WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

Summary of Technical Design Assumptions

- Design capacity of the DNR system is 17,600 gpm. Sufficient for irrigation of 2934 acres at 7.5 gpm per acre and 80% simultaneous operation.
- Water will be withdrawn from the Columbia River at the existing Columbia Water and Power District (CWPD) pump station. A total of three 1,500 hp vertical turbine pumps will be added to the station. The pumps have a combined capacity of 26,400 gpm at a discharge pressure of 230 psi and a river level of 263 ft. Discharge pressure matches the existing typical maximum CWPD discharge pressure.
- Design includes a Nelson Liquid Drive (hydraulic variable speed drive) on one new 1,500 hp pump.
- DNR water conveyed through approximately 1,700 ft of existing 66 inch diameter pipe to a location north of Highway 14.
- DNR's 30 inch diameter pipe tees off the existing 66 inch pipe and extends northwesterly approximately 24,550 ft to the Main Booster pump station.
- The Main Booster pump station includes three 500 hp canned vertical turbine pumps with a combined capacity of 17,600 gpm at a head of 292 ft. At design capacity the suction pressure at the station will be about 30 psi and the discharge pressure will be about 126 psi. At very low flow rates the suction pressure at the station could approach 80 psi. Two variable frequency drives (VFD) are called out at the station to allow the pressure to be varied effectively until flow rates reach a level where the head requirement allows the pumps to operate efficiently.
- Approximately 24,300 ft of 30 inch diameter pipe is required between the Main Booster pump station and the Horrigan Road Booster pump station and farm.
- Three 500 hp horizontal split case pumps are planned at the Horrigan Road Booster pump station. At design capacity, 17,600 gpm, the suction pressure at the station will be about 20 psi and the discharge pressure will be about 115 psi. The discharge pressure is sufficient to irrigate the southerly, lower elevation areas of the DNR ground. The station includes two VFD's to effectively compensate for variable pipe head losses.
- Additional, smaller on farm booster pump stations will be required to irrigate higher more remote ground.