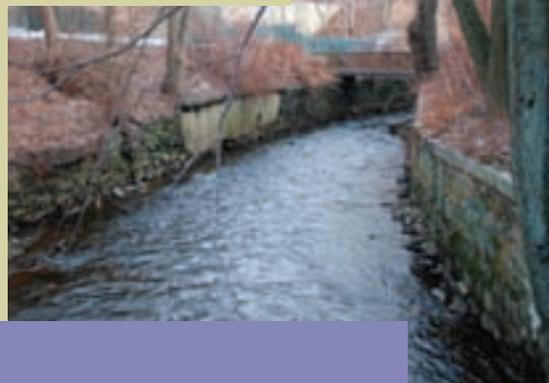
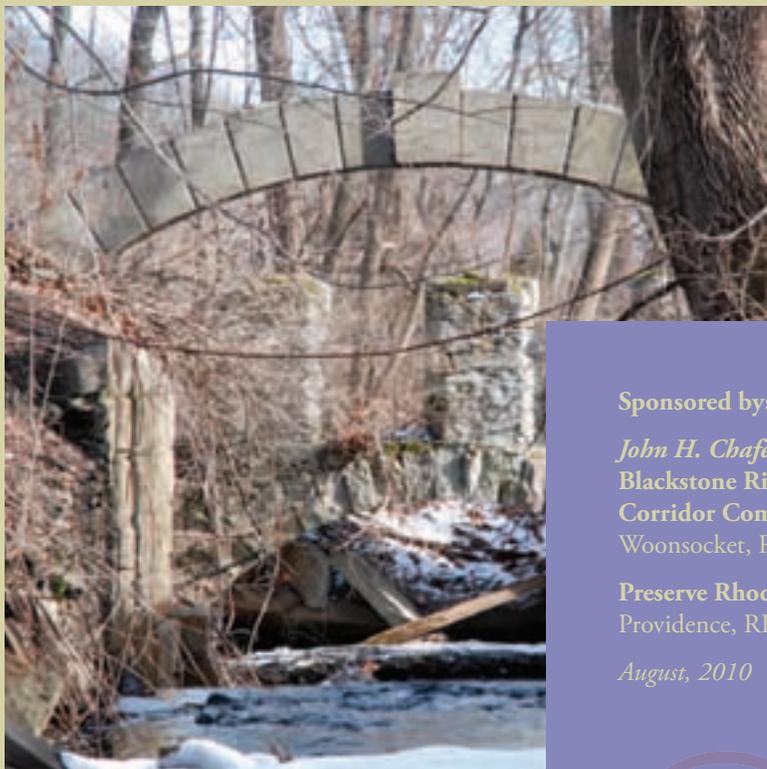




Blackstone

CANAL PRESERVATION STUDY • RHODE ISLAND



Sponsored by:

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Blackstone River Valley National Heritage
Corridor Commission
Woonsocket, RI

Preserve Rhode Island
Providence, RI

August, 2010



Blackstone Canal Preservation Study

Providence, Pawtucket, Lincoln,
Woonsocket and North Smithfield,
Rhode Island

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Executive Summary

Overview

In 1986, the U.S. Congress created the John H. Chafee Blackstone River Valley National Heritage Corridor, which encompasses 24 communities in Massachusetts and Rhode Island, in recognition of the region's central role in the early industrialization of America. At the same time, a federally-appointed Commission was created to oversee activities within the Corridor, staffed by employees of the National Park Service (NPS). The BRVNHCC works in partnership with a variety of Federal, State and local agencies, and non-profit and private organizations to preserve the historic and environmental elements of the Valley's landscape, and to promote investment in the Valley's historic mill villages and revitalization of its river system. Among the key goals of the Commission are to:

- Tell the story of America's path to industrialization by shaping experiences for visitors and making the story accessible to large numbers of people;
- Promote preservation and new life for the Valley's older village centers, mills, and other historic resources;
- Assist local communities in balancing conservation and growth; and
- Reaffirm an active commitment to improving the health of the river system.

The subject of the Blackstone Canal Preservation Study (the Study) is the portion of the Blackstone Canal in Rhode Island extending from Providence to North Smithfield. Constructed between 1824 and 1828, the Blackstone Canal connected Providence, RI and Worcester, MA. Though superseded as a transportation system by the construction of the railroad in 1847, many remnants of the Canal remain discernible along its route through Rhode Island. The purpose of the Study is to support the BRVNHCC mission to promote preservation of historic resources in the Blackstone River Valley and tell the story of the American Industrial Revolution in the region.

The goals of the Blackstone Canal Preservation Study are to facilitate a better understanding of the character and condition of the extant segments of the Blackstone Canal in Rhode Island; to assess opportunities for preservation, restoration, and interpretation of the Canal and its history; and to recommend key projects for such action. The Study includes the following elements:

- Inventory and comprehensive mapping of the existing and historic location of the Blackstone Canal and associated historic and archaeological resources,
- Narrative documentation of the existing conditions of canal resources,
- Identification of key canal projects in Rhode Island that offer outstanding opportunities for preservation, restoration, and interpretation of the history of the Blackstone Canal, the Blackstone River Valley and the Moshassuck River Valley, and
- Preliminary tasks and cost estimates associated with recommended restoration efforts.

Study Area

The portion of the Blackstone Canal located in Rhode Island extends approximately 17.5 miles from the Canal's southern terminus in the City of Providence to the Massachusetts state line in the Town of North Smithfield, passing through the cities and towns of Providence, Pawtucket, Lincoln, Woonsocket and North Smithfield (Figures 1-13, Appendix A).

The Study Area includes the path of the Canal and its associated engineering resources (locks, bridges, etc.), as well as adjacent mill buildings, houses and villages, surrounding mill sites, and natural bodies of water used to sustain the Canal's water supply.

Planning Process

Resource Inventory and Mapping

A Resource Inventory and Existing Conditions assessment was conducted based upon existing data inventories and in consultation with staff from the BRVNHCC and Rhode Island Historical Preservation and Heritage Commission (RIHPHC), local historians and stakeholders. The documentation of extant canal resources and their condition is based on the 1991 expanded and revised National Register of Historic Places Registration Form (NR form) for the Blackstone Canal Historic District in Rhode Island.

After the initial refinement of the location of the Blackstone Canal, the canal path and significant associated historic and archaeological resources identified in the 1991 expanded and revised NR form for the Blackstone Canal Historic District were mapped using a Geographic Information System format. The resulting maps show the following information for each of the five Rhode Island towns and cities containing remnants of the Blackstone Canal:

- Where the Canal is located in the Blackstone River or other water bodies,
- Where it is no longer visible,
- Where it is clearly visible, and
- Where the Canal is visible and watered.

Public Workshop

A public workshop was held in January 2009 with citizens from the Rhode Island communities containing the Blackstone Canal to solicit input on the accuracy of the Resource Inventory and mapping and to gather suggestions for areas in their communities where the Canal could be preserved and made publicly accessible. The workshop resulted in a list of five suggested sites for future preservation and accessibility. The detailed minutes from this meeting, including public comment and suggestions, is in Appendix B.

Canal Projects Selection Methodology

Selection of five key projects for the Blackstone Canal in Rhode Island for further study was a phased process relying on public input from Blackstone Canal corridor communities, input from BRVNHCC and RIHPHC staff, and assessment of the Resource Inventory and Existing Conditions summary. Where feasible, field inspections were conducted for sites suggested by the public. The projects were reviewed and rated based on the following criteria:

- The state of preservation of canal segments and associated resources,
- The rarity of survival of the Canal or associated features relative to the entirety of the Canal in Rhode Island or the community within which the segment was located,
- The level of protection afforded to the resource via ownership or management status,
- Current and potential public access, and
- Restorative and interpretive opportunities.

In selecting key projects for restoration or interpretation, emphasis was put on those segments of the Canal that were well-preserved (i.e. visible and/or watered), that were unprotected through public ownership or conservation or preservation restrictions, that were presently or would soon be publicly accessible, and that included resources associated with important historic contexts in the Blackstone River Valley.

Summary of Recommendations

Key Ventures

Based on the selection methodology outlined above, five projects or “ventures” were put forward for further evaluation for protection, stabilization, interpretation, and restoration. Four of the five key ventures focus on discrete canal segments, while the fifth proposes a series of locations along the canal that would provide stories about various aspects of the Canal’s history.

These ventures were identified as offering outstanding opportunities for preservation, restoration, and interpretation by virtue of their high degree of integrity, unprotected status, current or potential public access, proximity to other protected segments of the Canal, and high interpretive value. The five ventures are presented in geographical order from south to north.

Canal Basin to Randall Street, Providence

The Canal Basin to Randall Street area in Providence comprises two sections of watered trench, of which the northern section is the Blackstone Canal and its stone walls, while the south section opposite the Roger Williams National Memorial next to Canal Street contains a watered trench with walls that post-date the Canal’s construction. The south section, however, is within the original Canal Basin that served as the termination point for the Blackstone Canal in Providence. The north section is surrounded by a number of offices and residences. The south end of this key venture area is close to Water Place Park and the hotels, restaurants, shops, offices and convention center facilities of downtown Providence.

The Canal Basin to Randall Street Area presents a prime opportunity to remove the concrete cap that covers a portion of the watered trench just north of Park Row and restore and stabilize collapsed sections of canal trench wall in the north section. In addition, this project presents an outstanding opportunity for enhanced interpretive signage to promote public awareness and encourage public visitation of all key areas of the Blackstone Canal in Rhode Island.

Lorraine Mill Area, Pawtucket

The Lorraine Mill Area in Pawtucket, which extends to the north and south of the Lorraine Mill complex on Mineral Spring Avenue, comprises both watered and visible canal and sections that are no longer visible. The northern end of this area includes Lockbridge Street on the north, near the Pawtucket-Lincoln municipal line, which contains mill worker housing opposite an extant segment of watered canal. The central section contains wetlands of the Moshassuck River, which the City of Pawtucket is interested in preserving and opening to limited use through the implementation of a conservation easement and potential to connect this segment

with planned linkages to City-owned future trail segments. The south end of the area includes remnants of the Mineral Springs Lock #4, a rare survivor, which are located in the parking lot of a former industrial complex.

The Lorraine Mill Area offers significant opportunities to restore deteriorated trench walls; protect a section of the Moshassuck River wetlands which historically were part of the setting of the Canal in Pawtucket; and develop a recreational walkway that links the wetlands to extant portions of the Canal. This key segment also provides an important opportunity to interpret the locally-relevant story of the Canal in relation to the post-Canal era development of mill buildings, worker housing and railroads over portions of the Blackstone Canal bed after the Canal's closure in 1848.

Ashton Dam Area, Lincoln

The Ashton Dam Area in Lincoln comprises a 1.8-mile length of watered canal, beginning in the south at a point approximately 0.8 miles south of Martin Street and across the Canal from the northern leg of Maria Street, and extending north to Ashton Dam.

The Ashton Dam Area provides a highly important opportunity to rebuild the Ashton Gates, which would protect the Canal and towpath from chronic danger of being washed out by the Blackstone River. There is also an opportunity to monitor and protect historically significant archaeological resources that are associated with the Canal, including a mile-marker, a ford, cart and towpath bridge abutments, and cart ramps.

Mammoth Mill Area, North Smithfield

The Mammoth Mill Area in North Smithfield includes a 0.4-mile length of watered canal beginning in the south at the Singleton Street bridge and extending north to the town line; running between the railroad on the west and the Blackstone River on the east. The area encompasses the canal on the west and the Blackstone River on the east. Between the canal and the river are the extant ruins of the former Mammoth Mill, which features distinctive stone raceway arches and stone and brick walls. This key venture area is the northern gateway to the Blackstone Canal in Rhode Island, where it serves as an important link to and from the Massachusetts section of the Canal.

The Mammoth Mill Area presents an opportunity to repair and maintain a watered section of canal trench whose location makes it a valuable historic resource for the residents of both Rhode Island and Massachusetts. This project provides an opportunity to interpret the Canal and Mammoth Mill, an industrial development that was directly stimulated by the Canal. The Mammoth Mill Area also provides a significant opportunity to promote links to Canal features and facilities in

Massachusetts, which could strengthen public awareness and appreciation of the Blackstone Canal as an interstate resource that has regional importance.

Interpretive Signage/Activities for Canal, Various Locations

Interpretive signage and activities for the Blackstone Canal, to be located at various locations along the Canal in Rhode Island, can play an important role in promoting public awareness of the Canal as a state-wide resource. The disjointed nature of the Canal in Rhode Island, where visible and watered segments of identifiable Canal trench are by original design interspersed with long stretches of slackwater passages in natural bodies of water such as the Blackstone and Moshassuck Rivers, makes it difficult for the public to recognize that the Canal historically was a contiguous feature in the landscape.

This interpretive signage and activities initiative is proposed in order to help the public understand the Canal as a single entity that traverses 17 miles of the state. A highly consistent look and style for the signage will help reinforce public perception that the separated extant sections of the Canal are part of a larger whole. This interpretive approach would link sections of the canal in a more interactive way and moves beyond a series of static discussions about individual locations in isolation of the larger phenomenon of the canal, the valley and the visitor's experience. Suggested interpretive themes include the economic and demographic impacts of the Canal on Rhode Island communities, the construction techniques used to build the canal, the trajectory of the rise and fall of the Canal as a transportation facility, and what changes occurred after the closure of the Canal.

Interpretive efforts can also include activities at various locations along the Canal. These activities can take such forms as organized hikes, dramatizations, scavenger hunts, or demonstrations of how equipment used in the canal operation or how lock structures worked.

Projects for Future Action

In addition to the five key ventures recommended for consideration, the following four canal projects areas were identified for consideration in a second phase of planning and study to be conducted in the future:

- North Burial Ground, Providence,
- Lonsdale Bleachery Area, Lincoln,
- Market Square and Vicinity, Woonsocket, and
- Mott Dam Area, Woonsocket

These areas meet many of the criteria used to select the key ventures and should be priority areas for preservation, public access, and interpretation in the future. Several of these sites pose preservation, access, or restoration challenges that make them less

feasible for more immediate action, while others do not require substantive restoration efforts.

General Recommendations

While each of the key ventures for the Blackstone Canal in Rhode Island proposed for future work is unique, a set of general recommendations has been developed to be applied to each project or segment. The general recommendations include a phased program of short-term preservation and protection; mid-term stabilization, maintenance, and management; and long-term rehabilitation and interpretation. The general recommendations address issues such as land or easement acquisition, facilitation of public access to canal segments, and further study regarding historic restoration and interpretation opportunities.

The recommendations in this Study are necessarily preliminary and conceptual, which is appropriate for this phase of the study. The next steps would involve site specific feasibility analysis, preliminary design and environmental assessment, followed by final design and actual construction. These activities will take into consideration impacts to natural and historic resources, including known and potential archaeological sites, through research and/or survey. Further environmental study will ensure that important resources are not harmed and that all rehabilitation or restoration activities comply with applicable state and federal laws. In addition, information gained from a deeper understanding of each site's natural, historic, and archaeological resources will inform the treatment plan and enhance interpretive opportunities.

Protection and Preservation

The documentation of the Blackstone Canal for the National Register of Historic Places, beginning in 1971 and expanded in 1991, was a significant recognition of the importance of the Canal as an historic resource. Although there have been many successes in the past 39 years to preserve and protect the Blackstone Canal from adverse impacts, at present, there is no comprehensive protection for the Canal. Major portions of the Canal in Rhode Island remain in private ownership with limited protection from demolition, natural deterioration, or inappropriate abutting development. Many portions of the canal are not available for public access.

Providing protection of the most intact, well-preserved segments is the first step in facilitating future restoration and interpretation efforts. A concerted and cooperative effort between the BRVNHCC, state entities, municipalities in which the Canal is located, private organizations with preservation or conservation missions, and property owners should be undertaken to ensure sensitive treatment and long-term management of, and public access to, the Canal's most intact and well-preserved segments.

The strongest measure to ensure public access and appropriate treatment and management of extant segments of the Blackstone Canal is acquisition in fee simple, or acquisition of an interest in the property through an easement by donation or with federal, state, or local funds. In circumstances where acquisition is not feasible or appropriate, alternatives such as preservation or conservation restrictions, establishment of a local historic district or conservation district, zoning overlays, corridor protection bylaws or ordinances, or transfer of development rights provisions can be pursued. A preservation strategy – either calling for fee acquisition or alternative protection – is recommended for all well-preserved, extant sections of the Canal as identified in the Resource Inventory and Existing Conditions section of the Study, regardless of interpretive opportunity or public access.

Stabilization and Management

Though the key segments of the Canal recommended for restoration as part of the Study remain in a recognizable state, most are in need of stabilization and planning for ongoing management and maintenance. As segments of the Canal are planned for protection and future actions, resource management plans should be implemented at the corridor and local levels to assist stewards of the Canal in this work. The resource management plans should guide both routine operation and long-term decisions and planning concerning the use, interpretation, study, and preservation of the Canal, and provide the means to make informed decisions concerning future stewardship of key canal segments, with identified strategic objectives, achievable goals, and concrete action items. Means should also be secured to ensure long-term preservation of privately owned resources and to provide public access where appropriate and feasible. The plans should be completed prior to the commencement of rehabilitation or restoration activities and should take into consideration potential impacts to natural, historic, and archaeological resources.

Rehabilitation, Restoration, and Interpretation

The long-term goal for the five key ventures is to rehabilitate, restore or interpret the Blackstone Canal's structure and associated features in these locations in support of the preservation and interpretive goals of the BRVNHCC. This Study makes preliminary recommendations for potential restoration and rehabilitation of key canal segments and features as well as preliminary recommendations for interpretive opportunities. Rehabilitation or restoration tasks could include restoration of key features such as lock structures and water control gates, opening covered or hidden sections of the Canal, rebuilding damaged or destroyed towpath sections, and re-watering dry sections of extant Canal. The next phase of work should include site-specific research and planning activities resulting in consensus regarding plans and specifications to focus on the five key areas. Such research and planning should take into consideration potential impacts to natural, historic, and archaeological resources to ensure that these resources are not harmed and that all rehabilitation or restoration activities comply with applicable state and federal laws. Upon the completion of

these additional planning studies, the rehabilitation, restoration, or interpretive activities can be implemented.

Introduction

Study Purpose and Goals

In 1986, the U.S. Congress created the John H. Chafee Blackstone River Valley National Heritage Corridor, which encompasses 24 communities in Massachusetts and Rhode Island, in recognition of the region's central role in the early industrialization of America. At the same time, a federally-appointed Commission was created to oversee activities within the Corridor, staffed by employees of the National Park Service (NPS). The BRVNHCC works in partnership with a variety of Federal, State and local agencies, and non-profit and private organizations to preserve the historic and environmental elements of the Valley's landscape, and to promote investment in the Valley's historic mill villages and revitalization of its river system. Among the key goals of the Commission are to:

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The subject of the Blackstone Canal Preservation Study (the Study) is the portion of the Blackstone Canal in Rhode Island extending from Providence to North Smithfield. Constructed between 1824 and 1828, the Blackstone Canal connected Worcester, MA and Providence, RI. Though superseded as a transportation route by the construction of the railroad in 1847, many remnants of the Canal remain discernible along its route through Rhode Island. The purpose of the Study is to support the BRVNHCC mission to promote preservation of historic resources in the Blackstone River Valley and tell the story of the American Industrial Revolution in the region.

The Study includes a detailed inventory and comprehensive mapping of the existing and historic location of the Blackstone Canal and significant associated resources, and a narrative documentation of the existing conditions of these resources. The Study also identifies key canal segments in Rhode Island that offer outstanding opportunities for preservation, restoration, and interpretation of the history of the

Blackstone Canal and the Blackstone River Valley, and provides preliminary tasks and cost estimates associated with recommended restoration efforts.

The Blackstone Canal

The portion of the Blackstone Canal located in Rhode Island extends approximately 17 miles from the Canal's southern terminus in the City of Providence to the Massachusetts state line in the Town of North Smithfield, passing through the cities and towns of Providence, Pawtucket, Lincoln, Woonsocket, and North Smithfield (Figures 1-13, Appendix A).

Completed in 1828, the Blackstone Canal was a major engineering structure of the early 19th century. For two decades it served as the primary transportation corridor for the movement of agricultural products, raw materials, and manufactured goods between Providence, RI and Worcester, MA. The evolution of the Canal and its significance in the transportation and industrial history of the Blackstone River Valley make the Blackstone Canal an important historic and archaeological resource. The Canal was the last major transportation canal to be constructed in New England, and it embodies the distinctive design, materials, workmanship and methods of construction typical of the period. Portions of the Blackstone Canal still possess a high degree of physical integrity over 150 years after it was discontinued, and its setting is also well-preserved in the rural sections of the towns north of Providence.

Public appreciation for the canal tradition pervades past and present interest in preserving the significant attributes of the Canal and promoting its contributions to the history of New England and the emergence of the United States as an industrialized nation. In addition to the designation of the Blackstone River Valley as a National Heritage Corridor in 1986, the historic importance of the Canal was also federally recognized through the listing of a portion of the Blackstone Canal in Rhode Island to the National Register of Historic Places in 1971, the listing of the entire length of the Canal in Rhode Island in 1991, and the listing of the Massachusetts portion of the Canal in 1995. The establishment of the Blackstone River State Park in Lincoln and Cumberland indicates the importance of the Canal to the State of Rhode Island. Similarly, the establishment of the Blackstone River and Canal Heritage State Park, which includes the length of the Canal between Northbridge and Uxbridge, MA as well as the Millville Lock, demonstrates the importance of the Canal to the Commonwealth of Massachusetts.

Historic Context

The Blackstone River Valley of Massachusetts and Rhode Island is popularly known as the "Birthplace of the American Industrial Revolution," the place where America made the transformation from an economy based on agriculture to one centered on industry. In December 1789, Providence merchant Moses Brown hired Samuel Slater

to help establish a new factory at the falls of the Blackstone River in Pawtucket, RI, to spin cotton fiber into thread. One year later, the experimental mill was in operation - the first successful water powered cotton-spinning factory in the United States, and the beginning of a new age of industrialization. The success of the Slater Mill inspired other entrepreneurs to build their own mills, first throughout the Blackstone Valley and then eventually all over New England.

In addition to the Industrial Revolution, a transportation revolution was needed to cheaply and efficiently move heavy cargo between the mills on the river and the port of Providence and to link the rural countryside with the urban centers. Due to its change in elevations and numerous waterfalls, the Blackstone River was impassible to large boats, and horse drawn wagons were too slow and expensive. The need for a navigable waterway connecting the tidewater port of Providence with inland central Massachusetts was viewed by many merchants and industrialists as crucial to expanding their trades. As early as 1792, the idea of constructing a canal to allow horse-drawn boats to carry freight and passengers between inland factories and coastal seaports was receiving significant interest. Overland travel on unreliable and poor quality roads was time consuming and expensive; significant savings could be provided to merchants using a canal from Worcester to Providence rather than taking overland routes to Boston. In 1796, John Brown, a merchant in Providence, RI, obtained a charter from the Rhode Island General Assembly to create a canal. However, a lack of support from merchants in Boston and Springfield, MA, who thought the canal would impede their existing trade traffic, led the Massachusetts Legislature to withhold their approval, and the project languished in both states.

Inspired by the success of the Erie Canal, where construction began in 1817, similar ventures were begun in New England. The remarkable expansion of textile manufacturing along the Blackstone River in the early 19th century helped to generate additional support for the construction of the Blackstone Canal, and in 1822, the project was revived and a survey of the proposed route was conducted. Charters were finally obtained for the complete project, and the Blackstone Canal Company (BCC) was formed in 1823. The cost of construction was estimated at \$500,000. Holmes Hutchinson, a veteran of the Erie Canal, was appointed chief engineer to oversee the project, with a corps of assistant engineers, including Joseph D. Allen, who was in charge of the Worcester division.

Before the completion of a resurvey for the 45-mile long route from Worcester to Providence in 1825, construction of the Canal began in both Worcester and Providence. As most of the construction work was done by hand with picks, shovels, and wheelbarrows, the survey route followed existing contours of the Blackstone River and the Moshassuck River as closely as was reasonably possible. Construction of the entire Canal was completed in the fall of 1828. A final survey and mapping of the finished corridor was conducted in 1828 by Edward N. Phelps, who was brought in by the BCC in March 1828 as a new assistant engineer.

On July 1, 1828, the BCC's flagship, the canal packet *Lady Carrington*, took the canal's maiden ten-mile run from Providence to Scott's Pond in present-day Lincoln, RI. The *Lady Carrington*, named for Mrs. Edward Carrington, was also the first boat to travel the entire length of the canal on October 7, 1828. Following these initial voyages, the canal was closed for another month to remove the last obstacles to navigation. The full canal opened on November 17th, but by mid-December ice had set in and the levels were drained and the canal closed for the season.

The actual cost of building the Blackstone Canal reached \$750,000, exceeding the original cost pitched to BCC shareholders by \$250,000. Yet, despite its initial financial problems, the BCC was able to declare modest dividends for its shareholders from 1832 through 1836. Even during these years, however, operations were hampered by difficulties in sustaining a consistent water level, maintenance problems, and disputes with mill owners over water rights. Historians have noted that if the canal had been constructed when originally proposed in 1796, there would have been few mills to compete with the BCC over water rights. But, with the expansion of industrial activity, by 1844 there were over 90 cotton factories that lined the River between Worcester, MA and Pawtucket, RI.

The contentious relations due to competition and negotiations for water flow resulted in numerous lawsuits filed by mill owners. However, higher water levels created by the canal also precipitated the development of new mills along the route, and the Canal's reservoir impoundment system benefited factories as well. By the late 1830's, the BCC's operations were adversely affected by water flow arrangements. The operations were also adversely affected by the emergence of railroad transportation as a cheaper, faster and more reliable means to transport goods and materials, including a series of new railroad lines that were being developed in Massachusetts. However, unlike earlier antagonistic relations, the BCC's proposals to close the Canal in the 1840s were opposed by mill owners concerned about the loss of the reservoir system that helped stabilize their water power supply.

In 1844, the same year that the Providence & Worcester Railroad was chartered, the last boat traveled the full length of the Blackstone Canal. In 1846, the northern portion of the Canal was closed, and the Providence & Worcester Railroad bought all the canal property, exclusive of the reservoirs. The railroad, which opened in 1847, generally followed the canal corridor, and was built in part on the canal towpath. The BCC finally closed all aspects of its business in 1848, with the last toll collected on a run from Providence to Woonsocket, RI. With the closure of the company, most of the Canal's locks were dismantled, the stone was sold, and many road crossings were filled in. By 1851, disposal of all of the BCC's property along the canal route, including the reservoirs, was complete.

The defunct Blackstone Canal was quickly supplanted by five railroads which opened in Worcester between 1835 and 1848, linking Worcester to Boston, New York, Providence and other cities, thereby creating a regional rail center in Worcester. With

the closure of the Canal, mills along its route acquired the water rights or reclaimed rights taken by the BCC. The canal trench was converted to power canals for existing and new mills in many locations, augmenting the industrial use of the river's waters.

Planning Efforts

The Blackstone Canal Preservation Study seeks to expand upon previous planning efforts for the Blackstone River Valley and its cultural and natural resources. The BRVNHCC, the State of Rhode Island, and local communities have undertaken numerous studies and assessments of various elements within the Valley to promote public awareness and increase public access to the rich historic and cultural resources; to recommend strategies for protection, restoration, management or acquisition of significant resources; and to provide a framework for local and regional decision making.

The following sections describe some of the planning and preservation efforts that have been undertaken in the Blackstone Valley in recent decades. Many local grass-roots initiatives have also generated significant enthusiasm to identify opportunities to support the mission of the BRVNHCC, some of which have included recommendations for areas to concentrate preservation efforts. The following studies provide a general overview of key assessments conducted to date.

BRVNHCC Cultural Heritage and Land Management Plan

When Congress established the Blackstone River Valley National Heritage Corridor in 1986, it established a Heritage Corridor Commission comprised of local and state representatives to help preserve and interpret the unique resources and qualities that made the Blackstone Valley significant both to the nation and to its residents. When the Commission was established in 1986, it was part of a then novel idea to have a 10-year trial project to enlist the National Park Service in a partnership dedicated to helping states and localities conserve their special regions - those places where historical and natural characteristics had left their mark on American history.

Approved by the Secretary of the Interior in 1990, the *Cultural Heritage and Land Management Plan* was prepared by the Commission to serve as a blueprint for action to implement their goals and objectives. Several overriding goals from the document continue to direct the Commission's work:

- Protect the Valley's historic, cultural and natural resources in an integrated manner,
- Educate and interpret the Corridor's importance to the people of the Valley and its visitors,

- Foster specific activities that tap the Valley's unique resources and invite people to enjoy and celebrate them,
- Stimulate the research necessary to understand the Valley's role in the American Industrial Revolution and the lessons it holds for our times, and
- Coordinate and encourage all the partnerships that will be necessary to achieve these goals.

It should be noted that the Management Plan, which was appended by a series of five reports, including a Historic Resources Inventory, Design Guidelines and Standards, an Interpretive Plan, a Land Use Management Plan and an Economic Assessment, is now recognized as an early national model for the "heritage area" experiment.

With reauthorization of the Commission for ten more years in 1996, Congress gave a clear message to the Commission - stay the course! It basically said the Commission should not alter significantly the *Cultural Heritage and Land Management Plan* approved in 1990. The legislation mandated that the Commission develop a "revised" plan within one year. Among the revisions or supplements to the Management Plan were:

- Addressing a boundary change for the district,
- Including a Natural Resource Inventory, and
- Developing a 10-year development plan outlining resource protection needs and projects critical to maintaining or interpreting the distinctive character of the Corridor, as well as a work program that reflects the authorized \$5 million and the partnerships necessary to carry out the plan.

The revised plan document, *The Next Ten Years*, is a companion piece to the Management Plan, reaffirming the commitments of the first 10 years of the Commission, and describing an emerging focus and strategy that called attention to important work which remained undone. The Development Strategy designed by the Commission in *The Next Ten Years* was intended to create a legacy of sustainable development projects and programs, including:

- Heritage Infrastructure, such as signs, trails, gateways and exhibits,
- Heritage Programming, such as educational programs, festivals, tourism development and marketing, and other elements to complement the heritage infrastructure, and
- Strategic Design and Planning Assistance for partners to guide new investment that preserves historic resources, help communities manage growth and preserve open space, and respond to opportunities which preserve the Valley's special character.

The Next Ten Years is available in PDF format at:

<http://www.nps.gov/blac/parkmgmt/the-next-ten-years.htm>

Blackstone Valley Sustainability Study

In 2005, the National Park Service Conservation Study Institute published an analysis of the BRVNHCC titled *Reflecting on the Past, Looking to the Future* (commonly referred to as the “sustainability study”). The report evaluated the accomplishments of the BRVNHCC; analyzed the NPS investment in the Corridor and additional funding leveraged; identified further actions required to protect, enhance and interpret the Corridor; and evaluated the BRVNHCC management structure. In anticipation of the 2006 “sunset” of the legislation authorizing the BRVNHCC, the report also evaluated future management options for the Corridor, ranging from a continuation of the existing management framework to the establishment of a permanent NPS presence in the Blackstone Valley. In 2006, Congress passed legislation authorizing the BRVNHCC for five more years. The legislation also required the preparation of a Special Resource Study (see below).

Blackstone River Valley Special Resource Study

The Blackstone Valley Special Resource Study (SRS) is being undertaken as a requirement of the U.S. Congress to explore the potential for a permanent National Park Service presence in the Blackstone Valley. The SRS, which is being managed by staff from the NPS’ Northeast Regional Office, will focus on sites and landscape features that contribute to the understanding of the Blackstone Valley as the birthplace of the American industrial revolution. Using the NPS’s Criteria for New National Parklands, the study team will evaluate the national significance of these sites and features, their suitability for inclusion in the National Park System, and the feasibility of creating and managing a new unit of the National Park System. Additional information on the Blackstone Valley Special Resource Study is available at <http://www.nps.gov/blac/parkmgmt/upload/MeyerRptBLAC.pdf>.

Blackstone Canal National Register Historic District

The first federal recognition of the historical importance of the Blackstone Canal occurred in 1971 when two portions of the Canal were listed in the National Register of Historic Places: the portion between the Front Street Bridge in Lincoln and Steeple and Promenade Streets in Providence, and the portion between Front Street and the Ashton Dam in Lincoln. In 1991, the Rhode Island Historical Preservation and Heritage Commission submitted a more comprehensive nomination for the Blackstone Canal in Rhode Island, resulting in the listing of the entire length of the Canal in Rhode Island and its associated resources in the National Register, although not all of the approximately 17 miles of the Canal are described or inventoried. The 1991 National Register Registration Form (NR form) identifies the Historic District as consisting of 13 contributing segments and 11 non-contributing segments, all of

varying lengths. Despite the fact that the 1991 expanded and revised NR only describes contributing sections of the Canal and not all sections of the Canal, this NR form was the first comprehensive catalog of the Canal and its features, and continues to serve as an important planning tool. The 1991 Blackstone Canal Historic District NR form is one of the primary sources of information for the Blackstone Canal Preservation Study. It can be found in Appendix F.

The 1991 Blackstone Canal Historic District NR form included extensive review and synthesis of existing information on the construction and history of the Canal, and field investigations of the entire length of the Canal to observe, record, and photograph general attributes and specific features. During the field work, a copy of the final mapping of the Canal completed in 1828 by Edward N. Phelps was compared with on-site observations. Information was also collected from “A History of the Blackstone Canal 1823-49” by Richard E. Greenwood, 1984. Only limited new primary research was conducted, and no subsurface archaeological investigations were performed, although previous investigations at canal locations at Lime Rock Lot were reviewed.

The 1991 expanded and revised Blackstone Canal Historic District NR form evaluated publicly-owned and privately held properties abutting the canal route, and identified 13 contributing and 11 noncontributing canal sections of varying length in Rhode Island. The 13 canal sections constitute resources which contribute to the historical and archaeological significance of the Blackstone Canal.

Within the approximately 17-mile length of the canal in Rhode Island, the 1991 expanded and revised NR form identified 19 significant resources that contribute to the historic district. These resources include approximately one object, which is a mile marker; one non-archaeological site, which is an unnamed feeder stream; and 19 structures but no buildings.¹ Contributing sites include resources that are still wholly or partially extant, and resources which are no longer visible above ground, but which may survive as archaeological sites. Sites encompass the former locations of farms, basins, aqueducts, bridges, mills, mile markers, locks, street crossings, and embankments, as well as extant resources such as cemeteries and feeder streams. The single site in the Canal NR form is Crookfall Brook. Structures may encompass trenches, towpaths, locks, basins, ponds, channels, bridges, dams, and water control gates.

The Blackstone Canal Historic District passes through several districts and an individual property that are already listed in the National Register, including the College Hill Historic District, Moshassuck Square Historic District and the North Burial Ground in Providence; and the Saylesville, Lonsdale, Old Ashton and Albion Historic Districts in Lincoln.



¹The figures for contributing resources presented in this section are taken from the summary information in Section 7, Page 7.23 of the 1991 expanded and revised Blackstone Canal Historic District National Register Registration Form.

The Blackstone Canal Historic District meets National Register Criteria A, C and D and its areas of significance include transportation, commerce, engineering, industry, and archaeology. The period of significance specified for the district ranges from 1825 to 1849, with significant dates being 1828 (first canal voyage), 1845 (last full voyage of the entire length of the Canal), and 1848 (Blackstone Canal Company closure).

Blackstone River Greenway Planning

In 2003, the John H. Chafee Blackstone River Valley National Heritage Corridor completed a report titled *Trails and Greenways: A Vision for the Blackstone River Valley*. The report outlines a vision for future trail and greenway development, to help municipalities and state agencies in both Rhode Island and Massachusetts prioritize their planning, development and land acquisition strategies in an efficient and cost effective manner. Some of the proposed trails are located in the vicinity of the Canal and of the Blackstone River Bikeway (see below). This report, completed in cooperation with the states of Rhode Island and Massachusetts, along with the twenty four municipalities within the Blackstone Valley, is available in PDF format on the Corridor website at www.nps.gov/blac/parkmgmt/commission-project-reports.htm.

Designing and Planning the Blackstone River Bikeway in Rhode Island

When completed, the Blackstone River Bikeway will extend approximately 46 miles between Providence, RI and Worcester, MA, with 17 miles in Rhode Island. Approximately 12 miles of Bikeway have been constructed in Rhode Island to date. A scenic, multi-use trail, the Bikeway will roughly parallel the Blackstone River and Canal and link many of the Blackstone Valley's significant historic features.

Some segments of the Bikeway are or will be located on the Blackstone Canal towpath and pass through historic mill districts. The Bikeway traverses varied terrain, including wetlands which are crossed on a boardwalk, urban and industrial areas, an active railroad line, and a dam crossing. Development of the bikeway involved mitigation of contaminated soils on EPA Superfund sites and implementation of at-grade rail crossings.

Between 1987 and 2007, eight studies were completed to identify a feasible alignment for the Rhode Island Blackstone River bikeway, to further refine sections of the Bikeway alignment, and to study the specific bridge crossings. The earlier studies took place in Cumberland and Lincoln, while most of the later studies focus on Woonsocket and North Smithfield.

Blackstone River Access Sites

Along with the Bikeway, the Blackstone River and Canal are integral to a “Riverway” system designed to provide public recreational opportunities, educate users about the history of the Corridor, and encourage the protection of the Corridor’s historic resources. Spearheaded by the Corridor Commission and implemented in partnership with state agencies, local communities and volunteer organizations, the Riverway system includes numerous sites that provide access to the river and/or canal for thousands of boaters. Coordinating river access planning with canal preservation efforts has been and will continue to be important.

In Rhode Island, access sites have been built or are being planned and developed within the State Park, along the route of the Blackstone River Bikeway and in community centers along the banks of Blackstone River and parts of the Canal. Starting at the state border with Massachusetts, there are currently over 20 river access projects underway, including river landings in Woonsocket, Cumberland and Valley Falls that will accommodate both recreational non-motorized boats and tour boats. In between these larger facilities there are car-top access sites and portages being developed in every community along the Blackstone River. The Blackstone River State Park in Cumberland and Lincoln, Rhode Island provides an historic and idyllic setting that connects the river with the Blackstone Canal in paddling “tours” where people travel south down the river and north up the canal in a river tour “loop”. There are six access points for paddlers along this section of river and canal. Farther north in Cumberland and Woonsocket there are another six access points and portages being developed along the river. In some places, recreational paddlers will be able to access remnants of the Canal, either directly as part of the trip or as a detour along their way. At the southern end of the River in Central Falls and Pawtucket an additional three access points are complete or in development.

Blackstone River Visioning Project

The Blackstone River Visioning Project was developed in 2002 by a coalition of groups led by the John H. Chafee Blackstone River Valley National Heritage Corridor Commission (BRVNHCC) and the Massachusetts Audubon Society. The ultimate goal of the project was to guide the direction of growth along the main stem of the river and ensure that growth is complementary, as well as sensitive, to the river environment. The objectives of the project were to plan and visualize appropriate growth and economic revitalization, while at the same time demonstrating how to protect and rebuild the river’s sensitive environmental resources.

To meet these goals and objectives, the project proceeded in three phases. The first was research and outreach to identify past and present initiatives up and down the river valley. The second phase of the project was a series of public workshops held in eleven main stem communities. The workshops focused on gathering information on each community’s needs and planning issues, and identifying specific opportunities

and constraints for areas along the river. The final phase involved detailed design charrette for four key sites identified in the community workshops. Two of the four key sites are located in Massachusetts, the third key site includes both Massachusetts and Rhode Island and the fourth key site is located in Rhode Island. The two key sites involving Rhode Island communities are as follows:

- Blackstone, MA/North Smithfield, RI/Woonsocket, RI: Downtown Blackstone and corners of North Smithfield and Woonsocket, and
- Lincoln, RI: Lonsdale Bleachery Mill Complex #4.

These demonstration sites were the subject of in-depth site analysis and exploration of future alternatives for both conservation and economic development. Landowners, town officials and local residents participated in an all-day charrette for each of the four sites. The results of these exercises are described in the *Blackstone River Visioning* report produced in October 2004, and illustrated in a series of posters for public use.

Town Comprehensive and Master Plans

Every town in Rhode Island is required by state law to have a comprehensive plan that includes a section on natural and cultural resources. These plans must, for obvious reasons, be periodically updated to take into account inevitable changes in future goals and needs. These plans, as well as more focused plans for specific areas and resources, have noted opportunities for coordination with the BRVNHCC and/or the significance of the canal.

Resource Inventory and Existing Conditions

The Resource Inventory and Existing Conditions Chapter provides an overview of the route of the Blackstone Canal in Rhode Island, extant historic and archaeological features associated with the Canal, and their physical condition. The chapter describes the number and condition of various types of canal components, as well as specific canal components and associated resources present in each of the towns along the canal route. The history of the Blackstone Canal and its significance in the development of the Blackstone River Valley as an industrialized region is conveyed by more than just the history of the physical canal structure and associated engineering resources. The Resource Inventory and Existing Conditions Chapter also describes associated structures and natural bodies of water used to sustain the Canal's water supply. These descriptions are supplemented with maps showing the refined location of the canal segments and selected associated resources in each town.

Methodology

The Resource Inventory and Existing Conditions Assessment component of the Blackstone Canal Preservation Study was compiled through existing data inventories and through consultation with staff from the John H. Chafee Blackstone River Valley National Heritage Corridor Commission (BRVNHCC) and Rhode Island Historical Preservation and Heritage Commission (RIHPHC), local historians and stakeholders.

The documentation of extant canal resources and their condition is drawn from the following documents: (1) the 1991 expanded and revised National Register of Historic Places Registration Form (NR form) for the Blackstone Canal Historic District in Rhode Island (Appendix F) and (2) the 2003 Blackstone Canal Assessment Study conducted by PAL/Public Archaeology Lab, Inc. (Appendix G).

The 1991 expanded and revised NR form for the Blackstone Canal Historic District documented the path of the Blackstone Canal in Rhode Island, catalogued extant historic resources and known and potential archaeological resources associated with the Canal, and described existing conditions. Specifically, the 1991 expanded and revised NR form for the Blackstone Canal Historic District documented the character

of 13 sections of varying lengths of the Blackstone Canal that are designated as contributing to the Historic District. Taken together, the 13 sections comprise 9.6 miles (approximately 56 percent) of the canal's approximately 17-mile total length in Rhode Island. The 13 contributing sections are interspersed with 11 sections that are designated as non-contributing because the canal trench has been totally filled in and is unrecognizable. The 11 non-contributing sections, representing 7.4 miles (approximately 44 percent) of the canal's total length in Rhode Island, are not described in the 1991 expanded and revised NR form. Both contributing and non-contributing sections are described and mapped in this Study.

The 1991 expanded and revised NR form defines the canal's south and north boundaries, respectively, as Promenade and Steeple Streets in Providence, and the North Smithfield, RI/Blackstone, MA state line boundary. Regarding the east and west boundaries of the Canal, the 1991 expanded and revised NR form generally defines the boundaries as the actual physical edges of the canal bank, towpath berm, or where applicable, basins or other features. The east and west boundaries also include land and water known to have been used in canal operations. In sections of slackwater with preserved towpath, the eastern boundary runs in the river, 15 feet from the east towpath bank. In canalized sections, the boundary is generally considered to be the combined standard canal prism (34 feet) and towpath (10 feet) widths, with allowance of six feet for towpath berm slopes. The 1991 expanded and revised NR form notes that the precise historical boundaries of the canal are difficult to determine because of the nature of historical documentation and maps.

Portions of the 1991 expanded and revised NR form for the Blackstone Canal Historic District are included in the text of the Resource Inventory and Existing Conditions section of this report. The complete NR form is provided in Appendix F.

As part of the Resource Inventory and Existing Conditions Assessment, the information presented in the NR form was refined by comparing it with the path of the Blackstone Canal as shown on a series of maps drawn in 1828 by the engineer-in-charge, Edward N. Phelps (Phelps Maps), at the completion of canal construction, aerial photography, and input from BRVNHCC and RIHPHC staff.

The 2003 Blackstone Canal Assessment Study conducted by PAL built upon the 1991 expanded and revised NR form by providing additional information for five of the 13 sections of the Blackstone Canal that are designated as contributing to the Historic District. This additional information compiled by PAL includes a description of the location and setting of each of the five canal sections, a description of the 1828 Phelps map for these canal sections, and a description of current conditions of these canal sections as of 2003, and, in some cases, historical background on mills, railroads or individuals who were associated with the canal. The five canal sections covered in the 2003 Blackstone Canal Assessment Study conducted by PAL concern the canal sections that are numbered 3, 4, 5, 9 and 13 in the 1991 expanded and revised NR form.

Portions of the 2003 Blackstone Canal Assessment Study conducted by PAL are included in the Resource Inventory and Existing Conditions section of this report. The full 2003 Blackstone Canal Assessment Study is provided in Appendix G.

After the initial refinement of the path of the Blackstone Canal, the canal path and each of the historic resources identified in the NR form for the Blackstone Canal Historic District were mapped by VHB using a Geographic Information System format. The resulting maps show the following information for each of the five Rhode Island towns and cities containing remnants of the Blackstone Canal:

- Where the Canal is located in the Blackstone River or other water bodies,
- Where it is no longer visible,
- Where it is clearly visible, and
- Where the Canal is visible and watered.

