



Middlesex Canal Association

P.O. Box 333 ☆ Billerica, Massachusetts 01821

November 27, 2020

Ms. Brona Simon
SHPO and Executive Director
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

Re: Iron Horse Park Superfund Site, Billerica, Massachusetts
National Historic Preservation Act – Section 106 Consultation
Determination of No Adverse Effects for Remedial Action at B&M Railroad Landfill,
Area of Concern (AOC) 1

Dear Ms. Simon:

"The exact height of the berm and towpath are not known." Assessment, p. 8. Yet the assessment states the towpath or berm is high or low. "The width of the canal channel ranges from 25–45 feet . . .", p. 3. The width of the water surface is what rain and the height of the beaver dam make it. Rather than guess, EPA should measure the towpath elevation south of mile 20, the S curve. See Assessment, Figure 5, p. 10. The towpath south of mile 20 is low fill, two or three feet, in a swamp. The path is solid having been compacted by the hooves of thousands tow horses and oxen. Measurement in a half dozen locations of elevation, width of towpath, and width to berm side, would provide the data for an accurate estimate of the canal between the railyard and Pond St before it was disturbed by the railroad company.

The 75' width of the canal historic district as drawn on Figure 10, p. 18, of the assessment lacks the historic data of the 1829-30 George Baldwin survey. While the magnetic bearing, N 59½ W (Figure 4, p.9), of the canal is not relevant as the canal exists, the cross section of the canal (Figure 6, p. 10) has the measured width of the towpath as 6.50' and a prism width of 104'. The surveyed line for the canal almost certainly was down the middle of the 1829 towpath, say 3' from the waterside of a 10' design towpath. Thus the 1829 survey line should be drawn on Figure 10, and the historic district lines drawn 22' and 53' south and north of the historic line.

When plotting the canal, best would be to

- (1) note the true bearing of the canal using the magnetic deflection in 1829 of the line between the Bunker Hill monument and the State House in the Baker Library's *Middlesex Canal Field Survey Book*,
- (2) locate Turning Points 282 and 283, defining points of the linear canal between Pond St and the railyard, using grid coordinates, and
- (3) note the elevation of the towpath on the standard North American Vertical Datum, NAVD 1988, with a conversion factor for the AMSL datum used in the assessment.

Whether the existing canal at AOC 1 has an as-built prism width of 104' is dependent on the difference in elevation between the towpath and ground when built. Figure 10, p. 15, has profiles 3 through 6 but no indication that a purpose of them is to determine the cross section of the canal at AOC 1. They do not even transect the historic district. Cross sections of the historic district in the undisturbed part between AOC 1 and Pond St would be better locations for transects measuring the historic canal, indicating what was the historic canal at profiles 3 - 6. The transcribed "Section 2" from the 1829-30 survey in the notes to this letter shows how a section is done using the canal prism as a reference.

Under "Assesment of Effects", p. 17, the argument is the canal at AOC 1 has been signicantly altered . . . and need not be restored. The counter argument is that with signifcant grading to be done, Figure 10, p. 15, a typical 5' wide berm with 2-on-3 slope into the water and up the hill be should graded as shown in "Section 2", leaving the canal better than it was and historically accurate for the new hill.

Importance of Canal at AOC 1.

In August 1794, the English engineer hired by the Middlesex Canal Company fixed the elevation of the water in the summit pond at one foot higher than the Richardson dam^{1,2}. In September 1794, the company began digging the canal between the Concord River summit pond and the Merrimack River. In 1798, the company replaced the Richardson dam. The river meadow owners in Concord, Sudbury, et al. are complaining that the dams at Billerica Falls are causing damaging floods with eventually a legislative committee holding hearings in 1859 and writing a 500 page report followed by an engineering report in 1861.^{3,4} The most recent report on the summit pond and dam was on the removal of the dam to accomodate the reproductive cycle of diadromous fish.⁵ On the 200th anniversay in 2017 of Thoreau's birth, a biography was published a major part of which was his involvement with the 1859 effort to remove the dam to benefit the meadow owners.⁵

The Richardson dam of 1794 to which the engineer fixed the water one foot higher in the summit pond is gone without its elevation recorded. However, that part of the Middlesex Canal between the Concord River summit pond and the Merrimack River was constructed after 1794 and before 1798 when the second dam was built. In other words, that part of Middlesex Canal was constructed with the one foot higher as its control elevation.

