United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: __Winsted Water Works ____________________________
Other names/site number: __Winsted Water Supply System__________________________
Name of related multiple property listing: ________________________________
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Winchester Rd (north side), Old Waterbury Turnpike/Rugg Brook Rd
City or town: _Winchester________ State: ____CT______ County: _Litchfield______
Not For Publication: ☐ Vicinity: ☐

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide ___local

Applicable National Register Criteria:

___A ___B ___C ___D

____
Signature of certifying official/Title: Date

____
State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

____
Signature of commenting official: Date

____
Title : State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) ______________________

____
Signature of the Keeper Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private: [ ]

Public – Local [x]

Public – State [ ]

Public – Federal [ ]

Category of Property

(Check only **one** box.)

Building(s) [ ]

District [x]

Site [ ]

Structure [ ]

Object [ ]

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
2		sites
8		structures
		objects
10	0	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions
(Enter categories from instructions.)
GOVERNMENT/public works

Current Functions
(Enter categories from instructions.)
GOVERNMENT/public works

7. Description

Architectural Classification
(Enter categories from instructions.)
_OTHER ___________

Materials: (enter categories from instructions.)
Principal exterior materials of the property: _stone, metal; concrete_____________

Narrative Description
(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Winsted Water Works (aka Winsted Water Supply System) Historic District (or the District) is a continuous system of municipal water collection infrastructure covering approximately 210 acres of upland and waterbodies in the Mad River watershed of northwestern Connecticut. The District encompasses three stone and earth dams, two earth dikes, an earth and granite canal aqueduct, a tunnel aqueduct, and two artificial reservoirs constructed from 1893 to 1895. The Winsted Water Works is located in the town of Winchester, about 1 mile from the city of Winsted in Litchfield County. The system retains integrity as a collection of sites and structures designed to collect and send water to Winsted's water treatment and distribution infrastructure, and ultimately to customers within the city's distribution network. The District encompasses 10 contributing resources: 8 structures and 2 sites. The Winsted Water Works was listed in the Connecticut State Register of Historic Places on March 5, 1997.

Narrative Description

Setting

The city of Winsted within the town of Winchester lies in the Litchfield hills of northwestern Connecticut northwest of Hartford. The nominated Winsted Water Works (the Water Works) is approximately 1 mile from the center of Winsted (at its nearest point) and the Winsted Water Works' water supply service area, which is largely within the city boundaries. Components of the Water Works (a system of dams, reservoirs, and aqueducts at an average elevation of approximately 1,030 feet above sea level [ft asl]) are set within a grouping of unnamed hills that rise to a maximum elevation of 1,374 ft asl. The Water Works are within the Mad River watershed and draw directly from the Mad River and two of its tributaries: Rugg Brook and Sucker Brook. These components straddle multiple land parcels, the majority of which are owned by the Town of Winchester or the City of Winsted and are maintained as forested conservation land.[1] The District components are generally surrounded by successional growth forest, with brush near the edges of dams and dikes; thousands of red pines were planted near the southern edge of Crystal Lake in the early twentieth century.

The city of Winsted is east-southeast of the Water Works District on the Mad River at the intersection of North Main Street (State Route 8) and Main Street (State Route 44). Winsted was first settled in the middle of the eighteenth century as a small village between Winchester and Barkhamsted that grew as the business center of the two towns.[2] The city is a linear grouping of late nineteenth- and early twentieth-century mill buildings along the river, paralleled by a mid-nineteenth-century main street with brick commercial buildings, and high-style civic and religious buildings. Residential neighborhoods flank the downtown industrial and commercial core on the adjacent hillsides. The core of Winsted's downtown along the Mad River lies at an approximate elevation of 705 ft asl at the east end, and 755 ft asl at the west end.

Historical components of the gravity-fed municipal collection and storage system move water on a generally northwest to southeast course (although water is collected at several points within the system) (Figures 1–3). The system begins in the Mad River valley with the Mad River Diversion Dam and Mad River Diversion Canal. As its name indicates, the Mad River Diversion Canal diverts water out of the Mad River valley into that of its tributary, Rugg Brook. Rugg Brook is dammed by the Rugg Brook Dam and Rugg Brook North and South dikes to create the Rugg Brook Reservoir, with the Mad River Diversion Canal flowing into the northwest side of the reservoir. Water in the reservoir is then moved from the Rugg Brook valley into the Sucker Brook valley via the Gilbert Tunnel. The tunnel commences at the Gilbert Tunnel Inlet Works on the southeast shore of Rugg Brook Reservoir and passes below an unnamed ridgeline into Crystal Lake within the Sucker Brook Valley. Crystal Lake Dam—the terminus of the historic period water collection system—is at the south end of Crystal Lake. Water flowing past Crystal Lake Dam passes into Sucker Brook, outside of the water supply system. The distance between the Mad River Diversion Dam and the Crystal Lake Dam is approximately 2 miles.

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[1] In the historic period, some of these land parcels may have contained farms or other resources relating to European settlement of Winchester beginning in 1732. Evaluation or nomination of any archeological sites of this type (which historical maps indicate lay largely outside of the boundaries of the nominated Winsted Water Works Historic District) is excluded from the scope of the Winsted Water Works property documentation.

[2] "Winsted" is a portmanteau, or compound, of "Winchester" and "Barkhamsted."

Municipal water is removed from Crystal Lake via a late twentieth-century cast iron pipe intake (below the lake's surface) and then passes into a treatment and distribution complex on the southeast shore of the lake (outside the District). This complex of late twentieth-century buildings and structures consists of the unused Former Water Filtration Plant (aka the Former Water Filtration Plant, built in the 1970s), the active Water Filtration Plant (built circa [ca.] 1996), the Water Tank (built ca. 1996, 1-million-gallon capacity), and two wood frame and vinyl clapboard outbuildings (built ca. 1996). Water then moves into Winsted's system of water mains in the water supply service area (also excluded from the Water Works District boundaries). Any overflow from Crystal Lake not used for the municipal water supply flows into Sucker Brook. The intake, treatment, and distribution complex replaces an earlier gatehouse (demolished) and intake that lay within Crystal Lake. From this intake, water historically passed directly into the distribution mains without treatment (Winsted, CT, Water Improvement Committee 1896). The treatment and distribution complex is excluded from the District boundaries because it is not associated functionally or temporally with the late nineteenth-century water collection system.

Resources within the District are accessed by state and local roads. The Old Waterbury Turnpike and Rugg Brook Road run along the southeastern perimeter of the Rugg Brook Reservoir, and State Highway 263 runs along the south shoreline of Crystal Lake. The Mad River Diversion Dam is reached by a dirt access road that extends from the asphalt-paved Danbury Quarter Road.

The contributing resources of the Water Works are described as follows, moving from upstream to downstream within the system:

Contributing Resources[3]

The **Mad River Diversion Dam (contributing structure, photographs 1 and 2)** (CT Dam No. 16201), built 1893, is a gravity-type structure constructed of coursed, mortared, quarry-faced stone ashlar. It spans the Mad River on a northeast–southwest alignment, with the river flowing southeast. The dam is built on a rectangular plan with a tapering trapezoidal cross section and is 18 ft high (measured from riverbed to crest), 168 ft long, 14 ft thick at the base, and 5 ft wide at the crest. An uncontrolled (passive) 66-ft-long, broad-crested spillway lies near the dam's midpoint. The spillway's upstream side and crest are covered with a thin (2- to 3-inch) layer of reinforced concrete added ca. 1980; its downstream side is stepped and terminates without an anti-scour pad at the toe of the dam in the bedrock and cobble riverbed. The dam merges without visible abutments in sloping sides of the river valley.

A low-flow gate and the **Mad River Diversion Canal Gates (contributing structure, photographs 1, 3, and 4)** are set in the dam's right (southwest) abutment. These outlets are protected behind steel L-channel trash racks mounted on two mortared stone piers rising from the dam impoundment. Approximately 50 percent of the trash rack is now missing. The low flow gate's operating mechanism is missing; its gate stem is bolted to a concrete pedestal on the dam; and the gate frame and 2-by-2-ft gate leaf are buried in impounded sediments. The Canal Gates, a pair of vertical-lift rack-and-pinion gate assemblages (no longer operational) are bolted to a poured concrete gate frame notched into the dam. Each 4-by-4-ft steel gate leaf is operated by a manually operated wheel, and one of the leaves is missing. The downstream side of the

[3] Individual resource descriptions are compiled from field survey data, existing conditions engineering plans (Lenard Engineering, Inc. 2008a, 2012); dam inspection reports and studies (U.S. Corps of Engineers 1979; Lenard Engineering, Inc. 1991, 2008b; Wengell, McDonnell & Costello 1990); Connecticut Dam Safety Section files; and a historical report concerning the construction of the Water Works (Winsted, CT, Water Improvement Committee 1896).

gate openings is stone ashlar. The concrete components of the dam appear to be of early twentieth-century origin, although the exact date of these modifications is unknown.

The **Mad River Diversion Canal (contributing structure, photograph 5)**, built 1893, begins at the Canal Gates in the wingwall of the Mad River Diversion Dam and runs approximately 2,400 ft on a sinuous northwest–southeast course to its mouth at the Rugg Brook Reservoir. The earth canal prism is 7 ft deep (as built, not accounting for sedimentation), 8 ft wide at the bottom, and approximately 25 ft wide at the top. An approximately 30-ft-long segment of the canal's northerly prism wall where it connects to the Mad River Diversion Dam is constructed with stone ashlar. The Mad River Diversion Dam and the Mad River Diversion Canal are no longer actively managed for recharging the Rugg Brook Reservoir. The canal gates are seized in the open position, allowing the continuous flow of water from the Mad River into the reservoir.

