CASE STUDY

LOCATION: Crow Agency

INFRASTRUCTURE TYPE: Drinking Water

PROJECT TYPE: Management and Finance

Crow Agency is located on the Crow Indian Reservation in south central Montana. The Crow Indian Reservation is the largest of the seven Indian Reservations and is bordered by Wyoming to the south and the Northern Cheyenne Indian Reservation to the east. The reservation encompasses approximately 2.3 million acres, which includes the northern end of the Bighorn Mountains, Wolf Mountains and Pryor Mountains. The Bighorn River flows north from Yellowtail Dam and joins the Little Bighorn River just outside Hardin, Montana. The city of Billings is approximately ten miles northwest of the reservation boundary.

MAP staff was asked to provide technical assistance to the Crow Agency water treatment plants during the flood that occurred on May 24, 2011. The majority of the work was performed in the Tribal plant because the Bureau of Indian Affairs plant was in operation at the time of arrival of MAP staff. Electricians of ATS Inland NW went through the electrical systems of both plants and made a list of circuits and sensors that needed to be replaced for the plants to regain automation.

What follows is a day-by-day account of actions taken that brought the plant back into service:

May 25: The water treatment filter was flushed repeatedly to help bring the plant online. The Surface Scatter 6 Turbidimeter was checked and the light sensor was found to be inoperable. Parts for the Scatter 6 are no longer available. The 1720D Turbidimeter was calibrated and is in operation.

May 26: The clear well was emptied and disinfected.

May 27: Backwashing of the filter continued. Turbidity measurements were taken at the weir of the clarifier with a result of 10 Nephelometric Turbidity Units (NTUs). A grab sample was also taken approximately one foot into the clarifier with a result of 7 NTUs. Dave Evans, a past operator, came to the plant to offer assistance. A jar test was conducted and the chemical was adjusted. The turbidity in the clear well began to rise and the presets for chemical were adjusted back to previous settings and the NTUs began to decrease. MAP staff and the operators worked through the night to bring the NTUs down to 1.85

May 28: The plant ran through the day and maintained 2.0 mg/l residual. The NTUs were brought down to 1.4

May 29: The plant ran through the day to maintain 2.0 mg/l residual. NTUs did not decline. The plant was taken offline at 5:30 pm. The filter was treated with five gallons of sodium hypochlorite at 12.5%, and left to stand overnight. The clear well was emptied of all sludge.

May 30: The plant was put online with an additional 4.5 inches of coal placed in the filter. A backwash of the filter was conducted until .9 mg/l chlorine was maintained. The clarifier was also put back online and the treatment process began. The NTUs were falling until the intakes of both plants began to clog. After the intakes were cleared, the operators performed a jar test and dosed the clarifier. The NTUs were brought down to the .03 range and have remained constant.