The results of the resource inventory mapping were presented at a public workshop with interested stakeholders on January 22, 2009 to obtain input from knowledgeable parties on the accuracy of the mapping and identification of known extant features. This information was used to further refine the location of the Blackstone Canal, the condition of extant related resources, and possible locations of non-extant resources. A record of comments and input received at this public workshop and a categorized list of the project ideas is provided in Appendix B.

A public presentation presenting the nearly final results of the study was made on October 20, 2009. The presentation included an overview of the selected and future Key Canal Ventures and the opportunity for attendees to review and comment on the revised GIS figures that show the entirety of the canal route and its various features.

Canal Features and Resources

Canal features and resources mentioned in this section include the relatively few resources that are documented in the 1991 expanded and revised National Register Registration (NR) form for the Blackstone Canal National Register Historic District, plus other Canal resources that have been identified as a result of research efforts by VHB; consultation with BRVNHCC and Rhode Island Historical Preservation & Heritage Commission staff members; and input from interested individuals at the January 22, 2009 public workshop. The scope of this Study takes a broader view of Blackstone Canal resources than what is contained in the NR form.

The NR form for the Blackstone Canal National Register Historic District states that there are 13 canal sections of varying length that contribute to the historical and archaeological significance of the Blackstone Canal. The NR form indicates that 11 other canal sections do not contribute to the significance of the canal. The NR form's

United States Geological Survey (USGS) Maps labeled with these contributing canal sections are provided in Appendix F.

These maps also indicate the location of eight canal features within the 13 contributing canal sections noted in the NR form. These features include a mile marker; earthen, masonry and natural stone remnants of canal trenches, road embankments and bridge abutments; and masonry remains of dams, spillways and culverts. Several of the eight canal features listed in the NR are comprised of clusters of canal structures.²

The table below summarizes the number of contributing canal sections, as well as significant historic resources associated with the Blackstone Canal, that are located in each Rhode Island town and city along the Canal as identified in the NR form. It is important to emphasize that this tabulation of resources is based solely on the information contained in the NR form, not on fieldwork, and that other historic resources associated with the Blackstone Canal may be discovered through additional survey.

Contributing Resources by Town

Town	Contributing Canal and Towpath Sections	Associated Contributing Features Within These Sections
Providence	[2]	[0]
Pawtucket	[1]	[0]
Lincoln	[5]	[7]
Woonsocket	[4]	[1]
North Smithfield	[1]	[0]
Total:	[13]	[8]

Source: National Register Registration Form, Blackstone Canal Historic District

Canal Components

Within the Rhode Island section of the Blackstone Canal, the primary physical components of the Canal (i.e. the canal trench, the towpath and berm) are reasonably intact and recognizable in certain locations but have been covered over or destroyed in other locations. In addition, related engineering features, such as masonry walls, spillways, basins, bridge footings, as well as water power features and buildings associated with post-canal use of the water channel by local industries, exist in several locations.

² The figures for contributing resources presented in this section are taken from the summary information in Section 7, Page 7.23 of the 1991 expanded and revised Blackstone Canal Historic District National Register Registration Form.

Over the entire length of the Canal, in Rhode Island and Massachusetts, approximately 85 percent of the Canal consisted of trenches that were hand-dug using wheelbarrows, ox-carts, picks, axes, iron bars, shovels, and limited quantities of black powder, while the remaining approximately 15 percent of the Canal was merged with navigable portions of the Blackstone River and the Moshassuck River, referred to as “slackwater navigation.” (The proportion of slackwater navigation in the Rhode Island portion of the Canal appears to have been higher than in Massachusetts. However, sections of what is currently considered to be the channelized Moshassuck River may historically have been canal trench which coexisted with the natural Moshassuck River bed that has since been filled in.) The Canal was fed by a system of reservoirs, most of which were natural ponds that were enlarged by dams.

For the most part, the physical elements of the Canal conform to the construction specifications, under the direction of Holmes Hutchinson, and funded by the Blackstone Canal Company, chartered in 1823. However, in some cases, unexpected field conditions, variations among construction crews, and requests from abutting property owners or other affected parties for bridges or feeder stream control may have resulted in minor differences between the planned and final site design.

The following sections describe the canal components according to their anticipated design by the Blackstone Canal Company engineers, and the existing condition of the class of resources along the canal corridor in Rhode Island. The tables below summarize the total number of canal features originally constructed in each town along the Canal in Rhode Island and the number of extant canal features in each community.

Canal Trench

In most areas, the Blackstone Canal was in a trench that was prism shaped and generally designed to be 34-feet wide at the top and 18 feet at the bottom, containing water between four- to six-feet deep. Depending on soils and topography conditions, these dimensions varied along the route, in some areas widening to 45 feet at the top, and narrowing in others to only 30 feet.

The side walls of the trench were built at 45-degree angles, with the banks rising at least three feet above the water, and where ever possible, were dug against the side of a hill or slope contour to keep earth removal at a minimum. The trench was essentially an earthen structure, however in some instances the walls were lined with rubblestone. The design intended for the walls to be solid, compact and water-tight, and elements that could cause erosion (i.e. vegetation, roots, sticks and brush) were expressly prohibited from construction specifications. The canal builders also used clay on the canal bed (a process known as puddling) to ensure water-tight seals in some locations, according to more recent research in the BCC.

Most of the construction of the canal trench involved excavation and embankment, along with grubbing vegetation, and blasting in some areas. It was also necessary in some areas to build rubblestone walls on the exterior slope of the canal bank where it was exposed to seasonal flooding and scouring by the river. In such areas, the river bed was also widened to reduce the severity of such potential situations. Both the towpath and the canal trench incorporated numerous drains and culverts to carry water from intersecting springs and streams. Stop gates, consisting of wood gates and posts set in stone supports, were usually employed in places where the canal was also being used as the raceway for a mill, as a flood protection measure for the mill. Stop gates were also installed to isolate sections of the trench for repairs.

Of the 17.55 miles of canal in Rhode Island, approximately 6.58 miles of canal trench are visible and watered, approximately 0.56 miles are visible and dry, and approximately 5.3 miles are destroyed or not visible. Approximately 5.1 miles of the Blackstone Canal in Rhode Island are in bodies of water such as rivers or ponds. A town-by-town/city-by-city inventory of segments of the Blackstone Canal trench follows in this chapter.

Extant Canal Features by Town

Town	Canal Trench (miles)					Discernable Locks	Mile Markers	Towpath Bridge Remnants	Cart, Farm or Road Bridge Remnants	Dams	Visible Basin Sites
	Total	Visible, watered	Visible, dry	In River/Pond	Partially Visible or Not Visible						
Providence	2.13	0.45	-	0.31	1.37						
Pawtucket	1.83	0.79	-		1.04	1					
Lincoln	9.09	4.58	0.56	3.08	0.87		1	3	3	1	1
Woonsocket	4.03	0.29	-	1.71	2.02				1		
N. Smithfield	0.47	0.47	-	-	-						
Total:	17.55	6.58	0.56	5.1	5.3	1	1	3	3	2	1

Sources: Blackstone Canal Features Table I of the 1991 expanded and Revised National Register of Historic Places Registration Form, Blackstone Canal Historic District; 2003 Blackstone Canal Assessment Study conducted by PAL, January 2009 Blackstone Canal Preservation Study Public Workshop; field inspection: BRVNHCC staff

Canal Features in 1828 by Town

Town	Locks	Mile Markers	Towpath Bridges	Cart, Farm or Road Bridges	Dams	Lay-by Sites	Basins	Feeder Streams
Providence	4		1	3	1		1	
Pawtucket	2		3	2	2			
Lincoln	7		2	5	1		2	
Woonsocket	5				1		1	
N. Smithfield			1					
Total:	18 (includes tidal lock)	17*	7	10	5		4	

Source: 1991 expanded and revised National Register of Historic Places Registration Form, Blackstone Canal Historic District

* As there are approximately 17 miles of the canal in RI, it is assumed that each mile was marked with an upright stone (mile marker) set in the towpath

Towpath

The towpath was designed to be at least 10 feet wide for sections of the Canal in the river and canal trench, however, in some areas rock outcroppings and topographical considerations limited the width to only eight feet. Generally, the towpath was located between the canal and the river to serve as a buffer during heavy rains or spring thaws. The towpath generally rose no more than five feet above the water line, and in some instances it included a timber cap to keep the tow rope from catching. In locations where the water flow was particularly strong, the towpath edge was reinforced with stone work, laid either in courses or as riprap to reinforce the area and prevent erosion.

When the canal route was located in navigable sections of the river, the towpath was an enhancement of the natural river or pond bank. Wooden bridges were constructed to carry the towpath over the many streams along the route.

Few sections of surviving towpath are extant, while much more remains to be identified as extant, buried, or eliminated through fieldwork. Surviving towpath segments are in the Ashton area, although most of it is now incorporated into the Blackstone River Bikeway and overlaid with asphalt. Some visible sections are also along the river bank in the mill ponds to the north and a small intact section lies above the Manville Dam.

Locks

A series of canal locks helped boats to ascend and descend the elevation changes between Providence, RI and Worcester, MA. Forty-eight locks were built of stone quarried close to where they were erected, of which 17 locks were located along the Rhode Island segments of the Canal. Cut stone was more expensive than wood, but required less maintenance. The locks were generally 10-foot wide with 82 feet between the large oak gates on either end. The average lift of a lock was 9.5 feet. An attendant operated the locks and collected tolls, but later, to cut costs, the attendants were eliminated and tolls were billed.

The floor of the excavated lock pit was some two or three feet below the water level, over which sills and priming planks were laid. The stonework was granite, five feet thick at the foundations, and varied in height according to the lift design of the lock. With four feet of water in the locks at all times, an eight-and-one-half foot lift required a height of fourteen-and-one-half feet. The shape of the lock ends differed, with a squared cross section at the upstream end and fan wing walls outside of the downstream gates to help guide boats entering against the current.

A pair of wood mitre gates sealed the lock chamber from the canal levels above and below the lock and fit snug against a wood sill. When open, the gates folded into

seven foot-long recesses, and iron straps attached to the granite coping at the top of the lock held the gate in place and were used for opening and closing the gates. The lock was filled by two culverts passing under the gate sill at the upper end, and paddle gates controlled the water flow.

Of the 17 lift locks built along the Rhode Island portion of the Blackstone Canal, none presently survive intact. Several sites may or may not retain archaeological remnants of vanished locks, including the location of the former tidal lock in Providence and the excavated and reburied lock remnant in Market Square in Woonsocket. Only one site, located south of Mineral Springs Avenue in Pawtucket, is currently known to have visible above-ground remains of a lock.

Dams and Reservoirs

An integrated system of dams and reservoirs provided a percentage of the water in the Canal, and kept it at proper levels. Most of the main reservoirs were located in Massachusetts upstream from the Canal. The reservoirs were natural ponds enlarged by damming and were generally located from one to two-and-a-half miles from the canal. In Rhode Island, the main reservoirs were Herring Pond (200 acres) and Allum Pond (1200 acres), both located in the town of Burrillville. Smaller reservoirs in Rhode Island include Scott's Pond (40 acres) and Cranberry Pond (10 acres), both located in the town of Lincoln.

Along the Blackstone River, the mill villages at Old Ashton, Albion, Manville and several of the mills in Woonsocket predated the canal. At those sites, the pre-existing mill ponds, and even occasionally the pre-existing raceways, were incorporated into the canal for use as slackwater navigation segments. In addition, Social Pond in Woonsocket flows into the Blackstone River and hence the canal in Woonsocket. Butterfly Pond and Olney Pond, also built to power mills, feed into the Moshassuck River upstream from the canal.

A small number of dams were also built or improved by the BCC on the canal route itself. On the Blackstone River, they built the Mott Dam above Manville and they raised the Woonsocket Falls Dam two feet to help maintain a suitable optimum water level for the Canal. A coffer dam built on the Crookfall Brook in North Smithfield at its intersection with the Canal retained the brook waters in the Canal. Similar dams are thought to have been located on the Moshassuck River where it intersected with the Canal.

In addition to dams and reservoirs, the Canal's water control features that are associated with manufacturing include the trench at Albion as well as the upper segment of the Canal at Ashton, which were made by expanding the existing mill race at each of these locations. The Canal segment from Ashton to Lonsdale also contains several water control features which were installed by the Lonsdale

Company after the Canal was closed. These features include the remnants of the gates at the head of the trench near the Ashton dam and three overflow spillways.

The specific ponds, brooks, reservoirs, dams and other known water control features that served the Canal are described later in this chapter according to the Town or City in which they are located.

Mile Markers

Each mile of the 45-mile canal route from Providence to Worcester was marked by an upright stone set in the towpath and carved with the mileage distance between the stone and the Canal's origin in Providence. One mile marker remains in Rhode Island. This is at Gardner's Canoe Rock in Lincoln, where the granite 8-Mile Marker has been restored.

Archaeological Resources

The following is a list of archaeological features associated with the Blackstone Canal that should be accounted for in preservation planning for the Canal. These features are relatively exposed but may not be recognized as historic; therefore, care should be taken to ensure their historical significance is acknowledged and they are preserved. However, this should not be considered a complete list of the Canal's archaeological resources or its archaeologically sensitive areas:

- Providence: Possible masonry remnant of the tidal lock and dam/causeway under the concrete footings in the Moshassuck River, just north of Park Row at Canal Street,
- Pawtucket: Lock remnant on the south side of Mineral Spring Avenue, just west of the Lorraine Mill,
- Lincoln: Cart ramp on the east bank of the Canal, approximately 0.8 miles south of Martin Street, and across the Canal from the northern leg of Maria Street,
- Lincoln: Cart bridge abutment (and lime kiln) on the west bank of the Canal, above the Martin Street bridge,
- Lincoln: Cart ramp and Martin's Wading Place/ford on the east bank of the Canal and west bank of the Blackstone River, above the Martin Street bridge,
- Lincoln: Masonry enhanced towpath at Gardner's Canoe Rock,
- Lincoln: 8-Mile Marker at Gardner's Canoe Rock,
- Lincoln: Towpath bridge abutment on the east bank of the Canal, just south of Kelly House,
- Woonsocket: Mott Dam remnant on the east bank of the Blackstone River and associated canal segment on the west bank of the river, just north of the Woonsocket Water Treatment Plant at the overhead electric lines,

- Woonsocket: Lock remnant in Market Square that was excavated and reburied, and
- Woonsocket: Other lock remnants are thought to be buried beneath post-Canal era streets and the Bernon Street Bridge.

Canal Resources by Town or City

The following sections provide a geographically progressive, narrative description of the route of the Blackstone Canal and associated natural, historic, and archaeological features that contribute to the Canal's historic significance within the host communities in Rhode Island. The primary source of information for this existing conditions assessment is the 1991 expanded and revised Blackstone Canal Historic District National Register of Historic Places Registration Form, on file at the Rhode Island Historical Preservation and Heritage Commission. Additional information has been gathered through discussions with staff from the BRVNHCC and RIHPHC, as well as interested parties that attended a public workshop held as part of this assessment on January 22, 2009.

As noted in the Methodology section of this report, portions of the 2003 Blackstone Canal Assessment Study conducted by PAL are included in the description of Canal resources by town or city.

Although not explicitly stated in the narrative descriptions, it is assumed that features noted as being no longer extant or partially extant are potential archaeological sites, or have archaeological resources associated with them. Because no archaeological investigations were undertaken as part of this Study, the integrity of archaeological resources, or the extent to which archaeological material associated with no-longer-extant canal features survives, has not been determined.

The descriptions of the canal path and associated resources are supplemented with figures showing the refined location of the canal segments and key associated resources in each town (Figures 1-13, Appendix A).

City of Providence

Section 1

Promenade and Steeple Streets to 400 feet south of Industrial Drive, Providence (mile 0.0 to 0.95).

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

This southernmost section of the Blackstone Canal included a **large canal basin** in downtown Providence and a combined channel with the Moshassuck River. It is divided into several subsections or segments, all of which are defined as contributing resources.

The segment from Promenade and Steeple Streets north to the Smith Street bridge contains the easternmost portion of the **original Canal Basin**. Created by construction of a **causeway dam** across the northeastern corner of the **tidal cove** at Haymarket Street (approximately due west of the Old State House), the approximately 300-foot-wide Basin linked the canal (and the Moshassuck River) to the head of the Providence River estuary and port facilities leading to Narragansett Bay. Haymarket Street used to exist where the green space of Roger Williams National Memorial is currently located. By 1875, it was a continuation of South Court Street that extended west from North Main Street to a spot where the Canal is now located. The Canal Basin provided ample space for canal boats loading and unloading cargo and passengers. Filling of the Basin began with the construction of the Providence and Worcester Railroad in 1846-8, reducing the Basin to a channel running along the west side of Canal Street. Subsequent railroad and street improvement and building construction activities during the 19th and 20th centuries have further modified the retaining walls of this segment. Today, the channel is approximately 40 feet wide and is defined by **masonry walls** of dry-laid rubblestone and coursed and semi-coursed, mortared cut granite. Some spots are reinforced with poured concrete, probably associated with buildings that stood adjacent to or over the channel into the twentieth century.

The west wall of the Basin may remain buried under the former railroad yards that are now part of the Capital Center project area. The east Basin wall and the towpath may remain buried beneath the approximate modern centerline of Canal Street. The likelihood of any traces of the causeway dam surviving is minimal due to radical changes in that area; however, it is possible that some **granite blocks** at the site of Haymarket Street may be associated with the **lock (Lock #1)** between the Cove and Canal Basin. Finally, the site of the present-day Smith Street bridge marks the approximate historical location of a **canal bridge crossing**.

The segment from Smith Street to Mill Street Bridges is similar in configuration, with **masonry walls** defining the approximate channel which historically contained both

the Blackstone Canal and Moshassuck River flowage just above the Canal Basin. The **Mill Street Bridge crossing location** dates to at least the early eighteenth century.

Proceeding north from the Mill Street Bridge to Randall Street (.2 miles), the canal/river is 30-35 feet in width with 3-4 feet (west bank) and 7-8 feet (east bank) high **walls of dry-laid rubblestone**. The towpath, which crossed to the west side at Charles Street, has been partially compromised by subsequent development and fill, although original contours may remain.

A later **dam** and **arched wasteway channel** (filled) for the **Stillman White Brass Foundry**, 1 Bark Street (1871 et seq., NR), are located at the Charles Street Bridge where the building rises from the canal's east bank. There has been a dam at this site, although rebuilt repeatedly, since the 17th century, which is why the first lift lock was here. At the time the canal was built, the dam still served its original use, powering a grist mill. Subsequent water-powered industry used the mill privilege here through the 19th century. The dam may have been originally constructed in 1856 when Stillman White established the foundry in a **small frame building**, no longer standing.³ No visible traces remain of the **first lift lock** (which was located where there is currently a parking lot) and a **structure, possibly a lockkeeper's house or the Lewis' dye mill**, which stood at this location. Towards the northern end of this segment, the canal passes under a late 19th century **granite, single-arch bridge** at Stevens Street and a modern concrete-and-steel bridge at Randall Street, both **historic canal crossings**. The Randall mill stood a short distance to the west,

The northern segment of Section 1 extends .25 miles from Randall Street to a point 400 feet south of Industrial Drive. Here the canal/river channel has been widened and substantial sloped rip-rap banks created. All evidence of the towpath, which crossed again to the east bank at Randall Street, has been obliterated. Although the configuration of the canal trench has been modified in the late twentieth century, it conforms to the **location of the original route**, and as such remains an important physical record of the canal's original course.

For nearly one mile north of Section 1, the canal and Moshassuck River were sometimes separate and sometimes concurrent. Canal integrity throughout this stretch has been destroyed. At the southern end, the channelization in Section 1 continues, but follows the route of the river for 800 feet; the canal trench to the east is filled. The curve of Printery Street may follow the canal route. Approximately 400 feet north of Industrial Drive, the channel turns west and is culverted under Interstate Route 95 and railroad yards. Demolished features in this segment included **Lock #1** in the vicinity of the current intersection of Mill Street with Canal and Charles Streets, **Lock #2** which was located approximately 150 yards upstream from the Randall Street crossing and **three or four farm bridges**. The 19th century painting



³ There has been a dam at this site (though rebuilt repeatedly) since the 17th century. That's why the first lift lock was here. At the time the canal was built, the dam still served its original use, powering a grist mill. Subsequent water-powered industry used the mill privilege here through the 19th century. (Rick Greenwood, 2009)

of the Blackstone Canal at the Rhode Island Historical Society is believed to show the Allen Print Works and the Canal in the vicinity of Printery and Pettis Streets.

Section 2

0.2 miles across the northwest corner of North Burial Ground, Providence (mile 1.85-2.05)

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

About 1500 feet south of the Cemetery Street/North Main Street interchange, the canal and river emerge from underneath I-95 in a 34 foot wide, well-preserved **canal trench** running through **North Burial Ground** (listed in the National Register). It is lined with approximately 4-foot high dry-laid rubblestone walls, to which a low cement cap has been added. According to the metal plaque affixed to the east wall of the trench at the bridge over the canal, this portion of the Canal was reworked in 1935-36 as a Works Progress Administration (WPA) project. The WPA was part of the Federal government's New Deal-era initiatives to provide work for the unemployed during the Great Depression. The bridge over the Canal here may date from the WPA project. **Lock #3**, indicated as the Heirs of Moses Dexter just north of North Burial Ground on the 1828 Phelps map, appears to have been located along what is now the northwest edge of North Burial Ground. No other canal features are known to have existed along this segment.

Leaving North Burial Ground at Cemetery Street, the canal and river again separated. The present-day channel follows the river bed, while the canal trench to the west has been filled and destroyed by industrial development, Route 1-95, and railroad construction for .9 miles. A **towpath bridge**, where the present-day north-bound Smithfield Avenue entrance ramp meets the highway, has also been lost.

City of Pawtucket

Section 3

Saint Francis Cemetery to Mineral Spring Avenue

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

Emerging from beneath railroad yard fill at a point on the east side of Saint Francis Cemetery (off Smithfield Avenue), the probable remains of the canal trench follow the east cemetery boundary and the east edge of Veterans' Memorial Park, pass along the east side of the City of Pawtucket incinerator, then cross Grotto Avenue to approximately 200 feet south of Mineral Spring Avenue and the Lorraine Mill.

This location where the canal bed is filled, approximately 200 feet south of Mineral Spring Avenue and just west of the Lorraine Mill, is the **site of Lock #4 and contains**

visible remnant lock stones.⁴ The lock remnant is roughly midway between the Lorraine Mill complex and the river.

The interlaced original paths of the Moshassuck River and the canal have had numerous alterations over time. Between I-95 on the south and W. Forest Avenue on the north, the canal remains visible and watered, while the Moshassuck River, which had a meandering course on the east side of the canal here, has been filled. Both banks of the canal have been altered by adjacent railroad yard filling (east) and landscaping/maintenance (west). The **3-Mile Marker**, once located just south of Grotto Avenue, is the only feature known to have existed in this segment.

At a point approximately 400 feet south of Mineral Spring Avenue, the canal passed from the west to the east side of the river, as the river course took a broad westward curve. The current water flow follows the river bed north from the above mentioned point, across Mineral Spring Avenue and loops through the west and northern edges of the **Lorraine Mill complex** (1868, 1881 et seq.). Sanborn maps dated 1890 show that the canal trench ran in a straighter north/south course on the east side of the river. Features south of Mineral Spring Avenue of which no surface trace remains include: a **cart bridge**, **two towpath bridges**, a **possible dam** at the river/canal crossing (east), and a **possible lockkeeper's house**.

City of Pawtucket/Town of Lincoln

Section 4

Lorraine Mills (Mineral Spring Avenue), Pawtucket to Saylesville (Walker Street), Lincoln

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

Later Sanborn maps show that between 1902 and 1949 the canal was incrementally filled and covered with new mill buildings within the Lorraine Mills complex.

Today, the southern point of a V-shaped curve in the water flow northeast of Lorraine Mill marks the location in Pawtucket where the combined river and canal route resumed. Roughly 400 feet to the north, they again separated, with the canal to the west and passing through Lock #5. Approximately 1300 feet north of Weeden Street, the path of the combined river and canal crosses from the City of Pawtucket into the Town of Lincoln. In Lincoln, at a point due west of the west end of Cleveland Street, the river crossed to the west, while the canal continued straight in a northerly direction to Walker Street passing through three locks (6,7, and 8), the last of which connected the canal with Scotts Pond. The towpath ran along the east bank.



⁴ Personal communication to VHB from BRVNHCC staff, 5 May 2009

Construction of the railroad is considered to have impacted the alignment of the canal and the Moshassuck River in the area just north of Weeden and Lockbridge Streets in Pawtucket, where the railroad track bed was built directly on the **towpath berm** on the east side of the canal. However, the impact of the railroad construction is not readily discernable from a comparison of historic maps dated 1882, 1895 and 1917.⁵ The west side of Lockbridge Street contains eight multi-family houses whose design was originally identical. These structures were built by the Sayles family in 1882 to provide worker housing for employees of the Lorraine Manufacturing Company, which had been acquired by the Sayles family in 1881. These buildings have been identified as the only surviving 19th century company housing in Pawtucket.⁶

Some modification appears to have occurred along the west bank between Weeden Street and Higginson Avenue, a **series of small natural or constructed basins** have been filled creating a linear bank alignment. North of Higginson Avenue, the original earth trench appears largely unchanged to a point 500 feet south of Walker Street where the canal was incorporated into the **water system of the Saylesville Mill complex** (c. 1855-1920, NR) at a point 500 feet south of Walker Street. The canal route, which ran north and slightly east from this juncture to Scotts Pond, has been filled and the locks removed.

This segment contained several features which no longer exist: **possible dams at the canal/river junctions**, a **cart bridge**, Lock #5 just north of Lockbridge Street (formerly Log Bridge Road), a **side landing bypass** north of Weeden Street, a **towpath bridge**, Lock #6 on the route through the present Saylesville Mill complex, Lock # 7 and a small basin on the south side of Walker Street, and Lock # 8 on the north side of Walker Street at the edge of Scotts Pond are other features that no longer exist.

Town of Lincoln

Section 5

Walker Street through Scott's Pond and Cranberry Pond across Front Street, to the Ashton Dam, Lincoln

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

This section contains the longest, most intact length of trenched canal and towpath in Rhode Island. Leaving Lock #8, the canal route proceeded .8 miles through two connected natural but enlarged bodies of water, **Scott's Pond** and **Cranberry Pond**, which also served as **reservoirs** for the canal. The towpath apparently followed the east pond banks though there is little visible evidence on the steeply sloped east



⁵ Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003, 19

⁶ Ibid

banks. Note that the upright posts that are visible in Cranberry Pond are not related to the Canal, but, rather, were pilings that were driven as part of the never-completed Grand Trunk Railroad⁷. The present-day Front Street bridge stands on the approximate site of a **cart bridge crossing**.

Based on archaeological investigations that were conducted from 1989 to 1991, the **canal prism** in Section 5 is considered to be largely intact as a morphological feature that it retains **considerable stratigraphic evidence from the original construction** (Freedman and Morenon 1991:18).⁸

The canal north of Front Street was modified by the Lonsdale Company for a distance of 150 feet. The original trench to the west was filled and built upon and the water was rerouted into the small millpond, where a wooden bulkhead contains the flow in a separate channel that runs through the millpond. The course resumes through the original 30-40-foot wide earthen trench on the west side of the Lonsdale Mill complex and proceeds northward with the towpath on the east bank. From this point northward, the canal leaves the headwaters of the Moshassuck River and runs along the west side of the Blackstone River through a wooded, rural setting.

The southern stretch of this section appears to have been built with earth walls; an approximately 10 foot long area of **dry-laid low masonry** is, however, visible on the west bank of the canal opposite Pole 98 off River Road, Lincoln (Feature 1). Just south of Feature 1 on the east bank of the Canal is a long **earthen ramp** and a **stone abutment**, remnants of the **cart bridge** built to connect those portions of the John Wilkinson Heirs' property separated by the Canal (Feature 1A). A cluster of features remains at the recently rebuilt Martin's Way Bridge (Martin's Wading Place) which carries Martin Street across the Blackstone River and canal. **Earthen ramps** on both sides of the canal north of the bridge mark the location of a bridge over the canal and a ramp down to the river ford, near **two possible basins** as shown on the 1828 Phelps survey map (Feature 2). This northern site may have been abandoned in 1855 at the same time that the approach was moved south to a new bridge over the river (the "Hemlock Bridge" (Cumberland Plat Book 1:5). In the "Lime Rock Lot" on the west side of the canal, **scattered deposits of limerock** north and south of the present bridge and a **large pile of limerock**, possibly a **wharf**, north of the bridge attest to the archaeological presence of two lime kilns here and the transport of raw and processed lime from the **two limerock quarries** that were located to the west of the canal. Mid-twentieth century flooding in this area has caused washouts and required repairs. Nevertheless, the original contours and noted features remain remarkably intact. (Morenon and Raber 1989:7-9)

Approaching Quinville, one-quarter-mile north of Martin's Way, the canal prism passes through "**Gardner's Canoe Rock**" (Feature 3). On the wooded west bank a smooth-faced ledge outcrop slopes steeply into the canal. The east bank and towpath

▼
⁷ Personal communication from NPS to VHB, 5 May 2009
⁸ Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003

are cut into outcrop; **quarry chisel scars** and **low dry-laid masonry support walls** are visible along the water's edge. The only canal mile marker in Rhode Island remaining in its original location, the **8-Mile Marker** is sited adjacent to Gardner's Canoe Rock (Feature 4). No remains are known to exist of **several small wharves**. This area of Section 5 is within the Blackstone River State Park, which occupies the land between the Blackstone Canal and the Blackstone River in the Quinville section of Lincoln.

North of Gardner's Canoe Rock, the canal prism runs straight with earth walls to a point 300 feet south of the Ashton Viaduct (1934-45) and from there north to the Ashton Dam with **walls of excellently preserved masonry**. The remains of a **towpath bridge abutment** (Feature 5) are visible at the south end of the east bank masonry where the towpath crossed from the east to west canal bank in the Old Ashton National Register Historic District.

Several mill houses (c. 1810-15) along Lower River Road on the west side of the canal and the **Wilbur Kelly House** (c. 1835) on the east side of the canal south of the viaduct form the extant visible structures of Old Ashton, **Lincoln's oldest mill village**. Nearby, the outline of the Old Ashton/**Sinking Fund Mill has been recreated based on archaeological work**. North of the viaduct, later erosive flooding on the west side of the canal damaged the towpath for a short distance. No surface traces remain of a **footbridge** over the canal immediately north of the **Kelly House**.

The canal re-entered the Blackstone River just above the Sinking Fund dam, which was located just north of the existing 1893 Ashton Dam. No visible evidence remains of the canal's **guard lock structure** which was located across the canal just south of the old dam. The northern end of this section of canal does feature 1902 concrete abutments associated with the control gates and sheltering gatehouse that the Lonsdale Company built across the canal. Other c. 1902 water control features added to the canal by the Lonsdale Company include a concrete-walled spillway just below the Ashton Dam, a circular concrete weir just south of the intersection of River Road and Lower River Road and a third concrete spillway just south of Willow Way.

Archaeological remnants of a blacksmith shop are thought to remain below ground in the southern end of Section 5 but this has not been confirmed to date.

Section 6

Ashton Dam north to 800 feet below Albion Bridge (mile 8-10, approximate), Lincoln

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

This section begins at the **Ashton Dam**. West of the dam, the towpath is thought to have been built along the **30-foot high ledge** which drops down into the west side of the canal. Here the towpath may have been a wooden walkway or bridge that was bolted into the granite wall at a height close to the level of the water. Approximately 200 feet north of the dam, the canal entered the Blackstone River and ran in the river, with the towpath on the west bank for 1.1 miles. This section contains the most intact

length of slackwater towpath identified. Along this section, the towpath is visible as a **flat earthen berm**, approximately ten feet wide, along the riverbank. It is defined on the western side by a **shallow ditch**. The area is wooded and the terrain rises steeply to the west. No masonry work was observed along the berm. Approximately 1,900 feet south of the Albion Bridge, the **semi-coursed masonry footings for a small bridge** which carried the towpath over an unnamed stream are visible (Feature 6). Neither the stream nor bridge appear on the 1828 Phelps map.

Beginning at a point 800 feet below the Albion bridge and 1300 feet below the Albion dam, the canal was carried in a trench for a distance of 1800 feet around the dam. Lock #9 was located where the canal left slack water navigation and entered the canal trench leading up to the Albion Mill. The southern 200 feet of this short stretch was later modified for use as a **power canal** by Albion Mills expansion.

Section 7

North of Albion Mill, 1,000 feet, Lincoln

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

The canal trench, possibly somewhat enlarged, and towpath route on the west side are clearly visible, particularly north of the mill. Two natural islands between the canal and river remain, although the inlets have been filled, culverted, and spanned by railroad tracks. Other alterations may have occurred when the dam was relocated in the nineteenth century. The location of the present Albion Road bridge crossing the canal and the road alignment mark the approximate location of **canal-era crossings**. The canal reenters the river 900 feet above the **1887 pony truss bridge**. A **floodgate** across the canal trench was most likely erected by the mill to control water flow. Features no longer existing in this section include the **9-Mile Marker**, an adjacent **wharf**, and a **footbridge** over the canal to the mill.

North of Albion for 2200 feet to Mussey Brook the canal ran in the river. Railroad embankment has been overlaid onto the towpath, eliminating its visibility and integrity. No evidence of a towpath bridge crossing remains at Mussey Brook; only random stones and a modern culvert are visible.

Section 8

Mussey Brook to 2000 feet north of Mussey Brook, Lincoln

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

Beginning immediately above Mussey Brook, the riverbank and towpath veer east away from the railroad for a distance of 2000 feet. The towpath contours are moderately well-preserved throughout this section. The **11-Mile Marker** which stood at the northern end of this section has been removed.

Above this terrace, the canal route and railroad intersect again for 1000 feet to a more pronounced curve in the river. Here, the canal was trenched around the Manville dam and northward. To the south of and for 1400 feet north of the dam, this trench

appears to have been almost totally filled and altered by railroad and other construction, although a short section of visible and dry canal is visible south of the Manville bridge. This section contained **Lock #s10, 11, and 12** and a **road crossing bridge** below the dam and the **12-Mile Marker** a short distance above the dam. The road crossing bridge site remains marked by a modern bridge; the **masonry visible at ground level** on the east side of the railroad right-of-way north of the bridge appears to be associated with the Canal.

Town of Lincoln/Town of North Smithfield/City of
Woonsocket

Section 9 (RI-532)

1400 feet north of Manville Dam (Lincoln) to 300 feet south of Woonsocket Water Treatment Plant (Woonsocket)

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

Section 9 of the Blackstone Canal is an approximately 1.5 mile (approximately 7,000 feet) long section located on the west bank of the Blackstone River in Lincoln, North Smithfield and Woonsocket, Rhode Island. This section begins approximately 1,400 feet north of the Manville Dam and ends approximately 300 feet south of the Woonsocket Water Treatment Plant.

The Lincoln segment is located in a narrow, wooded strip of land at the bottom of the west river terrace, between the P&W Railroad tracks to the west and the edge of the Blackstone River to the east. At the south end of the North Smithfield segment, Crookfall Brook, which forms the north-south boundary between the town of North Smithfield and Lincoln, crosses the canal and meets the Blackstone River. A small, approximately 150-foot long segment of canal is located north in North Smithfield. The Woonsocket segment begins at the southern boundary of the city of Woonsocket and extends 1500 feet north to a point that is 300 feet south of the Woonsocket Water Treatment Plant. Through the North Smithfield and Woonsocket segments, the canal is parallel to Manville Road and is located in a swampy backwater in a westward bend of the river, with a steep hill and rocky cliffs to the west.

Throughout this distance the canal is reasonably intact and most of it contains standing water. An atypical feature of the canal in this area is that it is formed by berms on both sides that rise above the level of the surrounding wetlands. The canal is breached at one location to the north of Crook Fall Brook and is filled in by stream alluvium in the area around the mouth of Crook Fall Brook. The only ancillary engineering features known to have existed on this portion of the canal are a **dam and spillway** on Crook Fall Brook where it intersected the canal, and a **culvert** to the north of Crook Fall Brook (NR Feature 7). Some archaeological evidence of the dam and spillway was discovered during archaeological testing in July 1986 (Milner 1987). The breach north of Crook Fall Brook may be on the site of the culvert.



The remnants of the dam and spillway are believed to have been built by a cousin of David Wilkinson, the machinist who worked closely with Samuel Slater in Pawtucket. Several large flat square stones may be part of the former dam, but is difficult to ascertain due to the construction of the railroad here.⁹

Both the towpath bank (southwest) and the berm bank (northeast) are well preserved, although heavily overgrown with brush and small trees. The banks of the canal throughout this segment are 30 to 40 feet apart. To the south of Crook Fall Brook the canal towpath is under the existing railroad embankment. North of Crook Fall Brook the canal alignment veers away from the railroad and both banks of the canal are visible. At present, the canal prism is disturbed or destroyed 1400 feet north of Manville and 300 feet south of the Woonsocket water treatment plant. This section contained the **13-Mile Marker**.

Although the 13-Mile Marker associated with the canal is no longer extant, investigations conducted in 2003 revealed the existence of the cut granite 13-Mile Marker that is associated with the Providence & Worcester Railroad.¹⁰

From 300 feet south of the Woonsocket Water Treatment Plant to approximately 100 feet north of the plant (total distance of 700 feet), the canal prism has been thoroughly destroyed by earth moving associated with the plant construction.

Section 10 (Mott Dam)

From 100 to 700 feet above the Woonsocket Water Treatment Plant and extending to the east riverbank (Woonsocket)

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

Just above the treatment plant, a short dry section of canal and berm extend to a point where the **Mott Dam** stood. The canal reentered the river just above the dam (Morenon and Tidwell 1988). In addition, **masonry and earthwork** (Feature 8) most likely associated with the Mott Dam is present on both sides of the Blackstone River (although only visible at low water). The Mott Dam was an earth-filled timber frame structure built by the Blackstone Canal Company to maintain the water level in the canal; it has been dismantled. On the west riverbank is a **dry-laid, fieldstone embankment** interpreted as representing the entrance to the canal trench above the Mott Dam. It is approximately (12 meters) 25 feet in length and (1 meter) 3 feet high (exposed), facing north and east and earth-filled on the southern side. It curves northwest from the riverbank.

On the east riverbank, a **massive earth mole** which clearly appears on modern topographic maps is the eastern section of the dam. It consists of a **raised berm**,



⁹ Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003

¹⁰ Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003

approximately 7 feet above water level approximately (5 meters) 15 feet wide extending into the river from the bank for 100 feet and curved at the western end. Along the north, west and western (rivermost) section of the south sides, **large quarried granite blocks** (1-2 m x 50-60 cm) are laid at a sloped angle of 30-35 degrees, creating a smooth grade to the water. Where the berm meets the riverbank on the north side, granite blocks continue around a curved corner and to the north along the riverbank for approximately 80 feet. The blocks appear to have been added in the twentieth century, perhaps for flood control purposes. Other features in this section for which no remains are known to exist are **two wharves** located on the **island berm** inside the canal just below the dam.

Beginning 700 feet north of the Woonsocket Water Treatment Plant where a power line crosses the river, land filling, and earth moving associated with the City of Woonsocket Landfill have destroyed all traces of the towpath that ran along the west riverbank to a point approximately 900 feet below the Hamlet Avenue Bridge, where the canal entered a trench for a distance of 1800 feet around the Hamlet dam. This trench has been filled in some locations and the canal berm has been enlarged with earth overburden and rip rap for flood protection. **Two unwatered sections of canal prism** remain, possibly widened for later use as a **power canal**.

Section 11

South of Hamlet Avenue Bridge (Woonsocket)

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

This short, straight section is approximately 100 feet long, planted in grass, and terminated by parking lot fill to the south and by **Hamlet Avenue Bridge abutment fill** to the north. The survival of towpath contours is unknown. Between the Hamlet Avenue Bridge and the Kendrick Avenue foot bridge to the north; all traces of the canal prism have been lost in the grassy area between Florence Drive and the flood control berm.

Section 12

Villanova Street footbridge to Singleton Street Bridge (Woonsocket)

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

This section begins with an approximately 700-foot long, 50-70-foot wide broad trench which follows a river curve, with volunteer weed vegetation. It is terminated at the south by fill for a pedestrian bridge over the river and blends to the north with **masonry remains of a floodgate** and the **Hamlet dam**. Demolished features in this canalized section include **Lock #13** and **two wharves**.

Reentering the river, the canal route followed the west (or south) bank for a short distance before crossing to the opposite bank, where it was again trenched, following the riverbank contours through the village of Woonsocket Falls to just above the **Woonsocket Dam** and present-day **Main Street Bridge**. Later nineteenth and twentieth century construction has destroyed all traces of this trench. Lost features

include **Lock #s 14 and 15**. Remnants of **Lock # 16** remain under Market Square. Above the dam, the canal towpath route followed the east river bank, but has most likely been destroyed by washouts and flood control projects.

At a point approximately 100 feet north of the Conrail Bridge, the canal again entered a trench which carried it straight, paralleling present-day Water Street, across an oxbow in the river for 700 feet to a point approximately where the railroad now crosses. Later industrial construction resulted in the filling of this segment at around the turn of the twentieth century. Crossing the river, the canal again became a separate trench, shortly after entering the canal trench, Lock #17, the final lock in Rhode Island, was located, but no evidence of the lock remains. The lower 1100 feet of canal trench has been filled by industrial buildings, some portions of railroad bed, and River Street.

Town of North Smithfield

Section 13

Singleton and River Streets (Woonsocket) 1200 feet along Canal Street (North Smithfield) to Blackstone, Massachusetts state line.

Source: 1991 expanded and revised NR form for the Blackstone Canal Historic District

At a point opposite the present-day **Singleton Street Bridge**, the **canal trench** becomes visible again as a **wide basin** which narrows to the more standard canal prism and parallels River and Canal Streets for 1200 feet through the village of Waterford to the Massachusetts state line. The present-day bank contours appear basically unchanged since 1828, although diversion of water to the river has substantially lowered the water flow level in the trench. In this section, the towpath ran along the east side of the canal, and forms the base of the present-day River/Canal Street. **Dry-laid fieldstone masonry retaining walls** of the **earth-filled towpath berm** are visible on both sides of the road embankment. On the canal side (west) the embankment walls are approximately 6 feet high. Demolished features in this section include **an inlet for a small mill race** to the river, the **17-Mile Marker**, **two wharves** and a **mill pond inlet to the Mammoth Mills** and **associated towpath bridge**.

Investigations conducted in 2003 documented that the northernmost portion of the canal in Rhode Island has earth banks until it reaches a concrete culvert at Canal Street, which carries the canal water into the **former Green Mill/Mammoth Mill millpond**, through the south raceway in the ruins of the **Mammoth Mill foundation**, and then back into the Blackstone River by way of the Mill's **original tailrace trench**. **Fieldstone and concrete remnants of water control structures** are located just downstream of the culvert. These structures are considered to have been constructed after the canal was no longer used for transportation, and their purpose is thought to

have been to regulate water flow between the north and south halves of the canal section.¹¹

As of 2003, there was no above-ground evidence of several local features that are shown on the 1828 Phelps map, specifically the **channel** that connected the canal with the river near the present Singleton Street Bridge, the **17-Mile Marker**, the **Mammoth Mill millpond inlet towpath bridge**, or the **small oval landing basin with the rectangular wharf or dock structures**. However, remnants of a number of historic features associated with the Mammoth Mill remain to the east of the millpond, including the **granite block raceway arches, walls, and breast wheel axle shaft bearing pockets**, as well as the **mill tailrace**.¹²



¹¹ Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003
¹² Blackstone Canal Assessment Study, PAL, Pawtucket RI, 2003

Recommendations

This Study recommends five key projects or “ventures,” four of which are focused on specific Canal segments while the fifth is a canal-wide interpretive effort.

As shown by the Resource Inventory and Existing Conditions Chapter, portions of the Blackstone Canal in Rhode Island remain reasonably well-preserved over 150 years after its closure. This chapter presents those key ventures of the Blackstone Canal that offer outstanding opportunities for public access, restoration, and interpretation. These ventures warrant immediate attention in the areas of preservation, stabilization, and further study for restoration and public access feasibility. This chapter presents general recommendations for future planning actions and preliminary scopes and cost estimates for necessary stabilization and restoration tasks. It should be emphasized that the recommendations in this Study are preliminary, and additional, site-specific research and planning activities will need to be completed prior to their implementation.

Key Venture Selection Methodology

Selection of key ventures for the rehabilitation, restoration and interpretation of the Blackstone Canal in Rhode Island was a phased process, relying on public input from Blackstone Canal corridor communities, input from BRVNHCC and RIHPHC staff, and assessment of the Resource Inventory and Existing Conditions summary.

A public workshop was held in January 2009 to solicit input on the accuracy of the Resource Inventory and mapping and to gather suggestions for areas where the Canal could be preserved and made publicly accessible. The workshop resulted in a list of five suggested portions of the Canal for future preservation and accessibility (see Appendix B).

Following the public workshop, the suggested sites were reviewed and rated based on the following criteria:

- The state of preservation of the canal segment and associated resources,

- The rarity of survival of the Canal or associated features relative to the entirety of the Canal in Rhode Island or the community within which the segment was located,
- The level of protection afforded to the resource via ownership or management status,
- Current and potential public access, and
- Restorative and interpretive opportunities.

