



Ohio Department of Natural Resources Division of Water Fact Sheet

Fact Sheet 97-41

Ohio & Erie Canal/Hydraulic Operations

History

The Ohio & Erie Canal provided a transportation link from Cleveland to Portsmouth in the early 19th century. The original canal was about 250 miles long after its completion. The abandonment of the Ohio & Erie Canal as a viable method of transportation after the 1913 flood resulted in the transfer of ownership to adjacent landowners and local government entities. With the exception of several small parcels scattered along the original stretch, the state retained ownership of about 10 miles from the north end of Summit Lake in the City of Akron south to Barberton near the confluence of Wolf Creek.

The Portage Lakes, located south of the City of Akron, were originally constructed in the 1830's to supply water to the Ohio & Erie Canal. The reservoirs were retained by the state for recreational development and water supply. Due to the expansion of industry and the demand for raw water, Nimisila Reservoir and Tuscarawas Diversion Dam were built in 1936 and 1956, respectively, to augment water supply from the Portage Lakes and the canal.

The Department of Natural Resources, Division of Water operates and maintains the Portage Lakes Dams, Nimisila Reservoir Dam, Tuscarawas Diversion Dam and 10 miles of the Ohio & Erie Canal. The Division of Parks and Recreation operates Portage Lakes State Park.

Hydraulic Operations

The Portage Lakes system consists of East Reservoir, West Reservoir, Turkeyfoot Lake, North Reservoir and Long Lake. Turkeyfoot Lake is connected to and has the same normal pool elevation as West Reservoir. Turkeyfoot Lake and West Reservoir have a combined drainage area of 8.56 square miles. West Reservoir discharges its water into North Reservoir. North Reservoir has a watershed drainage area of about 1.34 square miles. The combined watershed area including West Reservoir is approximately 9.90 square miles. Water from North Reservoir flows into Long Lake. East Reservoir and West Reservoir have the same pool elevation and are connected by a 1500-foot-long, 30 to 50-foot-wide channel. East Reservoir has a drainage area of 4.57 square miles. Water from East Reservoir also flows into Long Lake. (See Flow Chart A)

Long Lake was a natural lake with a drainage area of 5.73 square miles. Outflows from the lake into the Tuscarawas River are regulated by two outlet works. The first outlet consists of a set of six metal gates (Flood Gates) which serve as overflow weirs. One of the gates is 6 inches lower than the other five gates to allow normal flow into the Tuscarawas River. All the gates can be raised vertically to regulate the water level in the lake. The second outlet consists of a 50-foot concrete weir and has the same elevation as the lower Flood Gate. There are two, 3-foot-square gated conduits (Feeder Gates) located near the second outlet which are being used to release water into the Ohio and Erie Canal. (See Flow Chart A)