Rugg Brook Reservoir (contributing site, photograph 6), filled 1893, covers approximately 44 acres within the Rugg Brook valley and stores approximately 275 million gallons of water from the Mad River and Rugg Brook. Almost the entirety of the reservoir consists of the natural slopes of the valley. The reservoir is created by **Rugg Brook Reservoir Dam (contributing structure, photographs 6–8)** (CT Dam No. 16202) and two secondary dikes—the **Rugg Brook North Dike (contributing structure, photograph 9)** and **Rugg Brook South Dike (contributing structure, photograph 10)** (aka Earth Dam No. 1 and Earth Dam No. 2, respectively)—all completed in 1893. Rugg Brook Reservoir Dam is gravity-type stone structure oriented on a north–south axis 29 ft high and 300 ft long. The dam is equipped with a 64-ft-long broad-crested spillway, depressed three ft below the crest of the dam. The spillway is located about 165 ft from the left (northerly) abutment and 70 ft from the right (southerly) abutment. The dam's cross section is trapezoidal, rising from 29 ft thick at the base to 5 ft wide at the crest of the wingwalls, which are covered with an asphalt skim coat. The entire dam is constructed of irregular coursed ashlar of quarry-faced blocks bound with a mortar made with natural cement.[4] The dam's spillway has a poured concrete lip, its downstream face is stepped, and it terminates at the toe of the dam in a poured concrete apron. The entire upstream face of the dam has been armored with a poured concrete liner. A low-flow outlet (currently inoperable) is placed just north of the spillway in the north wingwall and consists of a pair of 18-inch gates that are currently without an operating mechanism. Winsted's Water Department, in partnership with the federal Works Progress Administration, added the concrete on the entire upstream side of the dam in 1935–1936 to resolve a leakage problem. At the same time, the spillway elevation was also raised by 15 inches using concrete. In about 1987, the low-level outlet gate leaves and stems were repaired and the operation mechanism was removed (Lenard Engineering, Inc. 2008b:2–3, 12).

The Rugg Brook North and South dikes are about 1,300 ft southeast of Rugg Brook Reservoir Dam. Each dike is a gravity-type earth berm with a masonry core (not visible) without spillways or outlet structures. The North Dike measures approximately 20 ft high and approximately 240 ft long and is 110 ft thick at the base and 20 ft wide at the crest. The South Dike is approximately 14 ft high and 170 ft long, and is 75 ft thick at the base and 20 ft wide at the crest. The masonry cores for both structures are mortared stone and taper from 5 ft thick at the bottom to 3 ft thick at the top. The upstream face of each dike appears to be

[4] Natural cement (aka hydraulic cement) is a product of natural cement rock—argillaceous limestone that contains a mixture of calcium carbonate and clay. Cement rock is fired in a kiln, pulverized, and ground to form dry cement, which is then mixed with water and sand to form a mortar. Natural cement was used in the construction of the Erie Canal beginning in 1819, and the production and distribution of the material was widespread in the eastern United States by 1850. Because of its strength and ability to harden in wet conditions, natural cement was favored over lime mortar where structural integrity and/or moisture-resistance were critical, such as dams, bridges, and canals. After ca. 1880, Portland cement (aka artificial cement) largely replaced natural cement in these applications (McKee 1973).

cobble; the downstream faces are vegetated. There are no abutments. A paved town road (Rugg Brook Road) crosses both dike crests, where it is flanked by cable guard rails mounted to wood posts.

Rugg Brook Reservoir and Crystal Lake are connected by **Gilbert Tunnel and Inlet Works (contributing structure, photographs 11–13)**, completed in 1893. This tunnel aqueduct passes below an approximately 1,500-ft-high ridge in a straight southeasterly alignment. The structure has an overall length of approximately 3,600 ft, of which approximately 3,300 ft is tunnel and the remainder is an open channel. The tunnel commences on the southeast shore of Rugg Brook Reservoir with the Inlet Works. This tunnel portal consists of a mortared random ashlar stone headwall and wingwalls built against the bedrock tunnel opening and surrounded by a chain link fence. The headwall, surmounted by a concrete pad, accommodates a vertical-lift steel gate consisting of twin 4-ft-wide iron slide gates that are controlled with a manually powered hydraulic mechanism. The hydraulic mechanism and trash rack date to 1987 and were added atop the historic stone headwall, and the iron slide gates were repainted at that time. A galvanized steel trash rack set between poured concrete piers rises from the reservoir waters about 6 ft off the face of the headwall to guard the gate. This rack replaced the Inlet Works' original trash rack in 1987. The original rack was located about 20–30 ft farther north from the gate and was constructed of iron within masonry guard walls (Lenard Engineering, Inc. 2008b:12). The Gilbert Tunnel is an unlined native stone bore with an irregular 6-ft diameter and is approximately 3,590 ft long. The tunnel mouth has no formal portal or similar structure. It spills into an open, unlined earth and stone channel that empties into Crystal Lake.

Crystal Lake (contributing site, photograph 14) is a 134-acre waterbody with wooded natural shorelines created by the damming of the existing natural lake (originally called Little Pond) and Sucker Brook. The lake has an estimated 999-million-gallon total capacity, with nearly 449 million gallons of usable capacity. The **Crystal Lake Dam (contributing structure, photographs 15 and 16)** (CT Dam No. 16203), located at the south end of the lake, is an approximately 550-ft-long, 10-ft-high masonry and earth berm dam on an east–west longitudinal footprint. Winchester Road (aka State Route 263) is located immediately south of and parallels the dam on an elevated earth causeway with a footprint that covers approximately one-third of the dam embankment at its eastern end. As built, the dam was constructed primarily of mortared rubblestone with a trapezoidal cross section measuring 11 ft wide at the base and 4 ft wide at the crest. Subsequent fill deposition over the original dam for dam modifications and rehabilitations (described below) has widened the structure to an approximately 8-ft-wide crest and perhaps a 30-ft-wide base. The masonry is founded on a 1- to 2-ft-thick concrete pad or mattress. The dam has a 51-ft-wide passive spillway of stone construction lined with a concrete apron on its downstream face. The spillway empties into a 40-ft-wide spillway channel with walls and floor of mortared rubblestone covered with a concrete facing. These walls also formerly served as bridge abutments for the crossing of Winchester Road. Concrete flow dissipators (small piers) with a trapezoidal cross section project from the floor of the spillway. The earth berm that covers the original stone dam dates to multiple fill episodes beginning nearly immediately after the completion of the dam. During the dam's construction in 1895, the Water Improvement Committee and Board of Selectmen decided that the Town's highway should be constructed on the downstream side of the dam, resulting in the placement of fill against the downstream face and construction of a bridge over the Crystal Lake outflow stream (Lenard Engineering, Inc. 2008b:13–14; Winsted, CT, Water Improvement Committee 1896:17–19).

In 1976, Winchester Road was relocated to the current earth berm south of the dam, resulting in the removal of the spillway bridge and the covering of the approximate eastern third of the dam with fill (including, perhaps, an original low-flow outlet gate). The relocated roadway's concrete culvert and culvert inlet apron were connected to the downstream end of the historic spillway channel. At unknown dates between 1895 and the 1970s, the following alterations were made to Crystal Lake Dam: adding earth fill and rip-rap protection on the upstream side of the dam's earth berm; adding concrete facing to the downstream side of the spillway masonry; laying a concrete floor over the spillway channel's stone pavers; and addition of fills on the crest and downstream face of the dam. In 1983, modest repairs were made to the structure that included regrading the crest of the dam berm and repairing eroded areas on its upstream face, and patching the spillway concrete (Lenard Engineering, Inc. 2008b:3, 15–17).

Statement of Integrity

The Winsted Water Works system retains integrity of overall design, workmanship, and materials, along with the function of the Winsted Water Works system, with the overall system and individual structures and operations remains largely unchanged and in continuous usage from its late nineteenth-century origins. The system retains integrity of setting, feeling, association, and location, as all historic components of the system are extant and in fair to good condition, retaining the original relationship to the Mad River and of municipal engineering infrastructure within a rural wooded environment. Each of the water control components of the system—the Mad River Diversion Dam, Rugg Brook Reservoir Dam, Crystal Lake Dam, and Gilbert Tunnel Inlet Works—has been subject to maintenance and repair activities (described above) necessary to support their continued operation that have imposed modest changes to their appearance. These changes primarily consist of the addition of reinforced concrete or earth to the upstream sides of the dam and alterations in the operation of the dam gates. In the case of Crystal Lake Dam, the addition of fill began almost immediately following its construction in order to accommodate the Town's main highway.

HISTORIC DISTRICT DATA SHEET

Contributing Resources

Assessor Property ID	Resource Name	Date	Resource Type	Photo No.(s)
Structures = 8				
014 155 0005B	Mad River Diversion Dam	1893	Structure	1, 2
014 155 0005B, 014 155 006AA, 015 155 003	Mad River Diversion Canal	1893	Structure	4
014 155 0005B	Mad River Diversion Canal Gates	1893	Structure	1, 3, 4
015 153 014B15	Rugg Brook Reservoir Dam	1893	Structure	6–8
015 153 014B15	Rugg Brook North Dike	1893	Structure	9
015 153 014B15	Rugg Brook South Dike	1893	Structure	10
021 153 016H	Gilbert Tunnel and Inlet Works	1893	Structure	11–13
Sites = 3				
027 120 006C	Crystal Lake Dam	1895	Structure	15, 16
None	Crystal Lake	1895	Site	14
015 153 014B15	Rugg Brook Reservoir	1893	Site	6
Total Contributing Resources = 10				

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [x] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B. Property is associated with the lives of persons significant in our past.
- [x] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark “x” in all the boxes that apply.)

- [ ] A. Owned by a religious institution or used for religious purposes
- [ ] B. Removed from its original location
- [ ] C. A birthplace or grave
- [ ] D. A cemetery
- [ ] E. A reconstructed building, object, or structure
- [ ] F. A commemorative property
- [ ] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)
COMMUNITY PLANNING AND DEVELOPMENT
_ENGINEERING _

Period of Significance
_1893–1930_________

Significant Dates
1896: Opening of improved water system in Winsted

Significant Person
(Complete only if Criterion B is marked above.)
__N/A_______________

Cultural Affiliation
__N/A ______________

Architect/Builder
_Brinsmade, Daniel S. (D. S.)
_Hull, Bradley H. (B. H.)
_Pierson, George H.___

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Winsted Water Works is eligible for listing in the National Register of Historic Places at the state level under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Engineering. Under Criterion A, Winsted's Water Works, completed in 1896, improved on its earlier 1860 water system by providing an increased water supply for both municipal consumption and industrial water power. The Winsted Water Works was crucial to the ongoing development of Winsted as the commercial center of the neighboring communities of Winchester and Barkhamsted in the late nineteenth and early twentieth centuries and the continued industrial activity in the area. Many of the historic water systems in New England are no longer functioning due to the adoption of more modern systems, making Winsted an important early example of a municipal water system in the state of Connecticut. Under Criterion C, the Water Works represents a significant complex of dams, canals and aqueducts, and reservoirs designed for purposes of municipal water supply. It contains two late nineteenth-century, gravity-type, masonry dams that are outstanding examples of this dam type in Connecticut and a tunnel aqueduct that was the first such structure of its type in the state.