Where feasible, a field inspection was also conducted for each site.

In selecting key ventures, emphasis was put on those segments of the Canal that were well-preserved (i.e. visible and/or watered), unprotected through public ownership or conservation or preservation restrictions, that were presently or would soon be publicly accessible, and that included resources associated with important historic contexts in the Blackstone River Valley.

Based on community input, the evaluation criteria, and field inspection, the selection process resulted in the following four ventures being put forward for timely action towards preservation and stabilization, more detailed evaluation of restoration opportunities, and additional resource study. The list is in geographical order, from south to north:

- Canal Basin to Randall Street, Providence,
- Lorraine Mill Area, Pawtucket,
- Ashton Dam Area, Lincoln, and
- Mammoth Mill Area, North Smithfield.

As a fifth component of the recommendations for timely action, this Study recommends the development and implementation of interpretive signage and activities for various locations along the length of the Canal in Rhode Island. This interpretive component is intended to expand public awareness of the Canal's history and resources and promote public appreciation of the Canal as an historic linear feature that traverses 17.5 miles of the state. A highly consistent look and style for the signage will help reinforce public perception that the separated extant sections of the Canal are part of a larger whole. Use of BRVNHCC's sign standards and specifications, already applied to current signage on the corridor, for these new interpretive signs would further enhance this goal. The interpretive approach would link sections of the canal in a more interactive way and moves beyond a series of static discussions about individual locations in isolation of the larger phenomenon of the canal, the valley and the visitor's experience. Suggested interpretive themes include the economic and demographic impacts of the Canal on Rhode Island communities, the construction techniques used to build the canal, the trajectory of the rise and fall of the Canal as a transportation facility, and what changes occurred after the closure of the Canal. Interpretive efforts can also include activities at various locations along the Canal. These activities can take

such forms as walking tours, organized hikes, dramatizations, scavenger hunts, or demonstrations of how equipment used in the canal operation or how lock structures worked. Potential interpretive topics and locations are listed in this chapter after the detailed recommendations for the Mammoth Mill Area.

In addition to the recommendations noted above, the following four ventures were identified for consideration in a second, future phase of implementation. This list also is in geographical order, from south to north:

- North Burial Ground, Providence,
- Lonsdale Bleachery Area, Lincoln,
- Mott Dam, Woonsocket, and
- Market Square and Vicinity, Woonsocket.

These ventures meet many of the selection criteria listed above in this chapter and should be priority areas for preservation, public access, and interpretation in the future. Several of these ventures pose preservation, access, or restoration challenges that do not make them feasible for more immediate action, while others do not require substantive restoration efforts.

Each of the proposed key ventures, as well as those worthy of future planning efforts, are described and evaluated in detail in the following sections.

General Recommendations

While each of the key ventures is unique, a set of general recommendations has been developed to be applied to each project. The general recommendations include a phased program of short-term preservation and protection for the Canal; mid-term stabilization, maintenance, and management; and long-term rehabilitation and interpretation. The general recommendations address issues such as land or easement acquisition, facilitation of public access to canal segments, and further study regarding historic restoration and interpretation opportunities. The recommendations are described in detail below.

It should be emphasized that the recommendations in this Study are preliminary, and additional, site-specific research and planning activities will need to be completed prior to implementation. Such activities should take into consideration impacts to natural and historic resources, including known and potential archaeological sites, through research and/or survey. Further environmental study will ensure that important resources are not harmed and that all rehabilitation or restoration activities comply with applicable state and federal laws. In addition, information gained from a deeper understanding of

each site's natural, historic, and archaeological resources will inform the treatment plan and enhance interpretive opportunities.

Protection and Preservation

Although there have been many efforts over the past 40 years to preserve and protect the Blackstone Canal from adverse impacts, at present, no comprehensive protection of the Canal is guaranteed and major portions of the Canal in Rhode Island remain in private ownership with limited protection from demolition, natural deterioration, or inappropriate abutting development and no public access.

A concerted and cooperative effort between the BRVNHCC, state entities, including the Rhode Island Department of Environmental Management (RIDEM), municipalities in which the Canal is located, private organizations with preservation or conservation missions, and property owners should be undertaken to ensure sensitive treatment and public access to the most intact and well-preserved segments of the Canal. Providing protection of these key segments is the first step in facilitating future restoration and interpretation efforts.

The strongest measure to ensure public access and appropriate treatment and management of extant segments of the Blackstone Canal is acquisition in fee simple, acquisition of an interest in the property through a voluntarily donated easement, or with federal, state, or local funds. In circumstances where acquisition is not feasible or appropriate, alternatives such as preservation or conservation restrictions, establishment of a local historic district or conservation district, zoning overlays, corridor protection bylaws or ordinances, or transfer of development rights provisions can be pursued. One or more of these measures is recommended for all well-preserved, extant sections of the Canal as identified in the Resource Inventory and Existing Conditions section of the Study, regardless of interpretive opportunity or public access.

To assist with assessment of land acquisition or protection priorities, areas of public ownership and the current names of specific owners are presented for each outstanding project segment. Appendix C contains a listing and figure showing the tax parcels and ownership for each of the proposed Canal ventures, as well as the four future ventures. No tax parcel information is provided in this Study for locations that are part of the proposed Canal-wide interpretive effort, as specific locations have not yet been selected.

Stabilization and Management

More than 45 percent of the Blackstone Canal remains visible or visible and watered on its course through Rhode Island. (This does not include the approximately 5.12 miles of the Canal that is in bodies of water such as rivers or ponds.) Though the key segments of the Canal recommended for restoration as part of the Study remain in a recognizable state, most are in need of stabilization and planning for ongoing management and maintenance. Some of the most commonly observed passive threats to the integrity of the Canal include:

- Collapsing dry-laid stone walls of the canal trench,
- Private dumping and filling and natural erosion contributing to a loss of integrity for the canal trench,
- Natural growth, including large trees, compromising the structural integrity of the canal trench and towpath berm,
- Existing breaches in the towpath being further eroded by natural processes, and
- Erosion of towpath berm.

The BRVNHCC should assist state and local partners and individual property owners in planning for the stabilization and long-term management of those extant segments of the Blackstone Canal under their control. Preliminary cost estimates for typical tasks are presented in Appendix D.

As segments of the Canal are considered for protection and future actions, resource management plans should be implemented at the corridor and local levels to assist stewards of the Canal in this work. The resource management plans should guide both routine operation and long-term decisions and planning concerning the use, maintenance, and interpretation of the Canal. The plans should also provide the means to make informed decisions concerning future stewardship of key project segments, with identified strategic objectives, achievable goals, and concrete action items. Successful implementation of the plans will require cooperative public and private partnerships among individuals, businesses, non-profit organizations, and governmental entities, such as the Rhode Island Department of Environmental Management. The plans should be completed prior to the commencement of rehabilitation or restoration activities and should take into consideration potential impacts to natural, historic, and archaeological resources. Stabilization and management of important canal resources should be a mid-term goal, achieved within a time frame of three to five years for key ventures.

Rehabilitation, Restoration, and Interpretation

The long-term goal for the five key ventures identified by the Study is to rehabilitate or restore the canal structure and associated features in these

locations in support of the preservation and interpretive goals of the BRVNHCC. This Study makes preliminary recommendations for potential restoration and rehabilitation of key canal segments and features as well as preliminary recommendations for interpretive opportunities. Rehabilitation or restoration tasks could include restoration of key features such as lock structures, opening covered or hidden sections of the Canal, rebuilding damaged or destroyed towpath sections, and re-watering dry sections of extant Canal. Preliminary cost estimates to begin these tasks are presented in Appendix D.

Additional, site-specific research and planning activities will need to be completed prior to implementation of any rehabilitation, restoration, or interpretive activities. Such research and planning should include further study of historic and archaeological canal features and take into consideration potential impacts to natural, historic, and archaeological resources from restoration or interpretive activities. This work will ensure that these resources are not harmed and that all rehabilitation or restoration activities comply with applicable state and federal laws. In addition, information gained from a deeper understanding of each site's resources will inform the treatment plan and enhance interpretive opportunities.

Because of the historic and archaeological significance of the Blackstone Canal and associated resources, rehabilitation and restoration efforts should be carried out in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Copies of the Standards for Rehabilitation and the Standards for Restoration are included in this Study as Appendix E.

Key Canal Ventures

Four ventures along the Blackstone Canal were identified as offering outstanding opportunities for canal preservation, restoration, and interpretation by virtue of the high degree of preservation, unprotected status, public accessibility, proximity to other protected segments of the Canal, and high interpretive value of the canal segments represented in each venture; the fifth key venture aims to expand and improve interpretation and an understanding of the interconnectedness of the canal through the state. A consensus emerged through the course of this Study that investments in these five ventures would have the biggest impact on achieving goals of preservation and public use and enjoyment of the important historic asset. The significance, state of preservation, degree of public access, and interpretive and restorative opportunities for each of the five key ventures is described below. Key historic and archaeological resources are also noted. Appendix C contains the list of individual tax parcels and most current owners' names that could be obtained for the areas considered in four of the five key ventures. Because the specific locations for sites included in the interpretive key venture

are not yet identified, this venture does not have associated tax parcels or owners' names.

Canal Basin to Randall Street, Providence

The Canal Basin to Randall Street area includes a section of the river flowing in the original canal trench from the north side of Randall Street south to the Mill Street dam. South of Mill Street, the river continues in a later masonry channel along the course of the canal and into the site of the Canal Basin that formed the canal's southern terminus. The current channel is much narrower than the Basin which extended from today's Park Row to Smith Street (Figure 14).

The presence of the Blackstone Canal and Moshassuck River in this area; the area's status as the site of the former Canal Basin; the proximity to the shops, restaurants and hotels of downtown Providence; the public recreation amenities and interpretative signage of Water Place Park; and the well-established National Park Service visitor center facilities of Roger Williams National Memorial all make this area a key venture for physical restoration and expanded interpretation that will motivate visitors and residents to explore the other key segments of the Blackstone Canal in Rhode Island. This segment, located in Rhode Island's most populous city, is the southern gateway to the Canal and it is extremely well-positioned for enhancements that will promote the other key areas of the Canal as tourism and heritage destinations.

Resources

The Blackstone Canal is both visible and watered in the north part this segment. As noted above, in the south part adjacent to the west boundary of Roger Williams National Memorial, the river flows in a late 19th century channel through the site of the Canal Basin, which extended further to the east and west.

The southern portion of this segment, situated between Park Row and Smith Streets and consisting of the basin area, is located within the College Hill Historic District and adjoins the Roger Williams National Memorial, both of which are listed in the National Register of Historic Places. This portion of the Canal also is in close proximity to the National Register-listed Downtown Providence Historic District.

Several other canal-related historic resources are located nearby. Because these properties are outside of the boundaries of this key venture, they are not included in the recommendations of this Study but are briefly mentioned here as properties that may serve to enrich the public's understanding of the impacts of the newly-constructed Canal on the economy of Providence. These are the attached group of early 19th century brick buildings at numbers 1, 3

and 9 Steeple Street, which constitute a rare surviving remnant of the thriving commercial-industrial neighborhood that was clustered around the Canal basin and benefitted from the port activity that the Canal generated.

The northern portion of this key project, located between Smith and Randall Streets, contains a visible and watered trench with stone walls, which is closely bound by 19th century brick industrial buildings that back onto the Canal. These include the Stillman White Brass Foundry buildings at 1 Charles Street and the Fletcher Manufacturing Company Office Building and Warehouse at 2 Charles Street.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the City of Providence, Section 1, within Chapter 2.

Ownership and Access

The Canal Basin to Randall Street venture includes one large publicly owned parcel, containing the Roger Williams National Memorial, which is located directly across Canal Street from the Canal trench/bed of the Moshassuck River. With the exception of this parcel and a small piece of city-owned open space between Randall and Stevens Streets, the area abutting or adjoining this segment of the Canal is privately owned and includes the Girl Scouts of America and several real estate firms or ventures. The level of protection for these privately owned parcels is unknown.

Access to both the north and south areas is very good, via public roadways and sidewalks and is in close walking distance of downtown Providence.

Opportunities

The Canal Basin is currently interpreted by signage installed on the Steeple Street Bridge as well as signage installed within a pavilion on the west side of Canal Street opposite Throop Alley. Enhanced interpretation or wayfinding is recommended in order to promote visitation of other portions of the Blackstone Canal, including the nearby north end of this segment at Mill and Randall Streets.

Overall, this section of the Blackstone Canal and Moshassuck River, which is located near established interpretive sites, presents a prime opportunity to expand interpretive programming through additional signage. A panel at Water Place tells part of the story about the canal, but the goal would be to get the story told here.

Opportunities also exist to the partner with the Roger Williams National Memorial and the Rhode Island Historical Society for specific tours or events. The Canal in this area would also lend itself well to future restoration of the

stone canal trench wall as it is mostly intact but is currently in need of localized repairs.

Recommendations

Protecting and repairing this section of the Blackstone Canal is essential to protecting extant canal features in the City of Providence and as preparation for future restoration and interpretation of the Blackstone Canal in the city. Suggested actions include working with the City of Providence, the National Park Service, the Greater Providence Chamber of Commerce, the Rhode Island Historical Society, and the individual private property owners along this segment of the Canal to ensure its preservation through acquisition, easements, or conservation or preservation restrictions. Easements could be held by RIHPHC or another qualified preservation organization such as Preserve Rhode Island or Providence Preservation Society. Efforts such as repairing and stabilizing the stone walls of the canal trench, instituting an active vegetation management program, and completion of a conditions assessment/resource management plan are considered to be a joint effort among the various property owners and also recommended. Interpretative signage that presents this segment as a whole from Park Row to Randall Street is recommended, in order to focus public attention on the entire segment and not just the basin area that is closest to downtown Providence.

Walking tours sponsored by the Rhode Island Historical Society could be planned and executed for specific events. The Roger Williams National Memorial Visitor Center is an obvious location for visitors to obtain more information about the canal, possibly through a self-guided walking tour booklet.

Next Steps:

- Meet with parcel owners to come up with ideas for preservation and protection; there may be common ground or efforts that can be expanded upon or enhanced for everyone's benefit
- Completion of a conditions assessment and stabilization/restoration plan for walls and a vegetation management plan which would involve adjacent property owners
- Plan a specific event with Rhode Island Historical Society that focuses on the canal's history in this area and that introduces other sections of the canal to the north
- Research and prepare a self-guided tour booklet that would be available at the Roger Williams National Memorial visitor center
- Contact Chamber of Commerce with ideas for more visibly publicizing the canal's existence and ways to find out more about the story
- Explore funding sources for specific ventures that come out of partnerships with parcel owners

- Explore the possibility of easements with adjacent property owners
- Identify specific areas needing repairs on canal sections and seek funding sources to repair.

Lorraine Mill Area, Pawtucket

The Lorraine Mill Area in Pawtucket comprises both watered and visible canal, including a possible towpath section, to the north of the Lorraine Mill complex, and sections that are no longer visible within and to the south of this complex. The northern end of this area includes Lockbridge Street on the north, near the Pawtucket-Lincoln municipal line, which contains mill worker housing opposite an extant segment of watered canal. The central section contains wetlands of the Moshassuck River, which the City of Pawtucket is interested in preserving and opening to limited use through the implementation of a conservation easement and potential to connect this segment with planned linkages to City-owned future trail segments. The south end of the area includes the Mineral Spring Lock #4, a rare survivor, which is located in the parking lot of a former industrial complex (Figure 15).

This key venture includes a parcel that the City of Pawtucket is interested in preserving as open space, through the implementation of a conservation easement. This parcel includes a portion of the Moshassuck River and wetlands that are adjacent to the Canal. This key venture area is bracketed on the north by the Lockbridge Street mill workers' housing opposite a watered and visible section of the Canal and to the south, by the partially intact Mineral Springs Lock, south of Mineral Spring Avenue; the former a rare survivor in Pawtucket, while the lock, even in its altered state, is the only such feature that can still be viewed above ground along the Blackstone Canal in Rhode Island.

The Blackstone Canal and the Moshassuck River are historically interlaced in this area and the original paths of these waterways have had many changes over time. Construction of the railroad is thought to have impacted the path of the Canal, and a series of expansions of the Lorraine Mill complex between 1902 and 1949 resulted in the filling and building over of a portion of the Canal just north of Mineral Spring Avenue.

Extant Canal resources include the trench and towpath mentioned above. Remnants of the Mineral Spring Lock, the only lock on the Canal that can still be viewed above ground within the state, are located just south of Mineral Spring Avenue. Features south of Mineral Spring Avenue of which no surface trace remains include: a cart bridge, two towpath bridges, a possible dam at the river/canal crossing (east), and a possible lockkeeper's house. The 3-Mile Marker, once located just south of Grotto Avenue, is the only feature known to have existed in this segment.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the City of Pawtucket/Town of Lincoln, Section 4, within Chapter 2.

Ownership and Access

The ownership in this key venture area is a mix of public (City of Pawtucket) and private ownership. In addition to the large wetlands area in the central section of this area that the City would like to protect through a conservation easement, the City of Pawtucket has also acquired extensive segments of the former railroad line east of this key venture area. The City intends to protect the wetlands parcel through a conversation easement. The level of protection for privately owned parcels is unknown. Access to this segment is fair, primarily via Mineral Spring Avenue and Lockbridge Street

Opportunities

The Lorraine Mill Area offers significant opportunities to protect, rehabilitate and interpret extant portions of the Canal located north of the Lorraine Mill Complex and the Pawtucket-Lincoln municipal boundary on the north. The City is currently working to acquire a conservation easement for a privately owned parcel located to the north and west of the Lorraine Mill complex off Mineral Springs Avenue. This irregular-shaped parcel contains the interwoven beds of the Canal and the Moshassuck River, as well as adjacent wetlands.

Implementation of such an open space conservation easement may provide an opportunity to restore deteriorated trench walls; protect a section of the Moshassuck River wetlands which historically were part of the setting of the Canal in Pawtucket; and develop a recreational walkway that links the wetlands to extant portions of the Canal.

The Lorraine Mill Area also provides an opportunity to interpret the locally-relevant story of the Canal in relation to the development of mill buildings, worker housing and railroads over portions of the Blackstone Canal bed after the Canal's closure in 1848. This segment of the Canal may also present an opportunity to develop interpretive programming with nearby schools such as the Slater School in Pawtucket.

The Mineral Springs Lock #4, despite its altered appearance and somewhat hidden location in a privately-owned parking lot, could benefit from some level of recognition and awareness, possibly through signage either on or near its location.

Coordination opportunities may exist with non-profit organizations such as the Friends of the Moshassuck, www.themoshassuck.org, which was founded in 1998 to protect and enhance sites along the Moshassuck River and its

watershed. This group would most likely be interested in the area that the City wants to protect with a conservation easement.

The City of Pawtucket owns a large tract of land roughly bounded by Smithfield Avenue on the west, Grotto Avenue on the North and the Blackstone Canal on the east. At the present time, the City is believed to be interested in the acquisition of a parcel located on the east side of San Antonio Way opposite Grotto Avenue, which abuts the Canal. The City's ownership of land containing or abutting the Canal in this section of Pawtucket may provide opportunity for the protection, maintenance and interpretation of the Canal south of Mineral Spring Avenue in the future.

Recommendations

Protection, restoration and interpretation of the Canal are recommended for the Lorraine Mill Area. The extent of the canal trench included in this work will likely be shaped by the City of Pawtucket's initiatives to acquire parcels and/or conservation easements in this key segment of the Blackstone Canal. A prime opportunity exists to tie this venture to the City's efforts to preserve open space and provide more recreational trails in the area. This venture also offers the chance to highlight the only lock that is visible above ground. The row of mid-19th century workers' housing facing the Blackstone Canal on Lockbridge Street, a rarity in Pawtucket, can also benefit from an increased level of recognition and awareness, possibly through signage or other interpretive efforts.

Next Steps:

- Work with the City of Pawtucket to ensure that new trail connections include pathways next to the Canal within this key venture area
- Approach private property owner of lot that contains the Mineral Springs Lock #4 to determine if there are access issues and to suggest an interpretive sign at the site
- Research history of mill workers' housing on Lockbridge Street in order to either install an interpretive sign here or to include in a future guided walking or driving tour or booklet
- Also include the location of Lock #5 (in the area of Weeden St. in any interpretive marker
- Conduct investigations on the condition of the Canal trench and prescribe specific restoration/stabilization plans
- Approach Pawtucket School Department on the feasibility of Canal history programming in the school or a special event that focuses on the Canal's history in this area.

Ashton Dam Area, Lincoln

The Ashton Dam Area in Lincoln comprises a 1.8-mile length of watered canal and visible towpath, beginning in the south at a point approximately 0.8 miles south of Martin Street and across the Canal from the northern leg of Maria Street, and extending north to Ashton Dam (Figure 16).

This key project involves one of the best preserved sections of the Canal in Rhode Island and features a concentration of historical, recreational and natural resources that make this section a popular destination. The well preserved state of the Blackstone Canal in the Ashton Dam Area, its location within state park lands and its proximity to the Wilbur Kelly House/Kelly House Museum make this area a key segment for protection.

Resources

Blackstone Canal-related resources are abundant in the Ashton Dam Area. These include the 8-Mile Marker, which is located near Gardner's Canoe Rock and is the only canal mile marker remaining in its original location in Rhode Island. North of Gardner's Canoe Rock, the canal prism runs straight with earth walls to a point 300 feet south of the Ashton Viaduct and from there north to the Ashton Dam with walls of excellently preserved masonry, except for an area near the north end where they were lost in a storm-related washout. Other canal resources include earthen ramps, abutments from vanished bridges and a pair of canal basins that retain a form that is close to what is shown on an 1828 map.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the Town of Lincoln, Sections 5 and 6, within Chapter 2.

Ownership and Access

The Ashton Dam Area is publicly owned state park land. As the Canal is a state-owned historic resource in this area, actions affecting must be reviewed by the RIHP&HC in accordance with the Rhode Island Historic Preservation Act.

Public and park roadways, as well as parking lots within the state park, all provide good access to this segment of the Canal.

Opportunities

The major opportunity here is for protecting the trench and the towpath from being damaged by the uncontrolled waters of the Blackstone River. These resources are under chronic danger of washouts because the Ashton Gates controlling the flow from the river into the canal have long been non-existent.

The Rhode Island Department of Environmental Management and the Rhode Island Department of Transportation developed plans for a control gate at Ashton to address the control of water between the Canal and the Blackstone River in 2002, but construction was never completed due in part to safety concerns. A Hydraulic Analysis Report, evaluating the impact of the proposed gate structure on water velocity, was completed in 2006. The NPS is providing funds for a feasibility study for the Canal which will, among other things, revisit this issue and result in construction documents for some sort of water control structure at this location. Funds for implementation have not yet been secured. In addition, this could be a good location for a water flow gauge.

This segment is already well interpreted; however, the Ashton Dam Area presents an opportunity to interpret, should the selected flood control method for the canal be gates at this location, flood control and the engineered river system from the initial industrial era to the present.

There is also an opportunity to monitor and protect historically significant archaeological resources that are associated with the Canal, including a mile-marker, a ford, cart and towpath bridge abutments, and cart ramps.

Recommendations

Protecting and stabilizing this section of the Blackstone Canal is essential to protecting extant Canal features in the Towns of Lincoln and Cumberland. Recommended actions include coordinating with the NPS, the Town of Lincoln, RIHP&HC, and RIDEM over existing funding for feasibility study or designs about the reconstruction of the Ashton Gates.

Next Steps:

- Identify improved canal and river access
- Determine appropriate type of water control structure and prepare construction documents
- Identify funding sources for implementation
- Conduct archaeological investigations in the area, as needed and required
- Add interpretive signage.

Mammoth Mill Area, North Smithfield

The Mammoth Mill Area in North Smithfield comprises a 0.4-mile length of watered canal, beginning in the south at the Singleton Street bridge and extending north to the town line; running between the railroad on the west and the Blackstone River on the east (Figure 17). This key project segment is the northern gateway to the Blackstone Canal in Rhode Island.

Resources

The Mammoth Mill Area's canal-related resources includes the Canal trench, which appears as a wide basin near the Singleton Street bridge and then narrows to the more standard canal prism and parallels River and Canal Streets for 1200 feet to the Massachusetts state line, and its earthen berm, which now serves as the embankment that carries Canal Street. Dry-laid fieldstone masonry retaining walls are visible on both sides of the road embankment.

The principal features from the Blackstone Canal period that remains intact are associated with the former Green Mill/Mammoth Mill which operated using water drawn from the canal from the 1820s into the 1920s. These include a concrete culvert at Canal Street, which carries the water into the former Green Mill/Mammoth Mill millpond, through the south raceway in the ruins of the Mammoth Mill foundation, and then back into the Blackstone River by way of the Mill's original tailrace trench. Fieldstone and concrete remnants of water control structures on the canal just downstream of the culvert were constructed after the Canal was no longer used for transportation, presumably to regulate water flow between the north and south halves of the section.

Other features associated with the Mammoth Mill remain east of the millpond, including the granite block raceway arches, walls, and breast wheel axle shaft bearing pockets, as well as the mill tailrace. There is a direct connection between the development of the Canal and this mill's construction, which offers great interpretive potential.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the Town of North Smithfield, Section 13, within Chapter 2.

Ownership and Access

The Town of North Smithfield owns the Mammoth Mill parcel. The watered Canal segment in this area is noted as being owned by Narragansett Electric Company, which is now part of National Grid, as well as the adjoining parcels on the west side of the canal. The two parcels south of the Mammoth Mill site are owned by private real estate entities. The level of protection for these parcels is unknown.

Access to the Mammoth Mill Area can be gained from either Canal Street on the west or from Mill Street on the north. The site is immediately adjacent to Kelly Park, a town recreational area, and the site of the Blackstone River Bikeway which is currently under study directly north in the Town of Blackstone in Massachusetts.

Opportunities

The Mammoth Mill Area presents an opportunity to repair and maintain a watered section of canal trench whose location as the northern gateway to the Canal in Rhode Island adds to its significance. This project also provides an opportunity to interpret the Canal and Mammoth Mill, possibly in an enhanced recreational setting. Other opportunities include acquisition and removal of a nearby salvage yard, south of the Mammoth Mill site, in order to enhance this area as an interpretive and recreational destination. The Town of North Smithfield anticipates that the mill site will be transformed into a public park of some kind, although their plans for the area are currently on hold, pending the outcome of current studies to route the Blackstone River Bikeway in this area.

Recommendations

Rehabilitation and interpretation are recommended for the Mammoth Mill Area. Recommended rehabilitation actions include removing vegetation from the historic industrial site, providing general cleanup of debris for the area, and repairing the Canal trench and the walls and arches within the Mammoth Mill site. Interpretation of the mill and Canal might be achieved through signage located near the Canal on Canal Street and/or through signage on the Mammoth Mill site. Updates and participation in the planning for both the Town of Blackstone's section of the Bikeway and those currently being studied for the Town of North Smithfield should be sought, as these plans may help determine the best locations for signage and public access to the mill site.

Next Steps:

- Conduct archaeological investigations at Mammoth Mill site to determine archaeological sensitivity prior to any earth moving or construction activities
- Participate in planning efforts for the Blackstone River Bikeway route and amenities in both Blackstone, MA and in the Town of North Smithfield.
- Work with Town of North Smithfield in their planning efforts to convert the Mammoth Mill site into a park so that interpretation and access from both the public roads and the Blackstone River can be included.
- Approach National Grid, owner of record of the Canal in this key venture area, to determine specific rehabilitation issues and repair methods for the Canal walls.
- Identify a Canal Street location for a sign that gives a brief story about the Mammoth Mill.

Interpretation throughout the Canal Corridor

Interpretation of the Blackstone Canal along the Canal in Rhode Island can play an important role in promoting public awareness of the Canal as a state-wide resource. The disjointed nature of the Canal in Rhode Island, where visible and watered segments of identifiable Canal trench are by original design interspersed with long stretches of slackwater passages in natural bodies of water such as the Blackstone and Moshassuck Rivers, makes it difficult for the public to recognize that the Canal historically was a contiguous feature in the landscape.

Interpretive efforts could combine signs with activities that engage people more actively and tangibly. Signage would support visitor services, but could also be interactive through a game or a quest and not just display dates and figures. Scheduled activities that focus on historic and/or recreational events at the location of interpretive signage or other places along the Canal would also contribute to interpretive efforts.

This interpretive signage initiative is proposed in order to help the public understand the Canal as a single entity that traverses 17 miles of the state. A highly consistent look and style for the signage will help reinforce public perception that the separated extent sections of the Canal are part of a larger whole. Use of BRVNHCC's sign standards and specifications, already applied to current signage on the corridor, for these new interpretive signs would further enhance this goal. Suggested interpretive themes include the economic and demographic impacts of the Blackstone Canal on Rhode Island communities, the construction techniques used to build the Canal, the trajectory of the rise and fall of the Canal as a transportation facility, and what changes occurred after the closure of the Canal.

Some suggested interpretive signage themes and general locations are listed below in geographical order, from south to north:

- Providence - Economic impact of the Canal on the development of the port of Providence
- Pawtucket - Rise and fall of the Canal, and its replacement by mill buildings
- Lincoln: Competition between the Canal and mill owners over control of water
- Mott Dam, Woonsocket - opportunity to discuss ways that water was fed into the Canal
- Woonsocket - Relationship of the Canal, the mills and immigrant workers
- North Smithfield - Rise and fall of the mills that were constructed after the Canal
- Mammoth Mill, North Smithfield – Story of Welcome Farnum and how he got canal routed to his advantage

- TBD - Story about several mills' use of horse teams after the canal was built, as it was not always efficient to use for transport or for loading and unloading
- Use public art to interpret and enhance area – such as a steel version of a canal boat, which was done in Akron, Ohio.

Interpretive efforts can also include activities at various locations along the Canal. These activities can take such forms as walking tours, organized hikes, dramatizations, scavenger hunts, or demonstrations of equipment used when the canal was in operation. Signage, of course, would be a feature at all of the key ventures previously discussed.

Key Ventures for Future Action

Four ventures were identified for consideration in a second phase of planning and study to be conducted in the future. These ventures meet many of the criteria used to select the key ventures and should be priorities for preservation, public access, and interpretation. Several sites pose preservation, access, or restoration challenges that make them less feasible for immediate action while others do not require substantive restoration efforts.

North Burial Ground, Providence

This venture focuses on a 0.2-mile length of visible and watered canal trench located within the North Burial Ground in Providence, beginning at a point near the I-95 Exit 25A-B interchange along the northwest boundary of the North Burial Ground and extending northeast to Cemetery Street (Figure 18).

Resources

Blackstone Canal Lock #3, indicated as land owned by the Heirs of Moses Dexter on the 1828 Phelps map, appears to have been located along what is now the northwest edge of North Burial Ground, due southeast of the line of Ledge Street. Other than the Canal itself, no other canal-related features are known to exist in this segment. The Canal is intermingled with the Moshassuck River at this location.

The North Burial Ground was established as a cemetery in 1700 and contains historic monuments that commemorate many persons buried here who are significant to Rhode Island History. The North Burial Ground is listed in the National Register of Historic Places.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the City of Providence, Section 2, within Chapter 2.

Ownership and Access

The North Burial Ground is owned by the City of Providence Parks Department. No separate ownership is recorded in the City's assessor's database for the canal in this area. The level of protection for this publicly-owned parcel is considered to be high, given its purpose.

Paved roadways within the burial ground, particularly the roadway immediately adjacent to the Canal on the northwest edge of the property, provide ready access to this segment of the Canal.

Opportunities

The North Burial Ground provides an opportunity to interpret the unique physical character of the Canal at this location, whose stone walls were rebuilt in the 1930s as a WPA project that was meant to provide employment during the Great Depression. The site also provides an opportunity to interpret the historic associations between the Canal and certain prominent people who are buried here and who were influential in the development of the Canal. In addition to interpretive work, this segment provides an opportunity to maintain the stonework of the WPA canal trench that contains the Blackstone Canal and the Moshassuck River, which are intermingled here as a single water feature.

Coordination opportunities may exist with non-profit organizations such as the Friends of the Moshassuck, www.themoshassuck.org, which was founded in 1998 to protect and enhance sites along the Moshassuck River and its watershed.

Recommendations

Appreciation of the North Burial Ground could be enhanced through interpretive and restoration/maintenance efforts. Future efforts can include installation of signage and other interpretive activities; ongoing maintenance efforts to keep the 1930s walls in good condition; and partnerships with interested local or regional groups

Next Steps:

- Research history of individuals buried in the cemetery who were influential in the development of the canal
- Present this information either through signage, a walking tour guide, or occasional guided tours of the cemetery by knowledgeable individuals
- Prepare maintenance plan/checklist to keep the canal walls in good condition

- Partner with Friends of the Moshassuck to maintain canal trench within the cemetery and to enhance its adjacent setting.

Lonsdale Bleachery Area, Lincoln

The Lonsdale Bleachery Area in Lincoln comprises a 0.6-mile length of watered canal trench beginning at Front Street; extending north to Pratt Dam (which aligns with Park Boulevard) and extending east to Carrington Street (Figure 19).

The Lonsdale Bleachery Area was studied in 2005 by the Pare Engineering Corp, as an outgrowth of the Blackstone River Visioning project. Subsequent to the charrette workshops and the production of the *Blackstone River Visioning* report in 2004, a detailed plan for the reuse of the Bleachery Mill Complex was produced in October 2005.¹³

Built between the mid 1830s and 1919 as a textile and bleachery mill complex, the Lonsdale Bleachery redevelopment area now contains a mix of commercial, industrial and manufacturing businesses as well as a number of vacant buildings and parcels. A portion of the Blackstone Canal runs through the site. The Town of Lincoln recognizes that the overall property, located close to the Blackstone River State Park and downtown Lonsdale, presents an outstanding opportunity for commercial/industrial – and possibly residential – redevelopment.

The plan’s vision is to promote businesses in Lonsdale, attract consumers to shop and dine in town, and enhance the quality of life for residents, through the redevelopment of the Lonsdale Bleachery complex in a way that capitalizes on the site’s historic buildings, waterfront setting, and proximity to natural and cultural resources. In addition, the recreational resources of the nearby Blackstone River State Park and the Blackstone River Bikeway are seen as features that will be attractive to potential users of a redeveloped Lonsdale Bleachery. The redevelopment plan considers that suitable reuse of the site’s historic mill buildings, with the bleachery pond integrated as an amenity for the redeveloped site, could build upon the success of other mill complex renovations that have been undertaken in Rhode Island and Massachusetts.

Overall, the redevelopment plan’s goals are to incorporate the following elements in a phased development:

- Construct public streets and infrastructure

▼
¹³ www.lincolnri.com/documents/planning/lonsdale_bleachery_redevelopment_plan.pdf

- Provide mixed-use development, including residential use (retaining some units for Affordable Housing)
- Provide public access to the Blackstone River, Bleachery Pond, canal and sluiceway
- Improve pedestrian access and connections to the Blackstone River bike path
- Identify areas for parking lot construction
- Support continued viability of existing businesses, to the greatest extent possible
- Provide relocation assistance for displaced businesses.

The preferred alternative redevelopment plan involves residential units, artist lofts/production spaces, manufacturing facilities and mixed use buildings. Riverfront, pond, canal and downtown access are integral to the plan, with a riverfront plaza, riverfront walkway and riverfront bikeway proposed for different points along the Blackstone River; a pedestrian walkway along the north side of Bleachery Pond; a walkway along the Blackstone Canal; and a pedestrian connection to the Lonsdale Mill Housing neighborhood via Lonsdale School Street.

Resources

This project is centered on the Lonsdale Bleachery, which was built to finish cloth that was produced at the nearby Lonsdale Company mills. The mills were built here because the Canal was at a higher elevation than the nearby Blackstone River, which meant that the mill could generate waterpower by diverting water from the Canal into the mill's turbines, with the water then flowing down into the Blackstone River.

The original Lonsdale Mills #'s 1-3 were built here c. 1830-33. Mill # 3 remains on site, although modified. By the turn of the century, the Company's construction of new mills on the Cumberland side of the river enabled them to replace Mills 1 & 2 with the bleachery, which forms the bulk of the buildings now on site.

The canal passed through the Lonsdale mill pond and then continued under Front Street and into Cranberry and Scotts Ponds. For purposes of the Canal's operation, Cranberry and Scotts Pond were maintained at much higher elevations than they are today. Once the canal closed, the passage of water out of Scotts Pond and into the Moshassuck was eliminated and as described in Chapter 2, the route of the trench immediately north of Front Street was shifted east to run in the mill pond later in the 19th century. That configuration is seen today as a narrowed canal that feeds into the Lonsdale mill pond and a set of post-canal era control gates in decayed condition that regulates flow from the mill pond into Cranberry Pond. The original raceways to the

Lonsdale Mills leave the east side of the pond through underground culverts and so are not readily apparent.

North of Front Street, the east bank of the relocated trench is marked by a wood retaining structure constructed through the mill pond for a distance of 150 feet. The relocated trench joins the original 30-40-foot wide earthen Canal trench on the west side of the Lonsdale Mill complex and proceeds northward with the towpath on the east bank. From this point northward, the Canal leaves the headwaters of the Moshassuck River and runs along the west side of the Blackstone River through a wooded, rural setting and the southern boundary of the Blackstone River State Park.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to the Town of Lincoln, Section 5, within Chapter 2.

Ownership and Access

The area is mainly in the hands of private owners, including the Bleachery Complex, although there is some State ownership. The level of protection for these parcels is unknown.

There is good current access from public roads. The segment also offers good access for canoe and kayak travelers.

Opportunities

The Lonsdale Bleachery Area provides an opportunity to enhance existing interpretation and promote links to canal features and facilities in adjacent areas, especially with its proximity to the Blackstone River Bikeway. There is great potential for coordination with the Town of Lincoln, which is interested in revitalizing this area.

Recommendations

Initial steps to achieve success in this key venture include measures to control water flow and to approach the Town of Lincoln about additional interpretive efforts in the vicinity.

Next Steps:

- Water control work and rehabilitation of the Canal is recommended, along with enhanced interpretation of the Canal and the Lonsdale Bleachery complex
- Work with the Town of Lincoln to place interpretive signage at or near the Lonsdale Bleachery complex

- Inspect wooden gate at Lonsdale millpond and further investigate the relationship between the flow in the canal and the flow into Cranberry and Scotts Pond.

Market Square and Vicinity, Woonsocket

This project in Woonsocket comprises a 0.6-mile length canal segment beginning at the Sayles Street bridge and following the curve of the canal south and northeast to the railroad bridge north of the Court Street bridge (Figure 20). The venture would also include Market Square itself, which is composed of a large parking area surrounded by mainly 19th and early 20th century commercial buildings.

The City of Woonsocket was the recipient of a Preserve America grant from the National Park Service to create a Wayfinding Master Plan for the City's downtown area. The overall objectives of the plan included ways to improve the appearance, businesses and general image of Main Street, through better utilization of the downtown's walkable features and signage to enable enhanced wayfinding.

These walkable features include extant historic buildings, River Island Park, the Blackstone River Bikeway and sites where the Blackstone Canal and Clinton Pond were formerly located. The scope of the plan is ambitious and is intended to address conditions that currently impede comfortable pedestrian circulation among these walkable features, such as the steep terrain between Main Street and the Blackstone River waterfront, and especially the four-lane Truman Bypass that divides Main Street from so many of the desirable walkable features in downtown Woonsocket and its adjacent waterfront.

Resources

The Blackstone Canal's features in Woonsocket, including the trench and three locks, one of which was where the Bernon Street Bridge now stands, were largely destroyed during the late 19th and early 20th centuries, when new roadways, buildings and bridges were built over the path of the Canal. The remains of the uppermost lock still exist, but is deeply buried approximately 5 feet under Market Square. Within the last two decades, however, the City of Woonsocket has successfully sought to reconnect the City's identity with its Canal past, by implementing interpretive signage and pavement markings that commemorate the Blackstone Canal. These features, centered on Market Square, tell the story of the Canal and mark the location of the Canal on the pavement of the Square with colored pavers that show the public where the bed of the Canal and power canals once existed.

Additional historic and archaeological resources are described in Chapter 2 of this Study. Please refer to City of Woonsocket, Section 12, within Chapter 2.

Ownership and Access

The parcels within this future venture are owned by the City of Woonsocket (parking lot) and a private realty company.

There is very good current access from public roads and sidewalks. This access will be enhanced when the Blackstone River Bikeway is developed nearby in Woonsocket.

Opportunities

The Market Square and vicinity segment provides opportunities to enhance existing interpretation of the route of the Canal, which is now entirely covered in this area. This project also provides the potential for cooperation and synergies with the Museum of Work & Culture and the City of Woonsocket to raise public awareness and appreciation of the Canal.

Although the uppermost lock was covered over to provide more parking in the area, it may be possible to more specifically interpret it through guided walking tours. The canal's location to the north, where it was converted into Water Street and to the south near Florence Drive/ the Hamlet mills, offer opportunities for interpretation as well. The Hamlet location is especially promising as the city's new middle schools are right across the street.

Recommendations

Enhanced interpretation and signage is recommended for this project, including the City of Woonsocket's current initiative to develop a Wayfinding program that will promote cultural, historic and recreational resources within the city.

Next steps:

- Work with the City on their next steps, where feasible, for the Wayfinding Plan to streamline and coordinate design and interpretive efforts
- Investigate the possibility of opening the lock and then sealing with a clear material, such as structural glass, so that it can be viewed
- Identify additional new areas in the city, especially along the new bikeway route, for possible interpretive locations.

Mott Dam Area, Woonsocket

The Mott Dam area in Woonsocket is close to the Blackstone River Bikeway just north of the City of Woonsocket Wastewater Treatment Plant near Manville Road, just north of the N. Smithfield town line. The Mott Dam

consists of stone remnants that are only visible at low water periods (Figure 21).

Resources

Resources in this area consist of the remains of the Mott Dam and extant sections of the Canal to the south, which can be seen from the river or potentially accessed from the bikeway.

Ownership and Access

The parcel adjacent to the Dam's location is owned by the City of Woonsocket (Parcel 34-7). The Wastewater Treatment Plant to the south is owned also by the City of Woonsocket. Access to the dam's location on the Blackstone River is relatively accessible from the bikeway, although the parcel closest to it is rolling, wooded land that does not contain a discernable path to the river.

Opportunities

Providing access to Mott Dam, or noting its location nearby on the Bikeway, will give the public access to a scenic and essentially unknown section of the canal and make them aware of an interesting feature associated with the Canal.

Recommendations

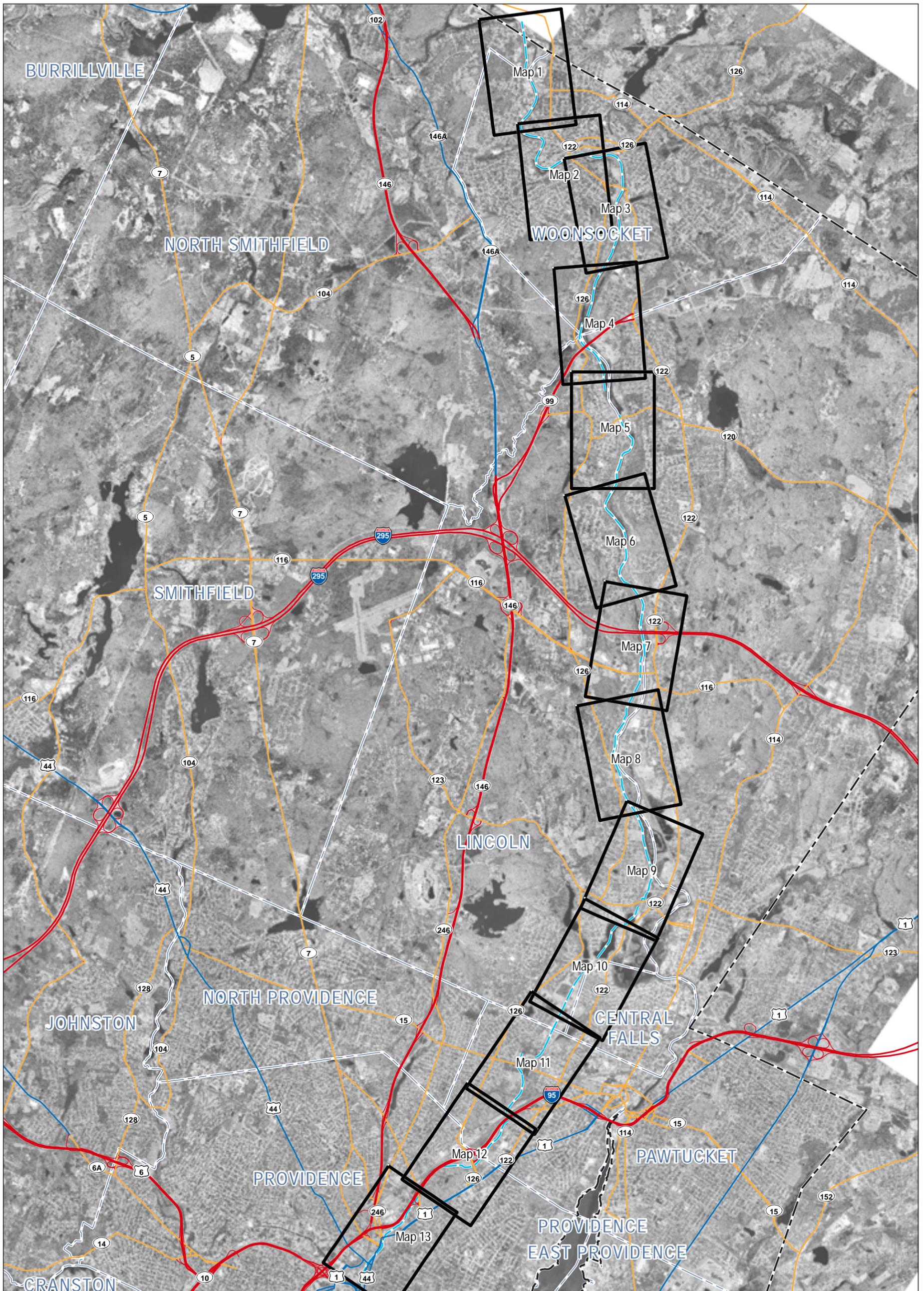
Providing more recognition for and possibly direct access to, the Mott Dam would be a relatively inexpensive venture that should be pursued. A path from the Bikeway to the River, which would not likely have universal accessibility, could be built with permeable materials. Signage could be placed either at the Bikeway intersection with this path or at the viewing site next to the River, or both. Discussions with the City of Woonsocket should be initiated in the near future to determine if access is feasible and to identify possible funding sources and additional partnerships, if needed.