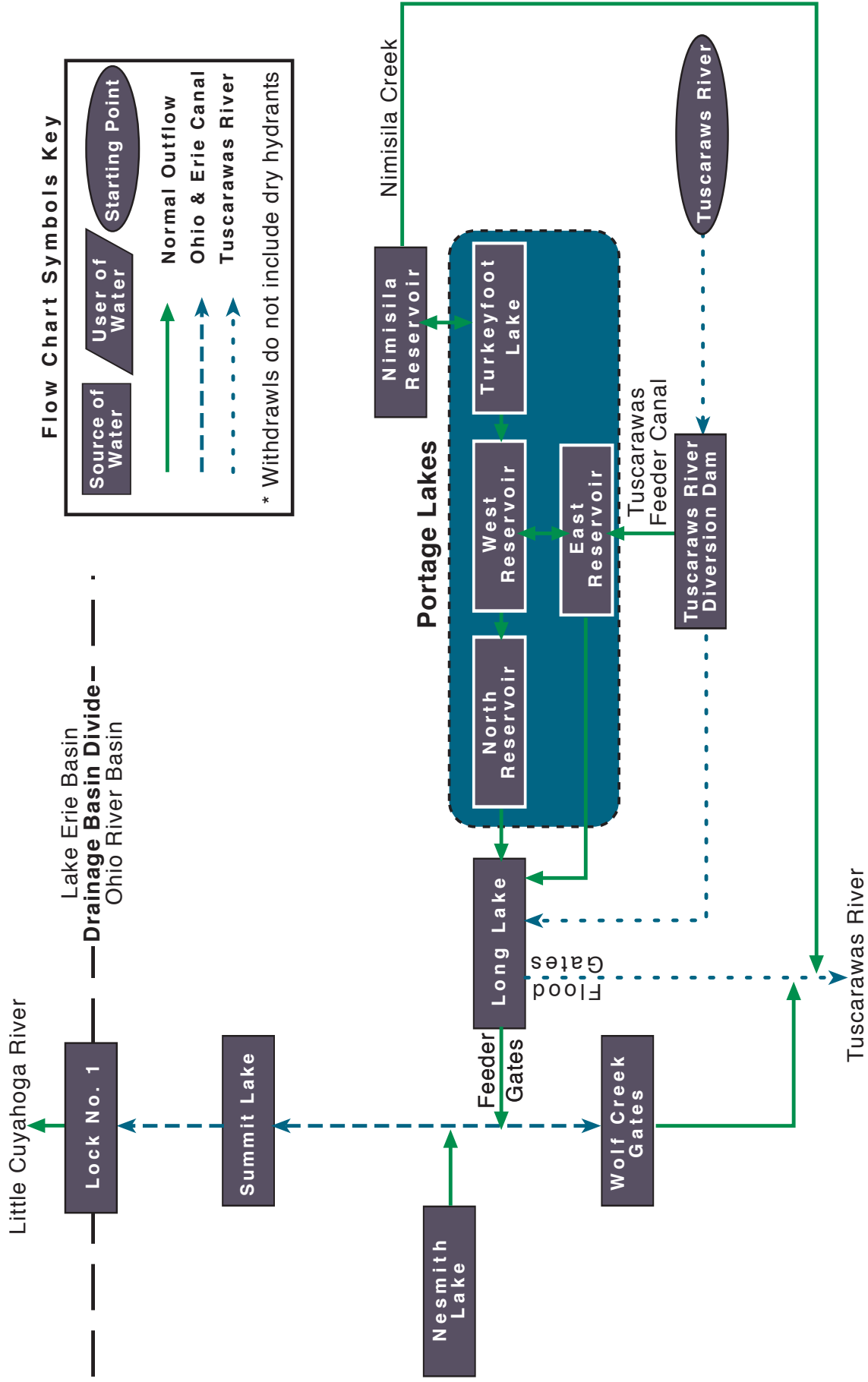
Nimisila Reservoir was built specifically for water augmentation. Nimisila Reservoir normally discharges through the uncontrolled spillway into the Tuscarawas River watershed. However, water can be released into the Portage Lakes system through two 36-inch gated outlets located on the west side of the reservoir. Water can also be pumped from the Portage Lakes into Nimisila Reservoir via a 24-inch pump located at the upper end of Turkeyfoot Lake. Nimisila Reservoir dam has a drainage area of 15.9 square miles.

Tuscarawas Diversion Dam was also specifically built for water augmentation. There are two outlet works for the dam. The first is an uncontrolled spillway discharging into the Tuscarawas River above Long Lake. The second releases water through two, 3-foot-square gates into East Reservoir via the Tuscarawas Feeder Canal. The dam has a drainage area of 35.44 square miles.