The canal between the summit pond and the Charles River, 107' below the pond, was constructed after 1798. The canal descended the 107' in steps through 16 locks. The first step was between the guard lock at the summit pond and the lock at Nichols' Street, 4.4 miles towards Boston. The elevation of the towpath of the first step towards Boston when compared to the elevation of the towpath to the Merrimack River will indicate how much, if any, the pond was raised when the 1798 dam was built.

While the canal was 27 miles long, the 4.4 miles of the first step in the descent towards Boston has an elevation pertinent to the Great Billerica Dam Controversy⁷, and in that distance, only the canal on either side of Pond St remains measurable. Spot elevations on berms and towpaths on the both sides which have different topography would produce data for calculating the elevation, xx.xx (NAVD88) of the historic towpath between the summit pond and Nichols' Lock and at the disturbed AOC 1.

Very truly yours,


president

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Notes.

1. *The Old Middlesex Canal* by Mary Stetson Clarke 1974. Easton PA: Center for Canal History and Technology, 2nd printing, 1987. "Report of William Weston to the Directors of the Middlesex Canal", August 2, 1794", one foot higher", p. 152. Clarke citation: Manuscripts Division, Baker Library, Harvard Business School, Baldwin Papers, Vol. 4.

2. "The Billerica Falls Dam" by J. Jeremiah Breen. *Towpath Topics*, Vol. 56, No. 2 (Jan 2018).

<http://middlesexcanal.org/towpath/towpathtopicsFeb2018.htm#BillericaDam>

3. Report of the joint special committee upon the subject of the flowage of meadows on Concord and Sudbury Rivers, January 28, 1860. Boston: William White, printer to the State, 1860. Google Books, <http://tinyurl.com/Jan1860report> .

4. "The 1825 Iron Bolt" by J. Jeremiah Breen. *Towpath Topics*, Vol. 52, No. 1 (Sep 2013), pp. 8-10.

<https://tinyurl.com/y8qxbggq>

5. *Concord River Diadromous Fish Restoration: Feasibility Study: Final Report*

prepared by Gomez and Sullivan, Engineers, 2016.

<http://archives.lib.state.ma.us/handle/2452/626310>

6. *The Boatman: Henry David Thoreau's River Years* by Robert M. Thorson. Cambridge: Harvard University Press, 2017.

7. "The Great Billerica Dam Controversy" by Arthur L. Eno, Jr. *Towpath Topics*, Vol 20, No. 2 (Apr 1982).

<http://middlesexcanal.org/towpath/towpathtopicsApr1982.htm>

A. The canal between the Concord and Merrimack Rivers is known as the Thoreau Towpath from Thoreau having boated on it and written of it in *A Week on the Concord and Merrimack Rivers*.

B. In 1828 a granite dam was built, submerging the 1778 dam. However, in 1825 an iron bolt was placed by the canal company as a benchmark for the use by the Faulkner Mill of summit water not needed for the canal. See Note 4. above. The 1825 iron bolt became a benchmark for measuring elevations on the dams and the Concord River.

C. "Section No. 2" by George R. Baldwin, 1830, on following page. Transcribed from the Internet Archive, Middlesex_Canal Plan_and_Profile, copy of all nine cross sections with graphical scale,

https://ia803003.us.archive.org/8/items/Middlesex_Canal_Plan_and_Profile/sections_linen_finish.jpg

D. Photo of "Middlesex Canal from railyard east to Pond Street" by J. Jeremiah Breen, November 2020, on following page. N. B., the width of the canal at the water's surface is uniform.

E. Link to October 30, 2020 *Assessment of Effects* and other files, [Dropbox](#)

<https://www.dropbox.com/sh/sext2euwuu1yku7/AAAW73wxqDXvsZJrRQEMFzIKa?dl=0>



Section by Parting of Mystick Pond. N^o 2.