The period of significance for the Winsted Water Works Historic District extends from 1893, when the first components of the extant water system were completed, until 1930, when the City of Winsted gained full control over the Mad River's water output, which continues to the present.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

CRITERION A – COMMUNITY PLANNING AND DEVELOPMENT

The Winsted Water Works Historic District (or the District) possesses significance under Criterion A in the area of Community Planning and Development for its association with the development of large-scale municipal water supply systems in the mid-to-late nineteenth century. Winsted was one of about 10 towns in Connecticut with municipal or privately owned water systems that were established before ca. 1860. The adoption of municipal water systems ballooned in the United States between 1880 and 1890 as cities expanded and the demand for clean water and fire suppression grew, and as smaller towns also began adopting water systems. By 1891, 52 municipalities in Connecticut had water supply systems. Winsted's expanded Water Works is also related to what was a concurrent trend in the northeastern United States wherein municipalities and industries worked to balance competing demands for industrial and municipal water supplies within sometimes constricted geographic regions (Anderson 1984:218; Baker 1890:51–60; Engineering News 1892:52–60; Mason 1937:361–362).

Early Water Supply Systems

In colonial America, ample potable water was a primary factor in the selection of a location for most early settlements. The distribution of water from a remote source was not a priority in these early settlements due to the immediate availability of water in private and public wells, from which residents drew water with their own buckets or other vessels and carried them home. The public saw little need for municipal water distribution, believing public water to be inferior to a private well for drinking, and rain water runoff was also frequently collected for bathing and laundry. As cities grew, however, the quality of such traditional water sources deteriorated, and concerns about general availability grew. To alleviate these concerns, a community needed money, access to emerging technology, and commitment from political leaders to make water systems a reality. Combining these three elements was more difficult in smaller cities and rural areas than in large cities such as Boston, New York, and Philadelphia. As a result, water distribution systems prior to about 1800 were typically privately owned, rather than municipally owned; enterprises, and places without such private or municipal water systems typically depended on a combination of water carriers, wells, and cisterns to meet water needs[5] (Anderson 1984:214; Melosi 2000:29).

The earliest recorded public water supply system in the United States was built in 1652 in Boston, Massachusetts. The system consisted of a 12-ft-square wood reservoir in Dock Square in Boston's North End that was supplied by water from springs and wells flowing through a conduit. The well and cistern system remained in place until 1796, when Governor Samuel Adams approved an act creating the Aqueduct Corporation, which drew water from Jamaica Pond in Roxbury. Three private water systems were constructed in Salem, Massachusetts, from 1796 to 1799: Frye's Aqueduct (1796), Salem and Danvers Aqueduct Company (1797), and Union Aqueduct (1799). The first municipally owned water works and distribution system was constructed in Philadelphia in 1801 and drew water from the Schuylkill River. Water was pumped through wood pipes to wood tanks that distributed water around the city via gravity. The adoption of the system in Philadelphia was a result of yellow fever epidemics in 1793 and 1798, which city residents believed were caused by polluted water. To promote use of the new water system, Philadelphians were offered free water for several years. Philadelphia's gravity-fed distribution system was not widely adopted, however, and by the end of the eighteenth century, there were only 16 public water systems in the fledgling United States, most of which were built to supply water for fire suppression, rather than household use.

These early water systems, predominantly constructed along the Atlantic Seaboard, typically took water from creeks or rivers and put it directly into distribution, without any form of water treatment and with gravity assisting in the distribution in low pressure systems. Water was initially distributed by wood water mains consisting primarily of charred logs of native trees, which worked well with low-pressure gravity fed systems. However, with the advent of steam pumps in the mid-nineteenth century, iron became the preferred material for pipes that needed to withstand increased water pressures (*Engineering News* 1881:303; LaNier 1976:174–178; Melosi 2000:23, 30, 34–35).

During the nineteenth century, as cities and populations grew, the need for more reliable water supplies became a pressing concern. Residents in cities feared catastrophic fires and epidemic disease, particularly because of the inadequacy of bucket brigades in the face of large fires. For example, prior to the completion of the Philadelphia water system, it took 15 minutes for a bucket brigade to fill a fire engine and only a minute and a half for the engine to be emptied. Companies and residents in cities that implemented water supply systems, whether publically or privately owned, had their fire insurance premiums reduced by 20–50 percent. Epidemic diseases such as typhoid, cholera, and yellow fever were an additional concern, as the "miasma" theory, or belief that disease was caused by "bad air," led to attempts to control environmental

[5] It is worth noting that unless a locality hired a water peddler, who went door to door with water, most people only used three to five gallons of water per day. The average American uses 80–100 gallons of water today (United States Geologic Survey [USGS] 2016).

factors, including the water supply.[6] By the 1850s, there were 83 municipal water supply systems in the country and they were still generally constructed without purification apparatus aside from settling basins to control particulate matter.

The first water system constructed in Connecticut was built in Hartford in 1851, followed quickly by one in Bridgeport in 1853. Five more systems were built in the state from 1857 to 1862, beginning with that in New Britain and ending with the one in Winsted. By 1882, 26 of the 129 water systems in New England were in Connecticut. In 1897, 3,350 water systems were in existence in the United States and, by 1900, public water systems had significantly expanded in popularity with the advent of sanitary treatment processes that provided cleaner water for public consumption. The systems constructed after about 1880 varied from expanded versions of earlier systems but with larger and more distant water supplies, to systems with more efficient pumps, some powered by electricity. The more advanced systems had filters and water treatment systems to ensure clean water for consumption and household use (Abbott 1904:24; Anderson 1984:214, 217; Kempe 2006:22; LaNier 1976:174–178; Melosi 2000:23, 2011:61).

A successful water system in the nineteenth century required a water source that was far enough from the population it served to keep it free of pollution, but not so far away that transporting the water was prohibitively expensive; a tank or reservoir was necessary in areas where the main water source depended on rainfall. Distribution pipes needed to be strong enough to transport the water under pressure without breaking, and the pumps that moved the water through the system needed to work reliably. Many New England water departments, concerned with protecting water reservoirs from soil runoff from the surrounding land, planted trees—frequently pine species—to prevent soil from washing into reservoirs and affecting the turbidity of the water (Anderson 1984:223, 360–361).

While early water systems drew water directly from creeks or rivers, the need for dams to increase water supply quickly became important in the nineteenth century, with pumps used to distribute the impounded water. Natural reservoirs were ideal water sources due to their size, but in some cases needed to be augmented with man-made dams to control water flow, which greatly increased the initial expense of constructing a water system. One of the earliest water supply dams to be constructed was the Old Forge Dam in New York, constructed in 1800 in the Adirondacks, followed by a water supply dam in Drumond, Virginia, in 1825. The construction of dams as part of the expansion of water use by cities for public use frequently led to conflicts with industrial plants, which frequently contested the rights of cities and towns to divert the water that factories had been using to power machinery. Some cities and towns were entirely unable to use local lakes and rivers for water supply systems due to rights acquired by mills and factories prior to the decision to create a water system. Those companies that held riparian ownership had the right to an undiminished stream flow and often won lawsuits against municipalities (Anderson 1984:222, 361; Lange 1991:13–14; LaNier 1976:178; Mason 1937:361).

Development of Winchester and Winsted

The development of a public water supply system for Winsted began almost immediately after the Town of Winchester's (Town) incorporation in 1771, prompted by a desire to provide fire protection (and thereby

[6] Until the advent of germ theory in the 1880s, the connection between clean water and public health was largely conjectural. Under the previous theory, known as the miasma theory, only water that smelled or tasted bad was considered polluted. After the introduction of germ theory, however, doctors and public health officials began to understand that diseases such as yellow fever, typhoid, and cholera were caused by bacteria living in the water and not by the air around the water, and water purification was considered a necessary part of water distribution systems (Johnson 2006:69, 99).

lower insurance costs) for industries in the area and a water source for domestic consumption. The impetus for fire protection likely stemmed from major fires in Winsted in 1856 and 1860. The Borough of Winsted incorporated in 1858, and two years later the first Winsted Borough Water Works was completed in 1860 following the granting of water rights at Highland Lake to the Town by the Connecticut legislature. As part of its petition to the Connecticut General Assembly for permission to draw water from Highland Lake, the Town stated that the water level in the lake would drop no more than one inch in a year due to municipal use. The Town raised an earlier (1806) stone and earth dam across the north end of Highland Lake to a height of 9 ft and installed water mains to downtown Winsted for fire suppression and industrial and household use. Prior to this system, most people in town obtained water from wells or nearby springs, and residents who did not live within the service area for the water system continued to get their water this way. Although the water flow from Highland Lake had previously supplied ample water for manufacturing purposes, the additional use by the town residents and industries led to a significant drop in the water level of the lake.[7] As a result, mills and factories were only able to run about 50 percent of the time due to water scarcity. Further water issues arose with residents, who complained about the condition of the drinking water, which water commissioners attributed to eels in the water mains. Residents who lived outside the service area were equally unhappy because they paid taxes to fund the installation of a water service from which they did not receive any benefits (DeMars and Bronson 1972:274).

Conflicts between the Borough of Winsted and manufacturing companies that held water rights made improvements to the water system difficult. Throughout the third quarter of the nineteenth century, numerous proposals were made to improve the water supply situation in Winsted. In January 1877, a canal between Rugg Brook and Highland Lake was proposed. Despite the appropriation of funds by the borough, the project never came to fruition. In 1883, a bill was introduced to the Connecticut General Assembly to give the water commission authority to divert water from the Mad River into Highland Lake; the legislation passed in 1885. A special town meeting was called in 1887 to act on a proposal to build a dam at Crystal Lake and divert the Rugg Brook into the lake. Only 100 of the necessary 200 voters attended the meeting, so the measure was not taken up (Boyd 1873:24; DeMars and Bronson 1972:273–274, 278, 305).

