APPENDIX A
TECHNICAL SYSTEM REQUIREMENTS

Purpose of the New Design Raw Water Main and McKinney Treated Effluent Outfall Project

The New Design Raw Water Main and McKinney Treated Effluent Outfall project will provide the infrastructure associated with the New Design Raw Water System and the McKinney Wastewater Treatment Plant (WWTP) Treated Effluent Outfall. These improvements will be constructed in the vicinity of the C&O Canal National Historical Park. Frederick County is planning to build the McKinney WWTP to accommodate the wastewater flows from the future County growth, and to meet the National Pollutant Discharge Elimination System (NPDES) requirements for discharge to the Monocacy River. The new raw water main is required for the expansion of the New Design Water Treatment Plant (WTP), which draws water from the Potomac River. Due to the larger daily flows and upstream reservoir, the Potomac River can provide a more reliable source of water for the County. Other facilities include proposed electric and communication duct banks to allow for more reliable operation of the water facilities. The purpose of the New Design Raw Water Main improvements is to increase raw water conveyance capacity from the raw water intake pumping station to the New Design WTP. The purpose of the McKinney Treated Effluent Outfall improvements is to provide Frederick County a means to discharge the increased treated effluent from the proposed McKinney WWTP and to create an opportunity for treated effluent currently being discharged into the Monocacy River to be redirected into the Potomac River.

System Requirements of the New Design Raw Water Main and McKinney Treated Effluent Outfall Project

The system requirements for the New Design Raw Water Main and McKinney Treated Effluent Outfall project are based on the evaluations outlined in the following documents:

- *McKinney Wastewater Treatment Plant Treated Effluent Outfall/New Design Water Transmission Main Corridor Alignment Report*, Whitman, Requardt & Associates (WR&A), November, 2001
- *McKinney Wastewater Treatment Plant Treated Effluent Conveyance System Study Initial Alternatives Analysis*, WR&A, November 20, 1996
- *McKinney Wastewater Treatment Plant Alternatives Analysis Treated Effluent Conveyance System*, WR&A, March, 1999

Frederick County operates the Ballenger Creek WWTP which has an annual average daily capacity of 7.0 million gallons per day (MGD). Treated wastewater from the plant is discharged into the Monocacy River. To accommodate future growth, the County is planning to build the McKinney WWTP which will have an average daily flow capacity of 18.0 MGD. The Ballenger Creek and McKinney WWTPs have a projected combined design flow of 25.0 MGD average daily and 56.2 MGD peak flow. The combined first phase of the McKinney WWTP and the Ballenger Creek WWTP results in a discharge of 15.0 MGD to the Monocacy River. The remaining flows may need to be conveyed to the Potomac River.

The McKinney Treated Effluent Outfall will allow the McKinney WWTP to serve the future Frederick County wastewater requirement of 56.2 MGD. The New Design Raw Water Main will allow the New Design WTP to supply potable water to the Frederick County and City of Frederick Service Areas from the Potomac River raw water source. Each portion of the project serves a unique function in the overall system goal.

The New Design Raw water main is required to accommodate the increased demand projected for the New Design WTP. The completion of the raw water main will provide a connection between the intake pumping station and the New Design WTP, parallel to the existing 24-inch piping through the boundaries of the C&O Canal National Historical Park. Included in the alignment is a crossing of the Tuscarora Creek, CSX Railroad, the C&O Canal and the Canal Towpath.

The treated effluent outfall pipe is required to provide an effluent pipe to the Potomac River for the McKinney WWTP. The construction of this section of pipe will provide an increased capacity between

the existing 18-inch outfall pipe and the diffuser, through the boundaries of the C&O Canal National Historical Park and will allow future construction of proposed outfall systems without impact to the Park.

The second electric feed is required to provide an additional electric feed duct bank to the intake pumping station. The second electric feed will allow the intake pumping station to operate more reliably, and at a sufficient capacity to serve the New Design WTP.

The new communications duct bank will facilitate the integration of the intake pumping station control system with the New Design Road WTP system.