St. Mary Diversion and Conveyance Facilities

Points of Interest

1: Lake Sherburne Dam and Reservoir

Sherburne Dam is a compacted earthfill structure 107 feet in height with a crest length of 1,086 feet. Construction began in 1914 and was completed in 1919. A total storage capacity of 68,080 acre-feet is provided in Lake Sherburne.

Reservoir water surfaces are controlled by operation of the two 4- by 5-foot high-pressure gates, which permit a discharge of 2,100 cubic feet per second at an elevation of 4788.0 ft. At water surface elevations above 4788.0 ft, water flows over the crest of the overflow spillway and the discharge through the outlet works. Maximum discharge through the outlet works conduit at an elevation of 4809.2 ft is 4,200 cubic feet per second.

In 1982, the dam embankment was raised to crest elevation 4814.5 using the reinforced earth concept to provide additional surcharge to safely pass the inflow design flood.

Stored water is released to Swiftcurrent Creek during the irrigation season and diverted to the North Fork of the Milk River by the St. Mary Diversion Facilities. Water is also released from Lake Sherburne to satisfy the United States’ obligations to Canada under Article VI of the Boundary Waters Treaty (1909).

Operational constraints of the existing outlet gates prevent the US Bureau of Reclamation from releasing low flows during the winter months. As a result, Swiftcurrent Creek dries up and important wintering habitat for the threatened bull trout (Salvelinus confluentus) is lost. The Blackfeet Tribe and US Bureau of Reclamation have been working to resolve the issue for a number of years.
Boulder Creek is an uncontrolled mountain stream descending from the eastern slopes of Glacier National Park. Boulder Creek has been in an unstable condition since a major flood event in 1964 which has greatly increased the amount of sediment supplied to Lower St. Mary Lake (Decker, 1998). The stream channel undergoes major changes in response to even frequent floods and has been a concern to adjacent property owners (Decker, 1998).

The Bureau of Reclamation and Blackfeet Tribe are working on a plan to stabilize the banks of Swiftcurrent and Boulder creeks in an effort to reduce the sediment load.
Swiftcurrent Creek Dike is an earthen dike with a structural height of 13 feet and length of 4,800 feet. The dike was constructed in 1915 by Bureau of Reclamation to divert all flows from Swiftcurrent Creek and Boulder Creek into Lower St. Mary Lake. Prior to construction of the Swiftcurrent Creek Dike, the combined flow of these two creeks crossed the large alluvial fan that is now occupied by the town of Babb, Highway 89, and other development.

As a result of Swiftcurrent Creek Dike, the combined sediment loads of the two creeks are deposited into Lower St. Mary Lake. The resulting delta has increased in size by about 16 acres between 1958 and 1990. The Bureau of Reclamation and Blackfeet Tribe are working on a plan to stabilize the banks of Swiftcurrent and Boulder creeks in an effort to reduce the sediment load.
The St. Mary Diversion Dam and headgates are located 0.75 miles downstream from Lower St. Mary Lake. Both structures were built in 1910 to divert water from the St. Mary River into the St. Mary Canal.

The diversion dam is a 6-foot high concrete weir and sluiceway with length of 198 feet. Mechanically operated sluice gates were installed in 1995.

Both structures are believed to have a negative impact on tribal fishery resources. The diversion dam acts as a barrier to fish moving upstream and a large number of fish become entrained in the canal through the headgates during the irrigation season.
The St. Mary River Siphon consists of two 90-inch riveted steel barrels that traverse the valley from the inlet, transition to a 84-inch diameter at the river crossing, transition back to 90 inches in diameter and traverse up the valley slope to the outlet. The barrels are approximately 3,200 feet in length. The discharge of each barrel is approximately 425 cfs at a velocity of 9.63 feet per second in the 90-inch section and 11.05 feet per second in the 84-inch section. The maximum head on the Siphon is 165 feet. The total head-loss from inlet to outlet is about 16.5 feet.

Unstable valley sidewalls have resulted in the downslope movement of the steel barrels and concrete supports producing buckling in the siphon barrels, and compression of the expansion/contraction joints.

The left barrel (looking downstream) was constructed from 1912-15, and the right barrel was constructed in 1925-26. The left barrel is buried for approximately half its length at a depth of 3-5 feet, and the right siphon runs entirely above ground. The left barrel has undergone a series of extensive repairs due to problems associated with being buried, such as seepage, corrosion, and buckling. A cathodic protection system was installed in the 1950s.
The Halls Coulee Siphon crosses a broad valley approximately about 8 miles downstream of the St. Mary River Siphon. It has two riveted steel barrels, 6.5 feet in diameter and 1,405 feet in length, with concrete saddle supports. The total head-loss from inlet to outlet is about 14.5 feet. The twin barrels have a combined capacity of 850 cfs.

As with the St. Mary River Siphon, 90 years of harsh climatic conditions has corroded the steel barrels, and weakened the concrete saddle supports.
After crossing the Hudson Bay-Missouri River drainage divide, water from the St. Mary Canal passes through five reinforced concrete hydraulic drop structures before reaching the North Fork of the Milk River.

The five structures have a combined vertical drop of 218 feet. Construction began in 1912 and was completed in 1915. Each drop has a design capacity of 850 cfs.

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<th>Length (ft.)</th>
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