In 1888, local business owner and philanthropist William L. Gilbert became interested in the project and, after meeting with local business owners in 1890, stated that he would be willing to give $48,000 toward the costs of an expanded water supply system. Local businessman Thomas C. Richards was appointed the chairman of a committee to bring the new water system to fruition; Richards hired civil engineer B. H. Hull of Bridgeport to conduct the necessary surveys to complete the project. Six months after making the offer, Gilbert fell ill in Canada. Gilbert's banking partner, Henry Gay, had been responsible for drawing up Gilbert's will and knew that it had no provision for providing the promised funds. Gay traveled to where Gilbert was staying in Canada and convinced him to add a codicil to his will, with the additional stipulation that the borough matched the funds to construct the reservoir dams and purchase water rights. With this substantial donation as impetus, the community moved ahead with the project. A system design and preliminary plans were completed and approved by the Town in July 1892 and, by December 1892, preparations for construction were complete. These preparations included surveying the land, clearing the land for the reservoir, and siting the locations for the dams. The Town-appointed Water Improvement Committee was placed in charge of the construction, with multiple engineers providing input on the final

[7] By the early nineteenth century, numerous iron forges had been established in Winsted, supplying wrought and cast iron goods to local and more distant markets; by the mid-nineteenth century, mills and factories in Winsted were making everything from scythes, carpenters tools, and pocket knives, to carriage axles, pins, and clock bells. Raw materials and finished goods were transported to and from Winsted along three turnpikes constructed in the late eighteenth and early nineteenth centuries (Gilson and Shultz-Charette 2014:6; Wathen 1989:9–10, 43).

design of the structures within the Water Works (see **Criterion C – Engineering**) (Winsted, CT, Water Improvement Committee 1896:15).

In early 1893, builders Babcock, Lary, and Company were awarded the contract for building the first components of the project: the **Mad River Diversion Dam (contributing structure)**, the **Mad River Diversion Canal (contributing structure)**, and the **Mad River Diversion Canal Gates (contributing structure)** to divert water into the **Rugg Brook Reservoir (contributing site)**. The water level of the Reservoir was raised through the construction of the **Rugg Brook Reservoir Dam (contributing structure)** at the northern end, with two earthen dams, the **Rugg Brook North Dike (contributing structure)** and **Rugg Brook South Dike (contributing structure)**, along the east edge that were both wide enough to accommodate a roadway across the top. Water flowed to **Crystal Lake (contributing site)** from Rugg Brook Reservoir through the Gilbert Tunnel at the southeastern end of the reservoir. Construction of the Gilbert Tunnel began on April 1, 1893, and was completed in mid-December of that same year; a team that began at the **Gilbert Tunnel and Inlet Works (contributing structure)** on the north and another at the outlet of the tunnel on the south met in the middle (DeMars and Bronson 1972:275, 280–284; Gilson and Shultz-Charette 2014:3–4; Winsted, CT, Water Improvement Committee 1896:6–9; 23, 24).

Borough officials and the Water Improvement Committee agreed that the Crystal Lake component of the project should not begin until the other improvements had been completed. Therefore, after the completion of testing of the Gilbert Tunnel Works in March 1894, planning began for **Crystal Lake Dam (contributing structure)** in the spring of 1894. Plans for the structure were finalized in September that year, and a contract was issued to Joseph F. Carey of Winsted the same month. Construction was complete by August 1895. Water was first diverted from the Mad River into the Rugg Brook Reservoir on January 29, 1894, when water flowed through the Mad River Diversion Canal and out the Mad River Diversion Canal Outlet. On March 8, 1894, the Gilbert Tunnel Works gates were lifted, letting water flow from Rugg Brook Reservoir into **Crystal Lake (contributing site)** for the first time. After 8 minutes and 11 seconds, the water reached the tunnel outlet, flowing into the lake. In December 1895, the water level of Crystal Lake was finally high enough to spill over the Crystal Lake Dam (DeMars and Bronson 1972:275, 278, 280–284; Gilson and Shultz-Charette 2014:3–4; Winsted, CT, Water Improvement Committee 1896:6–9, 23, 24).

The new water system (Figure 3) was fully operational by 1896, with water mains from Crystal Lake bypassing the old main at Highland Lake, and instead connecting to a junction at Prospect Street, near the borough center, as a substantial design improvement and a money saving measure. By the contract established for regulating use of water impounded in the Rugg Brook Reservoir, two-thirds of this water was retained for use for the Water Works and the remaining third was guaranteed to manufacturers along Mad River to maintain a 1,600 cubic-foot per minute flow in the river as needed. At this time, Highland Lake was removed from the system and began to be used predominantly for recreational purposes. In the 1912, the town Health Officer, Dr. S. G. Howd, expressed concern over the safety of water from the Mad River. In 1924, land was purchased for the construction of a chlorination plant (not extant), and in 1927, 2,000 four-year-old red pines were planted around Crystal Lake to protect the watershed; 3,000 more were planted in September 1931. The lake continues to be surrounded by mature red pines that may be from those planting campaigns having survived the 1938 and 1955 hurricanes in the region. In 1930, following the stock market crash and the onset of the Great Depression, the City of Winsted acquired the Empire Knife Company's rights to water from the Mad River, thus controlling the entirety of the Mad River output

(DeMars and Bronson 1972:287).[8] After 1931, individual components of the Winsted Water Works district were subject to occasional routine repairs and alterations (described in Section 7) to keep the system in a state of good repair and continuous operation, but the design and function of the components has been retained, and none have been demolished or disabled (DeMars and Bronson 1972:282–286; Winsted, CT, Water Improvement Committee 1896:9).

CRITERION C – ENGINEERING

The Winsted Water Works is significant at the state level under Criterion C in the area of Engineering as a significant grouping of dams, aqueducts, and reservoirs designed for purposes of municipal water supply. Through its overall design, it conveys a typical late nineteenth-century approach to the construction of such works, employing massive masonry dams to retain reservoirs capable of providing a long-term supply of water to the city of Winsted. The Winsted Water Works garners additional significance from three of its contributing resources: The Mad River Diversion Dam and Rugg Brook Reservoir Dam both exemplify stone masonry dam design of the period, and the Gilbert Tunnel and Inlet Works is the first tunnel aqueduct to be built in Connecticut (Raber 1997:5). The Winsted Water Works was designed by multiple engineers with prior experience with water works and dams.

Design of Municipal Water Collection and Storage Systems

The nineteenth-century shift in the United States from informal collection of water from surface bodies or wells by individuals to organized municipal water supplies introduced the need for large-scale water collection and storage systems that could reliably supply community needs throughout the year. In general, the types of water sources available to municipalities consisted of wells, direct pumping from nearby surface bodies (often with extensive filtration), and collection from distant surface bodies. As municipal well capacities were outstripped and local water supplies became polluted, urban communities such as Winsted often had to look outside their boundaries for water supplies. Therefore, the use of remotely located dams and reservoirs with a gravity feed into the distribution network became the chief technological means to establish constant water supplies for many American cities, including Winsted. New York City's construction of the Croton Dam and Reservoir in 1842 exemplified this approach, which was emulated across the country. A large masonry dam was constructed, and the resulting reservoir connected to the city using a buried aqueduct and water main distribution system. The geography of New England facilitated this type of water supply, as it provided numerous well-watered but (relatively) sparsely populated uplands that provided opportune sites for reservoirs and the requisite elevation change to provide for a gravity-fed system (Kempe 2006:25; Mason 1937:349–350; Melosi 2000:79–82, 117, 126–129).

Among the chief problems faced in the design of these water systems were the preparation of the impoundment and the construction of the dam, which became foci of professional engineering literature in the late nineteenth century.[9] Boston's experience with developing its reservoirs was widely published and established the importance of a well-prepared impoundment bottom to water quality. Clearing and grubbing of vegetation, followed by careful removal of organic soil matter, were essential, and these steps were

[8] Empire Knife Company was one of the most successful knife companies in Winsted. The firm began in 1853 as the Beardsley & Alvord Company. It became Empire Knife in 1878 and operated using water rights on Coe Street until the Great Depression, at which time the firm's water rights reverted to the City of Winsted (DeMars and Bronson 1972:287).

[9] The design of treatment and distribution systems was also highly important but is not treated in this document because there are no water treatment or distribution resources within the nominated property.

diligently followed in the construction of the Winsted Water Works (Kempe 2006:28; Winsted, CT, Water Improvement Committee 1896).

The massive impoundment dams being erected for municipal reservoirs like the **Mad River Diversion Dam, Rugg Brook Dam,** and **Crystal Lake Dam** in Winsted dwarfed in size and capacity many of the regional industrial dams that had been constructed heretofore. The history of dam construction in New England until ca. 1850 was highly irregular and may be characterized as vernacular in character and drawing on European traditions of construction. Dams were often built without professional consultation, and their particular details were based on the personal experience of the millwright or local contractor hired for the job. Compounding the issue was the high variability (and constraints) of the available sites, materials, and funding of the dam owner. The dams were usually intended for industrial purposes and were typically run-of-the-river structures (aka weirs) that lacked substantial impoundments. Timber and earth were the earliest materials to be used in the capital-starved colonial period. When it could be acquired, stone was a favored material because of its durability (Condit 1960:256; Kempe 2006:28).

Municipal water supply dams were often better capitalized than their industrial brethren, and their large size introduced new engineering problems and higher costs in case of failure. There were a number of infamous dam failures, many of which were for municipal water works that heightened the desire for robust structures on the part of the engineers and their clients. These disasters included the failure of the first Croton Dam during construction in 1842, the 1848 failure of Boston's original Lake Cochituate Dam, the 1867 failure of Hartford's Dam No. 1, and the failure of the Lynde Brook Dam in Worcester, Massachusetts, in 1876. Thus, late nineteenth-century water supply engineers often turned to masonry dams for their systems. The first masonry dam in the United States was probably built in 1743 in New Brunswick, New Jersey, for a local water supply, and the first large masonry dam in the country was the 50-ft-high 1842 Croton Dam for the New York City water supply system. As demonstrated by the Mad River Diversion Dam (Figure 4) and Rugg Brook Dam (Figures 5 and 6), these masonry structures relied on their sheer mass to resist the thrust of water impounded behind them and on careful cutting and laying of the stone to prevent leaks. The dams' upward-tapering trapezoidal profile was designed according to mid- and late nineteenth-century theories of structural engineering; it employs a vertical or near-vertical downstream face with a steeply sloping upstream face. Careful attention was paid to the base of the dam, where the ground surface was carefully excavated to bedrock (when available) and a cut-off wall extended in a trench below the dam to eliminate water undercutting and possibly imposing uplift forces on the dams (Condit 1960:256–260; Kempe 2006:28–29; Schuyler 1909:204–207; Smith 1972:192–205).

