

from a hatchery operations standpoint, it was necessary to establish the maximum pumping rate that could be achieved during the low-flow periods.

On September 19, 1989, the pumping configuration was changed. PW-2 was operated at 600 gpm while PW-4 was turned off. The combined pumping rate was therefore increased to about 1,140 gpm. This resulted in excessive drawdown in PW-2, and after four days, water levels were approaching the pump intake. On September 24, 1989, the pumping configuration was re-adjusted to include PW-4 at 360 gpm, and PW-2 pumping at 200 gpm. The resulting total withdrawal was 1,100 gpm. This rate was maintained for the remainder of the test. The pumping rates throughout the long-term pump test are summarized in Figure 3.

After September 24, groundwater levels continued to decline at a rate of about 0.14 ft/d until mid-October, and at a rate of about 0.1 ft/d until mid-November. During the same period, the water level in the White River continued to decline by about 0.007 ft/d. Based on the pump-intake elevations in the operating wells, and including a two-foot factor of safety above the pump intakes (or top of screen, if the pump intake was set in the screen), a pumping rate of 1,100 gpm could have been maintained until mid-December before water levels in PW-1, PW-2, and PW-4 would have reached a critical level. There was sufficient available drawdown in PW-5 to continue pumping for a greater period of time. The available drawdown in the pumping wells throughout the test is illustrated in Figure 4.

Between November 7 and November 13, 1989 heavy rains caused a rapid increase in river flows, and water levels in the wells recovered by as much as ten feet. After the storm, groundwater levels appeared to fluctuate with river stage, declining, then rising again. Over the last two weeks of December, 1989 river levels declined, increased and declined again. Over the same period, groundwater levels in observation wells SB-1, TW-12, and TW-7 also fluctuated concordantly (see Figures 1 and 2). This appears to indicate that hydraulic communication with the river has been re-established.

River flow during 1989 was similar to flows recorded in 1988 (Figure 5a). Based on long-term river-flow data for the White River, summer flows during both 1988 and 1989 were below the statistical 50 percent value, while winter and spring flows were generally higher than average. This is shown on Figure 5b. Also note that flow in October 1988 was significantly higher than in October 1989, and was also higher than the October average flow. Therefore, it is difficult to establish whether the impact of the river on aquifer behavior over the past two years is typical or not. This is discussed further in Section 3.0

Throughout the testing period, surface-water inflow to the wetland area was measured using a V-notch weir located on the culvert beneath the main access road to the hatchery. On August 7, 1989, immediately prior to the pump test, flows were estimated at about 700 gpm. Three days into the test, the flows had declined to about 70 gpm, and by September 24, 1989 (about 48 days into the test), there was no flow over the weir. Flow was reestablished in mid-November coincident with the increase in groundwater levels. The reduction in spring flow is due to the decline in groundwater levels throughout the hatchery site as pumping reduced storage in the aquifer.