

The Spanish River, when it reaches High Falls, drains an area of 2,150 square miles. The average rainfall in this area is not in excess of 30 inches, and during one season, when the rainfall did not exceed 24 inches, the minimum discharge of the river was 1,600 cubic feet per second. The best description of the character of this watershed is found in Dr. Robert Bell's report in the Geological Survey of Canada for 1888-1890. It is owing to the nature of the covering of this watershed and to the numerous lakes in the upper reaches that the minimum flow is high, being .71 cubic foot per second per square mile. The minimum flow of the stream was reached in September, 1904, and also in February, 1905.

Above High Falls, for a distance of six miles, the river is a succession of rapids, and it was considered necessary that these should be drowned so as to prevent the formation of frazil, and to form as much of a reservoir as possible. For these reasons the river level above the falls was raised 18 feet, drowning all troublesome rapids, providing a storage basin about six miles long, and increasing the head from 67 to 85 feet.

The river above the falls flows between rocks and hills. Immediately at the head of the falls are rocky islands, which break the stream into several channels, finally dividing the river into the east and west channels, the two branches uniting a short distance below and thus forming High Falls Island.

The system of dams necessary to control the water was somewhat complicated, and work on concrete dams 1, 2, and 4 was begun first and carried on continuously to completion, notwithstanding the severe winter of 1904-5. At the same time the concrete foundations of the power house were built to above high water so as to avoid any delay in the following spring. A log slide and two temporary openings were left in dams 1 and 2 so as to pass water when it became necessary to stop the water on the east side of the river. The channel on the east side was then closed up by a crib cofferdam against a head of 32 feet of water. This cofferdam was built in the form of the letter "V" in plan, each leg abutting on the rock projecting outwards and up stream at an angle and finished square, leaving a key shape space between the two legs. Accurate measurements were made of this space, and a crib of these dimensions was built up stream a short distance, loaded, and then lowered with heavy tackle to within a short distance of its proposed location, and was then built up and loaded until it was within a few inches of the bottom. When this was completed the position of the key crib was adjusted; then it was lowered as far as possible under control of the ropes, and