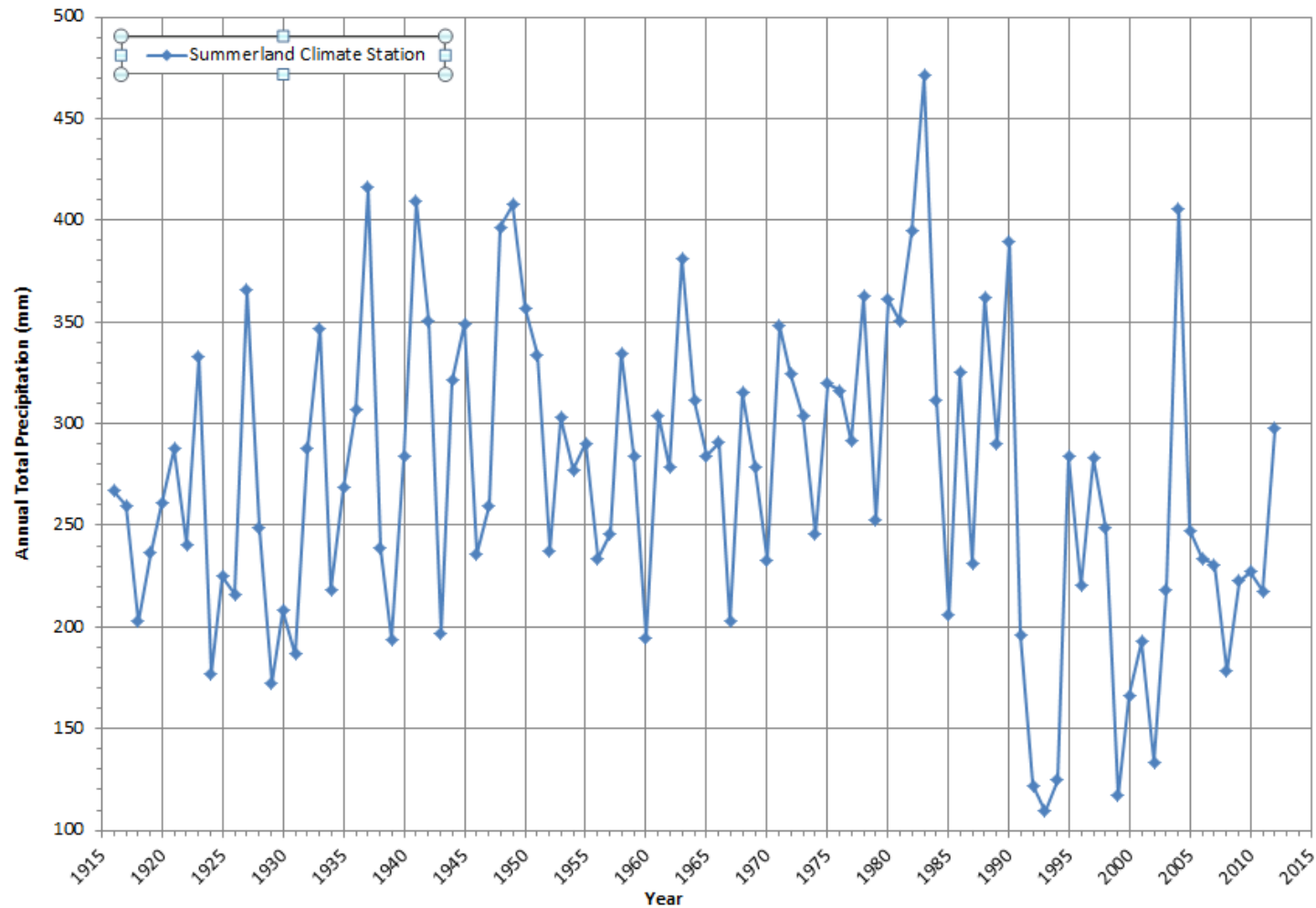


Faulder Hydrogeology - Cross Section N-S



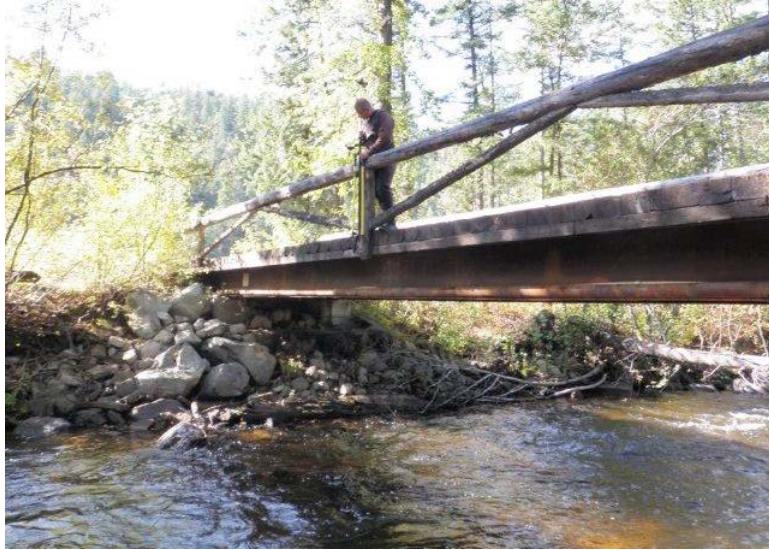


Water Balance: Annual Precipitation



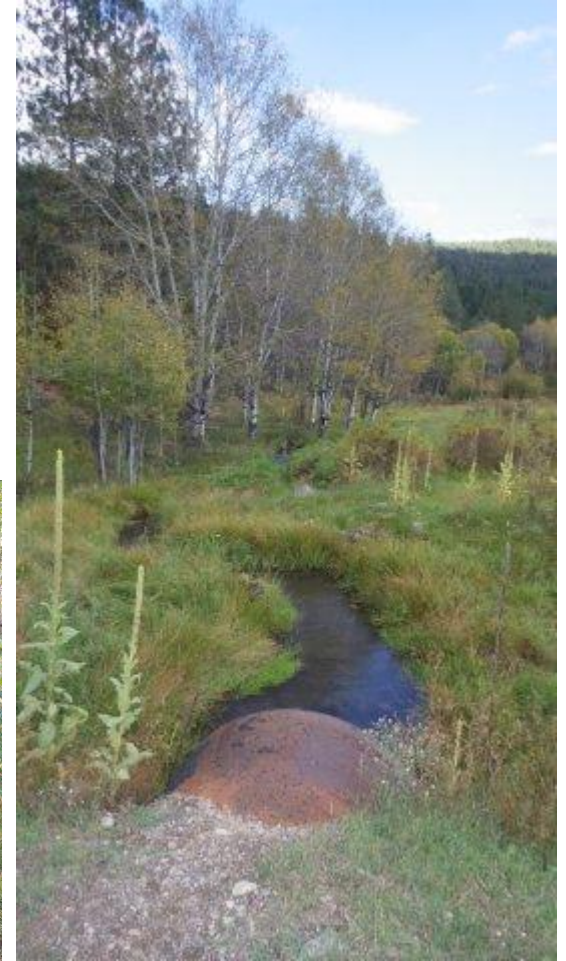