In addition to exemplifying late nineteenth-century masonry dam engineering, the Rugg Brook Reservoir Dam is one of the largest and best examples of masonry dam construction in Connecticut. State dam records show that there are approximately 260 dams in Connecticut of primarily stone construction. At 29 ft high and 300 ft long, Rugg Brook Reservoir Dam's overall size is equaled or exceeded by only approximately a dozen others. Additionally, Rugg Brook Reservoir Dam (and the Mad River Diversion Dam, although it is not as large) possesses masonry construction of a fine workmanship, employing ashlar or cut stone masonry, as opposed to the more common rubblestone, throughout the structure. Only a handful of dams in the state offer comparable workmanship: the American Felt Company Dam (CT Dam No. 5704) and Pemberwick Dam, both built in 1867 in Greenwich, and the Congdon Pond Dam (CT Dam No. 8601), built ca. 1900 in Montville.[10] These three dams, like the Rugg Brook Dam, exemplify stone dams through their extensive use of carefully split stone ashlar and trapezoidal cross section. The American Felt Company Dam and Pemberwick Dam both utilize a gravity arch design—the former is 37 ft high and 208 ft long and the latter

[10] None of these structures are listed in the National Register of Historic Places.

is 45 ft high and 115 ft long. Congdon Pond Dam is 35 ft high and 150 ft long. These three dams were constructed to provide waterpower for manufacturing purposes. Within the context of water supply dams, most structures are of earth embankment construction and use concrete spillways. Therefore, the dams of the Winsted Water Works are also perhaps the best examples of masonry dams built for water supply (Connecticut Dam Safety Section, 2015; Peter Spangenberg, Connecticut Dam Safety Section; personal interview with John Daly, PAL December 9, 2015; U.S. Army Corps of Engineers 2015).

The three dams of the Winsted Water Works are mature examples of the masonry type, which became outmoded by new dam construction technologies in the early twentieth century. Chief among these new technologies were reinforced concrete and earth fill dams, the latter often constructed using the hydraulic fill method in which watertight cores were created by pumping the dam fills, suspended in water, into place. Such means would allow dams hundreds of feet in height to be constructed in the twentieth century for a new generation of municipal reservoirs. They were also more cost-effective than masonry dams, which required high labor costs for quarrying, shaping, and laying the stone (Condit 1960:260; Kempe 2006:34).

Finally, the Winsted Water Works is notable for its incorporation of the **Mad River Diversion Canal** and **Gilbert Tunnel and Inlet Works** (Figures 7 and 8). Both are aqueducts that move water between different sub-basins of the Mad River watershed—a system trait unusual in municipal water collection systems. The **Gilbert Tunnel and Inlet Works**, which was required to achieve the Rugg Brook–Sucker Brook water transfer, is the first of only four tunnel aqueducts built for municipal water supplies in Connecticut. The other three were built later, two by the New Haven Water Company: the Wepawaug River Diversion Works (built 1911) and the Genesee Tunnel (built 1956). The third, the Shepaug aqueduct tunnel supplying Waterbury, was built in 1921–1926 (Agar and Cairns 1927:15–16; Blair 1912; Kempe 2006:32; Raber 1997:5).[11]

Engineering of the Winsted Water Works

During the late-nineteenth century, the increasing size and complexity of municipal water supplies necessitated that their design be the responsibility of trained engineers with specialized experience in sanitation and dam engineering (Melosi 2000:79). The report of the Winsted, Connecticut, Water Improvement Committee shows that six engineers participated in the design of the Water Works, although the roles of all the engineers are not strictly defined. Available biographical information shows that all of the individuals to whom specific designs within the Water Works could be attributed had moderate or substantial experience in municipal water system design, although they were not necessarily masters in their field (Winsted, CT, Water Improvement Committee 1896:9, 13, 15).

Bradley H. Hull (1825–1905, commonly referred to as B. H. Hull), a civil and hydraulic engineer whose main office was in Bridgeport, Connecticut, completed the design for the general layout and function of the system ca. 1890–1892, and also participated in construction of the system, apparently in the role of a contracting engineer. Hull was born in Ridgefield, Connecticut, and had no formal engineering training, only practical experience as an engineer. His first trade was millwrighting; he then learned surveying while working for a Fairfield County, Connecticut, surveyor. Through unknown means, Hull gradually established himself as a mechanical and hydraulic engineer specializing in the construction and mechanical outfitting of water power plants, dams, and water works. Doing business as B. H. Hull & Company, he served as consulting engineer for multiple important water works and water power installations in

[11] Both the Wepawaug and Genesee tunnels are now incorporated into the South Central Connecticut Regional Water Authority and remain an active part of the system. The Shepaug aqueduct tunnel continues to supply water to Waterbury.

Connecticut, New York, and Pennsylvania. In Connecticut, his dam or water works systems included those for New Haven, Stamford, Danbury, and New Milford. The water supply dam designed by Hull in New Milford was a 240-ft-long and 35-ft-high masonry structure. In 1885, he took on a junior partner—William B. Palmer—to form the firm of Hull & Palmer. Hull was well respected in Connecticut engineering circles. He helped organize the Connecticut Society of Civil Engineers, serving as its first president, and served as an inspector of dams and reservoirs. He retired in 1896 (Baker 1890:107, 117; Connecticut Society of Civil Engineers 1906:73–74; *Engineering News* 1881:81; Mailhouse 1908:106–107).

Daniel Seymour Brinsmade (1845–1912, commonly referred to as D. S. Brinsmade) may have been the designer of the Rugg Brook Dam. Brinsmade lived in Connecticut all his life. He graduated from the civil engineering department of the Sheffield Scientific School of Yale in 1870. After completing school, he immediately found employment with the Ousatonic Water Power Company in Derby and Shelton, CT, a regionally important industrial water power development on the Housatonic River. Brinsmade spent his entire career with the company, rising from assistant engineer to become president, chief engineer, and general manager by the time of his death. During his tenure, he oversaw the reconstruction of the Ousatonic Water Power Company dam and consulted across New England and New York on hydraulic engineering problems. He served as a president of the Connecticut Society of Civil Engineers (dates of service unknown) (Hill and Scofield 1913:82–84; Silvio 1986; Winsted, CT, Water Improvement Committee 1896:9).

George H. Pierson of New York City designed the Crystal Lake Dam. Only limited information could be found concerning this civil engineer, who apparently specialized in city sanitation and water works design. As of 1891, Pierson was the chief engineer for Coffin & Stanton, a New York-based investment banking house that owned railroads and water works. By 1903, he was consulting engineer for The Municipal Engineering Company, a firm that provided municipal sewage treatment and garbage disposal solutions. During his career, Pierson designed water works for Sharon, Pennsylvania, and sewage systems or treatment plants for Greenville, Pennsylvania, and Newark, New York (*Engineering News* 1887; *Engineering Record* 1906a:48; 1906b:42; *Engineering World* 1906:896; Municipal Engineering Company 1903:35; *Rockland County Journal* 1885:18, 1891:1).

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- Crystal Lake Reservoir, 16203
- Winchester—General Correspondence

Personal Communication

James Rollins, Public Works Director, Town of Winchester, CT; information provided via email to Virginia H. Adams, PAL, February 2020.

Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #____________
____ recorded by Historic American Engineering Record # ___________
____ recorded by Historic American Landscape Survey # ___________

Primary location of additional data:

____ State Historic Preservation Office
____ Other State agency
____ Federal agency
__x__ Local government

____ University
__x__ Other
Name of repository: _Beardsley and Memorial Library______________

Historic Resources Survey Number (if assigned): ________________

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10. Geographical Data

Acreage of Property _______210.32________

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates
Datum if other than WGS84:__________
(enter coordinates to 6 decimal places)

A. Latitude: 41.944009 Longitude:-73.124581

B. Latitude: 41.942276 Longitude:-73.116353

C. Latitude: 41.938340 Longitude:-73.113244

D. Latitude: 41.937764 Longitude:-73.113237

E. Latitude: 41.935942 Longitude:-73.115027

F. Latitude: 41.928819 Longitude:-73.106684

G. Latitude: 41.929060 Longitude:-73.106123

H. Latitude: 41.928213 Longitude:-73.101682

I. Latitude: 41.924246 Longitude:-73.098806

J. Latitude: 41.919901 Longitude:-73.098555

K. Latitude: 41.916971 Longitude:-73.104593

L. Latitude: 41.917113 Longitude:-73.106611

M. Latitude: 41.918400 Longitude:-73.107783

N. Latitude: 41.920431 Longitude:-73.106867

O. Latitude: 41.922254 Longitude:-73.104363

P. Latitude: 41.923232 Longitude:-73.105893

Q. Latitude: 41.925013 Longitude:-73.107041

R. Latitude: 41.928714 Longitude:-73.107027

S. Latitude: 41.935846 Longitude:-73.115405

T. Latitude: 41.935346 Longitude:-73.118012

U. Latitude: 41.933361 Longitude:-73.120330

V. Latitude: 41.934686 Longitude:-73.120309

W.Latitude: 41.939115 Longitude:-73.117433

X. Latitude: 41.941896 Longitude:-73.117074

Y. Latitude: 41.943671 Longitude:-73.124917

Or
UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

1. Zone: Easting: Northing:
2. Zone: Easting: Northing:
3. Zone: Easting: Northing:
4. Zone: Easting : Northing:

Verbal Boundary Description (Describe the boundaries of the property.)

The boundaries of the Winsted Water Works follow the physical footprints of the contributing resources within the system, as shown on the accompanying Winsted Water Works National Register District Property Map (Figure 2).

Boundary Justification (Explain why the boundaries were selected.)

Boundaries of the Winsted Water Works property have been chosen to conform to the footprints of the resources within the District that were a part of the original 1890s design for the system and are extant today. The resources lie within larger parcels of undeveloped conservation land that are devoid of resources relating to the Water Works. Late twentieth-century Winsted Water Works treatment and storage infrastructure on the southeast shore of Crystal Lake has been excluded from the District as these structures are not temporally or functionally associated with water collection and storage.

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11. Form Prepared By

name/title: John Daly/Senior Industrial Historian; Gretchen Pineo/Architectural Historian; Virginia H. Adams/Senior Architectural Historian; Melissa Andrade/Architectural Historian
organization: Public Archaeology Laboratory, Inc.
street & number: 26 Main Street
city or town: Pawtucket state: RI zip code: 02860
e-mail vadams@palinc.com
telephone: (401) 728-8780
date: February 2020

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.

- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photograph Log

Name of Property: Winsted Water Works

City or Vicinity: Winsted/Winchester

County: Litchfield State: CT

Photographer: Gretchen Pineo and John Daly, The Public Archaeology Laboratory, Inc.

Date Photographed: September 2015

Description of Photograph(s) and number, include description of view indicating direction of camera:

1 of 16. Mad River Diversion Dam and Canal Gates, looking east.

2 of 16. Mad River Diversion Dam, looking southwest.

3 of 16. Mad River Diversion Canal Gates, looking east.

4 of 16. Mad River Diversion Canal, looking northwest.

5 of 16. Mad River Diversion Canal Outlet at Rugg Brook, looking west.

6 of 16. Rugg Brook Reservoir and Dam, looking north.

7 of 16. Rugg Brook Reservoir Dam, looking east.

8 of 16. Rugg Brook Reservoir Dam, looking west.

9 of 16. Rugg Brook North Dike, looking southeast.

10 of 16. Rugg Brook South Dike, looking southeast.

11 of 16. Gilbert Tunnel Inlet Works, looking south.

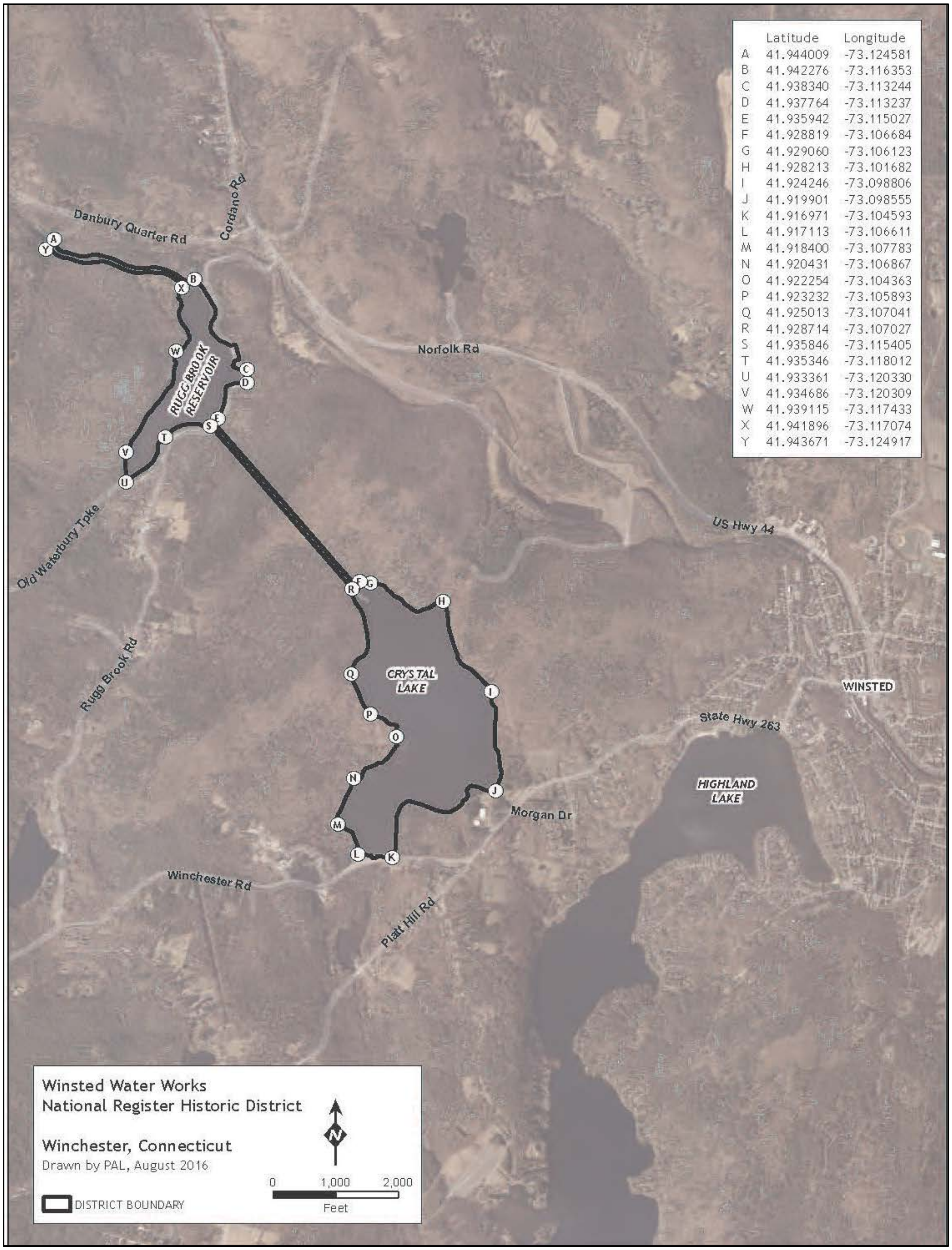
12 of 16. Gilbert Tunnel Works, looking southwest.

13 of 16. Gilbert Tunnel Outlet, looking northwest.

14 of 16. Crystal Lake, looking northwest.

15 of 16. Crystal Lake Dam, looking west.

16 of 16. Crystal Lake Dam spillway, looking north.



	Latitude	Longitude
A	41.944009	-73.124581
B	41.942276	-73.116353
C	41.938340	-73.113244
D	41.937764	-73.113237
E	41.935942	-73.115027
F	41.928819	-73.106684
G	41.929060	-73.106123
H	41.928213	-73.101682
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J	41.919901	-73.098555
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M	41.918400	-73.107783
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U	41.933361	-73.120330
V	41.934686	-73.120309
W	41.939115	-73.117433
X	41.941896	-73.117074
Y	41.943671	-73.124917

