

MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: March 24, 2011

To: Monica Van Bussum

From: Craig Tesch *CT*

cc: Sean Vincent and Rick Raymondi

Subject: Technical Review of Groundwater Monitoring Plan for Permit 61-12090

As requested, the Idaho Department of Water Resources (IDWR) Hydrology Section in the State Office has reviewed the groundwater level monitoring plan submitted for Permit 61-12090 to evaluate the effects of extended pumping from the Elk Creek Village production well. SPF Water Engineering submitted the monitoring plan to John Westra in the IDWR Western office on February 4, 2011, and to Monica Van Bussum in the State Office on March 7, 2011. After reviewing the monitoring plan, the Hydrology Section recommends the following:

- 1) Installation of pressure transducers in the pumping well and nearby shallow observation well, with a reading frequency of every six hours for the first year, and re-evaluation thereafter.
- 2) Installation of a barometric pressure recorder in the shallow observation well, with a reading frequency of every six hours for the first year, and re-evaluation thereafter.
- 3) Installation of a flowmeter on the production well (e.g. magmeter) to record discharge over the first year with re-evaluation thereafter. The flowmeter should meet IDWR's minimum acceptable standards for measurement and reporting of surface and groundwater diversions below:
 - Minimum manufacturers' design accuracy of +/- 2 percent of reading
 - Installed accuracy of at least +/- 10 percent of reading
 - Meter must be calibrated with an independent, secondary measuring device when installed, and at least once every four years thereafter
 - Must read instantaneous flow or be capable of flow rate calculation
 - Must record total volume
 - Non-volatile memory (power outage does not zero volume reading)

- Sufficient digits to assure “roll-over” to zero does not occur within 2 years
- Volume reading cannot be “reset” to zero
- Installed to manufacturers’ specifications

Meter manufacturers typically specify that a meter must be located in a section of straight pipe at least 10 pipe diameters downstream and 5 pipe diameters upstream of any valves, bends, contractions, or other interferences which will distort the flow pattern. However, some types of meters will produce acceptable results when installed in shorter sections of straight pipe. For example, at least one electro-magnetic flowmeter provides excellent measurement accuracy with only 5 lengths of straight pipe upstream from the meter.

- 4) Monthly hand measurement of water levels for the first year, and re-evaluation of measurement frequency thereafter.
- 5) Collection of water levels in the production and shallow observation wells prior to the commencement of pumping.
- 6) Monitoring at an increased frequency in the pumping well at the end of the irrigation season to facilitate water level recovery analysis.
- 7) Reporting of water level data on a monthly basis to IDWR for the first year, and re-evaluation of submittal frequency thereafter.
- 8) Submission of an annual report to IDWR that would include:
 - a. Analysis of water level trends in the production well, shallow observation well, and nearby wells.
 - b. Reporting of discharge rates over time and analysis in relation to water levels.
 - c. Evaluation of downward return flow from irrigation discharge water in relation to water levels.
 - d. Reporting of crops grown and acres irrigated during the year.
- 9) Initiation of pumping using an uninterrupted, constant withdrawal rate over some time period (e.g. 5 days) to evaluate the effects of extended pumping.

One of SPF’s stated goals is to stress the aquifer to evaluate adequacy of water supply for Applications 61-12095 and 61-12096. The Hydrology Section supports the SPF proposal to stress the aquifer in the Nevid area, providing an opportunity to evaluate impacts from pumping using real data. However, it is important to note that the rate of pumping during the period of this plan will be considerably less than the combined stress resulting from full build-out of Applications 61-12095 and 61-12096. Finally, it is important to note that the hydraulic connection between water bearing zones in the shallow observation well and the production well are unknown. Other than the production well, there are no nearby wells greater than 560 feet deep that could help in monitoring the 1,000-foot deep pumping zone.