Next steps:

- Clean up fill that obscures parts of the Canal and Dam
- Approach City of Woonsocket with a proposal to gain access to the River from the Bikeway in this area south of the Wastewater Treatment Plant
- Identify suitable location and install interpretive signage on the Bikeway in the vicinity of the Mott Dam's location on the Blackstone River, if no access is granted on the parcel next to the River
- Build connecting path on the parcel from the Bikeway to a viewing location next to the Dam, if access is granted.

Appendix A

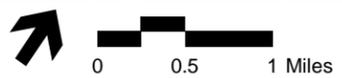
Blackstone Canal in Rhode Island, Figures 1-13



Source: RIGIS

Legend

-  Map Page Grid
-  Approximate Path of Blackstone Canal
-  State Boundary
-  Municipal Boundary



Vanasse Hangen Brustlin, Inc.

Blackstone Canal

From Massachusetts to Providence, Rhode Island

Index Sheet

START



Map 2

Source: RIGIS

Legend

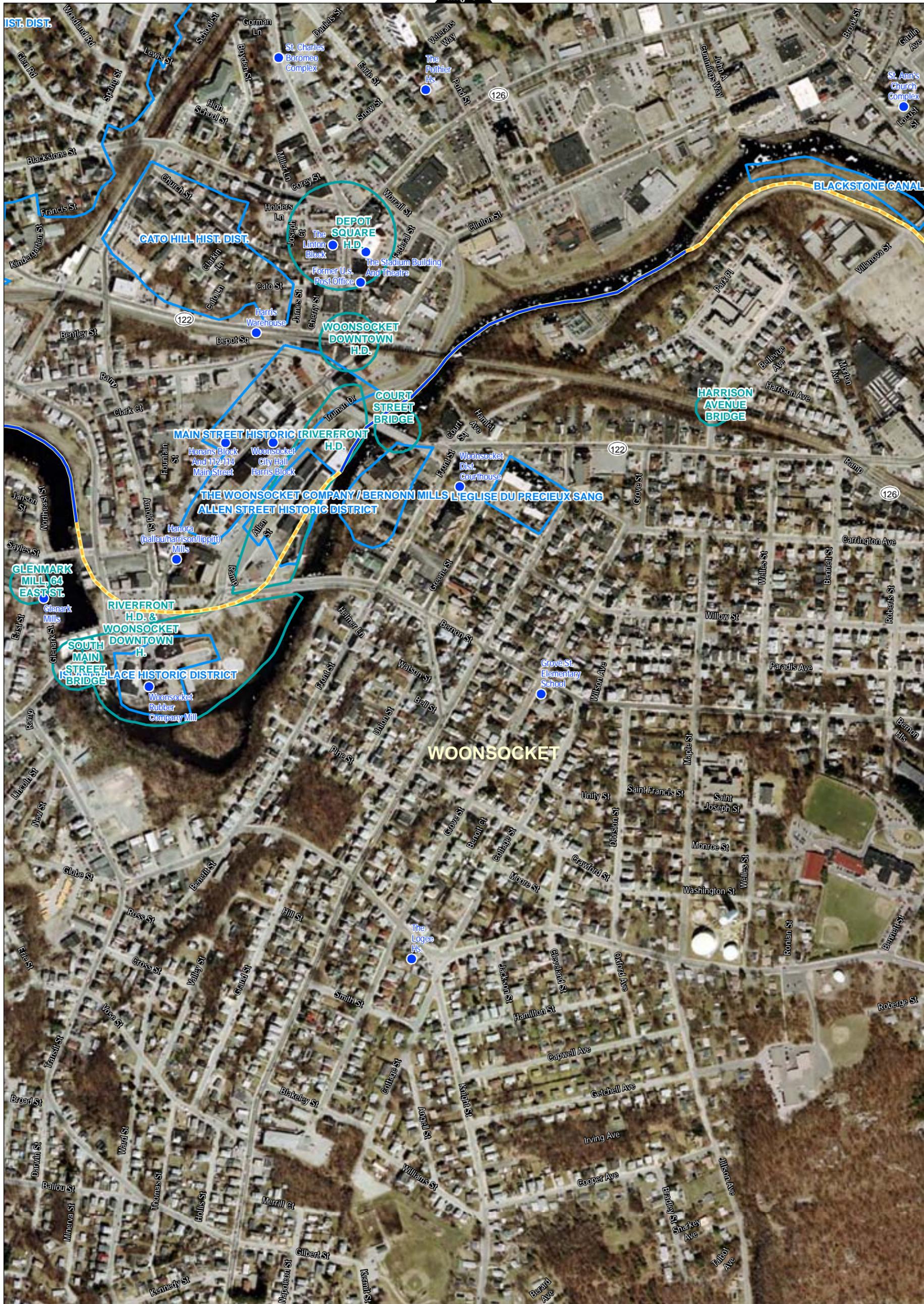
- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places
- Blackstone Canal**
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



0 500 1,000 Feet

Vanasse Hangen Brustlin, Inc.

Figure 1
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 North Smithfield/Woonsocket

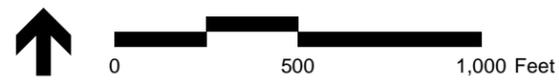


Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 2
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Woonsocket (North)



Source: RIGIS

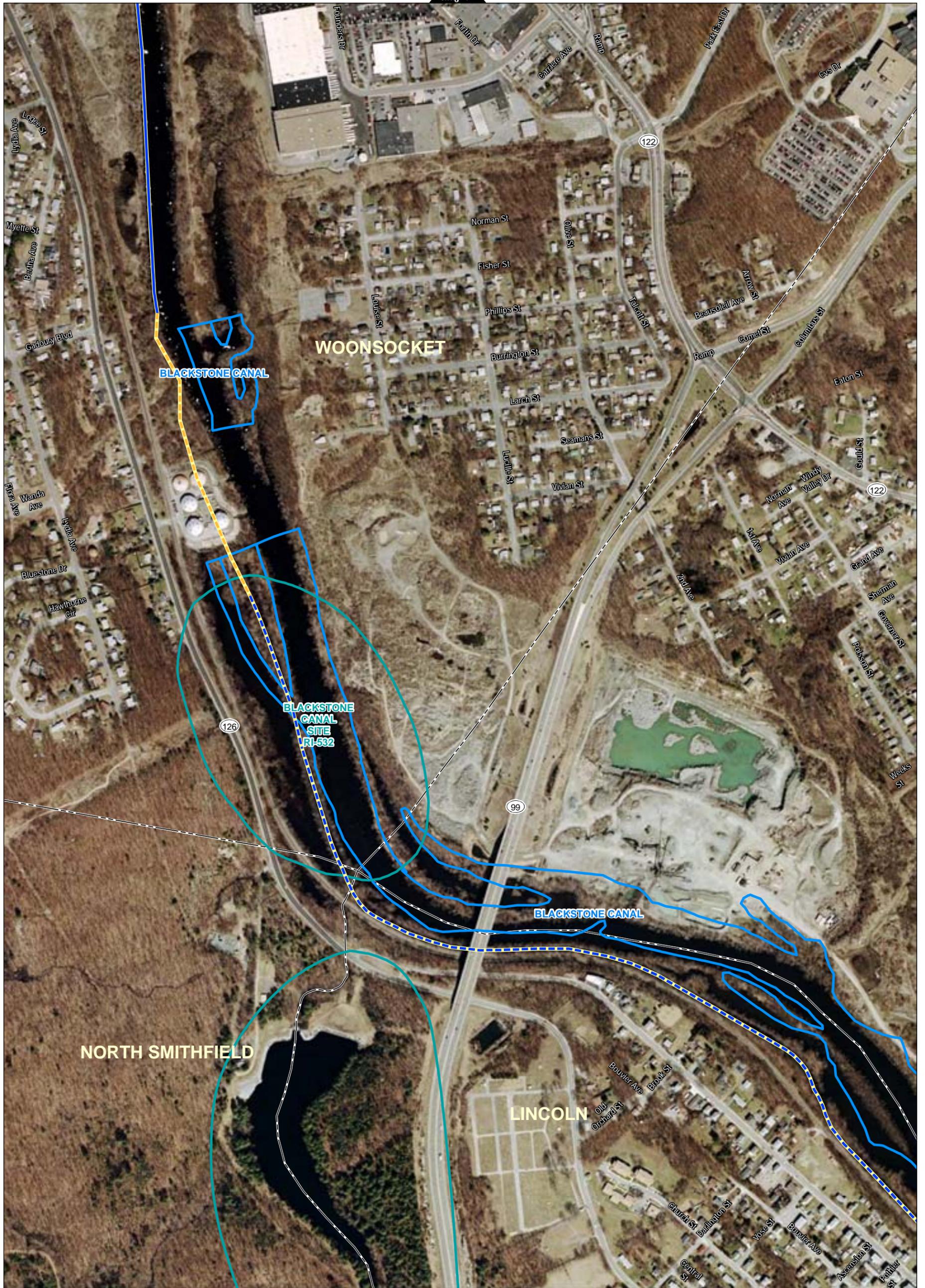
Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places
- Blackstone Canal
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 3
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Woonsocket (South)



Source: RIGIS

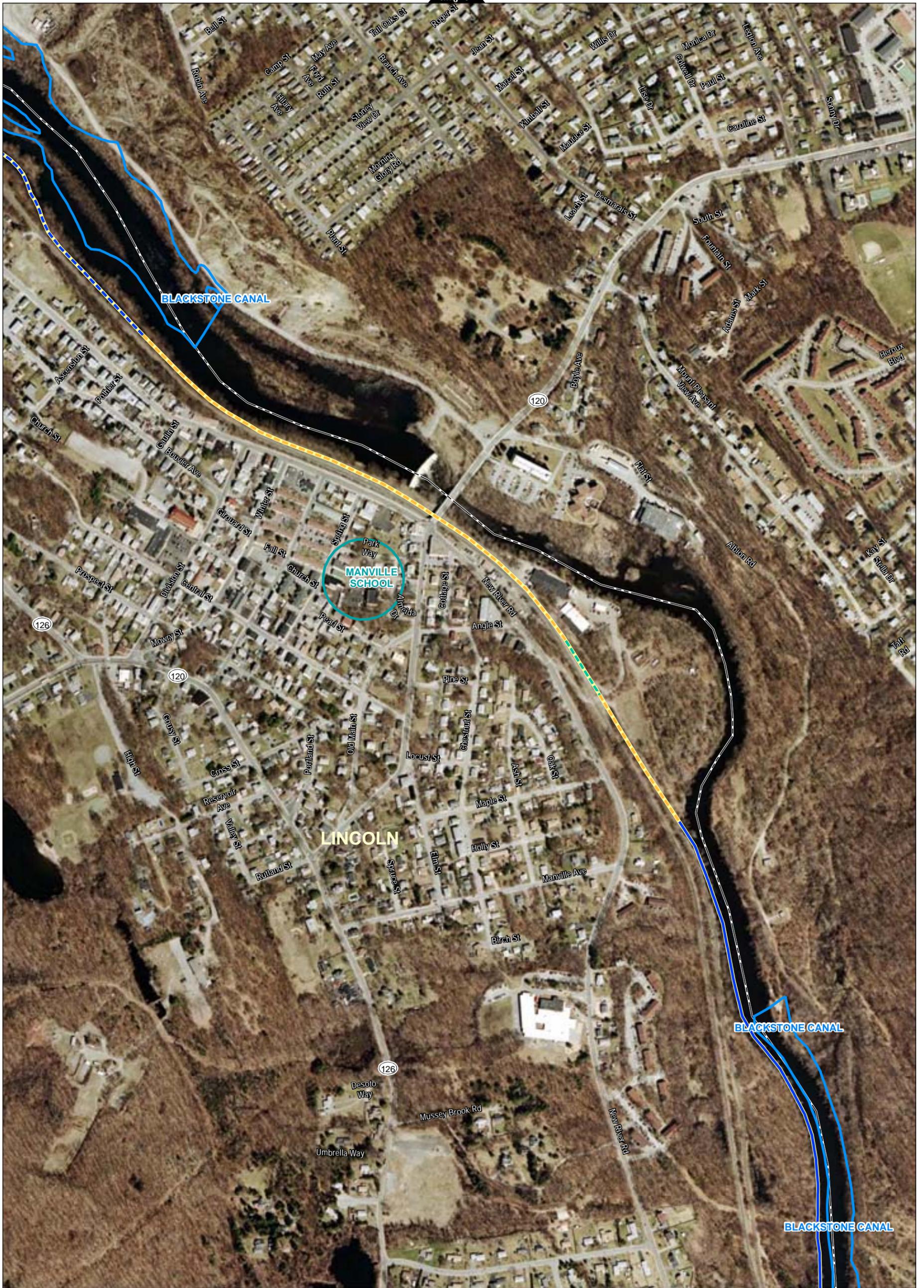
Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places
- Blackstone Canal**
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 4
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Woonsocket/North Smithfield/Cumberland



Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
 - Canal Visible with Water
 - Canal Visible
 - Canal Not Visible



Vanasse Hangen Brustlin, Inc.

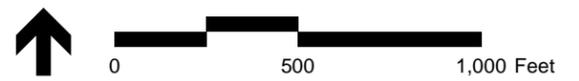
Figure 5
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Cumberland (1)



Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places
- Blackstone Canal
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

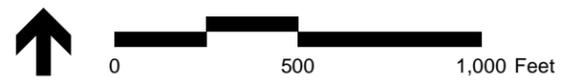
Figure 6
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Cumberland (2)



Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- ▭ Municipal Boundary
- Property Listed in the National Register of Historic Places
- ▭ Historic District Eligible for Listing in the National Register of Historic Places
- ▭ Historic District Listed in the National Register of Historic Places
- Blackstone Canal**
- Canal in Water
- - - Canal Visible with Water
- · - Canal Visible
- · - Canal Not Visible



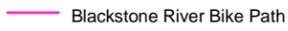
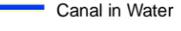
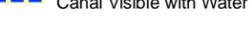
Vanasse Hangen Brustlin, Inc.

Figure 7
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Cumberland (3)



Source: RIGIS

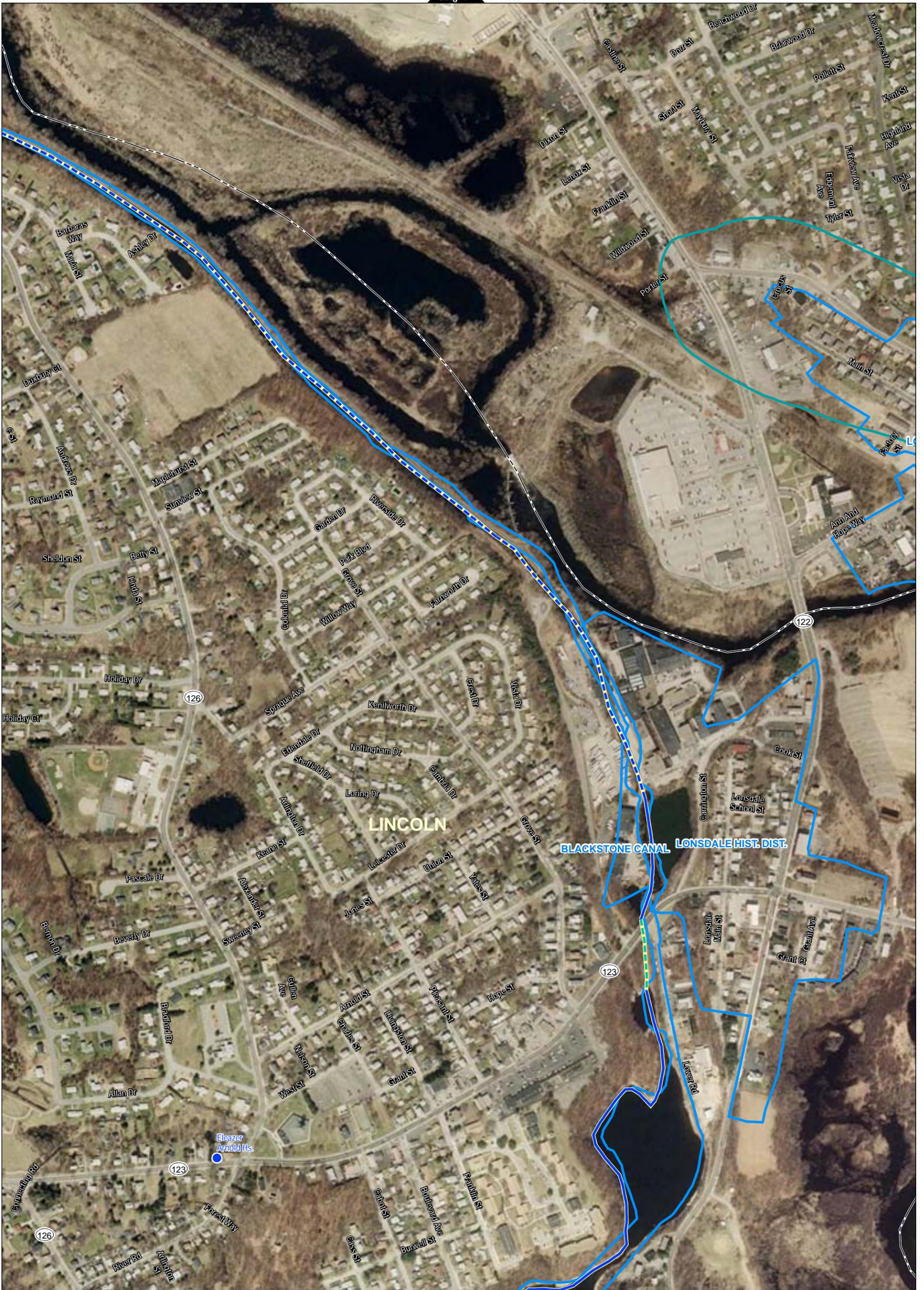
Legend

-  Existing Gravel
-  Blackstone River Bike Path
-  Municipal Boundary
-  Property Listed in the National Register of Historic Places
-  Historic District Eligible for Listing in the National Register of Historic Places
-  Historic District Listed in the National Register of Historic Places
-  Blackstone Canal
-  Canal in Water
-  Canal Visible with Water
-  Canal Visible
-  Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 8
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Cumberland (4)



Source: RIGIS

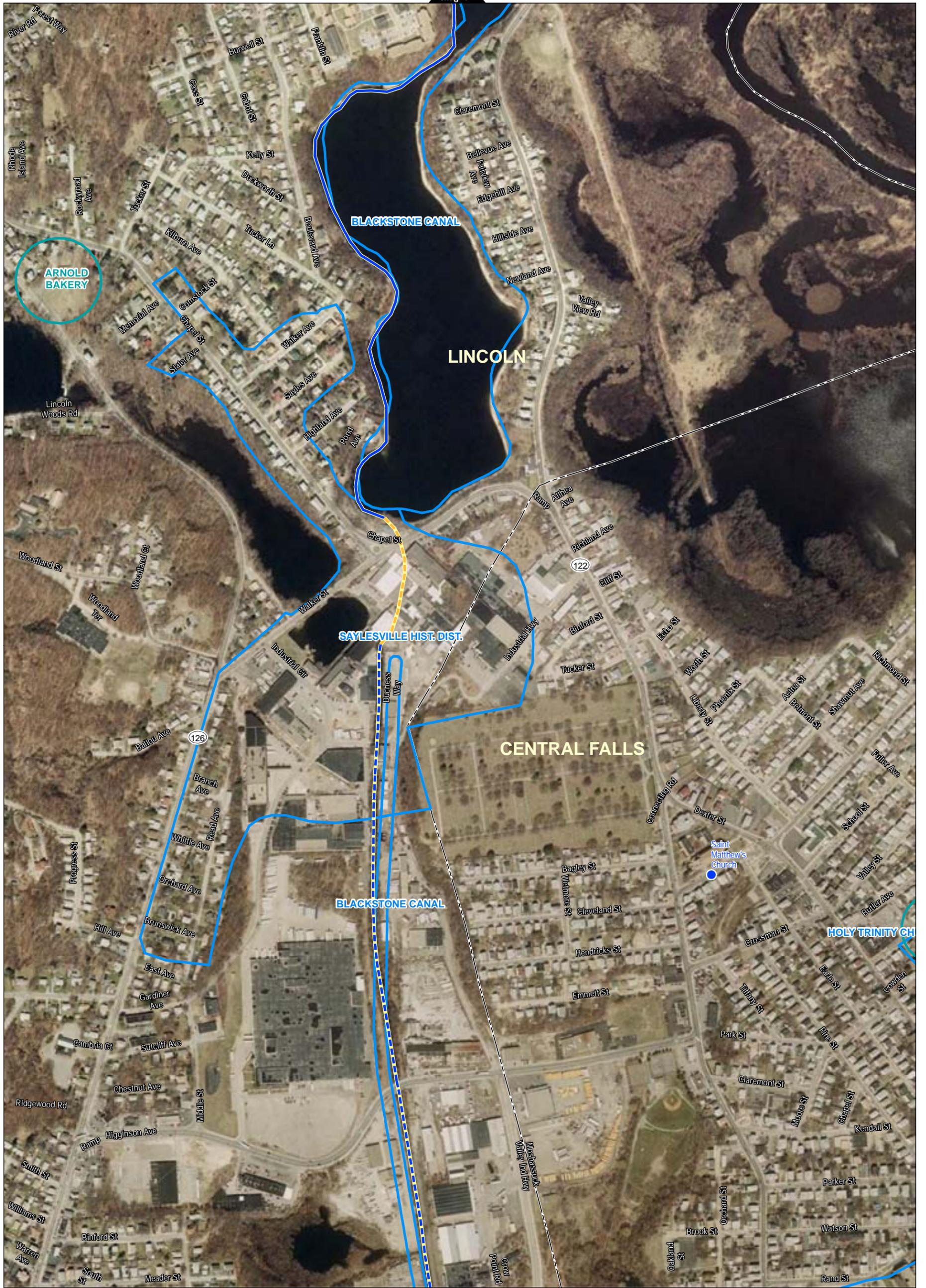
Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places
- Blackstone Canal**
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 9
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Cumberland (5)

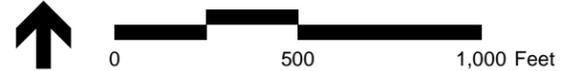


Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
- Canal Visible with Water
- Canal Visible
- Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 10
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Central Falls

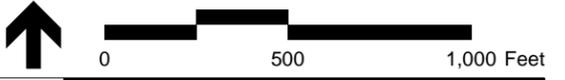


Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
 - Canal Visible with Water
 - Canal Visible
 - Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 11
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Lincoln/Central Falls/Pawtucket



Source: RIGIS

Legend

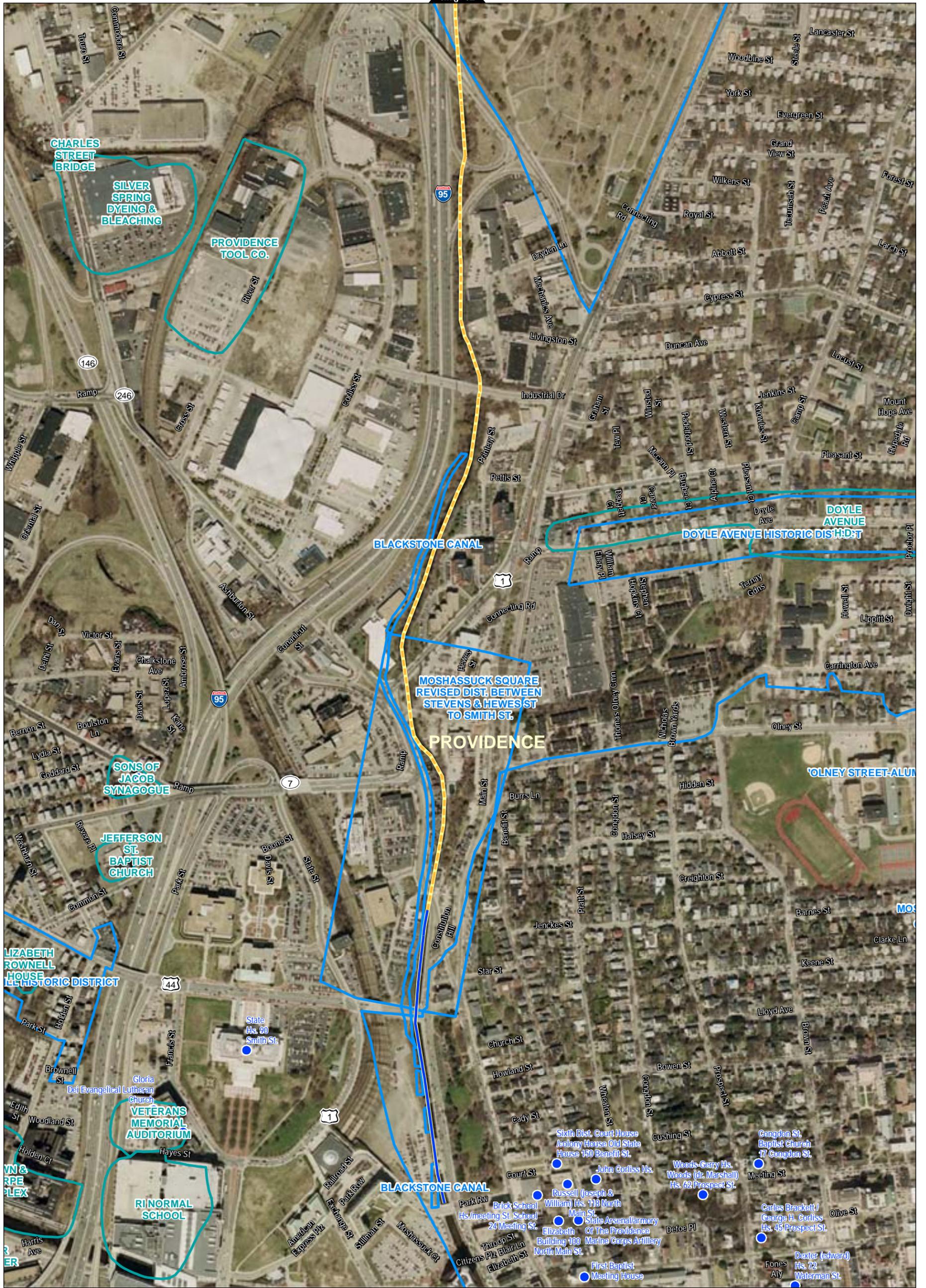
- Existing Gravel
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- Municipal Boundary
- Property Listed in the National Register of Historic Places
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- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
 - Canal Visible with Water
 - Canal Visible
 - Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 12
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Pawtucket/Providence

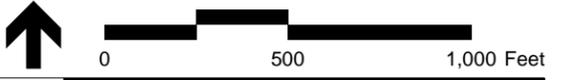


Source: RIGIS

Legend

- Existing Gravel
- Blackstone River Bike Path
- Municipal Boundary
- Property Listed in the National Register of Historic Places
- Historic District Eligible for Listing in the National Register of Historic Places
- Historic District Listed in the National Register of Historic Places

- Blackstone Canal**
- Canal in Water
 - Canal Visible with Water
 - Canal Visible
 - Canal Not Visible



Vanasse Hangen Brustlin, Inc.

Figure 13
Blackstone Canal
 From Massachusetts to Providence, Rhode Island
 Providence

Appendix B

January 2009 Public Workshop Notes

Categorized List of Suggested Projects and Ideas

Blackstone Canal Study – Rhode Island Section
Public Forum/Workshop
January 22, 2009 • 6:30 p.m. – 8:30 p.m.
Location: Blackstone River Theater – 549 Broad Street, Cumberland RI

MINUTES

I. Welcome / Introductions

Joanna Doherty, Community Planner

Blackstone River Valley National Heritage Corridor Commission (BRVNHCC)

- Project is a collaboration between BRVNHCC and Preserve Rhode Island (PRI)
- Introduced staff (Chuck Arning, Kevin Klyberg)
- Study of MA section of Blackstone Canal is already complete
- Provided overview of agenda, purpose and format of meeting:
 - Opportunity for attendees to look at draft maps of canal-related resources and note any corrections, additions or comments
 - Brief exercise and group discussion so attendees can identify segments of the canal they feel deserve priority in terms of preservation
 - Identify people who have an interest in the canal and who may want to continue to be involved in its documentation and preservation

II. Project Overview

Walter Maros, Preservation Planner

Vanasse Hangen Brustlin, Inc. (VHB)

- Introduced self as preservation planner, from a state (NJ) with two canals (Morris Canal, Delaware & Raritan Canal).
 - Mentioned prior volunteer experience with regional nonprofit group, planning 48 miles of walking and horse trails on 3,000 acres located in proximity of D&R Canal.
 - Mentioned belief that the historical, educational and recreational values of the canal help sustain quality of life in communities where population density is high and land development is increasing.
 - Mentioned interest in working with BRVNHCC, PRI and public meeting attendees to identify key segments of Blackstone Canal where opportunities exist for preservation, restoration, enhanced interpretation and increased public access.
 - Emphasized that the project is not to develop a master plan for the entire canal in RI, but instead is to (1) increase the accuracy of the base map of the Blackstone Canal & its associated historic resources and (2) identify and recommend key segments of the canal for the actions listed above.
- Presented PowerPoint slides covering project scope, methodology, goals, and examples of recommended key canal segments from the project on the MA section of the canal.
- Provided limited time for questions about the project process.
- Provided transition into review of draft maps, with instructions to meeting attendees to please affix Post-It Notes to maps, showing:
 - Corrections to the canal route and/or location of sites of canal locks, remnants of the tow path, etc.
 - Comments, such as knowledge that an owner of a portion of the canal is interested in having it preserved, or that a parcel along the canal is slated for development, or that there is a town project planned for an area near the canal.

III. Review of Draft Maps Invited meeting attendees to pick up the Post-It Notes and pens provided for their use, and affix corrections/comments to any or all of the four large-format maps arrayed around the auditorium. Together, the four maps contain the entire 17-mile length of the Blackstone Canal in RI.

- Joanna Doherty, Chuck Arning and Kevin Klyberg of BRVNHCC, as well as Susanna Prull of PRI, were stationed at the maps in order to assist the public and answer questions.

Synopsis of Map Corrections/Comments Provided by Meeting Attendees

Map #1 (all map corrections/comments concern resources in Woonsocket)

1. Correct the location of the Aram Pothier Monument
2. Show the location of Lock #17 at the Mammoth Mill site
3. Lock #14 is under what is now the Court Street Bridge
4. Lock #15 is at Bernon Street
5. Lock #16 is under the parking lot (vicinity of Island Place, south of S. Main Street)
6. Towpath crosses the river (vicinity of Park Place)
7. Is the canal visible or is it a flood control feature (vicinity of Hamlet Avenue and Florence Drive) [Jeff Emidy]
8. Mott Dam and dry ditch (in vicinity of river, at point between Bertha Avenue and north end of Louise Street)
9. Location of Mott Dam and guard lock #13 is questionable

Map #2 (all map corrections/comments concern resources in Lincoln, unless otherwise noted)

1. Location of Manville Lock, maybe two locks (vicinity of New River Road, opposite the foot of Maple Street) [Val S.]
2. Albion had a lock (vicinity of east side of railroad, opposite the foot of Ledge Way) [possibly Val S.]
3. Three Holes in the Chimney – Samuel Hill's Farm (vicinity of Old River Road, between Rosemount Terrace and School Street)
4. Another Three Holes in the Chimney House?, Cumberland side (vicinity of Mendon Road, southeast of I-295 interchange in Cumberland)
5. Fix the canoe entry into the canal above the Ashton Dam / It worked for a while, then, when the canal was dewatered to put in utilities for the Kelly House, rocks were placed there and never removed (vicinity of Ashton Viaduct) [Ginny Leslie, former RIDEM Planner, 781-8117]
6. Ashton spill structure has been further damaged by high flows in Fall of 2008 / If left to deteriorate, river flow may shift and canal may be starved of water at Ashton entry, Lincoln side (vicinity of Ashton Dam)

Map #3 (all map corrections/comments concern resources in Lincoln, unless otherwise noted)

1. Area of siltation due to poor storm water BMP (Best Management Practices)/lack thereof (vicinity of Lower River Road, between Avenues B and D)
2. Newer canal breach – area of concern (vicinity of Lower River Road, between Avenues A and B)
3. Remaining construction materials from Martin Street Bridge construction needs to be removed from canal (vicinity of Gardner's Canoe Rock)
4. Old canal breach – 1980s (vicinity of Lower River Road, east of map marker for National Register Feature #1A Cart Bridge Remnants)
5. Loss of canal bank for filling for small swale/pond in a person's back yard / Berm should be repaired (no arrow or other indication of where this swale/pond is located)
6. Old wooden dam prior to new Pratt Dam / Area needs to be cleared of debris and cement pipes (vicinity of east bank, opposite the foot of Park Drive)
7. Lonsdale Spillway is in need of repair
8. Remnant of dock used for ice house when cutting ice (vicinity of cove situated to the south side of Front Street) [Frank Geary, 333-2123]
9. Two locks (vicinity of a point north of Industrial Circle in the Saylesville Historic District)
10. Lillie Wyman House (no arrow or other indication of location where this house is, note posted in vicinity of Jenks Avenue/Eben Brown Lane in Central Falls)

Map #4 (all map corrections/comments concern resources in Pawtucket or Providence, as noted)

1. Gone (arrow pointing to Leroy Theater in Pawtucket)
2. Part of canal? (area to northwest of Lorraine Mills in Pawtucket) [post-meeting follow-up research/maps provided by Sue & Mike Cassidy of Pawtucket and Joanna Doherty of BRVHNCC regarding canal path here]
3. Questionable canal alignment west of incinerator (vicinity of St Francis Cemetery in Pawtucket) [Val S. / Rick Greenwood]
4. Canal route is within cemetery bounds (North Burial Ground in Providence)

5. Norton's Grove, house on Phelps Map (arrow showing building within North Burial Ground, east of point where the canal crosses Branch Avenue in Providence)
6. 1st Lock, at Mill Street (vicinity west of Mill Street, at point in line with Star Street in Providence)
7. Canal Terminus Basin (arrow pointing to canal, at south end of Park Row where it intersects with Canal Street in Providence)

IV. Discussion of Potential Preservation Actions for Key Canal Segments

Valerie Talmage, Executive Director

Preserve Rhode Island

- Explained desire/need to select certain segments of canal for preservation attention, given limited resources, varying condition of canal, etc.
- Shared our selection criteria for segments (and invited suggestions for additional criteria):
 - Condition / integrity of resource – is it in good shape? Has it been highly altered over time?
 - Rarity of survival of given resource(s) – is there something unusual and notable about a particular stretch of the canal?
 - Ownership or management issues – is segment in private or public ownership? How well is it currently cared for?
 - What potential is there for public access?
 - How feasible would it be to restore? Is it a good location for interpretation (e.g., an interpretive sign)?
 - Are there other projects in the vicinity that would work well with the restoration of the canal (e.g., bikeway may go by, nearby mill may be being redeveloped)
- Asked attendees to identify their top three places for preservation, with colored dots
- Group back together to discuss the 3-5 most popular spots (those with the most dots)
 - What is of interest at these locations?
 - What would you like to see happen there – restoration, interpretation?
 - What are the opportunities for public access/benefit in these locations?
 - Are there other projects (public, private) nearby that would complement canal restoration at these locations?
 - Are there any constraints at these locations – physical, financial, political?
 - Are there any threats to the canal at these locations?

Synopsis of Preservation Actions/Key Canal Segments Recommended by Meeting Attendees

Key Segments & Associated Positive Features or Causes for Concern

1. Lonsdale
 - a. Close to Bleachery, barrel facility and historic locks
 - b. Concentration of features, mostly mill-related
 - c. Water quality issues
 - d. Blackstone-Moshassuck River connections
 - e. Mill housing already rehabilitated
 - f. Town is focused on this area for revitalization
 - g. Good place to tell story of area resources, close to the Kelly House
 - h. Has a diversity of canal construction techniques
 - i. Debris needs to be removed from Ashton Dam area
 - j. Ashton Dam area also needs flood control, canal is vulnerable and washes out
 - k. Wash outs impact ecology, which then has to rebuild itself every season
 - l. Suggestion to rebuild berm and mill gatehouse
 - m. Pratt Dam creates water pressure impacts
 - n. Brass tablet, Welcome to Lincoln, located where the river's original route was
 - o. Close to Scotts Pond, an important natural feature that was modified for the canal
 - p. Land/canal ownership is mostly private
2. Ashton Viaduct
 - a. Connects with the Lonsdale area
 - b. Kelly House [museum] on site
 - c. Area needs flood control

- d. Opportunity to tell story of Army Corps of Engineers impact on canal & river
 - e. Land/canal ownership is mostly public, lots of preserved land
 - f. BRVHNCC Visitors Center on I-295 is nearby
 - g. Could canal sections to the north be rewatered?
 - h. Opportunity to tell 20th century history of Ashton Mill [fall and rise/rehab of the mill?]
 - i. Open navigable water by Kelly House, around Pratt Dam by portage, up to Woonsocket from Pawtucket
3. Pawtucket
- a. Segment largely ignored, but has a dense population and vibrant ethnic heritage neighborhoods nearby
 - b. The canal's history and recreational opportunities should be available to all people, regardless of income level or ethnicity
 - c. Segment is not in very good condition
 - d. Difficult access/some areas are steep, need to find ways to improve access
 - e. Need to develop a walking path here, since the public's ability to walk the canal is critical in order to raise public awareness and appreciation of the canal
 - f. Land/canal ownership is mostly private
 - g. Lock remnant across from Lorraine Fabric
 - h. Pawtucket Industrial Park is city owned
 - i. Segment is not currently interpreted
 - j. Existing access/interpretation nodes along the canal are not sufficient; more need to be developed
 - k. Interpretive markers should include history of the people who dug the canal
 - l. Recommend placing interpretive signs along entire canal, roughly one mile apart, with overall context of canal
 - m. Close to Slater School
 - n. Close to an affordable housing complex
 - o. Question of who would manage this segment.
 - p. I-95 divides the canal here, crossing the interstate to follow the path of the canal is problematic
 - q. Focus on resources to either side of I-95 instead, like canal house or Smith Street-Randall Square areas
4. Canal Basin in Providence
- a. Site of the Canal Basin is relatively undeveloped, presents opportunity
 - b. Canal area is walkable from Providence Mall; need to make it attractive
 - c. Potential support from/collaboration with Girl Scouts and Marriott Hotel
 - d. Close to Roger Williams National Memorial
 - e. Opportunity to create a nice walk between Roger Williams National Memorial and the railroad station; need strong anchors to attract users
 - f. Opportunity for redefining the Haymarket/Farmers Market
 - g. Opportunity to restore tidal gates
 - h. Canal wall is collapsing at a private development; need a partnership to repair canal here [Need to identify exact location]
 - i. Segment is relatively intact
 - j. Short section near canal house is probably the best preserved section near downtown
 - k. Existence of bike path along the canal in Providence; need to join forces with bikers
 - l. Established walking tours are held nearby
 - m. Connection to North Burial Ground; good place to learn about RI history, including notables buried there; no interpretation now in place.
5. Other Ideas/Places
- a. Woonsocket/North Smithfield
 - i. Near Mammoth Mills
 - ii. Bikeway will be nearby
 - iii. Archaeological Ruins
 - iv. Not far from Museum of Work and Culture
 - v. Question about access to river
 - vi. Revitalization impact
 - vii. Connections with Millville Lock in MA

- viii. Impressive granite arches with inscribed dates near Lock #17 could be an attraction for public, near hiking, biking and canoeing spots
- b. Recommendation to create a canal barge replica, a full-size non-operational replica, on dry land, to give adults & children firsthand experience of the exterior/interior look of a canal boat, the feel of a canal boat, and the experience of hearing the sound of your feet on the deck of the canal boat
- c. Recommendation that if a full replica canal boat is not feasible, then a steel skeleton of a barge could be instructive for the public, one was created in Ohio
- d. Recommendation to restore a canal lock somewhere in RI.
- e. Recommendation that currently polluted stretches or areas with dumps should not be ruled out; the Kelly House segment is a good example of a formerly distressed area that has been rehabilitated successfully
- f. Recommendation to create chutes over existing dams
- g. Observation that linking neighborhoods to the canal and river is essential, builds local residents' pride in the canal and river

V. **Wrap-up/Next Steps**

*Chuck Arning, National Park Service Ranger
BRVNHCC*

- Indicated that VHB's recommendations will be presented at another public meeting in the spring; and VHB's report on key canal segments will also be submitted this spring.
- Explained and promoted idea of Canal Friends Group.

Minutes prepared by Walter Maros, VHB

Possible Projects for the Blackstone Canal in RI

Repairs

1. Fix the canoe entry into the canal above the Ashton Dam / It worked for a while, then, when the canal was dewatered to put in utilities for the Kelly House, rocks were placed there and never removed (vicinity of Ashton Viaduct) [Ginny Leslie, former RIDEM Planner, 781-8117]
2. Debris needs to be removed from Ashton Dam area
3. Ashton Dam area also needs flood control, canal is vulnerable and washes out
4. Area of siltation due to poor storm water BMP (Best Management Practices)/lack thereof (vicinity of Lower River Road, between Avenues B and D), Lincoln
5. Newer canal breach – area of concern (vicinity of Lower River Road, between Avenues A and B), Lincoln
6. Loss of canal bank for filling for small swale/pond in a person's back yard / Berm should be repaired (no arrow or other indication of where this swale/pond is located) – Lincoln
7. Old wooden dam prior to new Pratt Dam / Area needs to be cleared of debris and cement pipes (vicinity of east bank, opposite the foot of Park Drive), Lincoln
8. Lonsdale Spillway is in need of repair, Lincoln
9. Canal wall is collapsing at a private development; need a partnership to repair canal here [Need to identify exact location], Canal Basin, Providence

Reconstruction

1. Suggestion to rebuild berm and mill gatehouse (Ashton Viaduct)
2. Recommendation to create a canal barge replica, a full-size non-operational replica, on dry land, to give adults & children firsthand experience of the exterior/interior look of a canal boat, the feel of a canal boat, and the experience of hearing the sound of your feet on the deck of the canal boat
3. Recommendation that if a full replica canal boat is not feasible, then a steel skeleton of a barge could be instructive for the public, one was created in Ohio (Akron) see
4. Recommendation to restore a canal lock somewhere in RI.

Access

1. Create access point for paddle boats on Moshassuck River in Providence, opposite Roger Williams National Memorial, this would make all three Roger Williams sites accessible by water and provide interpretative opportunity at the terminal end of the canal (suggestion of Keith Gonsalves, forwarded by Chuck Arning NPS 2/5/2009. Mr. Gonsalves is President of the Ten Mile River Watershed Council and Chair of the Rhode Island Blueways Alliance.)
2. Recommendation to create chutes over existing dam
3. Pawtucket – Improve access - Difficult access/some areas are steep, need to develop a walking path here, since the public's ability to walk the canal is critical in order to raise public awareness and appreciation of the canal, land/canal ownership is mostly private.

Interpretation

1. Pawtucket segment not currently interpreted, existing access/interpretation nodes along the canal are not sufficient; more need to be developed, interpretive markers should

include history of the people who dug the canal, recommend placing interpretive signs along entire canal, roughly one mile apart, with overall context of canal

2. Existence of bike path along the canal in Providence, need to join forces with cyclists to promote more awareness and knowledge of history
3. Sponsor an event where people walk along the area that is presumed to have been the towpath in order to both understand its location and significance, but also to possibly identify new segments of the towpath, which has not been identified in many areas in RI.
4. Install trail markers to show the route of the towpath, help re-connect the route of the canal at the same time.

Other

1. Sponsor/coordinate a series of walks throughout the state to help identify the original location and condition of currently unknown segments of towpath. The activity(ies) could be carried out over a series of time period and might be concurrent with a guided historical tour or other event.