Figure 1. Winsted Water Works Coordinate Map

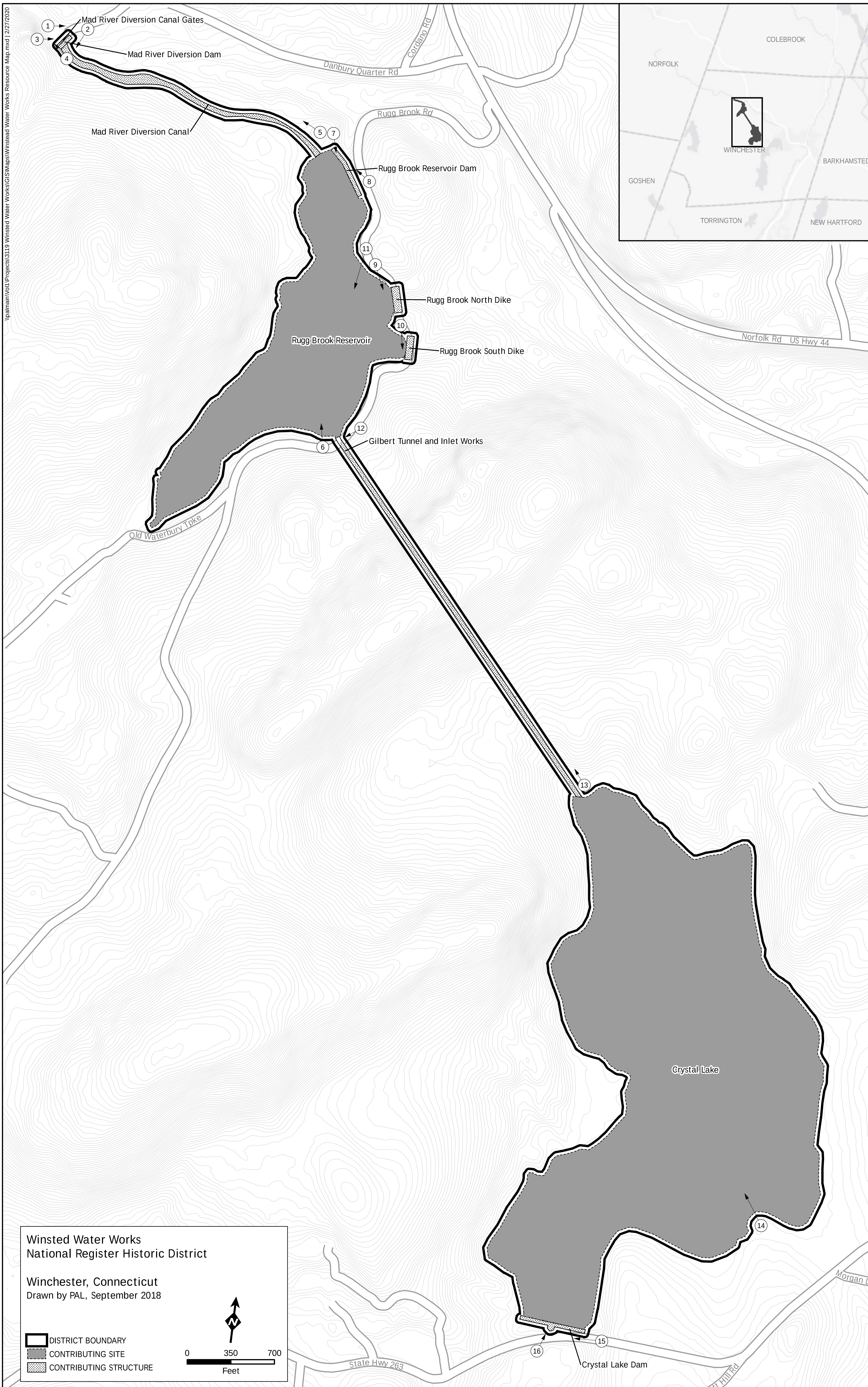

Figure 2. Winsted Water Works District Resource Map

Historic Images

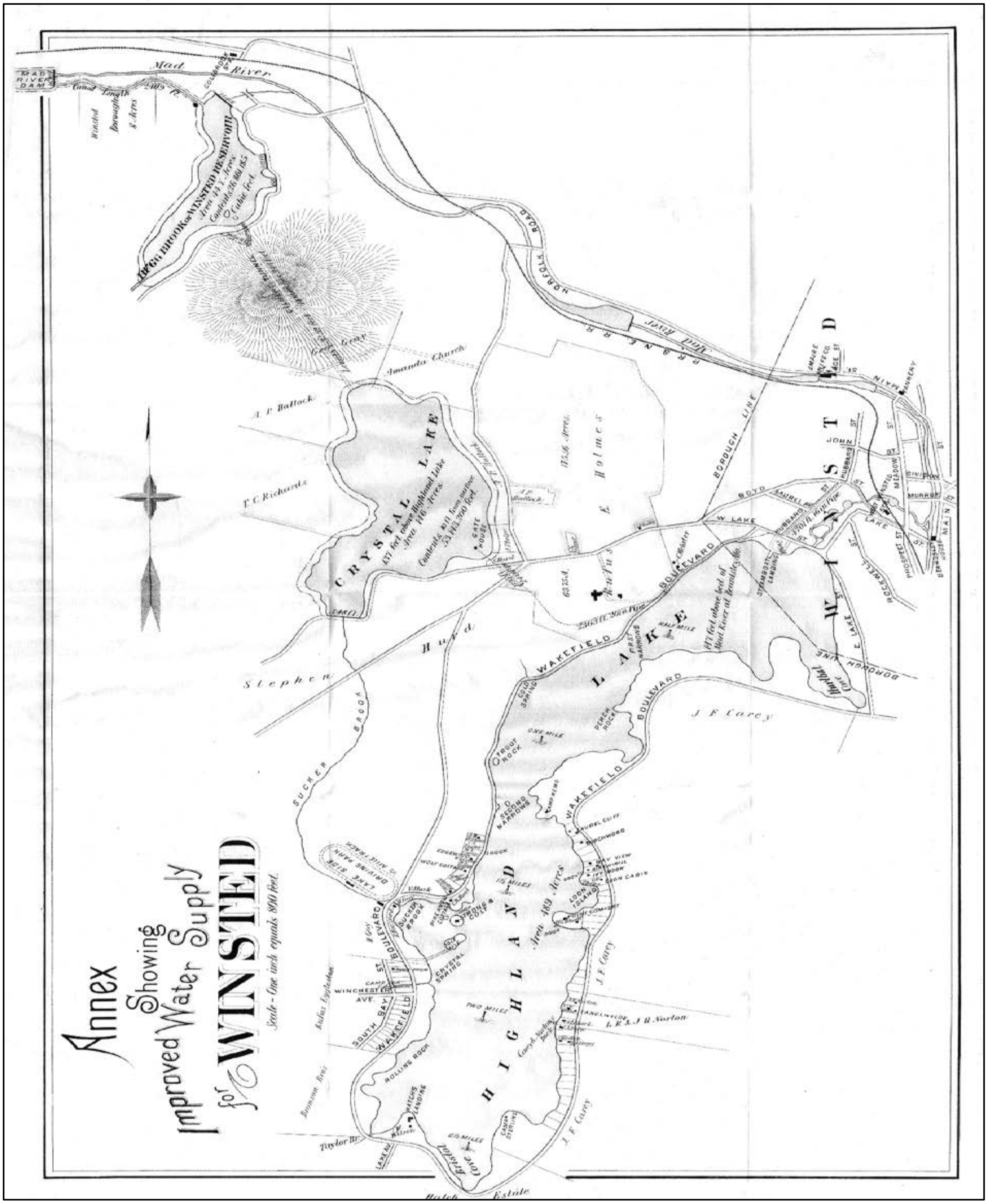

Figure 3: Map of Winsted Water System following completion in 1896 (Winsted, CT, Water Improvement Committee 1896).

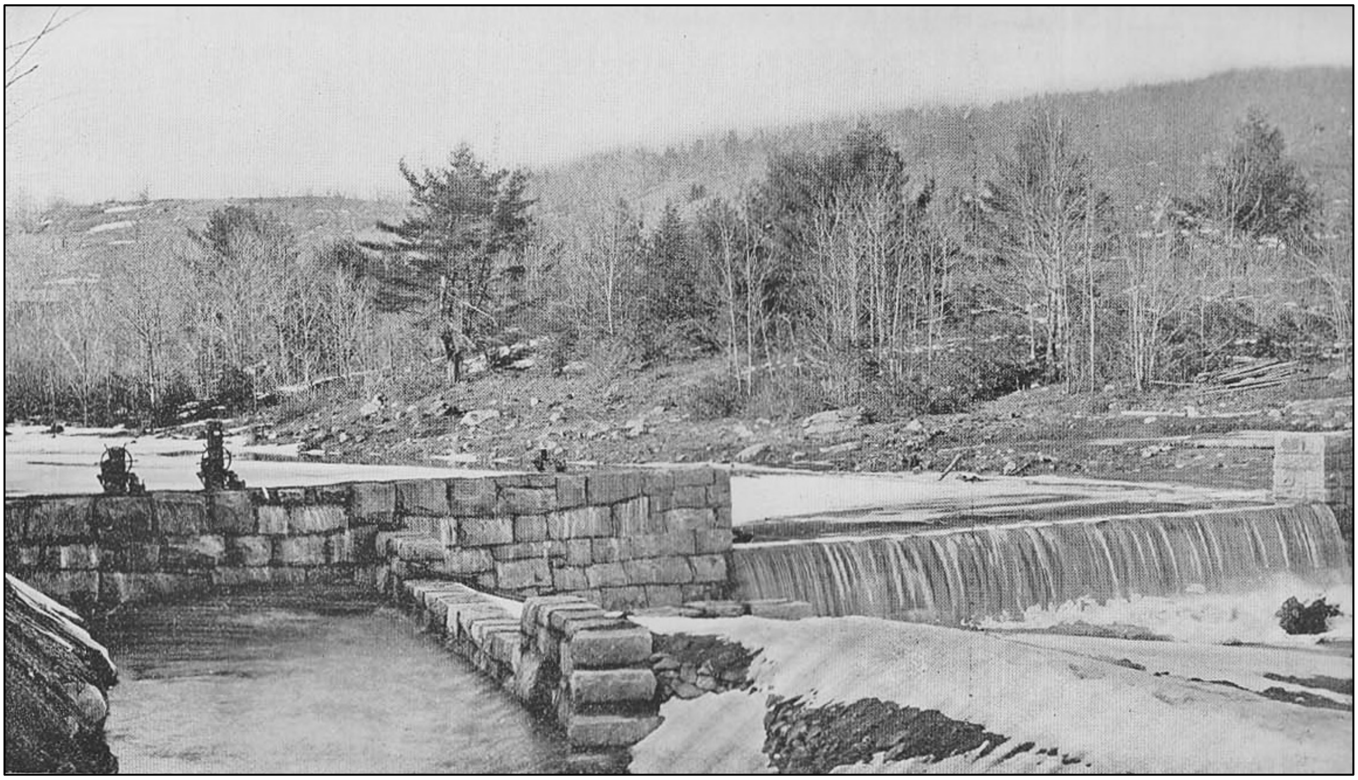

Figure 4: Mad River Canal and Mad River Dam, ca. 1894 (Winsted, CT, Water Improvement Committee 1896).

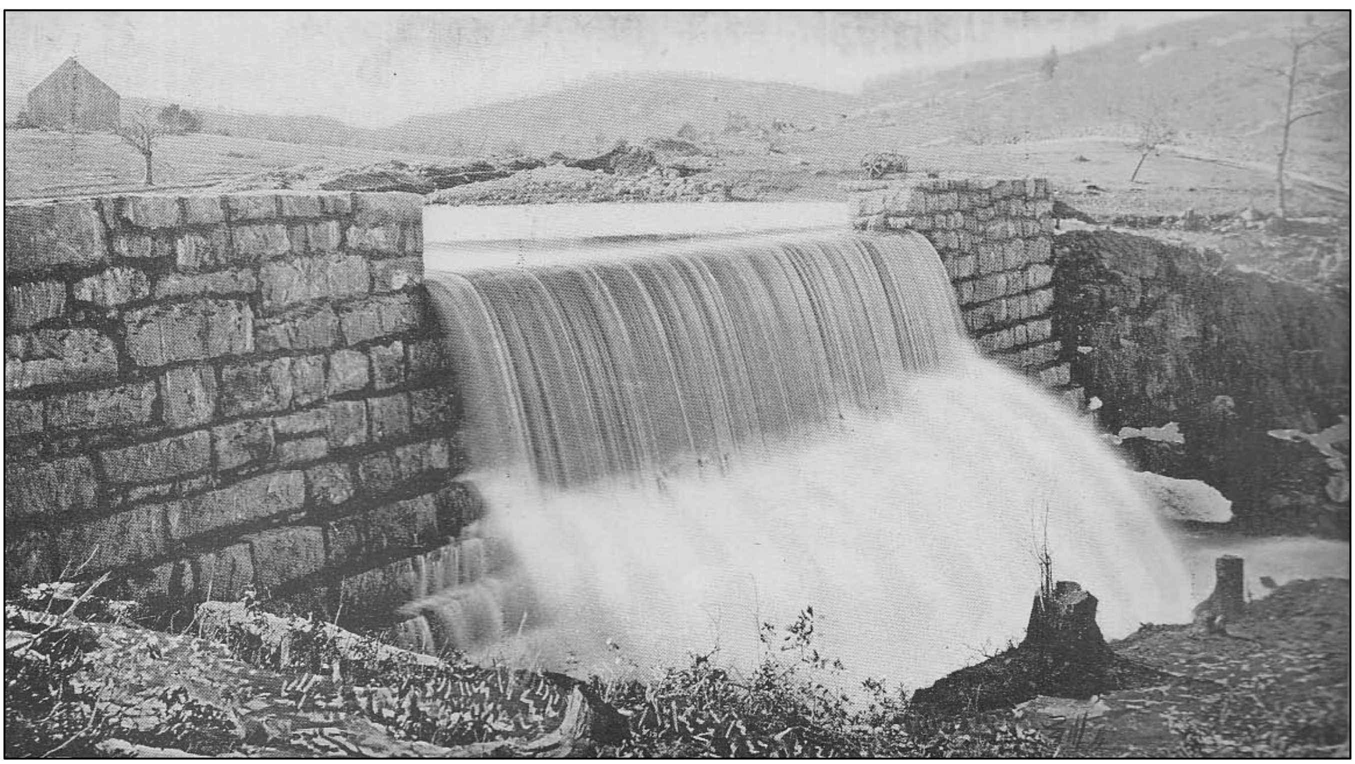

Figure 5: Rugg Brook Dam, ca. 1894 (Winsted, CT, Water Improvement Committee 1896).

Figure 6: Upstream side of Rugg Brook Dam, ca. 1935, before the addition of the concrete liner (courtesy Dave Battista, Lenard Engineering, Winsted, CT).