Water Balance: Stream Flow



Trout Creek

Darke Creek



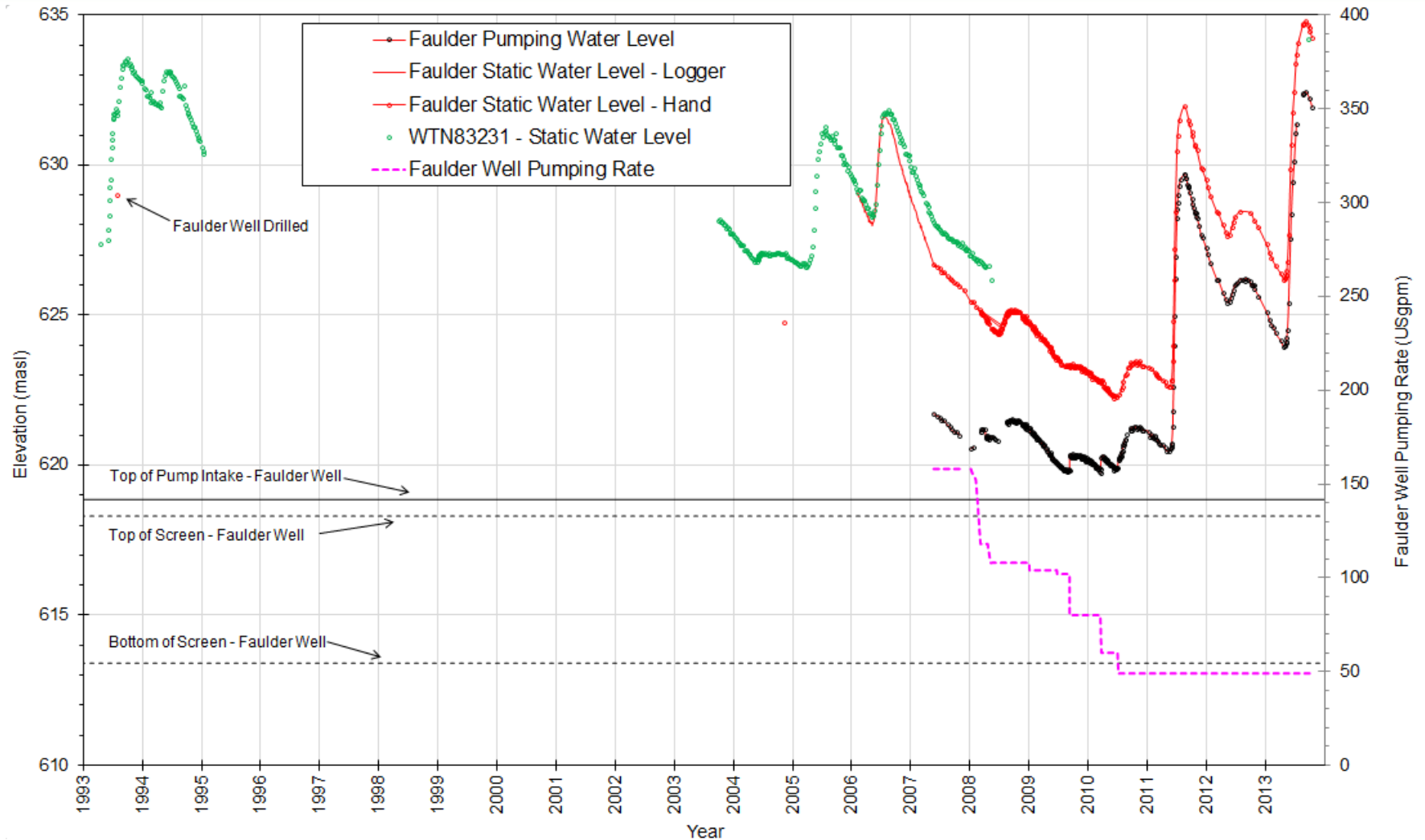


Water Balance: Well Pumping





Groundwater Levels





Drilling Faulder Well 2



Preparation





Setting Up