Appendix C

Key Canal Ventures, Figures 14-21

Ownership Information for Key Canal Ventures



Figure 15
 Lorraine Mill Area,
 Conservation and Interpretive Efforts,
 Pawtucket, RI

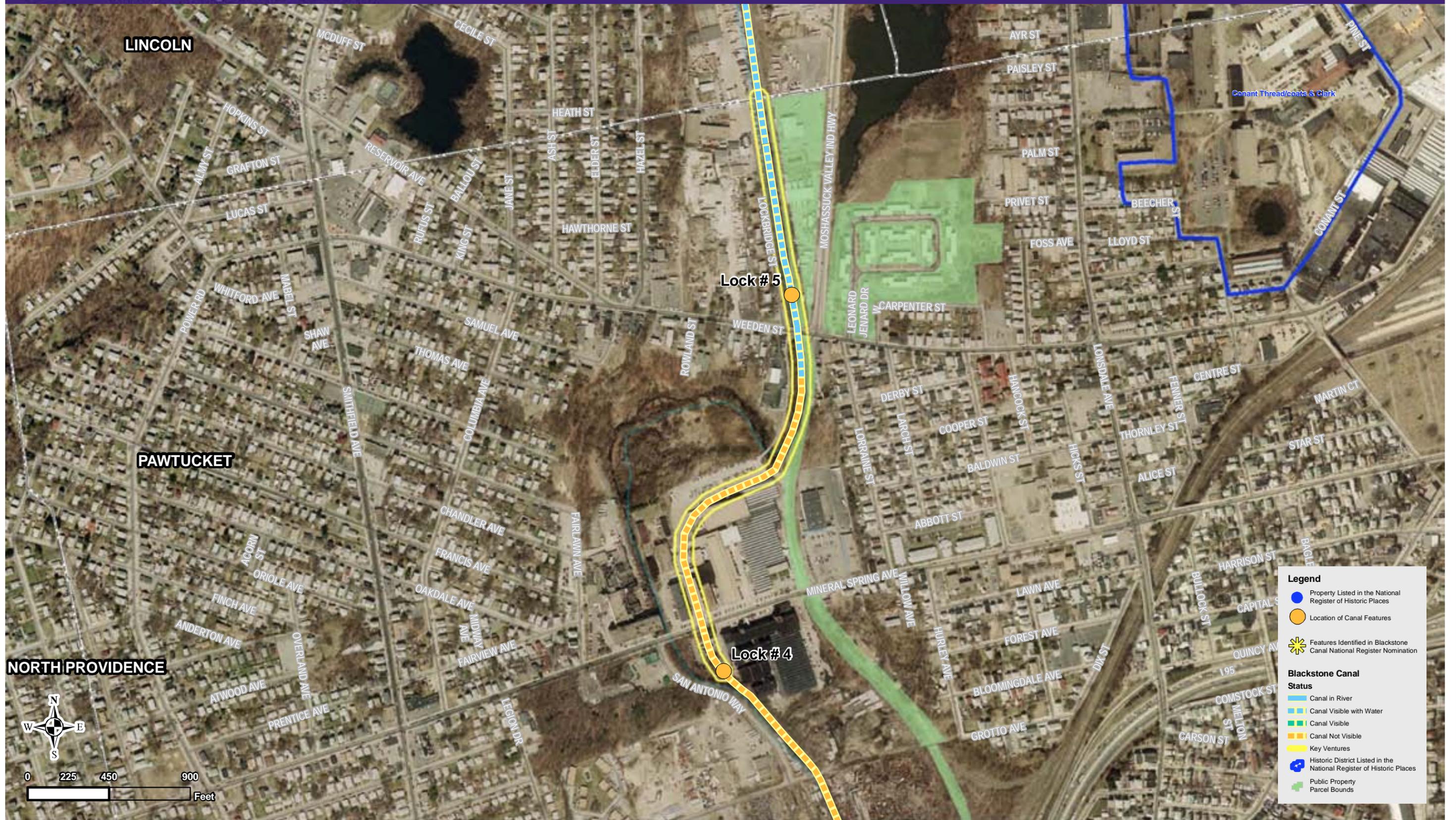




Figure 17
Mammoth Mill Area,
Long Term Planning and Interpretive Efforts,
North Smithfield, RI

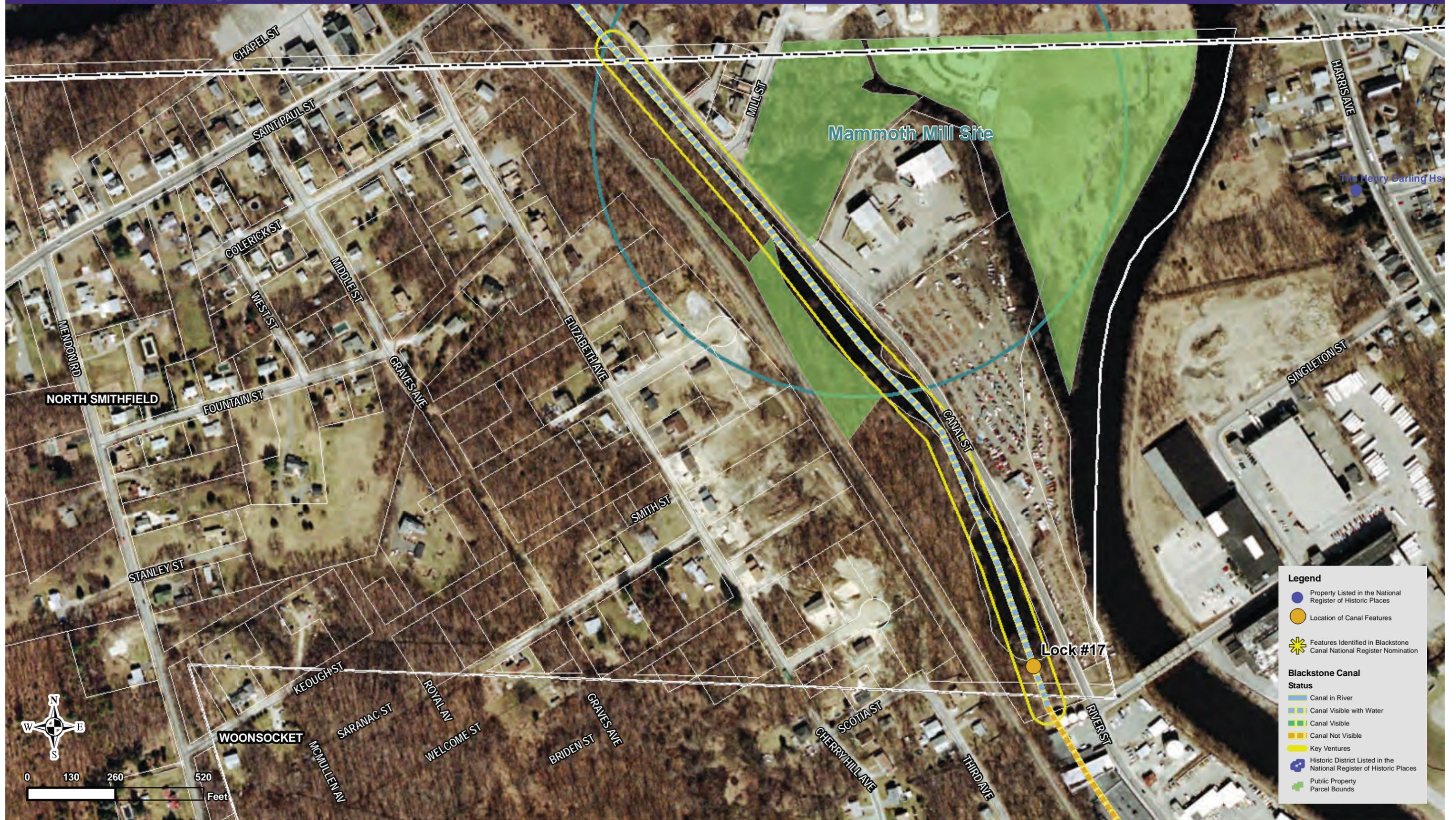
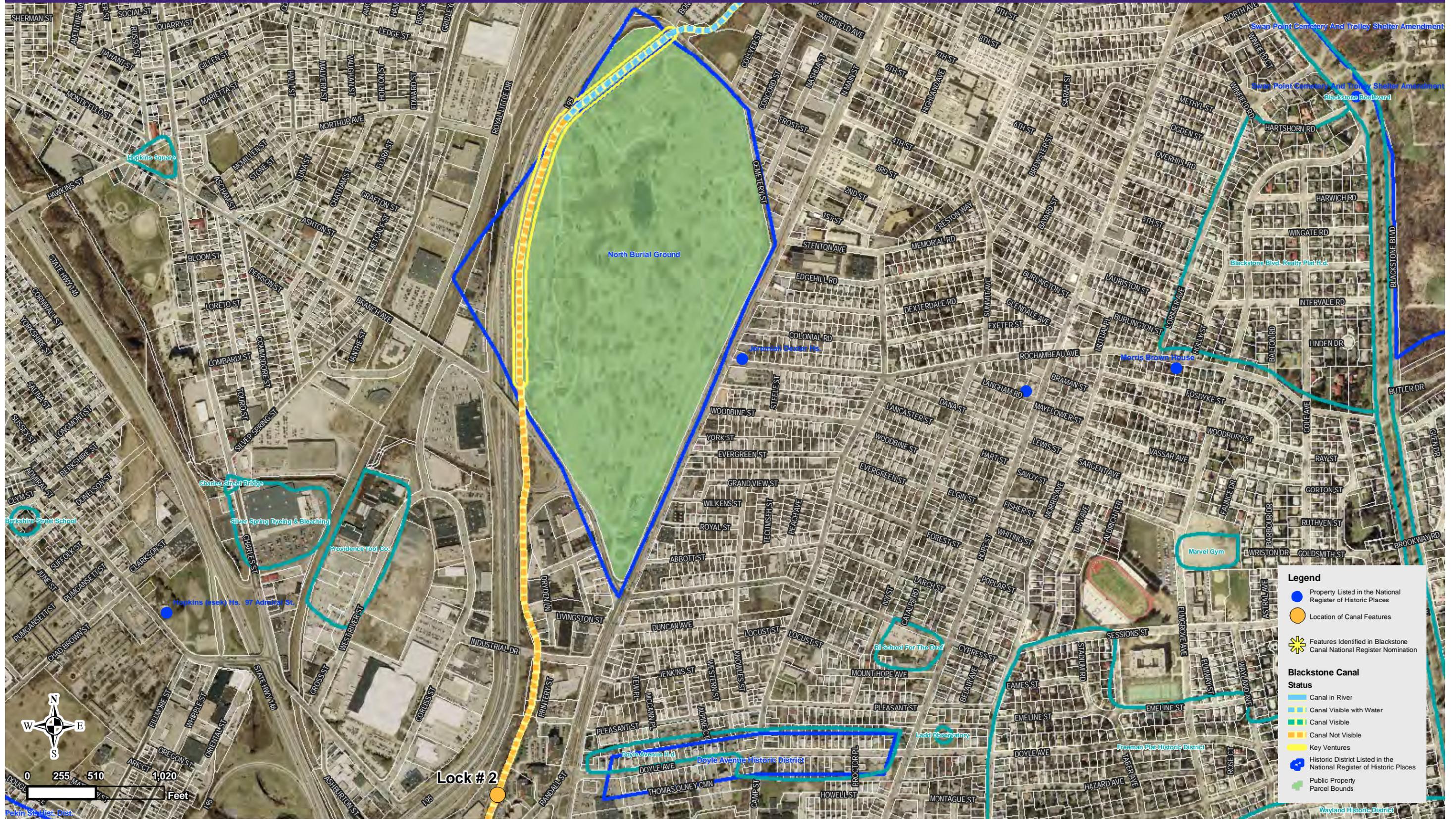




Figure 18

North Burial Ground, Interpretive Efforts,
 Providence, RI



Legend

- Property Listed in the National Register of Historic Places
- Location of Canal Features
- ★ Features Identified in Blackstone Canal National Register Nomination

Blackstone Canal Status

- Canal in River
- Canal Visible with Water
- Canal Visible
- Canal Not Visible
- Key Ventures
- Historic District Listed in the National Register of Historic Places
- Public Property
- Parcel Bounds



Figure 19
Lonsdale Bleachery Area,
Interpretive Efforts and Partnerships,
Lincoln, RI





Figure 20
 Market Square and Vicinity,
 Interpretive Efforts and Partnerships,
 Woonsocket, RI





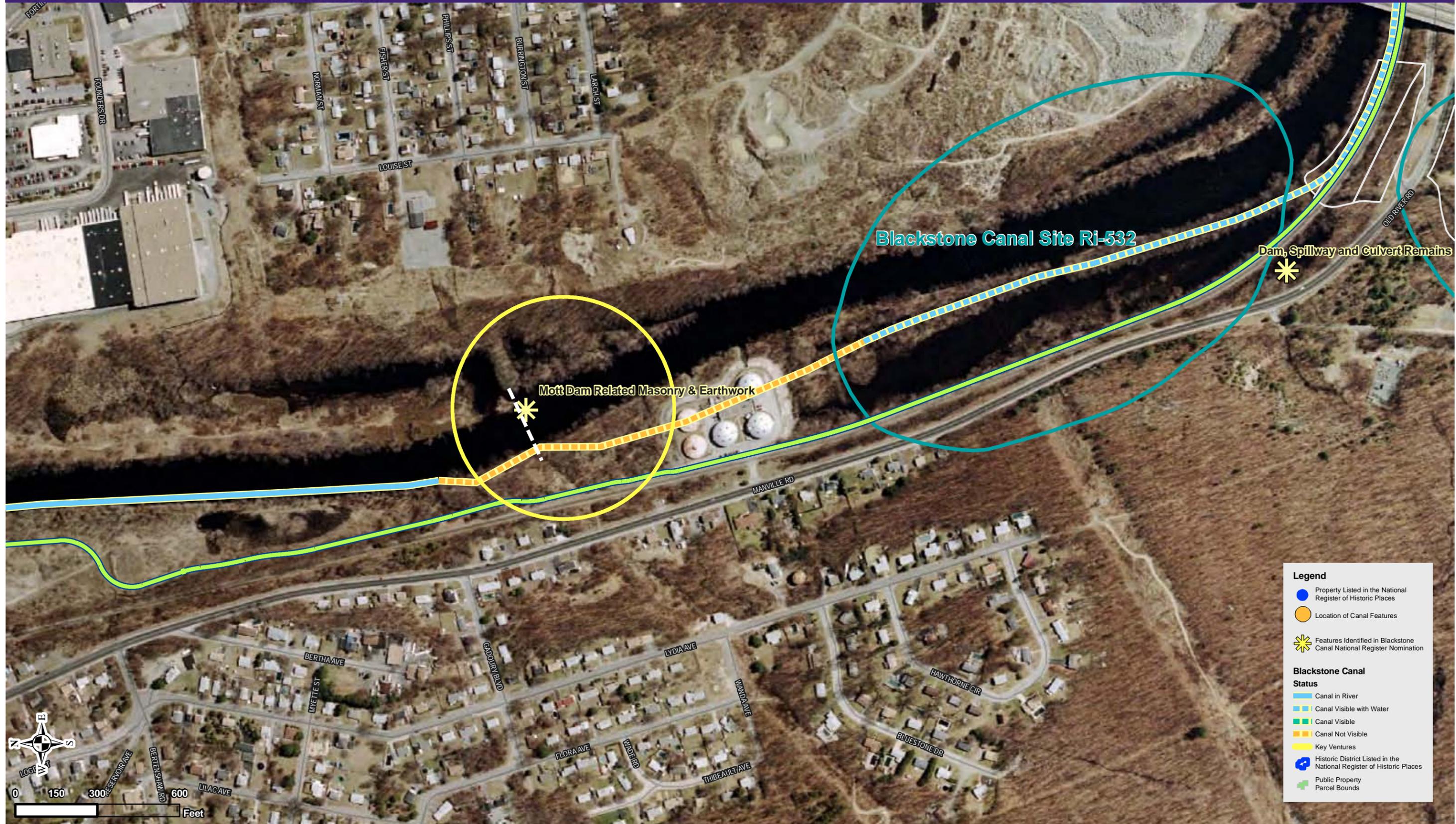
John H. Chafee

BLACKSTONE RIVER VALLEY

National Heritage Corridor Commission

Figure 21

Mott Dam Remnants and Vicinity,
Interpretive Efforts and Partnerships,
Woonsocket, RI

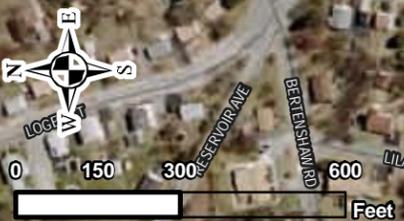


Legend

- Property Listed in the National Register of Historic Places
- Location of Canal Features
- ✱ Features Identified in Blackstone Canal National Register Nomination

Blackstone Canal Status

- Canal in River
- Canal Visible with Water
- Canal Visible
- Canal Not Visible
- Key Ventures
- Historic District Listed in the National Register of Historic Places
- Public Property
- Parcel Bounds



Tax Parcels Data for Key Canal Ventures and Future Ventures

Map #	Parcel No(s).	Ownership
<i>Canal Basin to Randall Street, Providence</i>		
	202740000	No owner listed
	302630000	Essex Fletcher LLC
	303120000	Altus Realty Co.
	305210000	RI Girl Scouts Inc.
	306170000	Moshassuck Square LLC
	402610000	Capital Cove LLC
	402620000	Capital Cove LLC
	206200000	Charlesgate East Affordable Housing Partnership
	202530000	Charlesgate South Affordable Housing Partnership
	206110000	American Mathematical Society
	302530000	Smith Hill Associates
	100030000	City of Providence
	206190000	Charlesgate Nursing Center
	1006610000*	United States of America*
<i>Lorraine Mill Area, Pawtucket</i>		
	046-705 (0 Weeden St.)	City of Pawtucket
	046-702 (483 Weeden St.)	City of Pawtucket Housing
		City of Pawtucket Housing
	048-630 (597 Mineral Spring Av.)	Providence Metalizing Co.
	048-631 (597 Mineral Spring Av.)	Providence Metalizing Co.
	048-536 (547 Mineral Spring Av.)	Providence Metalizing Co.
	048-526 (547 Mineral Spring Ave.)	Kilmartin Realty Co. LLC
	048-531 (bordering River)	Providence Metalizing co.
	048-530 (511 Mineral Spring Av.)	Kilmartin Realty Co. LLC
	N/A (former RR tracks) (between Weeden St. and I-95)	City of Pawtucket
<i>Ashton Dam Area, Lincoln</i>		
		State of RI
<i>Mammoth Mill Area, North Smithfield</i>		
3	135	Town of N. Smithfield
3	129	Town of N. Smithfield
3	183	Town of N. Smithfield)

Map #	Parcel No(s).	Ownership
3	241	Town of N. Smithfield
3	134	Bradley Real Estate Holding Group
3	120	National Grid – canal and area to west
3	117	A & G Realty
<i>North Burial Ground, Providence</i>		
	00100030000	City of Providence
	No #	State of Rhode Island (canal in ROW of I-95)
<i>Lonsdale Bleachery Area, Lincoln</i>		
	05-001.0 (Front Street)	State of RI (DEM)
	05.055.0 (along Blackstone Canal)	Jerome London LLC
	05.060.0 (Carrington St.)	FDS Industries LLC
	05.065.0 (Carrington St.)	Jerome London LLC
	05.067.0 (Carrington St.)	Jerome London LLC
	05.069.0 (Carrington St.)	Jerome London LLC
	05.070.0 (Carrington St.)	Jerome London LLC
	05.071.0 (Carrington St.)	Jerome London LLC
	05.072.0 (Carrington St.)	FDS Industries LLC
	05.074.0 (Carrington St.)	Jerome London LLC
	05.075.0 (Carrington St.)	Jerome London LLC
	05.078.0 (Carrington St.)	Primary Properties LLC
	05.079.0 (Carrington St.)	Primary Properties LLC
	05.082.0 (Carrington St.)	Primary Properties LLC
	05.085.0 (Carrington St.)	Jerome London LLC
	05.090.9 (Carrington St.)	Christopher S. Foster
	05.093.0 (Along Blackstone Canal)	State of RI (DEM)
	05.095.0 (Carrington St.)	Christopher S. Foster
	05.096.0 (Carrington St.)	Lincoln (Tax Sale Prop)
	05.098.0 (Along Blackstone Canal)	Robert Gaudette Sr. et al
	12.211.0 (Willow Way)	State of RI (DEM)
<i>Market Square and Vicinity, Woonsocket</i>		
Sheet D-3	14-25 (Market Square parking lot)	City of Woonsocket
Sheet D-3	14-25 (parcel west of parking lot between Dam and River Street)	City of Woonsocket
Sheet D-3	14-10	T.A.M. Realty, LLC
Sheet D-3	14-11	T.A.M. Realty, LLC
<i>Mott Dam Area, Woonsocket</i>		

Map #	Parcel No(s).	Ownership
34	7	City of Woonsocket
34	x	City of Woonsocket (Wastewater Treatment Plant)

* Roger Williams National Memorial, Providence (included as adjacent parcel)

Appendix D

Conceptual Cost Estimates

Note: The conceptual cost estimates presented in Appendix D are preliminary. They include anticipated costs for various activities, although they focus on planning aspects. They do not include costs associated with land acquisition or any necessary environmental, historical, or archaeological study that may be required to implement these actions, although some very general estimates for these latter tasks are noted.

BLACKSTONE CANAL PRESERVATION STUDY

CONCEPTUAL COST ESTIMATES

Providence to N. Smithfield, RI

Canal Basin to Randall Street, Providence

Next Steps:

- Meet with parcel owners to come up with ideas for preservation and protection; there may be common ground or efforts that can be expanded upon or enhanced for everyone's benefit.
- Completion of a conditions assessment and stabilization/restoration plan for walls and a vegetation management plan which would involve adjacent property owners.
 - Engineering conditions assessment – tech memo with photos and field notes - **\$5,000.**
 - Conceptual stabilization plan tech memo with typical wall repair detail and preliminary costs - **\$3,500.**
 - Vegetation management plan tech memo - **\$1,000.**
 - One meeting with property owners - **\$1,000.**
 - Meeting set up and coordination by NPS.
- Plan a specific event with Rhode Island Historical Society that focuses on the canal's history in this area and that introduces other sections of the canal to the north.
- Research and prepare a self-guided tour booklet that would be available at the Roger Williams National Memorial visitor center. **\$10-20,000.00**
- Contact Chamber of Commerce with ideas for more visibly publicizing the canal's existence and ways to find out more about the story.
- Explore funding sources for specific ventures that come out of partnerships with parcel owners.
- Explore the possibility of easements with adjacent property owners.
- Identify specific areas needing repairs on canal sections and seek funding sources to repair. Assumption is that this step would follow the conditions assessment.
 - Survey base plan showing topo, existing detail, property lines and easements needed for construction and specific locations and types of repair and any special construction specifications that differ from RIDOT Standard Specs for construction. Coordination with RIHP&HC and NPS for review and approval of design. Does not include final construction documents, environmental permitting or any other formal NEPA compliance effort (CE Checklist, etc). - **\$30,000.**

Lorraine Mill Area, Pawtucket

Next Steps:

- Work with the City of Pawtucket to ensure that new trail connections include pathways next to the Canal within this key venture area.
- Approach private property owner of lot that contains the Mineral Springs Lock #4 to determine if there are access issues and to suggest an interpretive sign at the site.
- Research history of mill workers' housing on Lockbridge Street in order to either install an interpretive sign here or to include in a future guided walking or driving tour or booklet - **\$10,000-20,000**.
- Also include the location of Lock #5 (in the area of Weeden St.) in any interpretive marker. The assumption is the marker would be the standard NPS/BRVNHCC interpretive sign detail used elsewhere in Corridor. Steps will include working out access agreement, parking, and wayfinding sign with property owner - **\$10,000** for plan showing easement, sign installation detail, and meetings with property owners and City.
- Conduct investigations on the condition of the Canal trench and prescribe specific restoration/stabilization plans. Conceptual design using available aerial photos and GIS level info to include wetlands, property lines and utilities. Build on earlier information. Develop additional detail, construction cost estimate and permitting requirements. Include meetings with property owners - **\$10,000**.
- Approach Pawtucket School Department on the feasibility of Canal history programming in the school or a special event that focuses on the Canal's history in this area.

Ashton Dam Area, Lincoln

Next Steps:

- Identify improved canal and river access - **\$35,000**
- Determine appropriate type of water control structure and prepare construction documents - **\$75,000**
- Identify funding sources for implementation
- Conduct archaeological investigations in the area, as needed and required - **TBD**
- Add interpretive signage – the price of signage is included in the water control structure work

Mammoth Mill Area, North Smithfield

Next Steps:

- Conduct archaeological investigations at Mammoth Mill site to determine archaeological sensitivity prior to any earth moving or construction activities (**Phase 1A-B \$50,000.00**)

- Participate in planning efforts for the Blackstone River Bikeway route and amenities in both Blackstone, MA and in the Town of North Smithfield.
- Work with Town of North Smithfield in their planning efforts to convert the Mammoth Mill site into a park so that interpretation and access from both the public roads and the Blackstone River can be included. Restoration of this site will require at least **\$50,000** for site assessment and testing. Removal and disposal costs depending on whether material is solid waste or hazardous waste will be in excess of **\$100,000**.
- Approach National Grid, owner of record of the Canal in this key venture area, to determine specific rehabilitation issues and repair methods for the Canal walls.
- Identify a Canal Street location for a sign that gives a brief story about the Mammoth Mill - **\$9,000-\$10,000** per sign - Graphic design/ research - **\$10,000** per sign.

Appendix E

Secretary of the Interior's Standards for the Rehabilitation and Restoration of Historic Properties

The Secretary of the Interior's Standards for the Rehabilitation of Historic Properties

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The Secretary of the Interior's Standards for the Restoration of Historic Properties

1. A property will be used as it was historically or be given a new use which reflects the property's restoration period.
2. Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Materials, features, spaces, and finishes that characterize other historical periods will be documented prior to their alteration or removal.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize the restoration period will be preserved.
6. Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible, materials.
7. Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.
8. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
9. Archeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
10. Designs that were never executed historically will not be constructed.

Appendix F

Blackstone Canal National Register Nomination

United States Department of the Interior
National Park Service

COPY

**National Register of Historic Places
Registration Form**

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in Guidelines for Completing National Register Forms (National Register Bulletin 15). Complete each item by marking "X" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Blackstone Canal
other names/site number _____

2. Location From Smith Street, Providence, to Mass. Line.

street & number Woonsocket R.I. not for publication
city, town Providence, Pawtucket, Lincoln, N. Smithfield, S. N. vicinity
state Rhode Island code R.I. county Providence code 007 zip code _____

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
<input checked="" type="checkbox"/> private	<input type="checkbox"/> building(s)		
<input checked="" type="checkbox"/> public-local	<input type="checkbox"/> district		
<input checked="" type="checkbox"/> public-State	<input checked="" type="checkbox"/> site	<u>13</u>	<u>11</u>
<input type="checkbox"/> public-Federal	<input checked="" type="checkbox"/> structure		
	<input type="checkbox"/> object		
		<u>13</u>	<u>11</u>
			Total

Name of related multiple property listing: _____
Number of contributing resources previously listed in the National Register 3

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, 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. See continuation sheet.

Signature of certifying official _____ Date _____
Rhode Island Historical Preservation Commission
State or Federal agency and bureau _____

In my opinion, the property meets does not meet the National Register criteria. See continuation sheet.

Signature of commenting or other official _____ Date _____
State or Federal agency and bureau _____

5. National Park Service Certification

I hereby certify that this property is:

entered in the National Register.
 See continuation sheet

determined eligible for the National Register See continuation sheet

determined not eligible for the National Register

removed from the National Register.

other, (explain) _____

Signature of the Keeper _____ Date of Action _____

6. Function or Use

Historic Functions (enter categories from instructions)

TRANSPORTATION/water-related
INDUSTRY/waterworks

Current Functions (enter categories from instructions)

LANDSCAPE/PLEAS
NOT IN USE

es De
ark Sen
onal Reg
ntinuation
ection

7. Description

Architectural Classification
(enter categories from instructions)

N/A

Materials (enter categories from instructions)

foundation STONE, EARTH
walls STONE, EARTH

roof N/A
other

Describe present and historic physical appearance.

The expanded and revised nomination for the Rhode Island section of the Blackstone Canal (constructed 1824-1828) comprises both canalized and slackwater segments of the canal from Providence to the North Smithfield, Rhode Island/Blackstone, Massachusetts border. It follows the original route of the canal through the cities and towns of Providence, Pawtucket, Lincoln, North Smithfield, and Woonsocket for a distance of seventeen miles. From Blackstone, Massachusetts, the canal proceeds north to Worcester. Within the nominated Rhode Island length, the primary physical components of the canal--canal trench, towpath and berm--are reasonably intact and recognizable in many sections. In addition, related engineering features such as masonry walls, spillways, basins, and bridge footings exist at specific locations. No locks are known to remain in the Rhode Island length of the canal. The setting of the canal varies throughout its length as it traverses urban and rural areas; the sense of time and place is particularly well preserved along canalized and slackwater woodland sections in Lincoln. This nomination incorporates three sections of the Blackstone Canal previously listed in or determined eligible for the National Register: (1) Blackstone Canal (from Steeple and Promenade Streets, Providence to the Front Street Bridge, Lincoln), listed 1970; (2) Paul Ronci Memorial Park (from Front Street north to the Ashton Dam, Lincoln), listed 1970; and (3) Blackstone Canal (RI-532) (from 1400 feet north of the Manville Dam to a point 300 feet south of Woonsocket Water Treatment Plant, North Smithfield and Lincoln), [DOE 1986-87].

The Blackstone Canal ran forty-five miles from Providence, Rhode Island to Worcester, Massachusetts. It was constructed under the direction of engineer Holmes Hutchinson and funded through the Blackstone Canal Company (chartered 1823). When completed, the canal passed in and out of the Blackstone River sixteen times and ran in the river for approximately ten percent of its forty-five-mile distance. A total of forty-nine locks, of which all but one were granite, accommodated the elevation change from sea level at Providence to 168 feet at Woonsocket, to 451

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feet at Worcester. The canal prism was generally eighteen (bottom) to thirty-four (top) feet wide and four to six feet deep; the towpath at least ten feet wide; and would accommodate boats between forty-five and seventy feet long. Following two decades of operation, the Blackstone Canal collected its last toll in 1848, one year after the rival Providence & Worcester Railroad opened.

Nomination Boundaries and Contributing/Non-contributing Designations

Due to the nature of historical documentation and maps, the precise historical boundaries of the canal are difficult to determine. Descriptions of land acquired along the route contained in the Blackstone Canal Company's Locations and Appraisals Book, 1825-33 (RHISL Collections) indicates that the width varied considerably, ranging generally from 33 feet (50 links) to 99 feet (1.50 chains), but in places was as little as 10 feet or as much as 132 feet across. Engineers' reports and construction contracts defined general range and standard dimensions for the canal prism, towpath, locks and other features, and the Edward Phelps survey map of 1820 delineated the canal as constructed at a scale of one inch to 200 feet. Nevertheless, because actual canal construction entailed incorporating natural topographic features and involved in-the-field decisions by a number of construction contractors, it is likely that the final dimensions varied within, and may have occasionally extended beyond, the established parameters. In addition, the physical remains of the canal have been shown to include subsurface archaeological features which may not be readily identified through historical research and visual observation.

Consequently, the nominated boundaries of the Blackstone Canal have been drawn to encompass the entire constructed resource to the extent that it is historically documented and known at present and to minimize inclusion of peripheral lands not directly associated with the canal. The south and north boundaries of the canal are defined, respectively as Promenade and Steeple Streets, Providence, and the North Smithfield, Rhode Island/Blackstone, Massachusetts, political boundary. These locations mark the linear extent of the Rhode Island portion of the canal.

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The east and west boundaries are generally defined by the actual physical edges of canal bank, towpath berm, and, where applicable, basin or other feature. They include the entire area of earth or masonry structure, thus extending to the toe of a towpath berm slope, for example. They also include areas of both land and water known to have been used in canal operations. Thus in sections of slackwater with preserved towpath, the eastern boundary runs in the river, 15 feet from the east towpath bank. In canalized sections, the basic boundary dimension is defined by the combined standard canal prism (34 feet) and towpath (10 feet) widths, with allowance of 6 feet for towpath berm slopes, or 50 feet. The actual boundary dimension, however, varies with actual canal dimensions in a given section.

Within the nominated length of canal, contributing sections are those which possess integrity of location and where the canal trench, at minimum, is moderately or well preserved. In some cases the preservation of towpath contours and stratigraphy cannot be determined on the basis of current information; sections where the canal trench has been totally filled and is unrecognizable are defined as non-contributing. But further information may become accessible through archeological techniques.

Methodology

Physical elements and primary archival documents record the history of the construction, use, and abandonment of the Blackstone Canal. Over the years, interest in the canal has generated numerous historical studies, drawn primarily from documentary sources. In Rhode Island, the most recent and detailed of these studies is A History of the Blackstone Canal 1821-49 by Richard E. Greenwood, 1984, prepared for the Blackstone Valley Linear Park project, under auspices of the Rhode Island Historical Preservation Commission. Portions of that study have been incorporated into the text of this nomination. Recognition of the canal's significance resulted in its inclusion in the Historic American Engineering Record inventory of Rhode Island sites (1978) and in the listing of several sections in the National Register of Historic Places. More recently, a number of cultural resource management archaeological investigations conducted along the canal have

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expanded the understanding of the canal's physical characteristics and survival.

The methodology used for this revised and expanded Blackstone Canal nomination consisted of a review and synthesis of existing information drawn from these various sources, along with a walkover of the canal length to observe, record, measure and photograph general attributes and specific features. Only limited new primary research and no subsurface archaeological investigations were conducted.

Historical Overview and The Canal as Constructed

Over one-quarter of a century prior to construction of the canal, the idea of an inland waterway linking the port of Providence and inland western Massachusetts had been first put forward in 1792 by a merchant, John Brown, of Providence. With considerable private support, Brown obtained a charter from the General Assembly in 1796. Canal enthusiasts in Worcester, Massachusetts, however, were unable to win over Boston and Springfield merchants, and the project lapsed in both states. In 1822, interest in the project was revived, and a survey of the proposed route was conducted by Holmes Hutchinson of Utica, New York. Charters were finally obtained for the complete project, and the Blackstone Canal Company (BCC) was formed. The cost of the construction was estimated at \$500,000. In 1825, \$400,000 worth of shares were sold in Providence, and a further \$100,000 worth were sold in Worcester. With these funds in hand, six canal commissioners were elected by stockholders and Holmes Hutchinson was appointed chief engineer.

Following a resurvey of the 45-mile-long route in 1825-26, construction began and was completed in the fall of 1820. A final survey and mapping of the finished canal was conducted in 1828 by Edward Phelps.

The finished canal served as a transportation corridor for the movement of agricultural products, raw materials, manufactured goods, and passengers between Worcester and Providence. On average, the journey took two working days.

The cost of building the canal exceeded the amount subscribed by the shareholders by over \$100,000. Despite these

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initial financial problems, the company was able to declare dividends from 1832 through 1836. Even during these years, canal operations were hampered by difficulties in maintaining a consistent water level, maintenance problems, and disputes with mill owners over water rights. The 1836 dividend was the last the company paid, and from that date, canal operations were adversely affected by the opening of the Boston and Worcester Railroad. In 1841, the company petitioned for permission to dissolve in the view of the unprofitability of the operation. This petition was unsuccessful and the company attempted repeatedly during the next few years to dissolve the corporation. In 1847, the Providence and Worcester Railroad opened, making further inroads into the canal's trade. The company was finally successful in its attempts to close the operation in 1848.

The Providence and Worcester Railroad company bought much of the canal property in Massachusetts in 1845 when the northern portion of the canal was closed. In Rhode Island, property which had been obtained by eminent domain was returned to the original owners and property which had been purchased by the canal company was sold at public auction. Much of this property, including locks, was sold to local mill operators who dismantled the locks for building stone. Where roads and rights-of-way crossed the canal, the company was required to fill in the waterway. By 1851, all of the company's property was disposed of and the shareholders received a final payment of \$1.25 for each share.

The Canal Route

The canal route in Rhode Island as determined by the engineers began in a terminal basin in the northeast corner of the Great Salt Cove in Providence at sea level elevation. It ran north from there through Providence and North Providence in the valley of the Moshassuck River, sometimes running with the river and sometimes alongside it. Shortly after the river entered Smithfield (Lincoln), the canal left the river valley and through a series of locks was lifted up to Scott's Pond. It ran through Scott's Pond and Cranberry Pond and then was carried in an excavated trench on the west bank of the Blackstone River for several miles, to the dam at Wilbur Kelly's factory (also known then as Sinking Fund and now known as Ashton). At that point, it entered the Blackstone River and ran with it to the next factory

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at Albion, where it passed again through a dug trench and reentered the river above the dam. Just below Hanville, the canal left the river for a trench on the west bank, which carried it to just above the Mott Dam. From there it ran in the river to the site of the Hamlet factory, Woonsocket, where it once again ran along the west bank in a trench about one half mile. It then crossed the river to the east bank and entered a trench on that side which ran through Woonsocket Falls village and entered the river again just above the upper dam. After a short passage in the river, it cut across a bend in the east bank, crossed again to the west bank and then ran in a trench through the site of Waterford village and into Massachusetts, where it reentered the Blackstone just below Blackstone village. Over the length of the canal, approximately 10% of the distance was in ponds or Blackstone River slackwater and 90% in a canal trench. The canal route followed the west bank of the river, except for a short section in central Woonsocket, where it crossed to the east bank.

The construction features of the canal fall into three constituent parts: the trench and towpath, the locks, and the dams and reservoirs. On each part of the canal, the job was largely completed by men working with picks, shovels and wheelbarrows.

Trench and Towpath

The trench was for the most part designed with a prismatic cross section, thirty-four feet wide at the top, tapering to a bottom width of eighteen feet and containing four and sometimes as much as six feet of water. The side walls were built on a 1/2 slope with the banks rising at least three feet above the water. These dimensions did vary along the route though, widening in some places to forty-five feet at the top and narrowing in others top thirty feet. In at least one section the canal was forty feet wide, top and bottom. Basins and lay-bys at landings and near the locks allowed for the loading and unloading of cargoes and smooth passage of the two-way traffic.

The towpath in both slackwater and canalized sections was at least ten feet wide, although rock outcroppings occasionally reduced its width to eight feet. It rose generally no more than five feet above the water and in some sections a timber cap log was installed on the side of the path to keep the tow rope from

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catching. The BCC also planted some trees on both banks of the canal, which served to prevent erosion and provide shade and ornament.

While the canal trench was lined with rubblestone walls, it was essentially an earthen structure. As specific clauses in the construction contracts made clear, it was critical that only the "most pure, solid and compact, and water-tight earth" be used in constructing the canal banks. "Vegetable mould, leaves, roots, sticks and brush" were expressly prohibited. Surprisingly, the surviving canal records contain no mention of the use of clay or the technique of puddling. Puddled clay, that is clay and water mixed to a gluey consistency, was an indispensable material for making a water-tight seal in the canal bed at the time and yet no evidence has been found to indicate that it was used on the Blackstone Canal.

The construction of the canal trench consisted of two basic jobs, excavation and embankment, with the associated tasks of grubbing, mucking and blasting. The principal tools of excavating and embanking were pick axes, shovels, iron bars and wheelbarrows. Embankment was generally more expensive than excavation and the prices for the latter varied according to conditions, more being paid for digging through hard pan or for digging below a certain depth.

In addition to excavating the trench and embanking, it was also necessary in some locations to build rubblestone walls on the exterior slope of the canal bank, where it was exposed to river freshets. At these spots, contractors also widened the river bed, to reduce the severity of the seasonal floods. Both the towpath and the canal also had to incorporate numerous drains and culverts to carry off the waters of the springs and streams that intersected them.

For those sections of slackwater navigation, where the canal ran in the river and in ponds, there were still obstructions, particularly rocks, to be removed, and the towpath to be built. In some of these locations, the towpath had to be carried by wooden bridges.

The work was performed by large gangs of unskilled workers assembled by the individual contractors. The contractors themselves included local farmers, such as David Wilkinson of

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Smithfield, and local manufacturers, such as Dan Daniels of Woonsocket Falls, as well as men from elsewhere in New England and New York, such as Elihu Ewers of Manlius, New York, who had previous experience building canals or working on other large projects. Several of the contractors, such as Tobias Boland and Patrick O'Connor, were Irish immigrants, who tended to hire their fellow countrymen. Boland even had agents in Boston and New York who directed new immigrants in search of work to the canal project in Worcester. Edward Carrington was the commissioner who was most often directly involved in hiring the contractors and other workers.

Locks

The key elements of the canal's hydraulic system were the locks, the chambers in which the canal boats made the series of ascents and descents between Providence and Worcester.

According to Hutchinson's 1825 survey there were to be forty-nine locks, twenty of them in Rhode Island. There were to measure ten feet in width and eighty-two feet between gates, with an average lift of nine and a half feet. Though somewhat shorter than the locks on the Erie Canal, when built they were considered "equal, both as to material and workmanship, to any in this country."

The floor of the lock pit was some two or three feet below the water level, over which sills and priming planks were laid. The stonework was granite, five feet thick at the foundations and approximately thirteen feet high, with the rear courses of irregular stone laid with mortar made from Dexter lime from Lime Rock in Lincoln. The facing courses were built of split granite stones with hammered beds and dressed and smooth faces, laid in the best water lime available. No locks survive in Rhode Island.

Dams and Reservoirs

The third integral element of the canal was the system of dams and reservoirs that provided the canal water and kept it at proper levels. The main reservoirs, all but two of which are in Massachusetts, were natural ponds enlarged by damming. The main

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reservoirs in Rhode Island were: Herring Pond (200 acres) and Allum Pond (1200 acres), both located in the town of Burrillville. In addition, smaller ponds, such as Scott's Pond (40 acres) and Cranberry Pond (10 acres), were designed to serve as reservoirs.

On the canal route itself, a series of dams served to raise the level of the Blackstone and Moshassuck Rivers and thus maintain the canal at proper levels. In some instances, the BCC raised the existing manufacturer's dams, as they did at Blackstone village and Woonsocket Falls. Elsewhere the company built its own dams, as at the Mott Dam above Manville. As with the reservoirs, the BCC was sometimes able to share the expenses with manufacturers who benefited from the dam raisings. Another dam built on the Crookfall River in Smithfield where it intersected with the canal served to pond the river's water in the canal. Although the official canal survey map of 1828 gives no indication of them, there must have been dams of this type on the Moshassuck River where it intersected with the canal, which kept the river from drawing down the level of the canal.

The Canal Boat

In keeping with the dimensions of the canal and its locks, the canal boats as requested by the BCC were to be between 5' and 70' long and no wider than 9'3" at the deck or 7'6" at the floor or dead flat. The naval timbers were to be a sturdy "round 9 on a side." "The bows and entrance of the boat below and above the water-line" were to be "of a full round and bluff form." This most likely was in an attempt to eliminate the problems encountered with sharp-prowed boats on the Erie Canal, which tended to inflict considerable damage in the event of a collision. Though not explicitly specified in the bylaws, the canal was built to accommodate boats weighing between twenty-five and thirty tons and drawing between two and two-and-a-half feet of water.

BLACKSTONE CANAL INVENTORY

Introduction

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The following inventory of the Blackstone Canal begins in Providence and proceeds north to the Massachusetts state line. The canal has been divided into thirteen sections of varying lengths designated as contributing and interspersed with eleven non-contributing sections. Of the total seventeen miles, some 9.6 miles are contributing (56% of overall length), and some 7.4 are non-contributing.

Section 1

Promenade and Steeple Streets to 400 feet south of Industrial Drive, Providence (mile 0.0 to 0.95).

This southernmost section of the Blackstone Canal included a large canal basin in downtown Providence and a combined channel with the Moshassuck River. It is divided into several subsections or segments, all of which are defined as contributing.

The segment from Promenade and Steeple Streets north to the Smith Street bridge contains the easternmost portion of the original Canal Basin. Created by construction of a causeway dam across the northeastern corner of the tidal cove at Haymarket Street (approximately due west of the Old State House), the approximately 300-foot-wide Basin linked the canal (and the Moshassuck River) to the head of the Providence River estuary and port facilities leading to Narragansett Bay. It provided ample space for canal boats loading and unloading cargo and passengers. Filling of the Basin began with the construction of the Providence and Worcester Railroad in 1846-8, reducing the Basin to a channel running along the west side of Canal Street. Subsequent railroad and street improvement and building construction activities during the nineteenth and twentieth centuries have further modified the retaining walls of this segment. Today, the channel is approximately 40 feet wide and is defined by masonry walls of drylaid rubblestone and coursed and semi-coursed, mortared cut granite. Some spots are reinforced with poured concrete, probably associated with buildings that stood adjacent to or over the channel into the twentieth century.

The west wall of the Basin may remain buried under the former railroad yards that are now part of the Capital Center project area. The east Basin wall and the towpath may remain

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buried beneath the approximate modern centerline of Canal Street. The likelihood of any traces of the causeway dam surviving is minimal due to radical changes in that area; however, it is possible that some granite blocks at the site of Haymarket Street may be associated with the lock between the Cove and Canal Basin. Finally, the site of the present-day Smith Street bridge marks the approximate historical location of a canal bridge crossing.

