

Mosier Ground-Water Project Update

Mosier Watershed Council Meeting, September 8, 2005

Project Funding and Plans

The Wasco SWCD has signed a new agreement to complete the study. The new agreement runs from October 1, 2005 through the end of the project in September 2008. We are working on a revised schedule for the remainder of the project. The major tasks in the next fiscal year will be:

- Continue ground-water and stream flow monitoring
- Complete estimates of inter-aquifer flow from borehole leakage (co-mingling wells)
- Estimate ground-water recharge using watershed model
- Estimate present and historical ground-water use for irrigation
- Begin geologic mapping and preparation of framework for ground-water flow model

Stream Flow Monitoring

Goals: (1) Monitor flow at Mosier Creek gaging station to evaluate how flows have changed since 1963-81 period when gage was last in operation. (2) Measure flows at other sites on Mosier Creek to determine where ground-water enters or surface-water leaves the creek. Evaluate seasonal and long-term changes since 1962 and 1986 when last measurements were made.

Progress: Stream gage was installed and made operational on June 8th. The gage is located just below the West Fork Mosier Creek and measures stream depth every 15 minutes. Depths are converted to flow (in cubic feet per second) using relation between depth and flow that is based on direct flow measurements. Flows appear to have a daily cycle that may be caused by water uptake by vegetation along the stream bank. We also have seen the effect of the pumping just upstream of the gage when the County filled its water truck. Flows this summer are well below the average summer flows of 1963-81; late August and early September flows are less than the minimum August-September flows for the entire 1963-81 period.

The second round of measurements in the gain-loss study was made July 20. 12 sites were measured on Mosier and Rock Creeks. (Dry and Roweena Creeks were dry). There was no measurable gain or loss from river mile (RM) 7 to the gaging station at RM 4. Although there was a slight gain near Tanawasher Springs, there was a net loss of about 0.5 cfs (25% of flow) below RM 4 in July 2005. This pattern is similar to that found in measurements by OWRD in August 1986. This contrasts with USGS data from 1962 that showed a net gain of 0.8 cfs between RM 7 and RM 1. We will be making another round of measurements in September to verify these findings.

Plans: Make third round of gain-loss measurements in September. Analyze historical gaging station data to see if there are effects of pumping on flow in the 1963-81 period.

Well logging

Goals: 1) Collect information on geology and water-bearing properties of aquifers, 2) measure leakage through boreholes of comingling wells.

Progress: Evaluated flow meter logs from March on three wells. There was no measurable upward leakage between aquifers in the Kinsey, Frost and Woods wells. There is a very small (2-5 gpm) component of downward flow from the Pomona/Dalles to the Priest Rapids/Frenchman Springs in the wells. This is due to water leaking into the borehole above the water table and cascading along the borehole walls. Under pumping conditions, over 90% of the discharge was derived from an individual interflow zone in each of the three wells. The zones are within 20 feet of the bottom in each well.

Plans: Identify 3-4 wells in lower valley where heads in the Priest Rapids are still above the contact with Pomona—this is where we would expect co-mingling to still be occurring. Run logs on these wells. Possibly log old and new City wells.

Ground-Water Level Monitoring

Goal: Monitor water levels in wells to evaluate changes over times scales ranging from hours to decades. These measurements will help understand the effects of climate, development and other factors on the ground-water resource.

Progress:

- 3 wells instrumented with continuous recorders measuring ground water levels and temperature. 1 additional well with a continuous recorder operated by OWRD.
- 22 wells measured bimonthly (April, June, August). 4 additional wells measured quarterly by OWRD.
- Additional wells will be added to the monitoring network in the near future.
- The Priest Rapids aquifer shows water level declines of ~78 ft. since 1986. The Pomona aquifer shows water level declines of ~85 ft. since 1986.
- Greatest water level declines are in the orchard tract. Declines in upper parts of the basin are significantly less, however they are harder to quantify until more data is collected.

Plans: Make fourth round of bi-monthly measurements in October and install 2-3 continuous recorders. Add 5-10 additional wells to bi-monthly network.