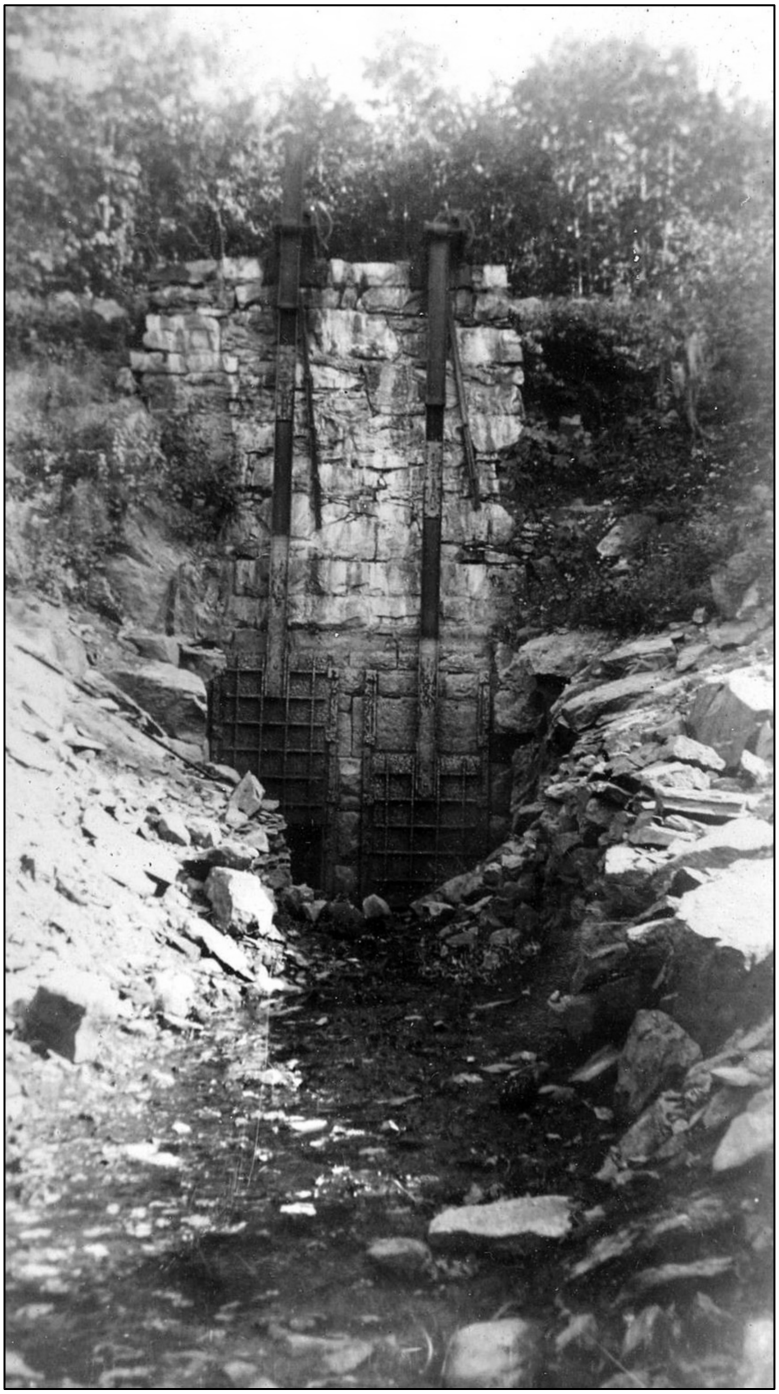

Figure 7: Gilbert Tunnel Inlet gates, ca. 1935 (courtesy Dave Battista, Lenard Engineering, Winsted, CT).

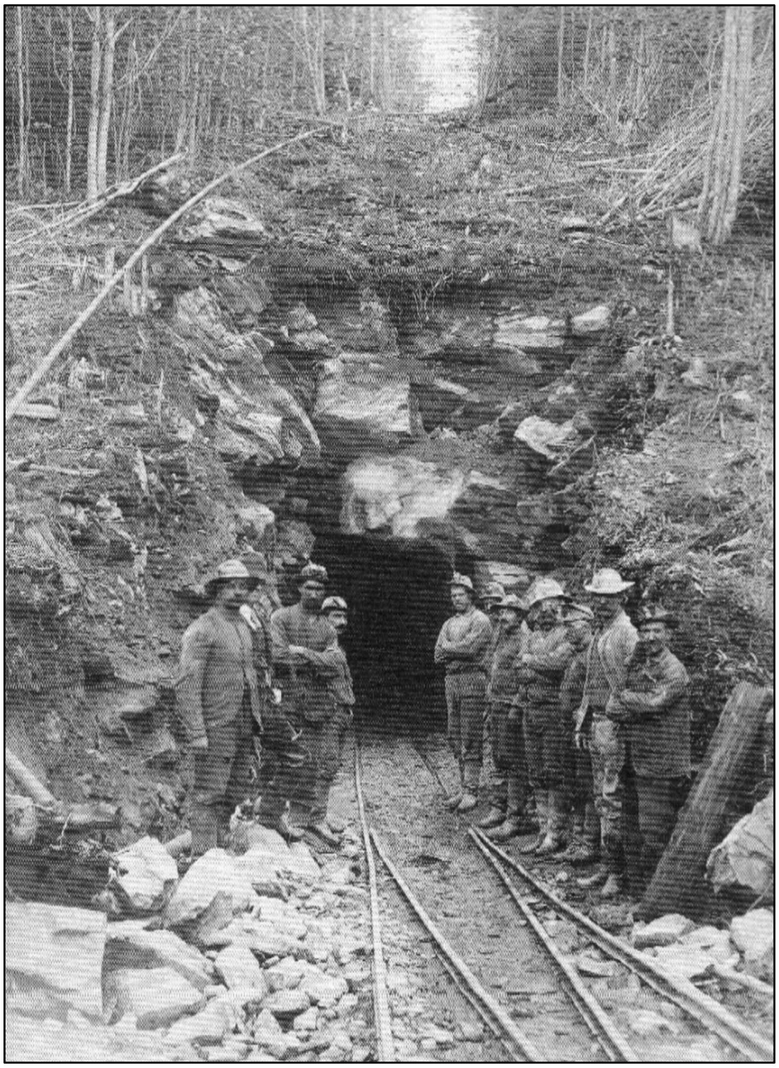

Figure 8: Gilbert Tunnel outlet following completion, ca. 1893 (Senack 2001).

Winsted Water Works Photographs

Photo 1. Mad River Diversion Dam, looking east.

Photo 2. Mad River Diversion Dam, looking southwest.

Photo 3. Mad River Diversion Canal Gates, looking east.


Photo 4.	Mad River Diversion Canal, looking west.


Photo 5.	Mad River Diversion Canal Outlet at Rugg Brook, looking west.


Photo 6. Rugg Brook Reservoir and Dam, looking north.


Photo 7. Rugg Brook Reservoir Dam, looking east.


Photo 8. Rugg Brook Reservoir Dam, looking west.

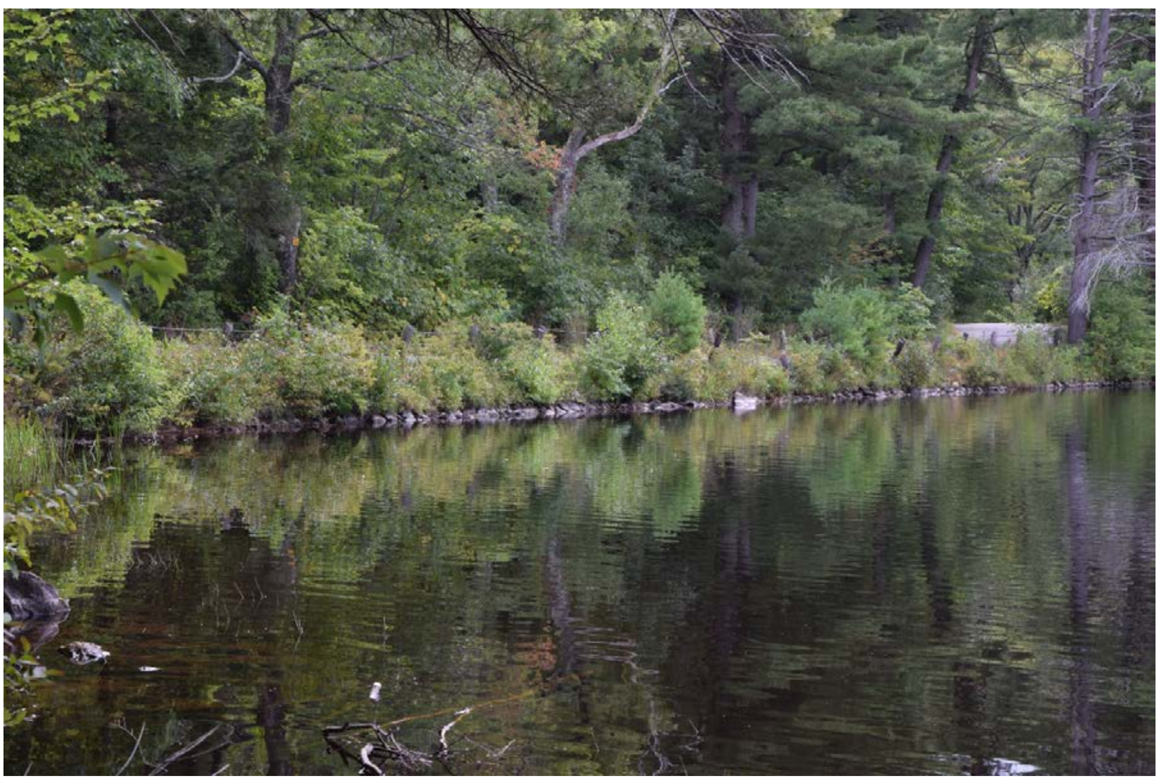
Photo 9. Rugg Brook North Dike, looking southeast.


Photo 10. Rugg Brook South Dike, looking southeast.


Photo 11. Gilbert Tunnel Inlet Works, looking south.

Photo 12. Gilbert Tunnel Works, looking southwest.

Photo 13. Gilbert Tunnel Outlet, looking northwest.

Photo 14.	Crystal Lake, looking northwest.

Photo 15.	Crystal Lake Dam, looking west.

Photo 16. Crystal Lake Dam spillway, looking north.