The segment from Smith Street to Mill Street Bridges is similar in configuration, with masonry walls defining the approximate channel which historically contained both the Blackstone Canal and Koshassuck River flowage just above the Canal Basin. The Mill Street Bridge crossing location also dates to at least the early nineteenth century.

Proceeding north from the Mill Street Bridge to Randall Street (.2 miles), the canal/river is 30-35 feet in width with 3-4 feet (west bank) and 7-8 feet (east bank) high walls of drylaid rubblestone. The towpath, which crossed to the west side at Charles Street, has been partially compromised by subsequent development and fill, although original contours may remain. A later dam and arched wasteway channel (filled) for the Stillman White Brass Foundry, 1 Bark Street (1871 et seq., NR), are located at the Charles Street Bridge where the building rises from the canal's east bank. The dam may have been originally constructed in 1856 when Stillman White established the foundry in a small frame building, no longer standing. No visible traces remain of the first lock and a structure, possibly a lockkeeper's house or the Lewis' dye mill, which stood at this location. Towards the northern end of this segment, the canal passes under a late-nineteenth century granite, single-arch bridge at Stevens Street and a modern concrete-and-steel bridge at Randall Street, both historic canal crossings.

The northern segment of Section 1 extends .25 miles from Randall Street to a point 400 feet south of Industrial Drive. Here the canal/river channel has been widened and substantial sloped rip-rap banks created. All evidence of the towpath, which crossed again to the east bank at Randall Street, has been obliterated. Although the configuration of the canal trench has been modified in the late twentieth century, it conforms to the location of the original route, and as such remains an important physical record of the canal's original course.

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For nearly one mile north of Section 1, the canal and Moshassuck River were sometimes separate and sometimes concurrent. Canal integrity throughout this stretch has been destroyed. At the southern end, the channelization in Section 1 continues, but follows the route of the river for 800 feet; the canal trench to the east is filled. The curve of Printery Street may follow the canal route. Approximately 400 feet north of Industrial Drive, the channel turns west and is culverted under Interstate Route 95 and railroad yards. Demolished features in this segment included one lock (Franklin Foundry?) and three or four farm bridges.

Section 2

.2 miles across the northwest corner of
North Burial Ground, Providence (mile 1.85-2.05)

About 1500 feet south of the Cemetery Street/North Main Street interchange, the canal and river emerge from underneath I-95 in a 34 foot wide, well-preserved canal trench running through North Burial Ground (NR listed). It is lined with approximately 4-foot high drylaid rubblestone walls, to which a low cement cap has been added. The towpath continued on the east bank from Randall Street, through this section, and northward. Some grading has undoubtedly occurred along the east bank in this section, but original towpath contours may also be present. No other canal features are known to have existed along this segment, although a small late nineteenth or early twentieth century [?] steel bridge, probably erected as part of cemetery improvements, remains today.

Leaving North Burial Ground at Cemetery Street, the canal and river again separated. The present-day channel follows the river bed, while the canal trench to the west has been filled and destroyed by industrial development, Route I-95, and railroad construction for .9 miles. A lock (Horton's Grove?), 100 feet north of Cemetery Street, and a towpath bridge, where the

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present-day north-bound Smithfield Avenue entrance ramp meets the highway, have also been lost.

- - -
 Section 3

Saint Francis Cemetery to 400 feet south of Mineral Spring Avenue

Emerging from beneath railroad yard fill at a point on the east side of Saint Francis Cemetery (off Smithfield Avenue), the probable remains of the canal trench follow the east cemetery boundary, the east edge of Veteran's Memorial Park, pass along the east side of the City of Pawtucket incinerator, then cross Grotto Avenue to 400 feet south of Mineral Spring Avenue and the Lorraine Mill. The Moshassuck River, originally located east of the canal, has been filled. Both banks of the canal have been altered by adjacent railroad yard filling (east) and landscaping/maintenance (west). The trench itself has been filled at the southern end, but is watered to the north. The 3-mile marker, once located just south of Grotto Avenue, is the only feature known to have existed in this segment.

At a point 400 feet south of Mineral Spring Avenue, the canal passed from the west to the east side of the river, as the river course took a broad westward curve. The current waterflow follows the river bed from the above mentioned point, across Mineral Spring Avenue and loops through the west and northern edges of the Lorraine Mill complex (1868, 1881 et seq.). The canal trench ran in a straighter north/south course and appears to have been lost to subsequent industrial construction. Features south of Mineral Spring Avenue of which no surface trace remains include: a cart bridge, two towpath bridges, a possible dam at the river/canal crossing (east), a lock, and a possible lockkeeper's house.

- - -
 Section 4

Lorraine Mills (Mineral Spring Avenue) to Saylesville (Walker Street)

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Today, the southern point of a V-shaped curve in the water flow northeast of Lorraine Mill marks the location where the combined river and canal route resumed. Approximately 400 feet to the north, they again separated, with the canal to the west. At a point due west of the west end of Cleveland Street, the river crossed to the west, while the canal continued straight to Walker Street. The towpath ran along the east bank and may now be partially covered by the Noshassuck Valley railroad tracks. Some modification appears to have occurred along the west bank between Weeden and Higgin Streets; a series of small natural or constructed basins have been filled creating a linear bank alignment. North of Higgin Street, the original earth trench appears largely unchanged to a point 500 feet south of Walker Street where the canal was incorporated into the Saylesville Mill water system.

This segment contained several features which no longer exist: possible dams at the canal/river junctions, a cart bridge, a lock at Lockbridge Street (formerly Log Bridge Road), a sidelanding bypass north of Weeden Street, and a towpath bridge.

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A short segment from 500 feet south of Walker Street northward to the southern end of Scott's Pond appears substantially destroyed or buried by development of the Saylesville Mill (c. 1855-1920, NR listed); the mill trench now appears to veer west of the original canal route.

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Section 5

Walker Street through Scott's Pond and Cranberry Pond across Front Street, to the Ashton Dam, Lincoln

This section contains the longest, most intact length of trenched canal and towpath in Rhode Island. It forms the northern end of the canal currently listed in the National Register. Leaving the northern of the two locks mentioned above, the canal route proceeded .8 miles through two connected natural but enlarged bodies of water, Scott's Pond and Cranberry Pond, which also served as reservoirs for the canal. The towpath apparently followed both east and west pond banks and was carried

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in sections on wood piers. Towpath contours and stratigraphy have most likely survived along much of the gently sloping west pond banks, and to a lesser degree along the steeply sloped east banks. Upright posts originally supporting the "floating towpath" are present in Cranberry Pond. The present-day Front Street bridge stands on the approximate site of a cart bridge crossing.

North of Front Street, the east bank of the canal is marked by a wood retaining structure constructed through a later mill pond for a distance of 150 feet. The 30-40-foot wide earthen trench resumes through the Lonsdale Mill complex and proceeds northward with the towpath on the east bank. From this point northward, the canal leaves the headwaters of the Moshassuck River and runs along the west side of the Blackstone River through a wooded, rural setting.

The southern stretch of this section appears to have been built with earth walls; an approximately 10 foot long area of dry-laid low masonry is, however, visible on the west bank of the canal opposite Pole 98 off River Road, Lincoln (Feature 1). Just south of Feature 1 on the east bank of the Canal is a long earthen ramp and a stone abutment, remnants of the cart bridge built to connect those portions of the John Wilkinson Heirs's property separated by the Canal (Feature 1A). A cluster of features remains at Martin's Way bridge (Martin's Wading Place) which carries Martin Street across the Blackstone River and canal. Earthen ramps on both sides of the canal north of the bridge suggest that an earlier crossing existed, possibly between two basins as shown on the 1828 Phelps survey map (Feature 2). This northern site may have been abandoned in 1855 at the same time that the approach and bridge over the river from the east was moved south (Cumberland Plat Book 1:5). In the "Line Rock lot" on the west side of the canal, scattered deposits of limerock north and south of the present bridge and a large pile of limerock, possibly a wharf, north of the bridge attest to the transport of this raw material from the Limerock Quarry to the west to the canal. Mid-twentieth century flooding in this area has caused washouts and required repairs undertaken by the town of Lincoln. Nevertheless, the original contours and noted features remain remarkably intact.

Approaching Quinville, one-quarter-mile north of Martin's Way, the canal prism passes through "Gardner's Canon Rock"

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(Feature 3). On the wooded west bank smooth-faced ledge outcrop slopes steeply into the canal. The east bank and towpath are cut into outcrop; quarry chisel scars and low drylaid masonry support walls are visible along the water's edge. The only canal mile marker remaining in its original location, the 8-mile marker, is sited adjacent to Gardner's Canoe Rock (Feature 4). No remains are known to exist of several small wharves.

North of Gardner's Canoe Rock, the canal prism runs straight with earth walls to a point 300 feet south of the Ashton Viaduct (1934-45) and from there north to the Ashton Dam with walls of excellently preserved masonry. The remains of a cart bridge abutment (Feature 5) are visible at the south end of the east bank masonry where the towpath crossed from the east to west canal bank in the Old Ashton Historic District (NR listed). Several mill houses (c. 1810-15) along Lower River Road on the west side of the canal, the Wilbur Kelly House (c. 1820) on the east side of the canal south of the viaduct, and Ashton/Sinking Fund mill or gatehouse remains between the viaduct and dam form the extant visible structures of Lincoln's oldest mill village. North of the viaduct, a later basin or impoundment on the west side of the canal may have damaged the towpath for a short distance. No surface traces remain of a footbridge over the canal immediately south of the Kelly House.

Section 6

Ashton Dam north to 800' below
 Albion Bridge (miles 6-10, approx.)

This section begins at the Ashton Dam, the northern terminus of the continuous length of canal beginning in downtown Providence and already listed in the National Register. West of the dam, the towpath apparently ran along the top of a 30 feet high ledge which drops down into the west side of the canal. Approximately 200 feet north of the dam, the canal entered the Blackstone River and ran in the river, with the towpath on the west bank for 1.1 miles. This section contains the most intact length of slackwater towpath identified. Along this section, the towpath is visible as a flat earthen berm, approximately ten feet wide, along the riverbank. It is defined on the western side by a shallow ditch. The area is wooded and the terrain rises steeply to the west. No masonry work was observed along the berm. Approximately 1,900 feet south of the Albion Bridge,

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the semi-coursed masonry footings for a small bridge which carried the towpath over an unnamed stream are visible (Feature 6). Neither the stream nor bridge appear on the 1828 Phelps map.

Beginning at a point 800 feet below the Albion bridge and 1300 feet below the Albion dam, the canal was carried in a trench for a distance of 1800 feet around the dam. The southern 200 feet of this short stretch was later modified for use as a power canal by Albion Mills expansion.

Section 7
North of Albion Mill, 1,000 feet

The canal trench, possibly somewhat enlarged, and towpath route on the west side are clearly visible, particularly north of the mill. Two natural islands between the canal and river remain, although the inlets have been filled, culverted, and spanned by railroad tracks. Other alterations may have occurred when the dam was relocated in the nineteenth century. The location of the present Albion Road bridge crossing the canal and the road alignment mark the approximate location of canal-era crossings. The canal reenters the river 900 feet above the 1887 pony truss bridge. A floodgate across the canal trench was most likely erected by the mill to control water flow. Features no longer existing in this section include a 9-mile marker, a lock at the southern end of the Albion trench, an adjacent wharf, and a footbridge over the canal to the mill.

North of Albion for 2200 feet to Mussey Brook the canal ran in the river. Railroad embankment has been overlaid onto the towpath, eliminating its visibility and integrity. No evidence of a towpath bridge crossing remains at Mussey Brook; only random stones and a modern culvert are visible.

Section 8

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Mussey Brook to 2000 feet north of Mussey Brook

Beginning immediately above Mussey Brook, the riverbank and towpath veer east away from the railroad for a distance of 2000 feet. The towpath contours are moderately well-preserved throughout this section. An 11-mile marker which stood at the northern end of this section has been removed.

Above this terrace, the canal route and railroad intersect again for 1000 feet to a more pronounced curve in the river. Here, the canal was trenched around the Manville dam and northward. To the south of and for 1400 feet north of the dam, this trench appears to have been totally filled and altered by railroad and other construction. This section contained three locks and a road crossing bridge below the dam and a 12-mile marker a short distance above the dam. The road crossing bridge site remains marked by a modern bridge; the masonry visible at ground level on the east side of the railroad right-of-way north of the bridge appears to be associated with the Canal.

Section 9 (RJ-532)

1400 feet north of Manville Dam (Lincoln)
to 300 feet south of Woonsocket Water Treatment
Plant (Woonsocket)

This segment extends for a distance of 7,000 feet parallel to the course of the Blackstone river. Throughout this distance the canal is reasonably intact and most of it contains standing water. The canal is breached at one location to the north of Crook Fall Brook and is filled in by stream alluvium in the area around the mouth of Crook Fall Brook. The only ancillary engineering features known to have existed on this portion of the canal are a dam and spillway on Crook Fall Brook where it intersected the canal, and a culvert to the north of Crook Fall Brook (Feature 7). Some archaeological evidence of the dam and spillway was discovered during archaeological testing in July 1986 (Milner 1987). The breach north of Crook Fall Brook may be on the site of the culvert. Both the towpath bank (southwest) and the berm bank (northeast) are well preserved, although

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heavily overgrown with brush and small trees. The banks of the canal throughout this segment are 30 to 40 feet apart. To the south of Crook Fall Brook the canal towpath is under the existing railroad embankment. North of Crook Fall Brook the canal alignment veers away from the railroad and both banks of the canal are visible. At present, the canal prism is disturbed or destroyed 1400 feet north of Manville and 300 feet south of the Woonsocket water plant. This section contained a 13-mile marker.

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From 300 feet south of the Woonsocket Water Treatment Plant to approximately 100 feet north of the plant (total distance of 700 feet), the canal prism has been thoroughly destroyed by earth moving associated with the plant construction.

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Section 10 (Mott Dam)

From 100 to 700 feet above the Woonsocket Water Treatment Plant and extending to the east riverbank (Woonsocket)

Just above the treatment plant, canal and berm extend to a point where the Mott Dam stood. The canal reentered the river just above the dam. Archaeological testing in this area indicates that intact sediments associated with canal construction and use are present within fifty centimeters of the surface (Morenon and Tidwell 1988). In addition, masonry and earthwork most likely associated with the Mott Dam is present on both sides of the Blackstone River (Feature 8). The Mott Dam was an earthen structure built by the Blackstone Canal Company to control water flowage in the canal; it has been dismantled. On the west riverbank is a dry laid, fieldstone embankment interpreted as representing the entrance to the canal trench above the Mott Dam. It is approximately (12 meters) 25 feet in length and (1 meter) 3 feet high (exposed), facing north and east and earth-filled on the southern side. It curves northwest from the riverbank.

On the east riverbank, a massive earth mole which clearly appears on modern topographic maps, is the eastern section of the dam. It consists of a raised berm, approximately 7 feet above water level approximately (5 meters) 15 feet wide extending into

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the river from the bank for 100 feet and curved at the western end. Along the north, west and western (rivermost) section of the south sides, large quarried granite blocks (1-2 m x 50-60 cm) are laid at a sloped angle of 30-35 degrees, creating a smooth grade to the water. Where the berm meets the riverbank on the north side, granite blocks continue around a curved corner and to the north along the riverbank for approximately 80 feet. The blocks appear to have been added in the twentieth century, perhaps for flood control purposes.

Other features in this section for which no remains are known to exist are two wharves located on the island berm inside the canal just below the dam.

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Beginning 700 feet north of the Woonsocket Water Treatment Plant where a power line crosses the river, landfilling, and earth moving associated with the City of Woonsocket Landfill have destroyed all traces of the towpath that ran along the west riverbank to a point approximately 900 feet below the Hamlet Avenue Bridge, where the canal entered a trench for a distance of 1800 feet around the Hamlet dam. This trench has been filled in some locations and the canal berm has been enlarged with earth overburden and rip rap for flood protection. Two unwatered sections of canal prism remain, possibly widened for later use as a power canal.

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Section 11 South of Hamlet Avenue Bridge (Woonsocket)

This short, straight section is approximately 100 feet long, planted in grass, and terminated by parking lot fill to the south and by Hamlet Avenue Bridge abutment fill to the north. The survival of towpath contours is unknown.

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Between the Hamlet Avenue bridge and the Villanova Street foot bridge to the north, all traces of the canal prism have been lost in the grassy area between Florence Drive and the flood control berm.

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Section 12

Villanova Street footbridge to site of the Hamlet Dam (Woonsocket)

This section is an approximately 700-foot long, 50-70-foot wide broad trench which follows a river curve, with volunteer weed vegetation. It is terminated at the south by fill for a pedestrian bridge over the river and blends to the north with masonry remains of a floodgate and the Hamlet dam. Demolished features in this canalized section include one lock and two wharves.

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Reentering the river, the canal route followed the west (or south) bank for a short distance before crossing to the opposite bank, where it was again trenched, following the riverbank contours through the village of Woonsocket Falls to just above the Woonsocket Dam and present-day Main Street Bridge. Later nineteenth and twentieth century construction has destroyed all traces of this trench. Lost features include two locks. Above the dam, the canal towpath route followed the east river bank, but has most likely been destroyed by washouts and flood control projects.

At a point approximately 100 feet north of the Conrail Bridge, the canal again entered a trench which carried it straight, paralleling present-day Water Street, across an oxbow in the river for 700 feet to a point approximately where the railroad now crosses. Later industrial construction resulted in the filling of this segment at around the turn of the twentieth century. Crossing the river, the canal again became a separate trench, the lower 1100 feet of which has been filled by railroad bed, industrial buildings and River Street. The V.F.W. Building parking lot at the intersection of River and Rhodes Streets marks the location of a canal basin.

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Section 13

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Singleton and River Streets (Woonsocket) 1200 feet along Canal Street (North Smithfield) to Blackstone, Massachusetts state line.

At a point opposite the present-day Singleton Street Bridge, the canal trench becomes visible again as a wide basin which narrows to the more standard canal prism and parallels River and Canal Streets for 1200 feet through the village of Waterford to the Massachusetts state line. The present-day bank contours appear basically unchanged since 1828, although diversion of water to the river has substantially lowered the water flow level in the trench. In this section, the towpath ran along the east side of the canal, and thus under present-day River/Canal Street. The dry-laid fieldstone masonry retaining walls of the earth-filled dam are visible on both sides of the road embankment. On the canal side (west) the embankment walls are approximately 6 feet high. Demolished features in this section include an inlet for a small mill race to the river, 17-mile post, two wharves and a mill pond inlet to the Mammoth Mills and associated towpath bridge.

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TABLE I

BLACKSTONE CANAL FEATURES

Feature	Location and Description
1	Off Old River Road at Pole 98, Lincoln. Approximately 10 foot long length of low, dry-laid masonry on west canal bank.
1A	Just south of Feature 1, Lincoln. Long earthen ramp and stone abutment, remnants of a cart bridge.
2	Martin's Wading Place and Lime Rock Lot. Both sides of Martin's Way Bridge, Lincoln and Cumberland. A cluster of earlier river and canal crossing road embankments, two canal basins and limerock deposits.
3	Gardner's Canoe Rock, Lincoln. North of Martin's Way Bridge. Natural ledge outcrop and blasted and quarried canal trench and towpath contours.
4	8-Mile Marker. At Gardner's Canoe Rock, Lincoln. Granite mile marker lying in the ground.
5	Bridge abutment, Old River Road, Quinville, Lincoln. Dry-laid masonry in a corner configuration on the east side of the canal south of the Wilbur Kelly House.
6	Unnamed stream, south of Albion, Lincoln. Low dry-laid masonry abutments for former towpath bridge in slackwater section of canal.
7	Crookfall Brook, Lincoln. Masonry remains of dam, spillway and a washed-out culvert at feeder stream.
8	Mott Dam, Off Manville Road, north of Woonsocket Water Treatment Plant on both sides of the Blackstone river, Woonsocket. Dry-laid masonry remains (west) and earthen mole (east) of water control dam built by the ECC.

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BLACKSTONE CANAL
Lincoln, Woonsocket, North Smithfield

Photographer: Walter A. Nebiker
Date: July 1991
Negative: Rhode Island Historical Preservation Commission

Section 7: Lincoln. North of Albion Mill, 1,000 feet. Canal in River where railroad runs over towpath.

Photo #1
View: North of Albion Mill, 1,000 feet. Slackwater section where road joins railroad, looking south.

Photo #2
View: Several hundred feet north of above, at junction of canal and river. Left to right: river, island, canal. view to southwest.

Photo #3
View: Same location as above, looking to south. Canal section.

Photo #4
View: Same place, to north, showing river.

Photo #5
View: About 200 feet north of Albion Dam. Left to right: canal, island, river.

Section 8: Lincoln. Mussey Brook to 2,000 feet north of Mussey Brook. Beginning at brook, riverbank and towpath veer east away from railroad for 2,000 feet.

Photo #6
View: Delta of Mussey Brook looking north.

Photo #7
View: Towpath. River is to left, behind trees, Along river is a line of low vegetation, marking the edge of towpath, visible as the light section to the right of center. Looking south.

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Photo #8

View: Albion Mill.

Section 9: Lincoln. North of Manville Dam. North of Crookfall Brook.

Photo #9

View: Stagnant water body just west of railroad tracks, about 150 feet north of brook.

Section 10: Woonsocket. From 100-700 feet north of Water Treatment Plant.

Photo #10

View: From fieldstone embankment along the east bank of the river, across river to east (in/near berm area).

Section 11: Woonsocket. South of Hamlet Avenue Bridge.

Photo #11

View: Atop riprap dike south of bridge, looking north (upstream).

Photo #12

View: From edge of parking lot, view north to Hamlet Avenue and bridge.

Section 12: Villanova Street footbridge to site of Hamlet Dam. 700 feet.

Photo #13

View: View across broad trench, toward elderly housing on Clinton Street.

Photo #14

View: From same spot, looking in opposite direction, to St. Ann's Church.

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Photo #15

View: View from opposite side of river to upstream part of dam.

Photo #16

View: View from opposite side of river to downstream part of dam.

Section 12 (cont.): North of Conrail Bridge to Woonsocket line.

Photo #17

View: Water Street to north, near crossing with Canal Street.

Section 13: North Smithfield: Singleton & River streets north to Massachusetts

Photo #18

View: Canal Street, North Smithfield, looking north.

Photo #19

View: Canal Bed parallel to (and west of) Canal Street.

Photo #20

View: Canal bed parallel to (and west of) Canal Street.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

nationally statewide locally

Applicable National Register Criteria A B C D

Criteria Considerations (Exceptions) A B C D E F G

Areas of Significance (enter categories from instructions)

ARCHAEOLOGY
HISTORIC-NON-ABORIGINAL
COMMERCE
ENGINEERING
TRANSPORTATION
OTHER: Regional Development

Period of Significance

1824-1849

Significant Dates

10/7/28

Cultural Affiliation

Yankee, Irish

Significant Person

N/A

Architect/Builder

Hutchinson, Holmes (engineer)

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Blackstone Canal is a significant engineering accomplishment of the second quarter of the nineteenth century. As a technical feat, the canal was a product of the outstanding skills of the American engineering profession. Essentially an earthen structure supplemented with masonry, and with a system of forty-nine locks, numerous bridges, dams and other features, the Blackstone Canal was the last major canal to be begun in New England during this period. Remaining sections of the canal are significant in that they embody distinctive design, materials, workmanship and methods of construction typical of the time. These attributes are accessible for study both through visual observation and archaeological investigations. The preserved individual sections gain additional significance in combination with lost sections of canal. Together they chart the route of an important transportation corridor whose path reflects engineering decisions based on technology and topography. Further, the route selected had impacts on the areas through which it passed. Canal construction marked a critical transition period in the economic and social history of the Blackstone Valley in Rhode Island and Massachusetts. The canal is a major artifact of the "Age of Internal Improvements," a historic archaeological site and engineering structure that links the period of industrialization with the preindustrial era of maritime commerce and near-subsistence farming which preceded it. It carried the life's blood that enabled Providence to sustain its growth into one of nineteenth century America's great industrial cities. As a financial venture, the canal demonstrated the ambition and vision of the entrepreneurs of Providence, Worcester, and the country towns in between. As a social force, the canal brought the surrounding countryside into closer contact with the urban center of Providence, promoting development along its route and accelerating the shift in rural society from focus on small circles of friends and family into the larger and more impersonal

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realm of national and international commerce and politics. The canal also served to introduce ethnic diversity into the Blackstone Valley, through the Irish laborers hired during construction.

ARCHAEOLOGY

As it exists today, the Blackstone Canal is both an engineering structure and an archaeological site. The canal has the potential to provide information through archaeological investigations which can broaden understanding of aspects of its construction, maintenance history, and use. The presence and value of these data categories have been demonstrated on the Blackstone Canal by several recently completed archaeological studies; a wider range of possible categories is suggested by work undertaken on the Farmington Canal (Raber 1981, Connecticut Archaeological Survey, 1983). Techniques such as core sampling, prism profile measurements, and cross-section excavations can provide physical evidence of canal design elements and period construction methods which are not revealed in the documents. Comparison of different sections of the canal broken down by construction contract and topographical character may reveal much about patterns of engineering design and construction decisions on the Blackstone Canal, as well as providing data for comparison with other contemporary canals. Study of soil stratigraphies may also be fruitful in understanding the impacts of flooding, siltation, washouts and repair on the original canal contours. In addition, the remains of numerous features such as dams, culverts, and bridges which were not recorded in the surveys, but were undoubtedly constructed at many locations, may be present, buried under overburden and vegetation. Such was the case at Crook Fall Brook, where footings for a dam and bridge were found through archaeological excavations (Milner 1987). A complete picture of these kinds of features would add greatly to our understanding of the full scope of the water supply system developed for the canal and subsequently used by numerous valley industries.

Canal-related archaeological studies already conducted suggest that cultural material deposits associated with the people who constructed and operated the canal are unlikely to exist. There is no known documentary or physical evidence that construction workers lived adjacent to the canal site, although

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it is possible that some may have camped in the vicinity. The transient nature of human activity along the canal route, which consisted primarily of animal-drawn boats moving north and south, is expected to have resulted in few and sparsely distributed artifacts. A potentially important exception to this general rule may be at on- and off-loading locations, such as basins, and at the site of specific engineering features, such as locks. For example, period artifacts apparently do not exist (Hair 198_) at the Lime Rock Lot, where limestone concentrations resulting from in-transport stockpiling are visible on the surface, although the raw material itself is a valuable physical record of canal trade.

Land use, engineering, and hydrology, and to a lesser extent, canal-associated activities, are data base categories which can be fruitfully explored through archaeological research along the Blackstone Canal. It should also be recognized that the original character of the seventeen-mile Rhode Island stretch of the Blackstone Canal was not homogeneous. Variations among density and type of adjacent development, three basic construction frameworks--open river, canalized river, and canal trench--, topography within those frameworks, and implementation of over two dozen construction contracts resulted in a structure of considerable variability in many respects. This essentially variable character, along with differential preservation along the canal length, indicates that in the absence of a comprehensive archaeological survey, the archaeological potential of different sections should be considered complimentary and equally important, but not redundant.

ENGINEERING

Formulated by American engineers who had previously worked and been trained on the highly acclaimed and successful Erie Canal (partially open by 1819), the design of the Blackstone Canal drew on the most advanced survey and engineering techniques of the day. In the summer of 1822, the Blackstone Canal promoters engaged Benjamin Wright, chief engineer of the middle section of the Erie Canal, to undertake a topographical survey of the proposed route. The actual survey was conducted by Holmes Hutchinson of Utica, New York, another veteran of the Erie Canal, under Wright's direction. At about the same time, Wright's expertise was also the choice of the Farmington Canal Company in Connecticut. In both projects, the engineer responsible for the

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actual survey stayed on as chief engineer for construction, leaving Wright free to pursue new projects. With the assistance of the commissioners, Hutchinson assembled a team of assistant engineers: Richard S. Scott, B.G. Dexter, Edward N. Phelps, and Joseph D. Allen. In addition, others such as Elihu Ewers in Woonsocket; Wheeler Blanding, a Providence carpenter who built the lock and dam at the boat basin, and Warren Hatchellor, a Providence road-maker who constructed the basin causeway, performed many of the duties of an engineer in their capacity as construction contractors. Within this context, the Blackstone Canal reflects the early history of the American civil engineering profession in which individuals with little more than some knowledge of land surveying or related construction trade techniques developed their skills by working under seasoned engineers and learning from practical experience.

Construction of the canal relied predominantly on manual labor and on traditional techniques of earth moving and masonry work, yet lessons learned from recent canal construction projects were also incorporated. Although the canal proposal outlined by Wright and Hutchinson in 1822 had referred to wooden locks, it was decided in the summer of 1825 to forego the short term economy of the wooden locks for a more permanent system of stone locks. While the difference in cost was considerable (a stone lock cost around \$4000), the canal commissioners could not have been unaware of the problems of maintaining the wooden locks on the Middlesex Canal (completed 1803). One wooden lock was apparently constructed on the Blackstone Canal in Rhode Island, but it is not clear where it was built or why.

On the other hand, unlike the Farmington Canal, which was a totally artificial waterway designed to avoid problems in river navigation, the Blackstone Canal included both slackwater and canalized sections. Cost concerns as well as topography undoubtedly shaped these decisions. In the five-mile stretch between Providence and Scott's Pond, the engineers took advantage of the narrow Moshassuck River bed and transformed it into canal trench except where the river course was excessively circuitous. In the larger Blackstone River, the route was required to run in an excavated trench, in a channel separated from the river by embankment, or in the river itself. There is some evidence that final trench decisions were made following land acquisition. At Albion, the BCC apparently planned "to continue the trench down until it reaches the lock at the head of Wilbur Kelly's mill pond

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[at Ashton]" (Book of Locations and Appraisals, 1825-33, RIHSL); as constructed, however, this section ran in the river itself with the towpath on the west river bank.

In addition to inherent flaws in the canal's technical design which resulted in disruption of travel (too much water, caused by floods and freshets; too little water caused by droughts; and ice which could close the waterway from late fall to early spring) and occasional structural failure of canal components, the ultimate demise of the canal can be attributed in large part to operational constraints written into the charter at the instigation of lower Blackstone Valley manufacturers rather than engineering shortcomings.

COMMERCE

Trade

Ostensibly an engine of commerce, the Blackstone Canal was first projected by Providence merchants eager to secure new home markets in the fertile interior to supplement their maritime trade in Europe and Asia. By facilitating the trip back downstream to Providence, the canal also encouraged production for market among farmers and artisans who had hitherto been frustrated by the length, labor, and expense of overland travel on roads of poor quality. As John Brown, the Providence merchant, had pointed out as early as 1796, by lowering transit time and costs, the canal made it feasible to deliver bulky and perishable country produce to Providence, where it would be consumed or shipped to other markets. At the same time, boats travelling back up the canal would be delivering merchandise and raw materials imported through Providence from this country and abroad, goods that would be distributed from Worcester and smaller villages along the way. In the balance of trade, the traffic up the canal heavily outweighed the downward; between 1831 and 1835, the tonnage shipped to Worcester averaged 4348 tons and the tonnage in the other direction averaged 822 tons.

For the most part, cargo from Providence consisted of staple goods: flour, grains, molasses, and salt; and raw materials for manufacturing: coal, wool, iron, cotton, and oil. There were also small but significant amounts of provisions: dried fish, coffee, tea, sugar, spices, and liquor, as well as imported or

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manufactured goods: machinery, hardware, dyes and plaster. Items travelling back down the canal fell into the general categories of country produce: fruit, vegetables, butter, cheese, hay, cider, feathers, bark, and firewood. Manufactured goods included items that could be produced at home: boots, shoes, hats, combs, and baskets, as well as a wide range of other goods: beer, bread, casks, chairs, paper, shingles, wagons, farm and textile machinery, firearms, iron castings, wire, and cotton and wool cloth. In addition, some commodities, such as building stone and lime, were in demand up and down the canal. Evidence of the transport of lime on the canal is present at the Lime Rock lot adjacent to Martin's Way, Lincoln.

By drawing the back country into closer commercial ties with Providence, the canal furthered an ongoing process of economic change, ushering in the era of the market economy and supplanting the traditional household economy. These changes were most evident in the textile factories and other industries that proliferated in the Blackstone Valley by the 1810s. The textile industry, although it proved to be a powerful rival in the subsequent contests over river water rights, served as a strong impetus for the canal. The numerous mills located on the Blackstone and its tributaries formed one of a few significant concentrations of industry in the country and had considerable transportation needs. Raw cotton and wool, machinery and other materials had to be obtained, and the finished cloth had to be delivered to market. Canal promoters (many of whom, such as Brown and Ives, who owned Lonsdale, and Edward Carrington, who owned the Hamlet factory, were also investors in these factories) viewed the canal and industry as mutually beneficial allies. As a review of the canal boat lading lists reveals, the factories generated a large percentage of the canal's business. The textile manufacturers did not, however, find the canal to be indispensable; indeed for the whole of the canal's career, they often united in opposition against it over water flow rights.

Canal Financing

Despite the enthusiasm the canal generated and its initial successes, inadequate financing, a problem common to many canal ventures, was a constant threat to the BCC and investors. The major Providence canal promoters were Nicholas Brown, nephew of John Brown, his brother-in-law and partner, Thomas Poynton Ives,

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and Edward Carrington, all among the town's wealthiest men. As was traditionally the case in the society of maritime traders, the launching of a venture by major capitalists attracted the support of many other investors, both large and small. Investment capital was relatively plentiful at this time due to previous successes in overseas trade, and merchants were searching for places to put their profits. The town of Worcester also seems to have unanimously supported the canal, with its business and political leaders taking the initiative to promote it.

Throughout the twenty years of canal operation, BCC officers struggled to secure investors and lenders to defray the increasing debt. Upon completion of the canal, deficits came to more than \$100,000, including \$29,550 owed by delinquent stockholders and \$84,200 in cost over-runs. By the end of the 1830 season, although the floating debt was reduced to \$7,000, sources of credit in Providence were exhausted and attempts to negotiate loans in New York and Philadelphia had failed. The solution was creation of the Blackstone Canal Bank, an improvement bank, chartered in January, 1831, with a capital of \$250,000 of which \$150,000 was to be invested in the BCC. This influx of money alleviated the BCC's financial bind, and with what would turn out to be the peak toll income of \$14,944, allowed payment of the first dividends at \$1.00 per share, three years after the canal had opened. Yet, tolls and dividends declined steadily in the ensuing years, and in 1836 a last dividend of 20 cents was distributed. Doubts of the canal's ultimate prosperity caused the Blackstone Canal Bank to dispose of its canal stock in 1834. In subsequent years, tolls continued to fall as the Boston and Worcester Railroad secured more and more of the regional transport business.

Canal Boat Companies

In addition to operating the canal, the BCC was also a commercial carrier through its subsidiary, the Providence and Worcester Canal Boat Company. The Canal Boat Company, one of several individuals and firms which maintained one or more boats, initially had a fleet of eight freight boats and the passenger packet boat Lady Carrington. The fleet was expanded, but by 1849, when the canal ceased operations, had been reduced to only four vessels.

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TRANSPORTATION

The Blackstone River, fed by ponds and small streams, has its headwaters in the eastern uplands of Worcester County, Massachusetts. It makes its way south over rocky, hilly upland to the head of Narragansett Bay at Providence, Rhode Island, draining an area of 540 square miles, one third of which is in Rhode Island. To a large degree, the settlement pattern developed by the early colonists in the Blackstone/Narragansett region was dictated by the nature of transportation, which was determined in turn by the abundance of navigable waterways and the natural superiority of water transport in comparison with overland travel through the largely uncharted wilderness. The Blackstone River was, however, continuously navigable only as far north as Pawtucket Falls. The colonists readily adopted an existing network of Indian trails which ran generally east-west, following topography; yet overland travel was predominantly by foot and was slow, laborious and frequently hazardous. As the Providence and Plymouth colonies expanded northward, a system of roads developed running up the Blackstone Valley. These roads, though of typically poor quality, served wilderness settlers and helped foster the gradual growth of commercial ties between the nascent port of Providence and its forest-rich hinterlands. The earliest toll roads were constructed with the principal support of merchants seeking to improve commercial trade with inland areas. By the second decade of the nineteenth century, many of the same capitalists were building turnpikes to promote industry and to improve access to the rural textile factories beginning to proliferate in northern Rhode Island. While the turnpikes served as the major means of improving overland travel in the late eighteenth and early nineteenth centuries throughout the country, they were far from being a complete solution. As an investment, turnpikes were largely a disappointment. As a means of improving travel, they were only partially successful. While passenger transportation was generally facilitated, long-distance freight hauling was still onerous, time-consuming, and expensive.

In 1792, even before the first turnpike charter was granted, John Brown, the merchant who best epitomized the bold entrepreneurial spirit of the Providence traders, had already set in motion his plans for a different and more ambitious transportation scheme, a canal from Providence to the

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Massachusetts interior and on into New Hampshire. The grandiosity of this idea, known as the Providence Plantations Canal, is particularly striking in that no canal of any length had yet been built in North America.

Despite the support for the canal generated in Providence and Worcester, there was serious opposition elsewhere in Massachusetts; the merchants of Boston and Springfield recognized the canal proposal as a direct threat to their established trade with the interior. Consequently, all efforts to secure a charter proved futile. During the next quarter century, while the canal idea lay dormant, farmers and artisans continued to make their way over the same rough and unimproved roads or on turnpikes where they were available and affordable. Providence merchants persisted in searching for ways to sustain their economic growth, a search that increasingly led them from maritime trade to the new field of textile manufacturing. As a result of textile expansion, the Blackstone Valley was on the verge of a major economic and population explosion by the early 1820s. An 1825 survey of valley traffic revealed that over 20,000 tons travelled between Worcester County and Boston and Providence annually, at an average distance of thirty-five miles. Traffic up and down the valley between Rhode Island and Worcester County accounted for 10,000 tons, over an average distance of about twelve miles.

Thus, once canal construction was initiated elsewhere in the country, the local climate was primed for renewed interest in a Blackstone Valley canal; inland navigation had come to be viewed as a viable and preferable alternative to the difficulties, inconvenience, and expense of overland travel.

Once completed, the canal did reduce inland transportation costs dramatically. In Worcester, for example, there was a savings of \$1.80 per ton on goods shipped from Providence by the canal, over those carried by road from Boston. It became cheaper to transport goods from Boston to Worcester by shipping them on sloop and canal boat via Providence, than to carry them the shorter distance overland. It was even 25% cheaper to ship merchandise from Worcester to New York by the canal, Narragansett Bay and Long Island Sound than to transport it to Boston by wagon. This reduction in transportation costs gave a major impetus to trade and manufacture throughout the valley, encouraging farmers, craftsmen and capitalists alike.

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Continuation SheetSection number 8 Page 8.10

The canal was less successful as a mode of passenger transportation and never effectively competed with the stage coaches, although the BCC's flagship, Lady Carrington, was primarily a passenger boat. Seasonal and daylight-only operation, water level fluctuations, and periodic closures due to structural failures such as lock breakage and washouts no doubt were factors.

Patterns of development that canal transportation did much to foster were largely sustained rather than disrupted by the subsequent construction of the Providence and Worcester railroad; the railroad followed essentially the same route up the river valley. Significantly, the railroad corporation organizers included earlier canal backers, as well as Blackstone Valley manufacturers, a fact that testifies to the prevailing faith in the value of a transportation route up the valley. It was not until the advent of the automobile in the twentieth century that marked changes in transportation corridors occurred, significantly altering patterns of development in the valley.

IMPACTS ON REGIONAL DEVELOPMENT

Throughout the Blackstone Valley region, introduction of the canal brought economic and social changes. The canal brought a more localized prosperity to the villages it touched directly,, through the disbursement of money by the BCC during construction, the influx of tradesmen taking advantage of the canal commerce, and the appreciation of property values. In Providence, for instance, over five hundred laborers, exclusive of artisans, worked on the canal at one time and the wages they earned and spent generated a great deal of business in the town. The construction of the canal basin in the Providence Salt Cove and the ensuing canal traffic led to the rapid development of a commercial district of wharves and storehouses on adjacent Canal Street. The canal's effect on the inland community of Worcester was similar, and perhaps greater.

In between the two largest and terminal towns, the same process occurred on a smaller scale, creating or expanding villages and causing appreciations in land values. As early as 1825, the Providence newspapers began reporting cases of property value increases to as much as five times their previous worth. Although settlements in the valley grew more like individual

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beads on the necklace of the river than the continuous band canal promoters envisioned, they were transformed from isolated hamlets into prosperous components of a thriving regional economy. Existing factories, such as at Ashton and Manville, were improved; isolated mill seats attracted developers; and in some cases, such as at Lonsdale, Hamlet, and Waterford, the higher water levels associated with the canal itself created manufacturing opportunities where none had existed before. Perhaps the greatest universal benefit was the system of reservoirs built by the canal, which helped regulate the river's flow year round, thereby eliminating some, if not all, of the manufacturers' low water problems even after the canal closed. Manufacturers also adapted sections of the canal trench itself for use in their water power systems.

With this economic change came social change as well, as the disruption of subsistence farming and production for home consumption led to the displacement of the home as the production center and the family unit as the basic labor force. The canal also brought new population to the valley. Irish laborers who worked on canal construction and stayed to farm or work in the textile industries brought their own cultural heritage and customs to the valley communities. Many of the traders and boatmen who operated on the canal came from areas outside the region, such as New Hampshire and Vermont.

In summary, although the Blackstone Canal proved to be a significant failure for its investors, and perhaps something of an anachronism as a transportation system, as one contemporary writer expressed it, the canal was "more useful to the public than to the owners," and the capital invested by the stockholders in many ways served as seed money for subsequent development in the Blackstone Valley.

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Section number 9 Page 9.1

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Section 1

A 19/299810/4634580
B 19/299710/4633220

Section 2

A 19/300180/4636080
B 19/299980/4635920

Section 3

A 19/300220/4638100
B 19/300360/4637400

Section 4

A 19/300210/4640400
B 19/300310/4638550

Section 5

A 19/300240/4640680
B 19/298020/4645800

Section 6

A 19/298020/4645800
B 19/296780/4646940

Section 7

A 19/296480/4647420
B 19/296680/4647050

Section 8

A 19/295770/4648390
B 19/295910/4647810

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Section 9

A 19/293620/4650720
B 19/294840/4649580

Section 10

A 19/293580/4651120
B 19/293620/4650980

Section 11

A 19/293060/4652960
B 19/293100/4652890

Section 12

A 19/292500/4653250
B 19/292820/4653220

Section 13

A 19/290010/4654300
B 19/290420/4653760

Feature 1

A 10/298660/4643820

Feature 2

A 19/298370/4644280

Feature 3

A 19/298360/4644560

Feature 4

A 19/298360/4644760

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Feature 5

A 19/298220/4645350

Feature 6

A 19/297000/4646770

Feature 7

A 19/293870/4650190

Feature 8

A 19/293610/4661040

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Verbal Boundary Description

The east and west boundaries are generally defined by the actual physical edges of canal bank, towpath berm, and, where applicable, basin or other feature. They include the entire area of earth or masonry structure, thus extending to the toe of a towpath berm slope, for example. They also include areas of both land and water known to have been used in canal operations. Thus in sections of slackwater with preserved towpath, the eastern boundary runs in the river, 15 feet from the east towpath bank. In canalized sections, the basic boundary dimension is defined by the combined standard canal prism (34 feet) and towpath (10 feet) widths, with allowance of 6 feet for towpath berm slopes, or 50 feet. The actual boundary dimension, however, varies with actual canal dimensions in a given section; see Section 7.

Boundary Justification

Due to the nature of historical documentation and maps, the precise historical boundaries of the canal are difficult to determine. Descriptions of land acquired along the route contained in the Blackstone Canal Company's Locations and Appraisals Book, 1825-33 (RIHSL Collections) indicates that the width varied considerably, ranging generally from 33 feet (50 links) to 99 feet (1.50 chains), but in places was as little as 19 feet or as much as 132 feet across. Engineers' reports and construction contracts defined general range and standard dimensions for the canal prism, towpath, locks and other features, and the Edward Phelps survey map of 1828 delineated the canal as constructed at a scale of one inch to 200 feet. Nevertheless, because actual canal construction entailed incorporating natural topographic features and involved in-the-field decisions by a number of construction contractors, it is likely that the final dimensions varied within, and may have occasionally extended beyond, the established parameters. In addition, the physical remains of the canal have been shown to include subsurface archaeological features which may not be readily identified through historical research and visual observation.