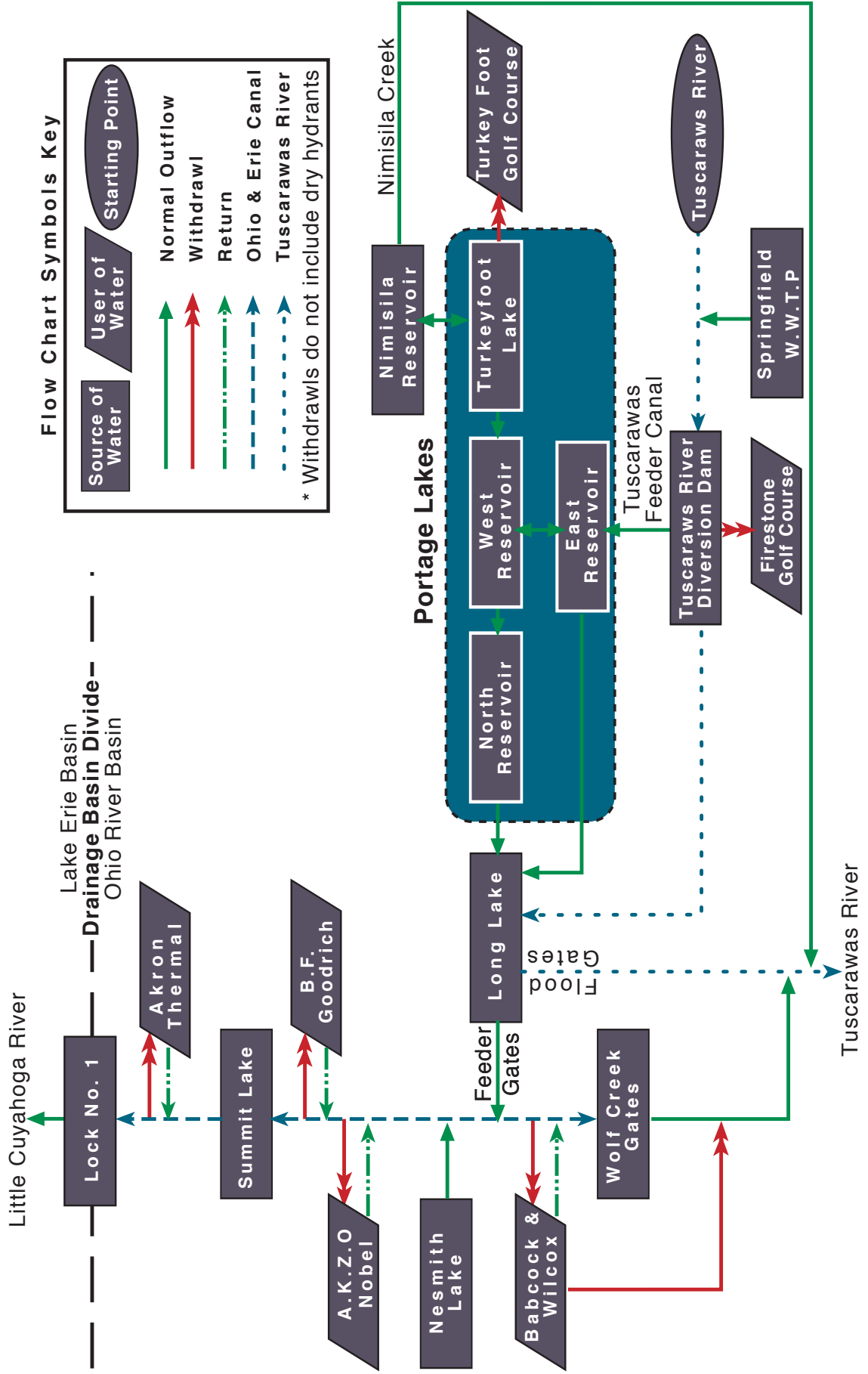
Long Lake normally discharges into the Tuscarawas River over the lowest overflow flood gate and the 50-foot-wide concrete weir. Additional runoff results in the manual opening of the flood gate system. The opening of the flood gates depends upon the amount of rainfall and runoff. A Telemark, water level measurement instrument, located just east of the flood gates allows the operator to determine lake level via a telephone connection. Gate openings are then adjusted based on the pool level and meteorologic conditions. Due to the potential for downstream flooding, only during significant precipitation events are all the gates opened simultaneously.

Continued on back!

Flow Chart A



Flow Chart B



Water released into the Ohio & Erie Canal is related to the normal water level of Long Lake. Each of the two feeder gates remains partially open when the water level in Long Lake is at or slightly above its normal elevation. This induces a flow in the canal for both water supply and aesthetic purposes. Occasionally gate openings are adjusted to ensure proper operating condition and to provide additional water for aesthetic purposes. This brief gate adjustment does not impact the water level of Long Lake.

The 10-mile-long Ohio & Erie Canal from Lock 1 in Akron to near the confluence with Wolf Creek in Barberton, including Summit Lake and Nesmith Lake, has a consistent water elevation. There is an outlet located at each terminus of the canal. Located at the north end of the canal is Lock No. 1 which consists of a primary and secondary concrete weir and a 5-foot-wide square sluice gate located near the bottom of the primary weir. The crest of the primary weir has the same elevation as the canal normal pool level. The crest of the secondary weir is about four inches above the canal normal pool level. The 5-foot square gate is used to regulate the water level in the canal during precipitation events. A Telemark is also located at Summit Lake. The second outlet works, located just north of the confluence of the canal and Wolf Creek in Barberton, consists of a 30-inch by 30-inch square sluice gate and a 30-inch-diameter sluice gate.

Water entering the Ohio & Erie Canal from Long Lake could flow toward either Lock No. 1 at the north end or the Wolf Creek gates at the south end. Since the early 1900's Lock No 1. has been utilized to regulate the water level of the canal system due to its quick discharge capacity and ability to reduce potential flooding to adjacent residents along Summit Lake and the canal. The outlet works near Wolf Creek is used only on an as-needed

basis, such as to induce a flow in the canal to prevent stagnation of water to reduce the formation of algae and aquatic vegetation. A 5-foot-wide weir was constructed through the concrete wall between the two gates at Wolf Creek in 1996 to allow algae and surface aquatic vegetation to flow out of the canal from the Manchester Road area. This was an effort to increase water quality in the canal. (See Flow Chart A)

Water Supply

Currently, there are eight active contracts, five for industrial and three for dry hydrants, allowing water to be withdrawn from the canal, Portage Lakes, Nimisila Reservoir and Tuscarawas Diversion Dam for industrial, business and fire protection use (See Flow Chart B). The contracts allow an annual minimum and maximum withdrawal. The state must be notified of any excess uses at the end of each year. The water being used by the industries is mostly returned either to the canal or the Tuscarawas River. Water being used for agriculture and fire protection is considered non-return water.

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