February 4, 2016

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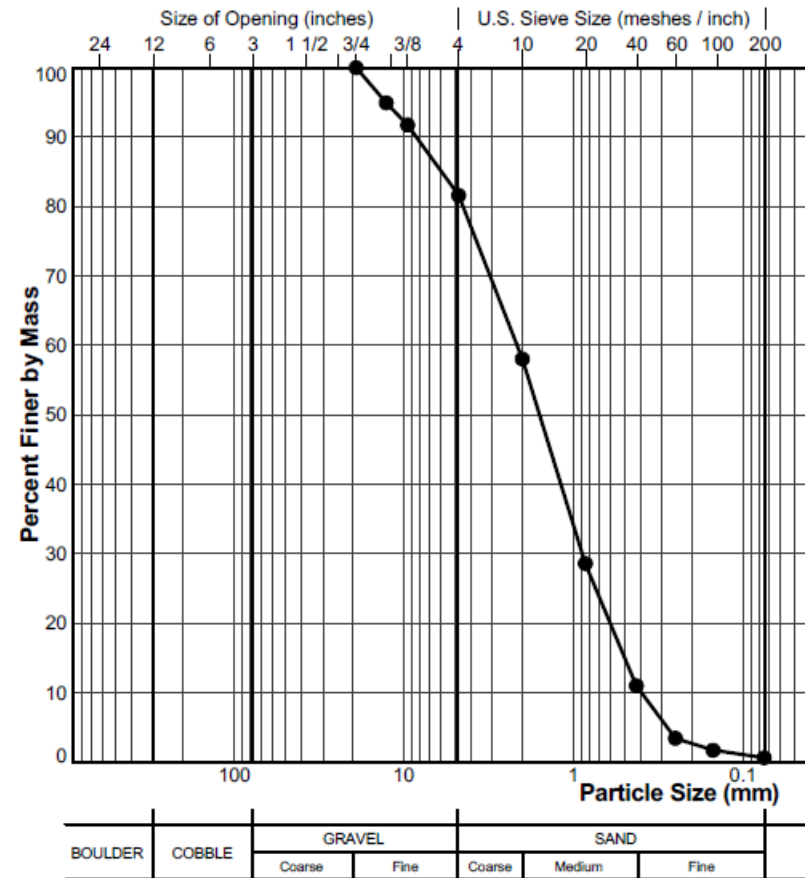


Drilling





Soil Sampling and Screen Design



Screen slot size (60 slot) was designed to retain 45% to 55% of aquifer sediments



Screen Installation



2 sections (10 ft or 3 m) of 60 slot 8 inch telescopic screen set to a depth of 306 ft (93.3 m). Bedrock encountered at 309 ft (94.2 m) below top of the drill pad.