Consequently, the nominated boundaries of the Blackstone Canal have been drawn to encompass the entire constructed resource to the extent that it is historically documented and

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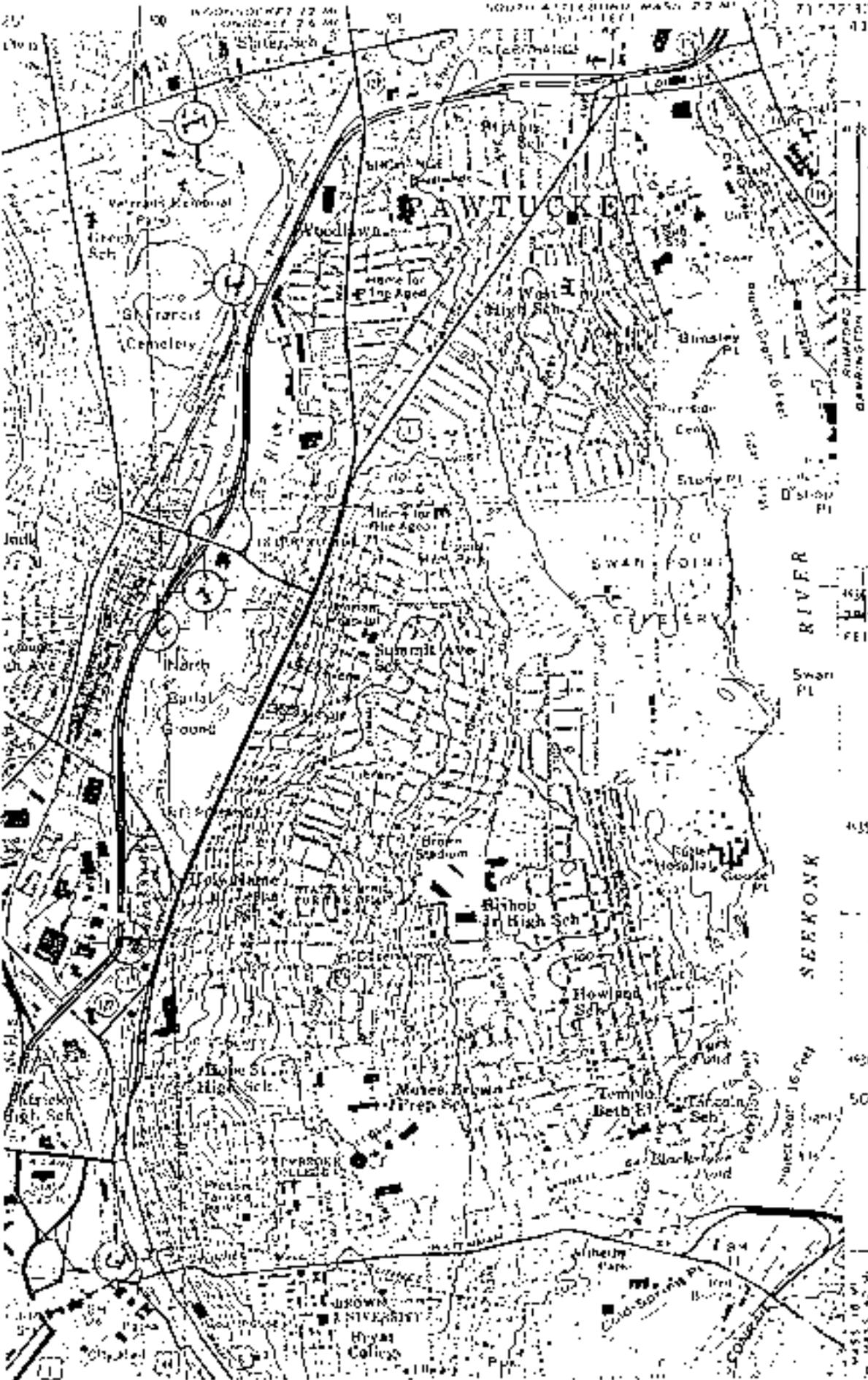
Section number 10 Page 10.5

known at present and to minimize inclusion of peripheral lands not directly associated with the canal. The south and north boundaries of the canal are defined, respectively as Promenade and Steeple Streets, Providence, and the North Smithfield, Rhode Island/Blackstone, Massachusetts, political boundary. These locations mark the linear extent of the Rhode Island portion of the canal.

PROVIDENCE QUADRANGLE
RHODE ISLAND
7.5 MINUTE SERIES (TOPOGRAPHIC)

SECTION 16
MAPLEBORO

Blackstone Cas.
Rhode Island



Section 3
A 19-300220-4638100
E 19-300360-4637400

Section 2
A 19-300180-4636090
E 19-299990-463592

Section 1
A 19-299810-463450
E 19-299710-463320

Blackstone Canal
Rhode Island



Section 5

Section 5
B 19-300240 - 46406.8

Section 4
A 19-300210 - 4640400

B 19-300310 - 463855

PAWUCKET, R. I. MASS
184152 5-47127 5/15

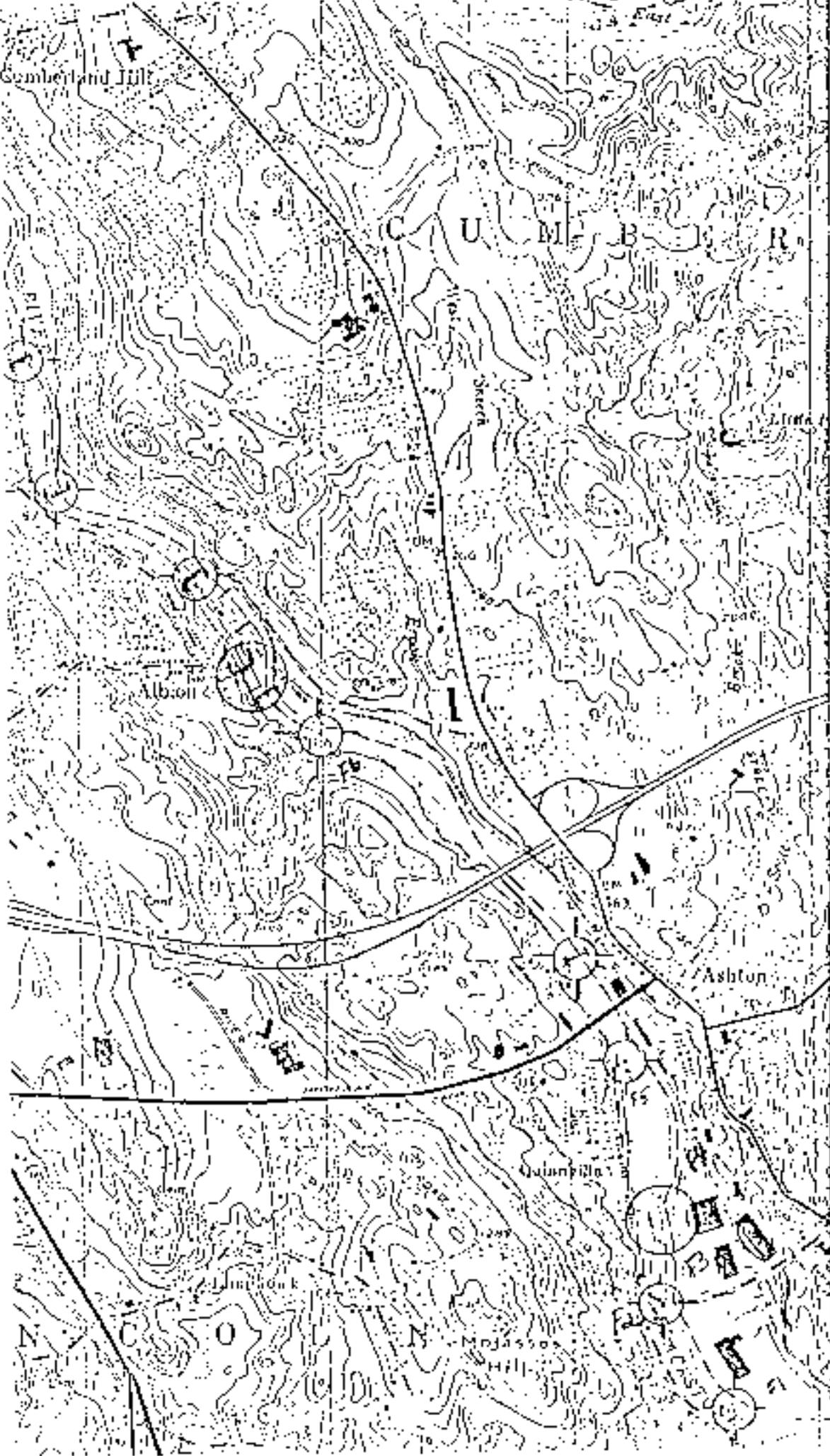
ROAD CLASSIFICATION

Heavy duty	—————	4.000 - 6.000	Light duty
Medium duty	—————	2.000 - 4.000	Unimproved dirt
U.S. Route	□	State Route	○
Intersecting Road	⊥		

NOTES: (1) This map is based on aerial photographs dated 1949. This information was field checked and found to be correct as of the date of publication.

1949
PUBLISHED BY THE U.S. GOVERNMENT PRINTING OFFICE
GPO: 4767 IN. HWY. STATION 1815

Blackstone Canal
Rhode Island



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SECTION 4
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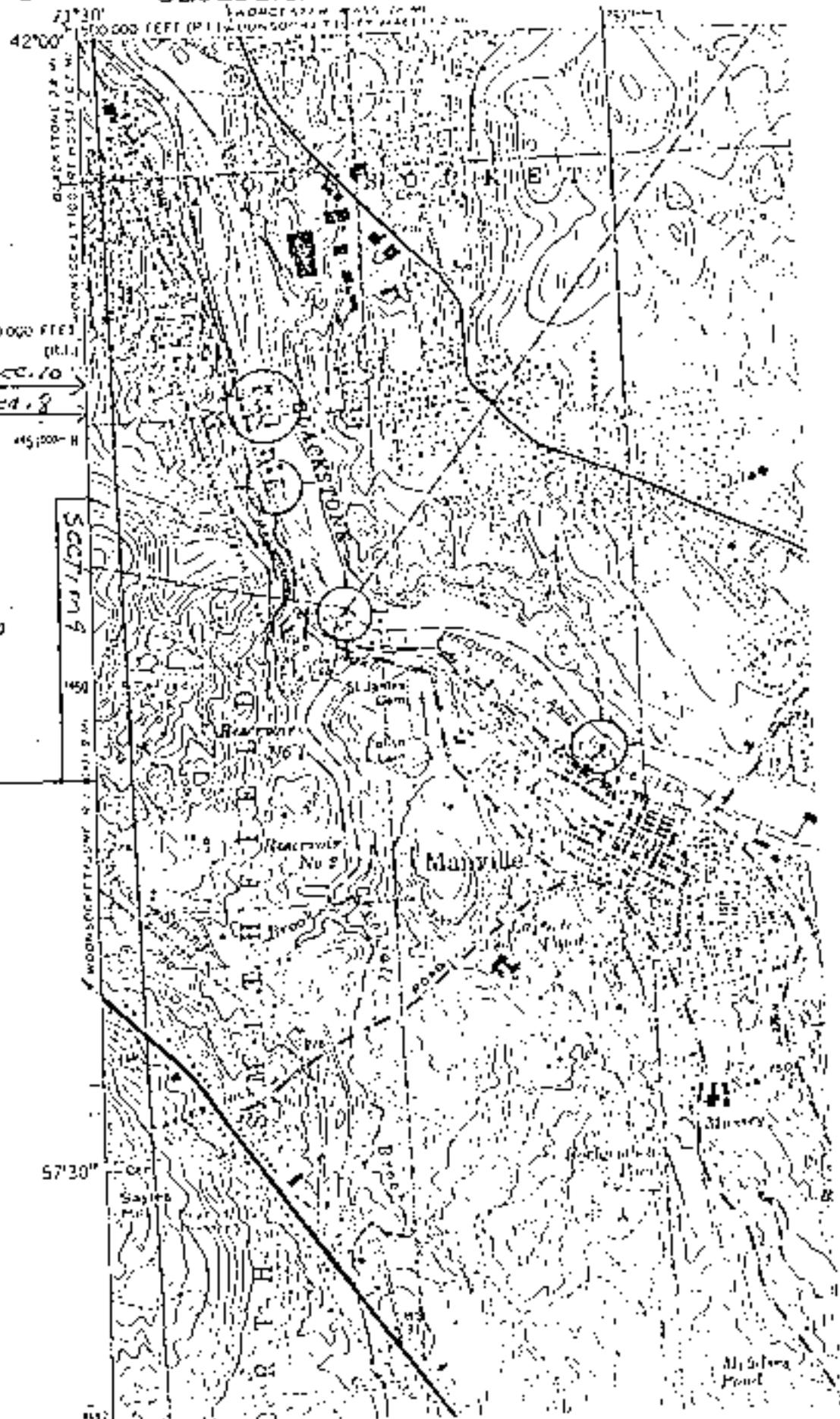
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- B 19-298020-464580
- F 5 A-298220-4645
- F 4 19-298360-464476
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- F 1 19-298660-46438

Blackstone Canal
Rhode Island

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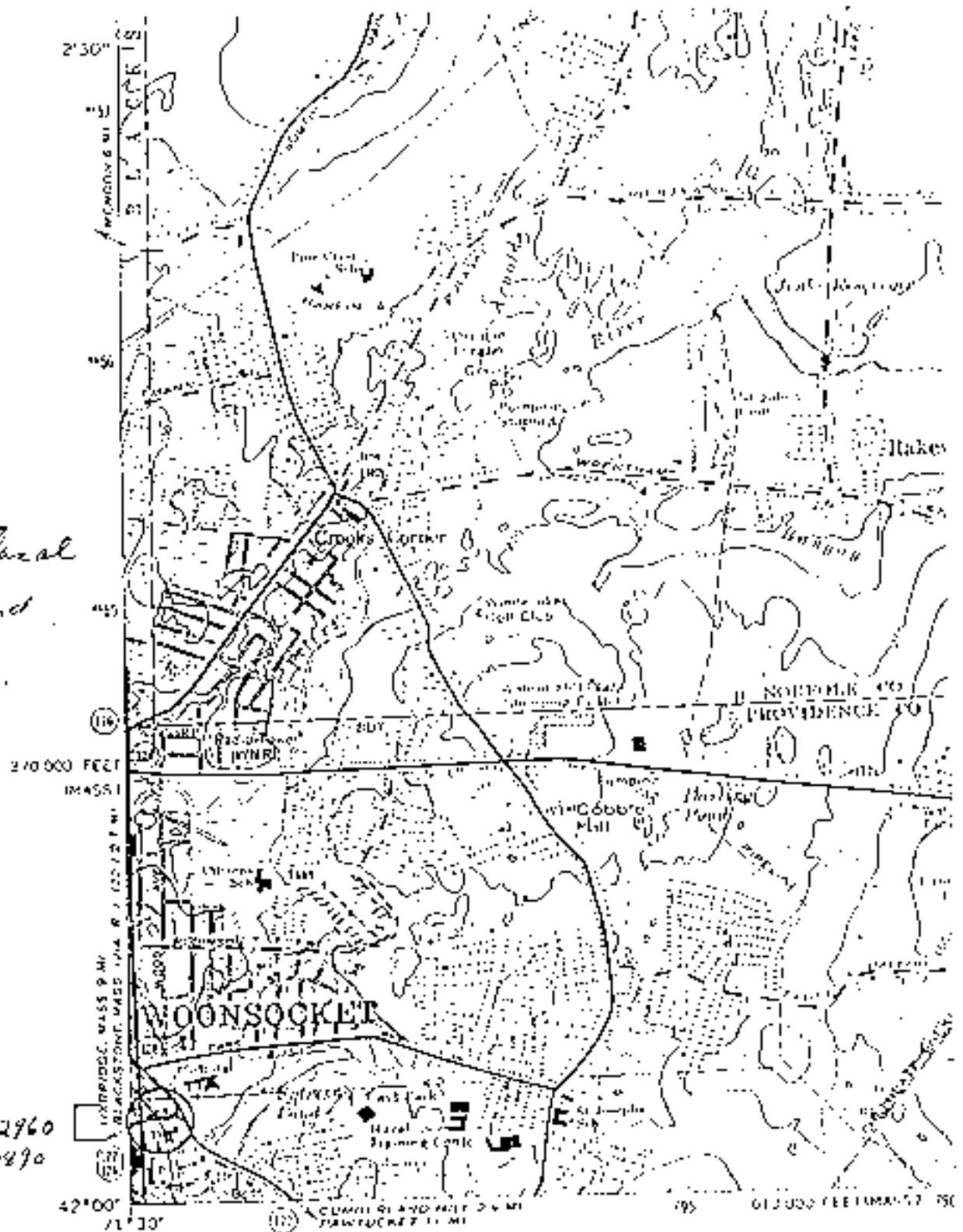
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Section 10
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B 19-293620 - 4650970
19-293600 - 4651040
Section 9
A 19-293620 - 4650720
Feature 7
19-293870 - 4650190
319-294840 - 4649580



*Blackstone Canal
Rhode Island*

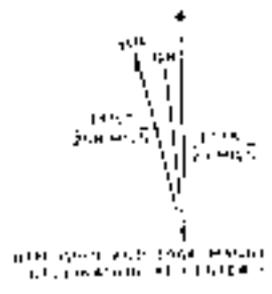
*section 11
A 19-293060-4652960
B 19-293100-4652970*



GEOGRAPHICAL
MAP 1:100,000

Compiled, edited, and published by the Geological Survey
Control by USGS, USCGS, and Massachusetts Geologic Survey
Topography by stroboscopic surveys 1938-40. Revised 1964
Polyconic projection. 1927 North American datum.
10,000-foot grid based on Massachusetts coordinate system
mainland zone and Rhode Island coordinate system
1000 meter Universal Transverse Mercator grid lines
zone 19, shown in blue

Thin red dashed lines indicate selected fence and field lines, all of which
generally visible in aerial photographs. They represent a scale of 1:100,000.
Red tint indicates areas of relatively high density of buildings and other
structures.



NOTE: THIS MAP IS A REPRODUCTION OF A MAP
PUBLISHED BY THE GEOLOGICAL SURVEY

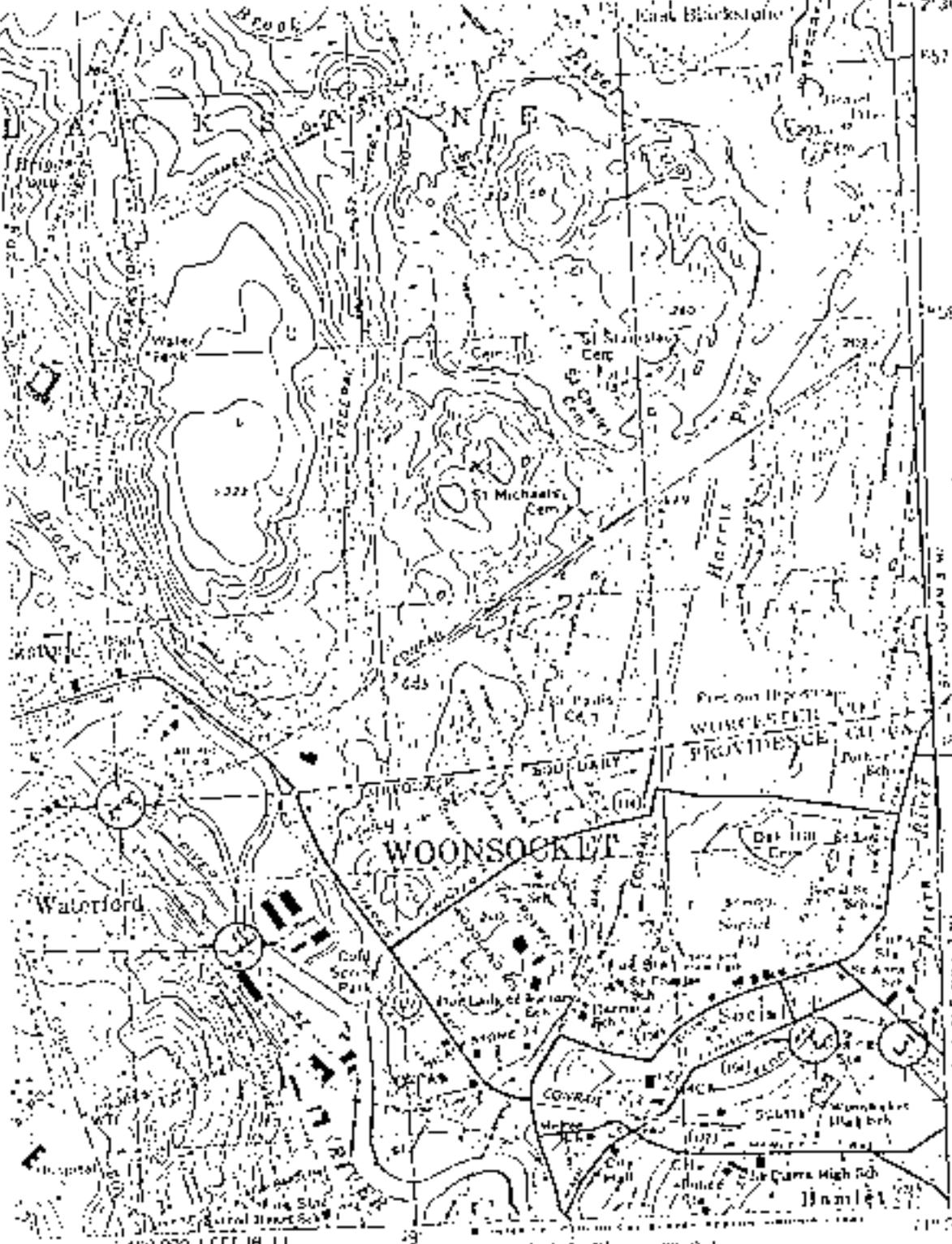
1	1500
2	1000
3	500
4	200
5	100
6	50
7	25
8	10
9	5
10	0

Isogonals based on datum
NAD 83
Horizontal scale by lat
and long is 1:25,000

*Blackstone Canal
Rhode Island*

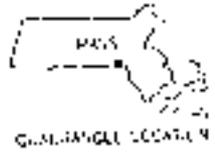
Section 1
A 19-29000 - 46543.0
B 19-29040 - 46537.6

Section 2
A 19-294300 - 4653.2
B 19-292720 - 4654.7



ROAD CLASSIFICATION

- Primary highway, all weather, hard surface
- Light duty road, all weather improved surface
- Unimproved road, fair or dry weather
- State Route



BLACKSTONE, MASS. - R. I.
H4201 1071 1077 5

This map was compiled in cooperation with State of
Massachusetts from aerial photographs taken 1977 and other
data. This information not field checked. Map edited 1979

1969
PHOTOREVISED 1979
AMS 6458 II SE - SERIES 4411

Appendix G

2003 Blackstone Canal Assessment Study (Public Archaeology Laboratory, Inc.)

BLACKSTONE CANAL SECTION 13, North Smithfield, Rhode Island

National Register of Historic Places Status

Section 13 of the Blackstone Canal is located in North Smithfield, RI, and is an approximately 2,200 ft long section of canal located between the Blackstone, MA, state line and Singleton Street in Woonsocket, RI. In 1991 Section 13 was included in the National Register of Historic Places Nomination (NR) for the entire Blackstone Canal in Rhode Island (Fitch 1991). This section number was assigned for the purposes of the NR, and is not a historical designation.

Location and Setting

Section 13 of the Blackstone Canal is located in the historic textile mill village of Waterford in the northeast corner of North Smithfield, RI. Waterford is located in a roughly 2,000 ft by 3,000 ft rectangular eastward projection of North Smithfield bordered by Blackstone, MA, to the north; Woonsocket, RI, to the south; and that city and the Blackstone River to the east. The western half of this approximately 140-acre area slopes gently to the east and contains the gridded street pattern of the village of Waterford. The east half of this area contains five, roughly parallel, prominent, linear, man-made and natural features. From west to east these are the active mainline of the Providence & Worcester Railroad ("P&W"), the remnant watered Section 13 of the Blackstone Canal, Canal Street, the tailrace for the former Mammoth Mill, and the west bank of the Blackstone River. The P&W right-of-way is a flat linear shelf cut into the top of the Blackstone River terrace. East of the railroad tracks the land drops off steeply to Section 13. The Rhode Island section of the canal extends from the state line to the north to a point approximately opposite the Singleton Street Bridge over the Blackstone River to the south. The east edge of the canal is confined by a raised earth and stone walled embankment carrying Canal Street between Blackstone, MA, to the north and Woonsocket, RI, to the south. On the east side of Canal Street, roughly 300 ft south of the state line, Mill Street extends northeast from Canal Street forming a small triangular area containing historic worker housing. South of Mill Street lies the Mammoth Mill millpond, an approximately 250 ft diameter shallow body of water. Immediately east of the millpond is the rectangular ruined foundation of the Mammoth Mill, which includes granite block raceway arches, walls, and breast wheel axle shaft bearing pockets. East of the mill ruins, the mill tailrace curves east and south to the Blackstone River at the extreme southeast corner of Waterford. South of the millpond, the east side of Canal Street serves a waste recycling facility and an automobile salvage yard.

1828 Phelps Map Description

Blackstone Canal Resident Engineer Edward N. Phelps's 1828 *Map of the Blackstone Canal and its Appendages* includes Section 13 of the canal (Phelps 1828) (Figure 1). This map was drawn at a scale of 200 ft to the inch. This description follows the flow of water in the canal from north to south. This section of the canal began approximately 800 ft north of the state line in Blackstone, MA, where water was diverted southeast (downstream) into the canal from the south side of the Blackstone River. The towpath was located on the east side of the canal in this section. The canal proceeded approximately 400 ft southeast to a road bridge at or near the current location of the St. Paul Street Bridge, and then extended southeast approximately 400 ft more before crossing the state line into Rhode Island about 200 ft south of where the Canal Street railroad bridge now

stands. Approximately 850 ft downstream of the St. Paul Street bridge location, on the east side of the canal, was a towpath bridge over an outlet feeding the mill pond for Welcome and Darius Farnum's "Green Mill," later used for their subsequent "Mammoth Mill." The oval pond measured approximately 250 by 350 ft. The Green Mill raceway exited the north end of the pond, passed through a gate structure, flowed north and east through the mill, and then flowed southeast in a long tailrace trench back into the Blackstone River. On the canal, just southeast of the millpond outlet, was an approximately 100 ft long canal boat landing basin with two small wharf or dock structures. Southeast of this basin the canal widened, expanding to the southwest in a lenticular pool, or basin, approximately 900 ft long. The canal then narrowed for approximately 250 ft, passed the 17 Mile Marker, and widened out again in an approximately 550 ft long basin. At the downstream end of the basin, a short channel straddled by a small structure, possibly a gatehouse or small mill, connected the canal with the Blackstone River at the approximate location of the current Singleton Street Bridge. The canal then flowed southeast into and across the Blackstone River.

Canal Site History

Waterford Mills

In 1808 the Blackstone Manufacturing Company constructed a large mill complex in the area located between present-day Main Street and the Blackstone River in Blackstone, MA. This event prompted the construction of additional mills in the area. In 1825 Welcome (1795-1874) and Darius D. (1798-1840) Farnum constructed a cotton spinning mill in the meadow bounded by the present-day St. Paul and Canal streets, where the Blackstone Municipal Building now stands. This mill, known as the "Red Mill," spawned the development of the village of Waterford. Welcome Farnum influenced the routing of the Blackstone Canal through Waterford to serve his mills. In 1828 the Farnums built the nearby "Green Mill," on what is now Mill Street, for manufacturing cotton warps. Its water supply was integrated into the canal infrastructure. The Blackstone Canal Company had raised the height of the Blackstone Village dam upstream of the mill to feed water into the canal. The canal, now higher than the river, was diverted into the Green Mill millpond (Greenwood 1984:53,99). In 1836 the Farnums completed their most ambitious mill project, a 400 ft by 51 ft, 5-story mill in Waterford. This mill was called "Mammoth Mill" as it was reportedly the largest of its kind in the country at the time of its completion. This mill was powered by the same system that powered the Green Mill, with diverted canal water passing under Mammoth Mill through three trenches and powering three large breast wheels. The Farnums manufactured woolen goods after 1840. Mammoth Mill burned in 1864, and was immediately rebuilt with only four stories on a 350 ft by 50 ft footprint. An atlas detail of Waterford shows the configuration of watercourses and transportation routes in 1895 (Figure 2). By that time the Blackstone Canal extended only as far as the approximate location of the Singleton Street Bridge. The millpond and Mammoth Mill, then owned by the Blackstone Woolen Company, are shown southeast of the Canal Street/Mill Street mill housing cluster. The P&W tracks, including a roundhouse and turntable, are located west of and parallel to the canal. The second incarnation of Mammoth Mill operated as the Saratoga Mills of the American Woolen Company Division during the early part of the twentieth century. It closed in 1929 and was demolished about 1930 (Blackstone Historical Commission 1996:21-31; Hurd 1889:610-611; RIFPC 1980:9,39-40).

Existing Conditions Description and Canal Remnants Interpretation

The remnant Section 13 of the Blackstone Canal within North Smithfield, RI, is approximately 2,200 ft long, and is parallel to and west of Canal Street. The contours of the canal appear little changed from the 1828 Phelps map. This section of the canal is frequently watered for its entire length by overflow water from the Blackstone River and from a storm drain at its south end, however diversion of water to the river has lowered the historic water level. The canal enters Rhode Island from the north and has earth banks until it reaches an early twentieth century concrete Canal Street culvert feeding the former Green Mill/Mammoth Mill millpond to the east. All of the canal water now flows east through this culvert, into the millpond, through the south raceway in the Mammoth Mill foundation ruins, and south back into the Blackstone River via the original tailrace trench. On the canal, immediately downstream from the Canal Street millpond culvert, is an opposed pair of rough fieldstone abutments supporting a narrow water control flashboard structure consisting of two parallel concrete channel walls with vertical flashboard grooves. This structure appears to have been installed after the canal was closed to transportation to regulate the flow between the north and south halves of the canal section. The section of Canal Street between the canal and the adjacent millpond to the east is raised approximately 6 ft above the water level of the canal on an earth filled causeway with dry laid fieldstone retaining walls. These walls include stubs of round wrought iron railing posts secured with poured lead that appear to date from the mid to late nineteenth century. In this vicinity and to the south the canal retains its original contours, including the two wider basins separated by a short section of canal prism. This watered section of the canal ends at an earth fill flood control berm opposite the Singleton Street Bridge over the Blackstone River. Water enters the canal from a large concrete storm drainpipe extending from the face of the flood control berm. An exposed cylindrical concrete manhole structure located uphill to the west suggests that the concrete pipe may be part of a storm drain system. The canal has been filled south of this location, where a small tank farm and brick industrial buildings are built on the Canal bed. There are no surface remains of the historic channel that connected the canal near the current Singleton Street Bridge, the 17 Mile Marker, the Mammoth Mill millpond inlet towpath bridge, or the small oval landing basin with the rectangular wharf or dock structures that are indicated on the 1828 Phelps map.

Interpretive Themes and Potential

Section 13 of the Blackstone Canal has potential for interpreting several historical themes associated with the canal. This section is still watered and retains its original contours, although the water level fluctuates seasonally. This relatively high degree of integrity offers potential for interpreting the construction and operation of the canal itself. This section of canal is unusual as it was integrated into industrial waterpower infrastructure as part of its original construction. The Mammoth Mill ruins and associated Canal Street culvert, millpond, and canal water flow control structure together with the canal itself have potential to interpret the use of the Blackstone Canal for industrial waterpower.

Additional Historic Transportation Features for Possible Interpretation

Section 13 is adjacent to several historic railroad resources located in Massachusetts and Rhode Island. In Massachusetts, the right of way of the New York & New England Railroad sweeps within 200 ft of the Rhode Island State line. This right-of-way includes two National Register of Historic Places-listed structures, the multiple concrete and stone arch Blackstone Viaduct

(Kierstead 2000), and steel deck girder Canal Street Bridge crossing the Blackstone Canal (a contributing element in the Massachusetts Blackstone Canal National Register Historic District (Fitch 1991)). At the west end of the Canal Street Bridge are the remains of a steam locomotive water tower consisting of a cruciform plan arrangement of twelve square cut granite footings with chamfered edges. On the Rhode Island side of the state line, west of the P&W tracks, lies the overgrown and partially filled circular granite block and concrete pit for a steam locomotive turntable. This facility included a multiple stall semi-circular engine house (see Figure 2). This section of the railroad right-of-way also includes several stone culverts carrying small streams under the track embankment. These railroad-related resources have potential to interpret the shift from the importance of the Blackstone Canal to its replacement by the parallel P&W, the importance of the Blackstone/Waterford area as a railroad junction, and railroad infrastructure including bridges and steam locomotive servicing facilities.

BLACKSTONE CANAL SECTION 9, Lincoln, North Smithfield and Woonsocket, Rhode Island

National Register of Historic Places Status

Section 9 of the Blackstone Canal is an approximately 1.5 mile long section located on the west bank of the Blackstone River in Lincoln, North Smithfield and Woonsocket, Rhode Island. This section begins approximately 300 ft south of the Woonsocket Water Treatment Plant and ends approximately 1,400 ft north of the Mansville Dam. Section 9 was listed in the National Register of Historic Places (NR) in 1986 (Parrington 1986). In 1991 it was included in an NR for the entire Blackstone Canal in Rhode Island (Fitch 1991). The section number was assigned for the purpose of the 1991 NR, and is not a historical designation.

Location and Setting

Section 9 of the Blackstone Canal lies between a point 300 ft south of the Woonsocket Water Treatment Plant and 1,400 feet north of the Mansville Dam. The Woonsocket segment begins at a point 300 ft south of the Woonsocket Water Treatment Plant and extends approximately 1,500 ft south to the southern boundary of the city of Woonsocket. Here a small, approximately 150 ft long segment of canal is located in North Smithfield. Through these segments the canal is parallel to Mansville Road, and is located in a swampy backwater in a westward bend of the river, with a steep hill and rocky cliffs to the west. At the south end of the North Smithfield segment, Crookfall Brook, which forms the north-south boundary between the town of North Smithfield and Lincoln, crosses the canal and meets the Blackstone River. South of this point the Lincoln segment is located in a narrow, wooded strip of land at the bottom of the west river terrace, between the P&W Railroad tracks to the west and the edge of the Blackstone River to the east.

1828 Phelps Map Description

Blackstone Canal Resident Engineer Edward N. Phelps's 1828 *Map of the Blackstone Canal and its Appendages* shows Section 9 of the canal (Phelps 1828) (Figure 3). This description follows the flow of water in the canal from north to south. The towpath was located along the west side of the canal for the entire length of Section 9. This section began at a point south of where the Woonsocket Water Treatment Plant is located today, where the canal crossed a marshy meadow

at the foot of high cliffs to the west. In this area the canal crossed this meadow on an earthen embankment, passing the 13 Mile Marker and a culvert that ran beneath the canal. Approximately 1,000 ft south of the culvert, within land owned by David Wilkinson, the canal crossed Crookfall Brook on a towpath bridge on the west side of the canal. Here a dam on the brook diverted water into the canal. South of this structure the canal rejoined the west bank of the Blackstone River. At that point the canal was on the west riverbank and continued south, following a broad westward curve of the river. From that point the canal trench then continued south through alluvial sediments deposited on the inside of a broad eastward curve for approximately 2,000 ft, to the south end of Section 9 where the east canal berm met the west edge of the Blackstone River. South of Section 9, in Section 8, the canal ran along the west edge of the river for approximately 300 ft, separated from the river by the east canal berm. The canal then left the river approximately 800 ft north of the dam, at a slight westward bend of the river at Mile Marker 12. It circumvented the milldam at Manville via a series of locks on the west side of the river, and reentered the river.

Canal Site History

Construction and Operation

Section 9 of the Blackstone Canal did not include any locks. For much of its length south of Crookfall Brook, the canal trench was cut into the river terrace, and the excavated material was heaped up on the east side to form a berm. Although placement of the towpath on the west side of the canal required more slope modification, it allowed easier transition to slack water navigation at the Manville Dam to the south and the Mott Dam to the north. Section 9 did incorporate unusual engineering features. In the Crookfall Brook area the canal route had to pass through an area where high cliffs fell to a swampy meadow in a westward bend in the river. The engineering solution in this area was to place the canal in a raised earth embankment across the meadow, essentially running it between two parallel earth berms or embankments. This type of construction had not been identified elsewhere on the Blackstone Canal at the time this section was listed in the NR in 1986 (Parrington 1986). Another unusual feature was the dam and bridge at Crookfall Brook built by David Wilkinson. The dam was built to divert the flow of the brook to feed the canal, raising the water level to compensate for the loss of water in this section at the downstream locks. The dam included a bridge to carry the towpath over the brook on the west side of the canal (Parrington 1986).

Historical records indicate that the section of the Blackstone Canal between Mott Dam and the locks below the Manville Dam was associated with control of industrial waterpower at mills below the Manville Dam. In 1821, William Jenkins and Samuel Mann purchased the land and water rights of the Unity Company, which had a textile mill in Cumberland opposite what would become Manville. In 1836 the Jenkins and Mann Company purchased land at the Mott Dam and entered into a maintenance and water usage agreement with the Blackstone Canal Company (Tidwell and Morenson 1988:17,14,26-27). The series of textile mills constructed at Manville were located on the east, Cumberland, side of the river, and it is likely that the canal flowage agreements were associated with balancing canal flow with mill pond height and not for water power.

Providence & Worcester Railroad

By the mid-1830s, after only two decades of operation, the Blackstone Canal was outstripped by a new rival transportation technology, the railroad, which was then serving both Providence and Worcester on east-west routes. In 1836 Providence interests planned to construct a railroad to Woonsocket in order to counter a proposed route from Boston. By the following year, the plan evolved to include a route continuing up the Blackstone Valley to Worcester. The plan was not pursued at that time because of opposition from Woonsocket, but by the early 1840s that city's manufacturers realized the need for a railroad. In 1844, the Providence & Worcester Railroad (P&W) was chartered to connect its namesake cities, and the last round-trip canal boat over the entire length of the canal was made the same year. Chief Engineer I. Willis Pratt surveyed a route passing through Pawtucket and Valley Falls that joined the canal route on the west side of the Blackstone River at Albion. The Massachusetts section of the P&W opened in 1847. The last Blackstone Canal boat trip toll was collected in November 1848, on a round-trip between Providence and Woonsocket. After the canal closed, Rhode Island property that had been taken by the Blackstone Canal Company by eminent domain was returned to its original owners and property that had been purchased was sold at auction. The P&W purchased some sections for its right-of-way. By September of 1847 the railroad was open between Providence and Woonsocket (Karr 1995:140-142, Morenon and Raber 1989:64-65, Parrington 1986).

Section 9 of the Blackstone Canal was impacted by the construction of the P&W. The railroad built its tracks in or near the canal bed for much of its length in this section. Track bed construction and maintenance overlapped and widened the canal towpath and encroached on the trench, raising and obscuring original canal surfaces between Manville and Crookfall Brook (Morenon and Raber 1989: 123). The railroad structure saw continued modifications and upgrading. The entire line was double tracked, with the Rhode Island portion completed by 1869. This project included curvature reduction. In Section 9 the second track was installed west of the first one. In 1963 the east or original track was removed. In 1873 the P&W Directors reported that because of the poor quality of construction, nearly all of the original stonework was in need of replacement. Wood bridges were replaced with iron ones starting in the 1880s. The railroad used granite milepost markers to identify all culverts and bridges by portions of miles distance from Providence. At MP 13.74, the bridge over Crookfall Brook was rebuilt in 1875 and again in 1913, and at MP 13.87, the bridge just north over a "dry brook" was rebuilt in 1875 and again in 1903 (Morenon and Raber 1989:65-69, 117).

Existing Conditions Description and Canal Remnants Interpretation

Section 9 of the Blackstone Canal begins at a point approximately 300 ft south of the Woonsocket Water Treatment Plant in a tongue of alluvium. South of this point the canal trench swings out into a watered meadow between two parallel earth berms. These parallel berms are breached in two places. At a point approximately 900 ft north of Crookfall Brook they are breached at what may have been the site of the culvert at the 13 Mile Marker located approximately 1,000 ft north of Crookfall Brook on the 1828 Phelps map. The canal 13 Mile Marker at the culvert location is no longer extant. South of this point the berms are relatively intact to Crookfall Brook, which now flows under the P&W and into the Blackstone River. At Crookfall Brook, which forms the North Smithfield Lincoln town line, the brook cuts across the canal and the area is filled with alluvium from the brook. Archeological investigations conducted in 1986 revealed sections of David Wilkinson's stone dam wall and spillway north of where Crookfall Brook crosses the canal bed (Parrington 1986). Several large flat square stones are visible above the alluvium at the

brook-canal intersection and may be remnant parts of the dam structure. As the upstream Matt Dam once raised the level of the Blackstone River at least six feet, the two parallel canal berms in this area must have been correspondingly high at one time and have since been eroded to their current height (Morenon and Raber 1989:125). South of Crookfall Brook the intermittently watered channel extends south, following the west riverbank. The Blackstone River then diverges east from the P&W right-of-way, forming a narrow, approximately 2,000 ft long, wooded crescent of land between the river and the railroad. Through this segment the railroad embankment has intruded into the canal trench in places, but the parallel, eroded east canal berm survives, forming a linear channel that is watered in places. Several railroad culverts drain into the remnant canal in this area. At P&W Milepost 13 there is a square, cut granite railroad milepost marker. At this location the canal bed can be crossed and a path leads to a scenic overlook on the Blackstone River. 1400 feet north of the Manville Dam the canal bed disappears, marking the south end of Section 9.

Interpretive Themes and Potential

Section 9 of the Blackstone Canal has potential for interpreting several historical themes associated with the canal. Although impacted by adjacent P&W Railroad construction, this section of the canal is still watered in places and retains some of its earthworks, including two unusual engineering features. The section of canal north of Manville that includes the P&W milepost and scenic river overlook offers potential for interpreting canal and railroad construction as well as the natural landscape. The Crookfall Brook dam and spillway site provides opportunity to interpret the Blackstone Canal Company's need to provide sources of water to feed the canal to maintain its level for transportation and downstream industries. The parallel earth berms across the meadow are an example of an unusual engineering solution to a canal construction obstacle.

Additional Resources for Potential Interpretation

Additional historic canal and industrial resources in adjacent sections flank section 9. Immediately north of Section 9 the canal has been obliterated by the construction of the Woonsocket Water Treatment Plant. Section 10, a 600 ft section beginning 100 ft north of the plant contains the remains of a segment of the canal and earth and masonry remains associated with the Matt Dam. This dam was an earthen structure built across the river by the Blackstone Canal Company to raise the level of the river and to divert water into the canal below the dam (Greenwood 1984:53). The dam was dismantled or destroyed by flooding when the canal closed, but evidence remains on both riverbanks. On the west, canal, side, the canal trench has been partially filled with demolition debris. A 25 ft long, 3 ft high section of fieldstone wall, possibly part of a canal trench entrance wing wall, curves northwest away from the edge of the river at the west end of the former dam. On the east bank, a massive, 7 ft high, 15 ft wide earth embankment extends into the river for approximately 100 feet. This remnant of the Matt Dam was sheathed in granite block revetment as part of flood control measures in the twentieth century (Fitch 1991:7:20). This is the only unmodified evidence of original canal river interface engineering remaining in Rhode Island, as the other similar locations remained important mill sites and were subsequently rebuilt (Tidwell and Morenon 1988:30).

South of Section 9, just north of the Manville Bridge and within canal Section 8, is the 246 ft long, granite block Manville Dam, built in 1868 to provide waterpower to the Manville Mill on the east, Cumberland side of the river. This waterpower privilege was earlier harnessed for Furnace Unity, a mid-eighteenth century iron furnace associated with the Wilkinson family.

During the second half of the nineteenth century the Manville Dam provided nineteen feet of head to an increasingly large series of textile mills built by the Manville Company. The mill, which ultimately reached a length of about 900 feet, was destroyed by flood and fire in 1955. The dam is adjacent to a small public park on the Cumberland side that contains a buried granite block headgate structure and headrace trench. The Town of Cumberland states this infrastructure for interpretation as part of public park improvements. The village of Manville, on the Lincoln side of the river, was a predominantly French Canadian, Catholic mill worker community and retains much of its historic architectural fabric (Kennedy 1982:26-28,64; Kulick and Bonham 1978:108). A buried granite wall possibly associated with the canal or an early mill was exposed east of the P&W tracks, opposite the Manville Dam in the area north of the Manville Bridge in 1989 (Morenon and Raber 1989:19). Subsequent lowering of the track bed underneath the bridge has obliterated this masonry.

An approximately 75 ft long section of possible Blackstone Canal berm is located in a wooded area immediately northeast of the gravel public parking lot at the north end of the Ashton-Manville section of the Blackstone Valley Bikeway, west of the P&W tracks and south of a modern prefabricated metal industrial building. Toward the end of the nineteenth century, this area became the location of a coal dock and ancillary buildings associated with the Manville Mill on the opposite, Cumberland side of the Blackstone River, and the area either side of the P&W tracks in this vicinity was crisscrossed with sidings and spur tracks serving the mill. This construction truncated and isolated this small section of canal, which has also been filled with demolition debris. This section of the canal therefore has poor integrity and interpretive potential.

BLACKSTONE CANAL SECTION 5, Ashton to Lonsdale Mills, Lincoln, Rhode Island

National Register of Historic Places Status

Section 5 of the Blackstone Canal is an approximately 3.65 mile long section located within Lincoln, RI, extending from the Ashton Dam south to Front Street. This section of the canal was listed in the National Register of Historic Places (NR) in 1970 (Klyberg 1970). In 1991 it was included in an NR for the entire Blackstone Canal in Rhode Island (Fitch 1991). The section number was assigned for the purpose of the 1991 NR, and is not a historical designation. At the north end of Section 5 the Blackstone Canal National Register Historic District is overlaid by the Old Ashton National Register Historic District (Kennedy 1984) and at the south end of this section the Canal NR is contiguous to the Lonsdale National Register Historic District (Kennedy 1984).