Testing and Results

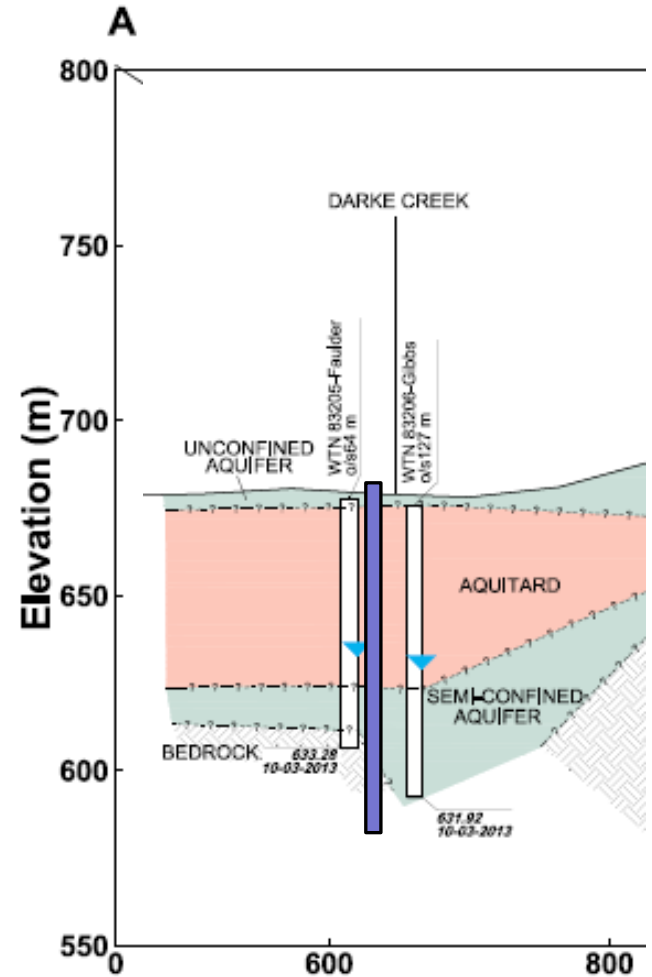


Drilling: Results



Developed to sand-free condition

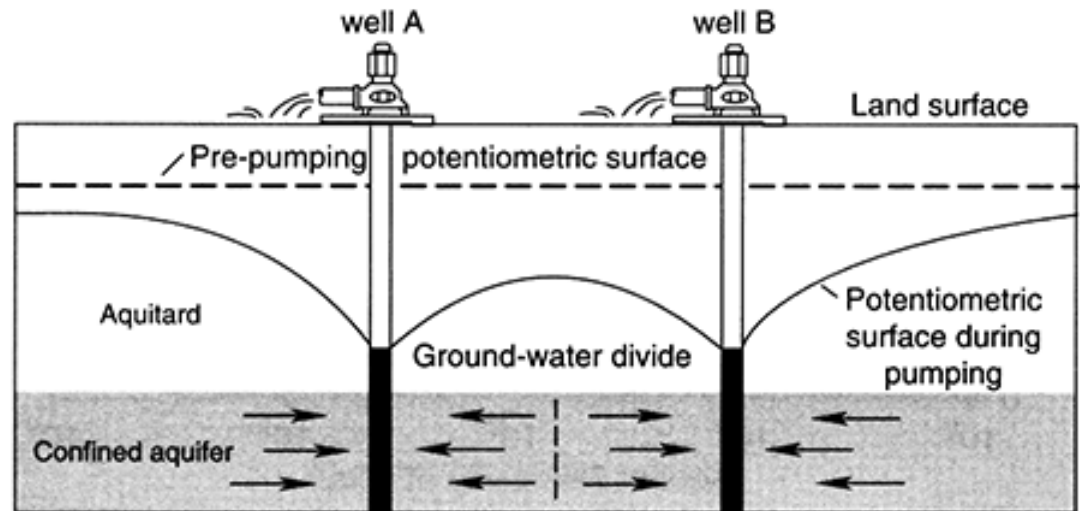
Well completion depths:
Well 1: 209 ft below ground
Well 2: 306 ft below drill pad
(Well 2 is 94 ft or 28.7 m deeper than Well 1 on an elevation basis)





Testing: FW2 Pumping Test and Sampling

- Pumped for 3 days continually
- Tested for well interference
- Rated at 160 US gpm (10.1 L/s) or original rate of Well 1
- Water quality similar to Well 1





Conclusions

- The aquifer is confined in the area of FW2 and has a thickness of 35 m (115 ft). The middle portion of the aquifer was finer grained and produced less water during drilling. Bedrock was encountered at 94.18 mbg (309 ft) bgs.
- The well screen design was based on the results of sieve analyses and consisted of 3 m (10 ft) of 60 slot installed within the coarser aquifer material located 90-93 m (295-305 ft) bgs.
- The well capacity is rated at the tested rate of 10.1 L/s (160 US gpm). This is equal to the target design rate for the Faulder community water system, which is based on continual pumping at a rate equal to the historical summer maximum daily demand.
- Little to no mutual well interference was observed between FW2 and FW1, or the other monitored observation wells.
- The uranium concentration at FW2 was similar to historical values reported for FW1, and slightly exceeded the GCDWQ, as expected.



Take Home Message

Because Well 2 is 28.7 m (94.2 ft) deeper than Well 1, it has more available drawdown (more storage). Based on historical water levels, it is expected that the well can be pumped at the target rate of 10.1 L/s (160 USgpm).

However, if water extraction exceeds recharge from precipitation and stream infiltration for an extended period of time, aquifer pressures will decrease. Potential consequences of this are reduced pumping capacity for wells, and reduced baseflow to hydraulically connected streams.