Location and Setting

Section 5 of the Blackstone Canal is located on the west side of the Blackstone River near the eastern boundary of the town of Lincoln. Section 5 can be divided into three main segments. The northerly 2.5-mile segment begins at the Ashton Dam and runs close to the west bank of the Blackstone River to the north edge of the "Old Lonsdale" mill property north of Front Street. This section is watered for its entire length and is essentially intact, with the earth towpath embankment running along the east side. The towpath is now paved and is part of the Blackstone Valley Bikeway. The canal is bordered on the west side by wooded areas with a few visible

clusters of residential buildings, and on the east side by woods and the west bank of the Blackstone River. At the south end of this section a ½ mile long section of the canal passes through the Old Lonsdale mill, a mixed-use complex of historic brick industrial buildings, to Front Street. Although still watered, this section of the canal has been channeled, culverted and manipulated for waterpower use and in some places is not visible. South of Front Street the canal continued for ¼ of a mile along the shores of Cranberry Pond and Scott Pond to Walker Street. The canal trench and towpath which are not visible in this section, ran along the east shore of the ponds. The shores of Cranberry Pond are wooded on the west side and host light industries on the east side. Scott Pond has steep, wooded banks with houses of the Saylesville mill village on the west side.

1828 Phelps Map Description

Blackstone Canal Resident Engineer Edward N. Phelps's 1828 *Map of the Blackstone Canal and its Appendages* shows Section 5 of the Canal (Figure 4). This description follows the flow of water in the canal from north to south. This section of the canal began at the Ashton Dam. Above the dam the canal ran in slack water with a towpath berm running along the west side of the river on land of a Mrs. Barnes. At the dam the river water was diverted into the canal on the west side of the river. The Phelps map shows two rectangular, hip-roofed structures located 100 ft apart at the mouth of the canal at a location marked "Sinking Ford." The location and configuration of these structures suggest that a guard lock was located at this point. Here the towpath was located on the west side of the canal, which is the west bank of the Blackstone River at this point. The canal proceeded approximately 700 ft south to a building marked "Wilbur Kelly," where a footbridge crossed the canal. This was the so-called "Kelly Factory" built by the Smithfield Cotton and Woolen Manufactory, and not the Wilbur Kelly House standing at the site today. Approximately 400 ft downstream was a scened bridge, where the towpath switched from the west to the east side of the canal. Through this stretch the canal was located approximately 100 ft west of the Blackstone River. South of the footbridge the river swung approximately 400 ft the east, and the canal ran in a straight line for approximately 1,400 ft before the river bent back to the west, closer to the canal. Approximately 400 ft south of this point was the 8 Mile Marker. For a distance of approximately 300 ft south of the mile marker, the canal narrowed through an area indicated as "Gardner's Canoe Rock," a bedrock outcrop that had to be blasted for the canal and towpath. After these narrows the canal passed onto land of Simon Whipple and into an approximately 400 ft long basin that bowed out on the west side of the canal. South of this basin was the site of Martin's Ford, at or near where the present Martin Street Bridge is located. The canal then passed into land indicated as the "Lime Rock Lot." Approximately 2,000 ft south of the ford site there was a small basin on the west side of the canal, now the location of a U-shaped concrete overflow structure. A second, smaller basin was located on the west side of the canal approximately 400 ft south, possibly where an unnamed stream flows into the canal today. Both of these basins were on the land of Stephen H. Smith. Opposite the basins the canal, which had been close to the river since Gardner's Canoe Rock, swung approximately 600 ft to the east. South of the basins the canal flowed for approximately 1,000 ft through the land of the John Wilkinson heirs, and into land of the Blackstone Canal Company for roughly another 1,400 ft, where the river swung back west toward the canal. The canal, now approximately 200 ft west of the river, passed into the land of A.I. Wilkinson for approximately 2,000 ft. The river swung away to the east, turned sharply south, and then sharply west again back toward the canal in a distinctive square bend measuring approximately 700 ft on a side. Approximately 800 ft south of this point the canal passed onto land of Stephen H. Smith. Approximately 600 ft south of the property line was the 6 Mile marker. At this point the Blackstone River swung away from the

canal to the east, and the canal turned toward the west, where the Lonsdale Old Mill is located today. Approximately 1,000 ft north of the north end of Cranberry Pond, an outlet or stream flowed east. The towpath was still on the east side of the canal, and there was a towpath bridge over this outlet. Approximately 200 ft south of the outlet a road bridge crossed the canal, at or about where Front Street crosses it today. Approximately 600 ft south of this bridge the canal flowed into Cranberry Pond, with the towpath on the east side. Cranberry Pond narrowed after approximately 800 ft and flowed into the larger Scott Pond on the land of A.J. Wilkinson. After following the east edge of the pond for approximately 2,000 ft, Section 5 ended at a lock at the south end of the pond, immediately north of Walker Street. From here the canal passed through two more locks in its descent into the Moshassuck River valley watershed.

Canal Site History and Infrastructure Function

This section of the Blackstone Canal includes numerous historic architectural, archaeological, engineering, and industrial resources associated with pre-canal, canal-era, and post-canal activities and contexts. Many of these resources and contexts are the subject of existing or planned interpretive programming by local, state, and regional agencies. This canal history section focuses on the transition of the canal from a transportation route to a source of waterpower under the control of the Lonsdale Company, the associated infrastructure of which has not yet been investigated and interpreted.

Prior to the construction of the canal, a small mill and several worker's houses were clustered on the west bank of the Blackstone River close to where the Ashton Viaduct now crosses the river near the north end of Section 5. The land on both sides of the river in this vicinity was then known as Ashton. This village, now known as Quinville, was the site of the Smithfield Cotton and Woolen Manufactory, Lincoln's first textile mill. The original mill village consisted of one mill and a few houses constructed from 1810 to 1815. In 1828 the Blackstone Canal trench divided this small industrial community, leaving four residences on the west side of the canal separated from the factory (by then property of Wilbur Kelly) to the east, directly on the canal between the canal and the river (see Figure 4). The mill property was purchased by the Lonsdale Company in the 1840s, and operated as a sheeting factory. After 1869 it was used as a warehouse for the company's extensive new mill on the Cumberland side of the river, now considered Ashton (Kennedy 1982:25). Figure 5 shows how this area looked in 1870. Although the mill is gone, this area retains the characteristics of an early nineteenth century mill village. The Kelly House and four worker houses on Lower River Road survive and now comprise the Old Ashton National Register Historic District (Kennedy 1984).

When the Blackstone Canal was constructed in 1828, it diverted water from the Blackstone River at the Ashton Dam, a configuration that typically would have incorporated a set of guard locks. The canal then followed a relatively uniform elevation that did not require any major engineering structures other than its earthen prism. This section of canal prism was excavated into the west riverbank, and the excavated material was used in the construction of an embankment forming the towpath berm on the east side of the trench, resting on the edge of the slope above the river floodplain. North of the Ashton Dam, the towpath was located on the west side of the trench. The east embankment generally served as the towpath berm for the canal south of the bridge at the Kelly House. It is not clear how the canal and Smithfield Cotton and Woolen Manufactory water infrastructure were integrated when the canal was constructed, and the company may have used the canal as its headrace. Further downstream, Scott Pond and Cranberry ponds served as

reservoirs for the canal. At the three locks south of Scott Pond, Blackstone River water was diverted into the drainage of the Moshassuck River (Greenwood 1984:51, 55,84).

During the 1830s this diversion was a major source of contention between the Canal Company and Blackstone River mill owners, who regarded the passage of canal boats through every lock as a depletion of their power reservoirs. Complaints were particularly strong from mill operators in the lower part of the valley, who complained about the diversion of Blackstone River power water into the Moshassuck River drainage by the Blackstone Canal at the locks at Scott Pond. This situation resulted in a series of lawsuits and court cases in the 1830s (Greenwood 1984:84-87).

The Lonsdale Company

Starting in the 1830s, Section 5 of the Blackstone Canal became increasingly intertwined with the Lonsdale operations of the Providence-based textile firm of Brown & Ives. At the south end of this section, mill construction required infrastructure associated with two mill sites, "Old Lonsdale" and "New Lonsdale."

Old Lonsdale

In 1831 Brown & Ives began to acquire land at Lonsdale in the triangular piece of land between the Blackstone Canal and the Blackstone River and north of Front Street. The Lonsdale Company was incorporated in 1834. The new mill complex (eventually to become known as "Old Lonsdale") was built alongside the canal and took advantage of its higher water, which provided 23 ft of head, to generate power. A series of raceways were built, with water flowing east out of the canal, through the waterwheels or turbines, and into the Blackstone River. In the 1840s the Lonsdale Company built a large bleachery in the north part of the complex to finish cloth produced at Lonsdale and at Brown & Ives's Blackstone, MA, and Hope, RI, mills. The bleachery made the Lonsdale Company mills one of the largest integrated mills in Lincoln (Kennedy 1982: 57).

After the Blackstone Canal Company failed in 1848 the Lonsdale Company purchased Section 5 of the canal for waterpower. In January 1849, an "Act in Relation to the Blackstone Canal," which resolved the longstanding issues between canal operators and mill owners over water rights, called for filling in the locks at the south end of Scott Pond, putting an end to the diversion of Blackstone River water into the Moshassuck River drainage via the old Blackstone Canal (Greenwood 1984:96).

The Lonsdale Company used the Blackstone Canal as a power source for this mill complex until steam power replaced it later in the nineteenth century. However the bleachery also needed enormous amounts of process water, which it continued to draw from the Blackstone Canal into the twentieth century. This resulted in construction of a complicated system for capturing, storing, and releasing the waters of the canal using a series of diversion trenches, gate structures, and Scott Pond.

An 1870 atlas view of Old Lonsdale provides a schematic view of the watercourses at the old mill. Moving downstream along the canal through the mill complex, water was drawn off the canal directly in raceways extending east through the buildings, and also diverted into a millpond created to the south of the mill (Figure 6). The canal was still completely open along the west

side of the complex. South of the bleachery buildings a tailrace fed directly from the canal extended east from the north end of the No. 2 mill. It joined a second tailrace coming in from the direction of the No. 1 mill to the southwest, and joined a third tailrace flowing north from under the No. 3 mill. The combined tailraces then flowed northeast to the Blackstone River. The tailrace outfall arches are visible today north of the No. 3 mill. The rubble stone No. 3 mill, now heavily modified, is the oldest remaining building in the complex (Kennedy 1982: 32). South of these buildings and raceways, the canal flowed into an approximately 650 ft long manmade millpond through channels at its north and south ends. A small structure, possibly a gatehouse, straddled the south channel. The canal continued south past the millpond and into Scott Pond. The function of this system is not clear from the map, however, presumably water from the new millpond flowed under some of the mill buildings, possibly the No. 1 and No. 3 mills, and the flow of water into the millpond, and Scott Pond, was controlled by the company.

The Lonsdale Company "Old Lonsdale" mill continued to evolve during the late nineteenth and early twentieth centuries. The largest, most ambitious, and last major mill building constructed in the complex was the 1901 Mill, a long narrow, two and three story brick building with a projecting tower and hip roof built on the site of the old No. 2 mill (Kennedy 1982:33). This expansion program appears to have coincided with upgrading to the power canal infrastructure as the concrete work at several gate and overflow structures exhibits the date "1902" cast into their surfaces. Concrete channel walls at the location of the former guard locks at the Ashton Dam was built for a headgate structure that included a battery of moveable vertical slide gate valves. The gates were used to regulate the flow of water entering the power canal, and shut it off for canal dredging or in the event of floods. This row of gates, no longer extant, would have spanned the space between the extant parallel concrete walls, now filled with rubble. Immediately downstream in the canal towpath berm the company installed a wasteway structure consisting of a concrete and stone-lined channel for regulating the canal pool height, with water overflowing to the river to the east. This structure is extant and now holds wood flashboards for regulating water flow. Further downstream, approximately 2,000 ft south of the Marin Street Bridge, in the canal towpath berm, the company installed a 15 ft wide, 9 ft deep, horseshoe-shaped concrete overflow structure extending 65 ft east to the river. This extant fixed-height structure allowed water to overflow into the river to the east when water reached a certain level. Further downstream, immediately north of the Old Lonsdale mill, the company built another wasteway structure. This may have once been equipped with a slide gate, but now contains flashboards to regulate the canal pool height and flow to the river to the east. Additional slide gates would have been located at the mill building turbine headraces for shutting off water to individual turbines when not in use or for repairs.

By the 1920s the Old Lonsdale mill had expanded with resultant changes to the canal (Figure 7). From north to south a Bleach Storehouse, and a Cloth House/Singe House complex straddled the canal. The open canal trench resumed south of the latter structure and continued south to a point opposite the manmade millpond (mislabelled "Scott Pond" on the map), where it flowed east under a railroad siding bridge into the millpond. South of this point the canal was filled in for the "Lincoln Store House" and other storage buildings that ran the length of the west side of the millpond. There the original canal trench resumed its course to Scott Pond south of Front Street. A Gate House was located at the northeast end of the pond, presumably to house turbine and/or process water control gates for the mill buildings at the south end of the mill building complex. Under normal water flow conditions, the mill operators wanted to store as much water as the millponds could safely hold, and droughts made water storage capacity and conservation even more important. During dry seasons the Blackstone River dropped to very low levels. The

Lonsdale Company increased their storage capacity by developing their reservoir system to fill and drain Scott Pond according to demand and seasonal flow patterns (Figure 8). The company constructed a long, straight cofferdam wall across the west side of the millpond, which separated the canal flow from the pond. This dam contained gate valves at either end. At the south end of the walled canal a battery of slide gates controlled flow into Scott Pond. This system allowed operators to direct water flowing from the canal directly into the millpond and through the Gate House. Operators could also divert canal flow south to fill Scott Pond, where it could be held until redirected as reverse (outflow) back into the millpond as needed. The slide gates in the cofferdam wall and slide gate battery are no longer in place and the system regulating flow in and out of the millpond and Scott Pond is no longer functional.

New Lonsdale

In 1860 the Lonsdale Company built a mill at "New Lonsdale," approximately 500 yards east-northeast of the Old Lonsdale mill, across the Blackstone River in Cumberland (Adams 1998:14). This mill complex and its waterpower infrastructure appear on an 1870 map (see Figure 8). This map shows the east end of a millpond at the west edge, with a structure, presumably a canal headgate structure, at the mouth of a long, narrow power canal extending southeast from the pond. The canal south of and parallel to the P&W tracks, crossing under Mendon Road (Route 122) and then under Mill Street to a mill with a complex floor plan at the north (east) bank of the Blackstone River.

This mill required construction of dam, spillway and gate infrastructure on the Blackstone River. The company constructed an earth dam upstream from the Old Lonsdale Mill between the canal and the P&W Railroad tracks, with an inclined timber crib spillway located at the southwest end, just north of the present Pratt Dam spillway. The spillway was later improved with a concrete surface. The location and nature of water height control features such as slide gates, flashboards, etc. is unknown. This dam created "New Pond," a massive millpond that extended approximately 3,000 yards upstream along the Blackstone River. This pond was approximately 1,000 yards wide at its widest point, straddling the P&W Railroad tracks, which ran across the millpond on an earth fill embankment. This enormous millpond is illustrated on an 1894 map (Figure 9). In 1893-1894 the New Pond dam spillway was replaced by the "Pratt Dam," a combination spillway/gate structure/railroad bridge built of regularly coursed ashlar granite blocks. This "dam" was part of a system built to increase waterpower capacity at the New Lonsdale mill. The structure consists of a curved spillway with a straight gate structure projecting east from its north end. The west abutment is located north of the Old Lonsdale mill complex, and the spillway extends northeast across the river in a broad arc to the gate structure. The spillway includes five bridge piers with upstream icebreakers with compound curve, "ship's prow" faces. The gate structure consists of a wide masonry wall with four Roman arch gate openings. There are no flashboards or slide gates remaining. This bridge carried a P&W spur track to link the Old Lonsdale and New Lonsdale mills. The bridge, no longer in place, consisted of a series of end-to-end riveted girder spans. After the 1860 "New Lonsdale" mill was eclipsed by larger, steam powered successors, including the 1886 Ann & Hope Mill to the east. The "New Pond" millpond and Pratt Dam spillway were used until 1954 (Kennedy 1982:57). The pond was shown on a 1944 USGS map (Figure 10). The pond was subsequently drained and by 1975 the Blackstone River cut through the accumulated alluvium on a more meandering path that crossed the Cumberland-Lincoln border several times. This path has changed at least once since the 1950s resulting in an isolated section of former river bed, an oxbow bend, and isolated islands in the alluvium (Figure 11).

Existing Conditions and Canal Remnants Interpretation

The 2.5-mile segment of Section 5 from the Ashton Viaduct to the Old Lonsdale mill is the best-preserved section of the Blackstone Canal in Rhode Island. This section includes a continuous, visually well-defined canal prism filled with water. Archaeological investigations conducted from 1989 to 1991 revealed the prism is largely intact as a morphological feature, and that it retains considerable stratigraphic evidence from the original construction (Freedman and Morenon 1991:18). Modifications to the canal towpath included the installation of a cast iron water line, located three to four feet below the surface of the towpath for an unknown distance (Morenon and Raber 1989: 87). Other later twentieth century modifications include occasional fill deposited at some of the basin-like widenings of the prism, and construction of the Martin Street Bridge across the canal. Most recently, the top of the towpath has been paved for the Blackstone Valley Bikeway between Ashton Viaduct and Old Lonsdale Mill, with the exception of an approximately 2,500 ft long stretch south of the Ashton Viaduct that has been left unpaved and is bypassed by the bicycle path. The $\frac{1}{4}$ mile long section of the canal within the Old Lonsdale mill complex has been highly modified for industrial purposes (discussed above), and the remaining $\frac{1}{4}$ of a mile along the east shores of Cranberry Pond and Scott Pond have been obliterated.

The water level in the canal appears somewhat lower than it originally was during operations. The former slide gates at the Ashton Dam have been replaced with a pile of rubble, which allows water to percolate into the canal trench. Canal water overflows at the overflow structures below the Ashton Dam and above the Lonsdale Mill. It is not clear whether any water from Scott Pond or the Old Lonsdale millpond flow through the mill complex; water in the tailrace appears stagnant.

Unlike the other sections of the Blackstone Canal that were surveyed and evaluated for this report, much of Section 5 (with the exception of the Lonsdale Company waterpower infrastructure) has been extensively studied archeologically for existing recreational and interpretive programs, is known to be the original canal, and is therefore not described here in detail. The complexity of the discussion of the evolution and infrastructure of the waterpower system lends itself to inclusion of existing conditions of associated resources, in the discussion above.

There are no surface traces of the possible guard lock structures at the Ashton Dam, or any of the 1830s mill buildings and structures east of the canal in this vicinity of Old Ashton Village. Archaeological evidence of a cart bridge abutment south of the Kelly House and cart bridge abutments and a limekiln north of the Martin Street Bridge were found in 1989 (Morenon and Raber 1989:7-9). Most of the canal basins are still extant and correspond closely with those on the 1828 Phelps map. The carved granite 8 Mile Marker was found during archaeological investigations and removed for safekeeping (Morenon and Raber 1989: 103).

Kelly House Vicinity

The canal in the Kelly House vicinity has been discussed as a potential location for interpretation of canal structure and operations, possibly including reintroduction of an operating canal boat. The Blackstone Valley Bikeway intentionally bypassed the section of canal towpath beginning just north of the Wilbur Kelly House at the Ashton Viaduct, and extending approximately 2,500 ft

south, in efforts to preserve a section of "original" towpath. It is currently unknown if any part of this section of the canal prism is indeed original in profile or materials. The canal in the vicinity of the Kelly House may have been altered or impacted during and after the 1828-1848 transportation era by the industrial activities of the Southfield Cotton and Woolen Manufactory, and later, the Lonsdale Company. Additional research and archaeology would be required to determine the configuration and remains of raceways in this area. It is also unknown how significantly the post-transportation-era operation of the canal as waterpower infrastructure by the Lonsdale Company for the mill at Old Lonsdale impacted the original canal prism. The canal bed was undoubtedly drained and dredged many times during its tenure as a source of power and process water. It is possible that the banks were modified in slope and/or lining to prevent siltation and contamination by debris that could potentially interfere with turbine and equipment operation. Indeed, the banks of the canal in the vicinity of the Kelly House are lined with schist stone walls that appear to postdate original construction. Additionally, a water line dating from prior to 1902 and extending north from the Lincoln pumping station to a point 600 ft south of the Kelly House was discovered during archaeological investigations (Morenon and Raber 1989:7).

Interpretive Themes and Potential

Section 5 of the Blackstone Canal has potential for interpreting several historical themes associated with the canal. The northern 2.5 miles is still watered and retains its original contours. This relatively high degree of integrity offers potential for interpreting the construction and operation of the canal itself. Section 5 of the canal is unusual as it was integrated into industrial waterpower infrastructure before, during, and after the period of operation as a transportation canal. The Lonsdale Old Mill gate and overflow structures together with the canal itself have potential to interpret the use of the Blackstone Canal for industrial waterpower. The Pratt Dam/railroad bridge and associated earlier dam infrastructure have potential to interpret changes in waterpower management as well as the shift from canal to rail as the primary mode of industrial transportation in the nineteenth century.

Additional Historic Transportation Features for Possible Interpretation

Section 5 of the Blackstone Canal is close to at least six identifiable sections of the right-of-way of the Southern New England Railroad. This 58-mile long railroad was to be constructed between the Canadian National Railroad-controlled Central Vermont Railroad at Palmer, MA, near Springfield, and Providence, RI. Championed by Charles Melville Hays, president of Canada's Grand Trunk Railroad, the line was intended to provide a warm-water port for the transcontinental Canadian National Railroad and an alternative rail route for southern New England industry, which was subject to the regional transportation monopoly of Charles Mellen's New York, New Haven & Hartford Railroad. Construction began in 1911 across hilly terrain. The project was almost completed in late 1912 when it abruptly came to a halt. Charles Hays, who was under fire for spending British Crown money on American soil, perished on the Titanic (Lowenthal 1998). Today all that is left are a series of overgrown but impressive cuts, fills, abutments, piers, and bridge sites.

North of Section 5, and just north of the I-295 bridge over the Blackstone River, there is a short section of blasted rock outcrop in the right-of-way near the top of the valley slope. A similar section of blasted rock outcrop is located on the hill west of the Ashton Dam. South of this location the paved bike path that connects the canal with the Route 116 parking lot cuts a section of earth and rock track embankment. Another section of blasted rock outcrop is located under

and just north of the Ashton Viaduct. A particularly unusual remaining wood structure is located along the east side of Cranberry Pond; these wood construction pilings were previously incorrectly identified as a Blackstone Canal floating towpath bridge (Fitch 1991:7:15). South of Lonsdale Avenue (Route 122) is a high sand embankment that extends south into the Valley Falls marshes.

Other historic resources within or adjacent to Section 5:

Ashton Mill Village (Cumberland side)
Ashton Viaduct (Washington Highway, bridge construction agencies and technology in Rhode Island, open-spandrel reinforced concrete bridges)
Old Ashton Mill Village (Lincoln side)
Gasholder archaeological site (Old Ashton Village, Lincoln side)
Quinaville, Lincoln
Lime Kiln and Cart Bridge archaeological site, Martin Street, Lincoln
Martin Street Bridge, Cumberland-Lincoln
Berkley Mill Village, Cumberland
Old Lonsdale Mill and Village, Lincoln
New Lonsdale Mill and Village, Cumberland
Front Street Bridge, Lincoln (1885 granite Roman arch)

BLACKSTONE CANAL SECTION 4, Lockbridge Street Pawtucket

National Register of Historic Places Status

Section 4 of the Blackstone Canal is an approximately 1.08 mile long section extending from a point 500 ft south of Walker Street in the Sayles Bleachery complex in Lincoln to a point 600 ft north of the Lorraine Mills complex in Pawtucket. This section of the canal was listed in the National Register of Historic Places (NR) in 1970 as part of a nomination for the canal from the Front Street Bridge in Lincoln to Steeple and Promenade streets in Providence (Harrington 1970). In 1991 it was included in an NR for the entire Blackstone Canal in Rhode Island (Fitch 1991). The section number was assigned for the purpose of the 1991 NR, and is not a historical designation.

Location and Setting

Section 4 of the Blackstone Canal is a watered linear trench that carries the Moshassuck River through a long, narrow, predominantly industrial corridor straddling Pawtucket and Lincoln. Section 4 begins about 500 ft south of Walker Street in Lincoln within the complex of brick buildings at the nineteenth-century Sayles Bleachery, at a point where the Moshassuck River flows under the buildings into the canal from the northwest. The Moshassuck River flows in the canal bed through this industrial corridor area all the way south to Weedon Street in Pawtucket in an almost straight channel lined with trees and scrub growth. South of Higginson Street, the Moshassuck Valley Railroad the Moshassuck Valley Industrial Highway, are located to the east and are lined with light industries. North of Weedon Street, Lockbridge Street runs parallel to the canal on its west side. A row of nineteenth-century worker houses lines the west side of

Lockbridge Street, which dead-ends at an industrial facility. The short section south of Weeden Street and north of the Lorraine Mills complex, in Pawtucket, has narrow wooded banks backing up to the Moshassuck Valley Railroad and houses on the east, and a parallel mill access road to the west. Section 5 of the canal ends at a bend approximately 400 ft south of Weeden Street where it joins the course of the Moshassuck River north of the Lorraine Mills complex.

1828 Phelps Map Description

Blackstone Canal Resident Engineer Edward N. Phelps's 1828 *Map of the Blackstone Canal and its Appendages* shows Section 4 of the Canal (Figure 12). This description follows the flow of water in the canal from north to south. North of the start of Section 4 the canal, flowing with Blackstone River water, swung west of the river, and passed through Scott Pond and a series of three locks at what is now Walker Street. The canal proceeded south for an undetermined distance (map continuity at this point is poor) through land of A.L. Wilkinson to a point where the Moshassuck River crossed the canal from west to east. Here the waters of the Moshassuck River joined the Blackstone River waters in the canal. South of this point the canal extended approximately 3,600 ft south in a straight line to a lock chamber, and the river meandered away to the east and then back toward the lock area. The east, towpath side of the canal was straight, while the west side of the canal meandered in and out forming a series of irregular basins. Immediately south of the lock chamber a pair of bridges crossed the canal and the river, now only approximately 100 ft east of the canal. Approximately 125 ft south of the bridges the river rejoined the canal. Section 4 ends approximately 400 ft south of this confluence at a V-shaped bend in the canal on land of John Comstock where the Moshassuck River flowed out of the canal to the west. Although they are not shown on the map, it can be assumed that there must have been dams at the intersections with the Moshassuck River that kept the river from drawing down the level of the canal (Greenwood 1984:53).

Canal Site History: Sayles Family Concerns

The post-operational evolution of the Blackstone Canal landscape in the vicinity of Section 4 and Section 3 to the south is closely linked to the development of the textile mill concerns of Pawtucket's Sayles family, who owned the Sayles Bleachery and the Lorraine Mills, and built the Moshassuck Valley Railroad built to connect them. The Sayles concerns took advantage of the delinquent Blackstone Canal for industrial purposes, turning it into a process water delivery and disposal system and captive transportation system.

Sayles Bleachery

Brothers William Francis and Frederic Clark Sayles were descendants of John Sayles who came to Providence in 1645. In 1847 F.C. Sayles purchased the 1830s Joseph Pimbley textile printworks in Lincoln. This mill was located on the Moshassuck River below what is now Bleachery Pond, west of the canal. In 1863, F.C. Sayles entered into partnership with his brother, incorporating as W.F. & F.C. Sayles. Under the Sayles the bleachery grew and the company acquired other local and regional mills, including the Lorraine Worsted Mills and operations in Connecticut and North Carolina. F.C. Sayles became Pawtucket mayor in 1885, and served two terms. By 1897 the company employed 1,100 people, and finished 7.5 million yards of cotton goods per year. Combined employment in Saylesville and Pawtucket reached 4,000 in 1908. In 1920 the company changed its name to the Sayles Finishing Corporation, and the Saylesville plant, which occupied 40 acres, had 3,000 employees alone. The company became a nationally

prominent finishing concern in the early twentieth century. The plant closed in 1960, and was listed in the National Register of Historic Places in 1984 (Anon.1908:12-16, Kennedy 1982:34,61, Kennedy 1984:*Pawtucket Times* 1975).

The physical relationship between the Pimbley mill and the Blackstone Canal is unknown as the mill was constructed after the 1828 Phelps map was drawn. The mill presumably used the Moshassuck River, which flowed into the canal downstream, for power and waste disposal. During the mid-1830s a group of Blackstone River mill owners sued the Blackstone Canal Company over the ability of the company's upstream reservoirs to compensate for the drawdown of river millponds by the canal's diversion of Blackstone River water into the Moshassuck River drainage via Scott pond. The Canal Company lost and was instructed to close the locks at Scott Pond if drawdown affected the mills for more than three days. When the canal closed in 1848 the legal proceedings included an order to fill the locks at Scott Pond, ending the diversion of Blackstone River water into the Moshassuck River. Scott Pond remained a component of the Blackstone River-fed water system for the Old Lonsdale mill, and Barney's Pond and Bleachery Pond and tributaries reverted to the sole source of water for the Moshassuck River. The Moshassuck River became the source of the large quantities of clean water required for fabric finishing, and also a convenient route for waste disposal (Greenwood 1984:85,86).

The Moshassuck Valley Railroad

In addition to using the canal for wastewater conveyance, the Sayles concerns also used its right-of-way as a transportation route to connect their compact Pawtucket/Lincoln operations with the outside world. In 1875 the Moshassuck Valley Railroad was incorporated to connect the Sayles Bleachery and Lorraine Mills with the Boston & Providence/Boston & Worcester (later New York, New Haven & Hartford) tracks between Pawtucket and Providence. The railroad was completed in 1877. The main line began at Woodlawn Junction on the New Haven, southeast of the Lorraine Mills complex, and proceeded north across Mineral Spring Avenue, east of the Lorraine Mills. North of those mills the track joined the canal and was built on a modified canal segment until it reached the Sayles Bleachery in Lincoln. Although the railroad had just 1.77 miles of track, it had two locomotives and some passenger equipment. Most of its traffic was freight in and out of the mills but it also had four passenger stations, presumably frequented primarily by Sayles employees. These stations were called Lorraine (Mineral Spring Avenue), Lock Bridge (Pawtucket), Crefeld, and Saylesville. The railroad operated ten daily passenger trains in 1883, twenty in 1903, and six in 1916. Passenger service was ended in 1921. By 1935 many employees were driving to work in automobiles and the company constructed a parking lot at the Lorraine Mills. Unlike most regional short line industrial railroads, the Moshassuck Valley Railroad escaped the New Haven Railroad's transportation monopoly and remained an independent line for more than 100 years. The P&W purchased the line in 1982, and the section of the line north of the Pawtucket city line was abandoned in 1991 (Karr 1995:153-154). The configuration of the canal and railroad in the vicinity of the Sayles Bleachery is shown in an 1882 atlas view (Figure 13).

"Sayles New Village" Row Houses, Lockridge Street

The west side of dead-end Lockridge Street is lined with a row of eight identical row houses built in 1882 by the Sayles's for workers at the Lorraine Manufacturing Company mills just to the south, which the Sayles had acquired in 1881. The vast scale of operations at the Sayles's mills dictated need for worker housing, and in the early 1880s the company began a campaign of house

construction on Smithfield Ave, Chapel St, and Walker Street in Lincoln. These houses bore close resemblance to mill housing built 40 years earlier. The houses built on Lockbridge Street, known as "Sayles New Village," were part of this building campaign. They remained company-owned tenements well into the twentieth century. This row of houses is the only known surviving nineteenth-century company housing in Pawtucket (Kennedy 1982:35;Roper 1978:32,52)

Current Conditions Description and Canal Remnants Interpretation

Section 4 of the Blackstone Canal parallels the Moshassuck Valley Railroad, which lies to the east. This section is watered for its entire length, and is typically lined with trees and scrub plant growth. It begins approximately 500 ft south of Walker Street in the Sayles Bleachery Complex, just east of Finishing Building 3B, Plant "A" (Figure 14). This point is not precisely located, as the mill trench may have veered slightly west of the canal route in this vicinity. North of this point the canal has been filled or destroyed to the south end of Scott Pond. The canal passes south through the numerous brick buildings of the Sayles Bleachery complex. Many of these buildings are still in use by a range of light industries. The canal proceeds south to a modern highway bridge at Higginson Avenue, where a prefabricated concrete construction materials plant is located northeast of the road/canal crossing. The canal continues south with the Moshassuck Valley Industrial Highway and light industries to the east, and woods and residential streets to the west. At Weeden Street, Lockbridge Street parallels the canal on the west side, separated by a narrow swath of wooded bank. The west side of Lockbridge Street is lined by numbers 3 through 18 Lockbridge Street, eight identical-plan, 1-1/2 story, rectangular, wood frame, side-gable, double cottages with 6-bay facades, and hooded doorways with heavy brackets (Figure 15). Although some of these houses have minor alterations, they still possess the uniformity of their original design. South of Weeden Street the canal is flanked by the railroad tracks and houses to the east, and a paved access road to Lorraine Fabrics on the west. The canal ends approximately 400 ft south of Weeden Street where it joins the course of the Moshassuck River at a tight, V-shaped bend. A concrete-capped access road bridge just west of this point is the modified railroad spur line bridge for the Lorraine Mills.

Construction of the Moshassuck Valley Railroad had some impact on the Blackstone Canal/Moshassuck River alignment within Section 4, particularly in the vicinity just north of Weeden and Lockbridge streets in Pawtucket. Here the railroad track bed was built directly on the towpath berm on the east side of the canal. Comparison of maps of this vicinity from 1882, 1895 and 1917 does not clearly indicate the impact the railroad had on the canal bed at which may or may not have been moved or altered by the track construction (Figure 16, Figure 17, Figure 18). Some modification appears to have occurred along the west bank between Weeden and Higginson streets, where a series of small basins were filled creating a linear west bank alignment. North of Higginson Street, railroad construction does not appear to have been impacted the canal to the degree it did to the south, although the canal may have been directed slightly westward within the Sayles Bleachery.

There are no visible surface features of the possible dams at the canal crossings with the Moshassuck River, the lock and bridges at Weeden Street, or the towpath bridge to the south.

Interpretive Themes and Potential

Section 4 of the Blackstone Canal has potential for interpreting several historical themes associated with the canal. Although the segment of canal trench along Lockbridge Street appears

to have been somewhat modified by construction of the adjacent Moshassuck Valley Railroad, this watered linear segment of canal trench could be used to interpret general canal construction and operation. Lockbridge Street and its "Sayles New Village" row housing have potential for interpretation of worker housing and corporate paternalism in general, and, more specifically, the history of the Sayles family textile mill operations. The presence of the railroad line could also be used to interpret the transition from the canal to the railroad for local industrial transportation.

BLACKSTONE CANAL SECTION 3, San Antonio Way Pawtucket

National Register of Historic Places Status

Section 3 of the Blackstone Canal is an approximately .45 mile long section extending between a point 400 ft south of Mineral Spring Avenue in Pawtucket to the east side of St. the Francis Cemetery. This section of the canal was listed in the National Register of Historic Places (NR) in 1970 as part of a nomination for the canal from the Front Street Bridge in Lincoln to Steeple and Promenade streets in Providence (Henrietta 1970). In 1991 it was included in an NR for the entire Blackstone Canal in Rhode Island (Fitch 1991). The section number was assigned for the purpose of the 1991 NR, and is not a historical designation.

Location and Setting

Section 3 of the Blackstone Canal is located south of Mineral Spring Avenue in the Lorraine Mills vicinity, east of the Fairlawn neighborhood. The north end of this section begins approximately 400 ft south of Mineral Spring Avenue where the course of the Moshassuck River meets the original course of the Blackstone Canal just southwest of the historic brick Lorraine Mills complex. The canal continues south, east of and parallel to San Antonio Way through an area characterized by light industrial buildings and patches of woods. The alignment of the canal then proceeds south parallel to the alignment of the Moshassuck Valley Railroad (now P&W) 600 ft to the east. South of Grotto Avenue the canal continues south, and is bordered by a wooded, marshy area to the east and Veterans Memorial Park and the landscaped St. Francis Cemetery to the west. The south end of Section 3 ends where the canal enters a culvert under the railroad yard east of St. Francis Cemetery.

1828 Phelps Map Description

Blackstone Canal Resident Engineer Edward N. Phelps's 1828 *Map of the Blackstone Canal and its Appendages* shows Section 3 of the canal (Phelps 1828) (Figure 19). The exact south end point of Section 3 cannot be ascertained because of a lack of historic map landmarks. This description follows the flow of water in the canal from north to south. The north end of this section is easier to locate as the 1828 map includes the alignment of what is now Mineral Spring Avenue. In this vicinity, and through Section 3 to the south, the canal and river were in close proximity, with the tow path on the east side of the canal. At Mineral Spring Avenue the center of the Moshassuck River was approximately 75 ft west of the center of the Blackstone Canal, both of which flowed south under the road. North of the road the canal curved north and east in a broad arc, and the river meandered in a broader northwestward curve before the two watercourses rejoined approximately 850 ft northeast of Mineral Spring Avenue on land of John Cunstock

South of the road, the canal proceeded straight southeast. After approximately 300 feet the river swung east, crossed the canal in an X-shaped configuration, and curved back to the south to parallel the canal to the southeast. The short section of the canal between the road and the river crossover ("northeast arm" of the X) included a towpath bridge over an unidentified watercourse on the east side, immediately south of the road. This segment also included a lock chamber located approximately 175 ft south of the road and immediately north of the river crossover, where a bridge carried the towpath over the river. There is no evidence on the map of any aqueduct, dam or water regulation infrastructure where the river and canal crossed. South of the crossing the river and canal ran roughly parallel on the land of Peter Pike, varying from 50 to 100 ft apart. 1,050 feet from Mineral Spring Avenue the canal bent slightly to the west, and did so again after another 500 feet at the 3 Mile Marker. At that point the river began to meander more broadly before reaching the area where Section 3 ends today.

Canal Site History: Lorraine Mills

The post-operational evolution of the Blackstone Canal landscape in the vicinity of Section 3 and Section 4 to the north is closely linked to the development of the textile mill concerns of Pawtucket's Sayles family, who owned the Lorraine Mills in Pawtucket and the Sayles Bleachery in Lincoln, and built the Moshassuck Valley Railroad built to connect them. The Sayles concerns took advantage of the defunct Blackstone Canal for industrial purposes, turning it into a process water delivery and disposal system and captive transportation system. History of the Sayles family, the Sayles Bleachery, and the Moshassuck Valley Railroad are included in the discussion of Section 4 above.

The first buildings at what later became the Lorraine Mills on Mineral Spring Avenue were originally erected in 1868 by the C.D. Owen Worsted Manufacturing Company, and were located at the south end of the complex, south of Mineral Spring Avenue and east of the Moshassuck River and Blackstone Canal. W.F. and E.C. Sayles purchased this company in 1881 and incorporated it as the Lorraine Manufacturing Company. The Sayles converted the works to cotton spinning and weaving, and built a large, four-story mill on the south side of Mineral Spring Avenue. The complex continued to grow and fill in, with doubling of weaving capacity on both sides of Mineral Spring Avenue in the early twentieth century. In 1935, the complex included 29 major buildings and employed 2,300 people (Kulick and Busham 1978:142; Roper 1978:54, *Pawtucket Times* 1935).

Post-Canal Landscape Evolution

In 1882 the Moshassuck River and Blackstone Canal were still intact through the Lorraine Mills complex (Figure 20). The northeast arm of the X formed by the river and canal crossing contained what appears to be a leucular island in roughly the position where the lock was originally located. A rectangular building with its long axis oriented east-west was located immediately east of this island, just north of the X crossing. In 1890 the canal in the northeast arm of the X had been ponded behind a weir just north of the former lock location (Figure 21). South of this weir, where the lock had been located, the canal narrowed and was joined by the Moshassuck River, which flowed in from the west side of the canal. Last of this section was a short parallel straight-walled channel that abutted the rectangular building noted on the 1882 map. This building was labeled "Filtering Offal Water (Grease Extracts)". The water used in this process was presumably diverted from the canal above the weir in the canal pond, directed through the building for process purposes, and discharged back into the canal via the narrow

channel abutting the west side of the building. In 1895 all four arms of the canal/river crossing X were still intact (Figure 22). In 1902 the southeast arm of the X where the Moshassuck River flowed east and south of the canal was filled in and occupied by two "open vats" (Figure 23). Sometime before 1917, the majority of the canal bed in the Lorraine Mills complex was covered over (Figure 24). North of Mineral Spring Avenue, a dam was built at the point where the canal and river diverged northeast of the mill buildings, possibly to control and divert water under the mills for waste disposal. Closer to Mineral Spring Avenue, a storehouse was built on the canal bed (Figure 25). South of the avenue the canal was covered to a point just north of where the lock had been located, and the adjacent process water channel was left open. This configuration remained as late as 1949 (Figure 26). Since then the canal has been filled in through the mill complex, as well as the short section of canal where the lock was located and the process water outfall channel. Valley Street was closed and access to the area south of Mineral Spring Avenue was changed to San Antonio Way, which begins west of the Moshassuck River and parallels it to the west until the intersection with Grotto Avenue.

The main line of the Moshassuck Valley Railroad crossed Mineral Spring Avenue east of the Lorraine Mill complex. By 1882 the mill buildings were served by a spur track that diverged from the main line north of the mill, followed the east bank of the former Blackstone Canal as it curved around the west side of the Lorraine Mills buildings north of Mineral Spring Avenue, and crossed that road just east of the canal, where it ended (see Figure 20). By 1890 this track had been extended south and west, crossing the former canal and the Moshassuck River on bridges just northwest of their confluence to serve the Lucius B. Darling Fertilizer Works. By 1917 the track configuration changed. A siding had been constructed off the spur track south of Mineral Spring Avenue, with the original track diverging west of the remaining watered section of canal where the lock had been located, and the siding diverging to the east of the canal. The fertilizer works was then the "Pawtucket Rendering Company Fertilizer Works Darling Branch" (see Figure 24). It is not known when service on the Lorraine Mills spur track was cut back or ceased.

Prior to construction of San Antonio Way, street access to the area then occupied by the fertilizer works and adjacent industries was via a street known first as Canal Street and later as Valley Street that extended south perpendicular to Mineral Spring Avenue from a point between the Moshassuck River and the canal alignment. It crossed the Moshassuck River on a bridge immediately west of the railroad bridge. By 1890 a water main was routed down the center of the street. This was indicated as an 8" water pipe in 1949 (see Figure 26).

Current Conditions Description and Canal Remnants Interpretation

Section 3 of the canal begins approximately 400 ft south of Mineral Spring Avenue, where the canal bed is filled at the entrance to the former lock, and the watercourse continues in the original Moshassuck River to the northwest. The east canal bank where the towpath was located is composed of modern fill that was piled to keep the river out of the mill property. The canal continues south, east of and parallel to San Antonio Way to Grotto Avenue. The canal is watered and visible in this segment, with wooded banks. South of Grotto Avenue the canal proceeds approximately 600 ft south, passing the National Wrecking Company warehouse and wetlands to the east and then curving south-southwest to a point where it meets a channeled brook that drains Veterans Memorial Park from the west. The canal then continues at the same heading for approximately 800 ft, approximately 50 ft west of the east border of St. Francis cemetery. The canal is lined with brush and trees and is watered and visible in this segment. Section 3 of the

canal ends at a culvert at the west edge of the P&W freight yard that parallels Interstate 95 to the east.

The Moshassuck River north of Section 3 contains an intact single track I-beam railroad bridge with concrete abutments and ties and rails in place. The concrete abutment for the siding that extended south on the east side of the lock site is still in place in the parking lot west of the mill buildings. Immediately upstream river is a pair of opposing concrete abutments carrying three cast iron water mains. These abutments originally carried Valley Street over the river.

There are no surface traces of the two towpath bridges and lock chamber in this vicinity, or of a possible dam at the river/canal crossing or of a possible lock keeper's house. There is a shallow trench immediately east of the river and south of Mineral Spring Avenue, but this feature is too far west and close to the Moshassuck River to be a remnant piece of canal bed.

Interpretive Themes and Potential

Section 3 of the Blackstone Canal and vicinity has potential for interpreting several historical themes associated with the canal. The segment of Section 3 along San Antonio Way consists of relatively undisturbed canal trench and could be used to interpret general canal construction and operation. The area immediately north of Section 3 has potential for interpretation of the history of the Sayles family textile mill operations. It also has potential to interpret the adaptive reuse of the Blackstone Canal, especially the environmental attitudes of nineteenth- and early twentieth-century manufacturers who saw open watercourses as logical routes for waste disposal. The railroad bridge adjacent to Section 3 could be used to interpret the transition from the canal to the railroad for local industrial transportation.

Additional Historic Resources for Possible Interpretation

The function of the rectangular two-story flat roof brick building immediately east of the former Lorraine Mills railroad spur track crossing at Mineral Spring Avenue has in the past been incorrectly identified as a railroad station. This building does not appear on Sanborn fire insurance maps until 1923, two years after the Moshassuck Valley Railroad ceased passenger operations. The fire insurance map identifies this building as an "office." The Moshassuck Valley Railroad's "Lorraine" station may have been in another building formerly at this location or at the crossing of the railroad's main line Mineral Spring Avenue crossing to the east.

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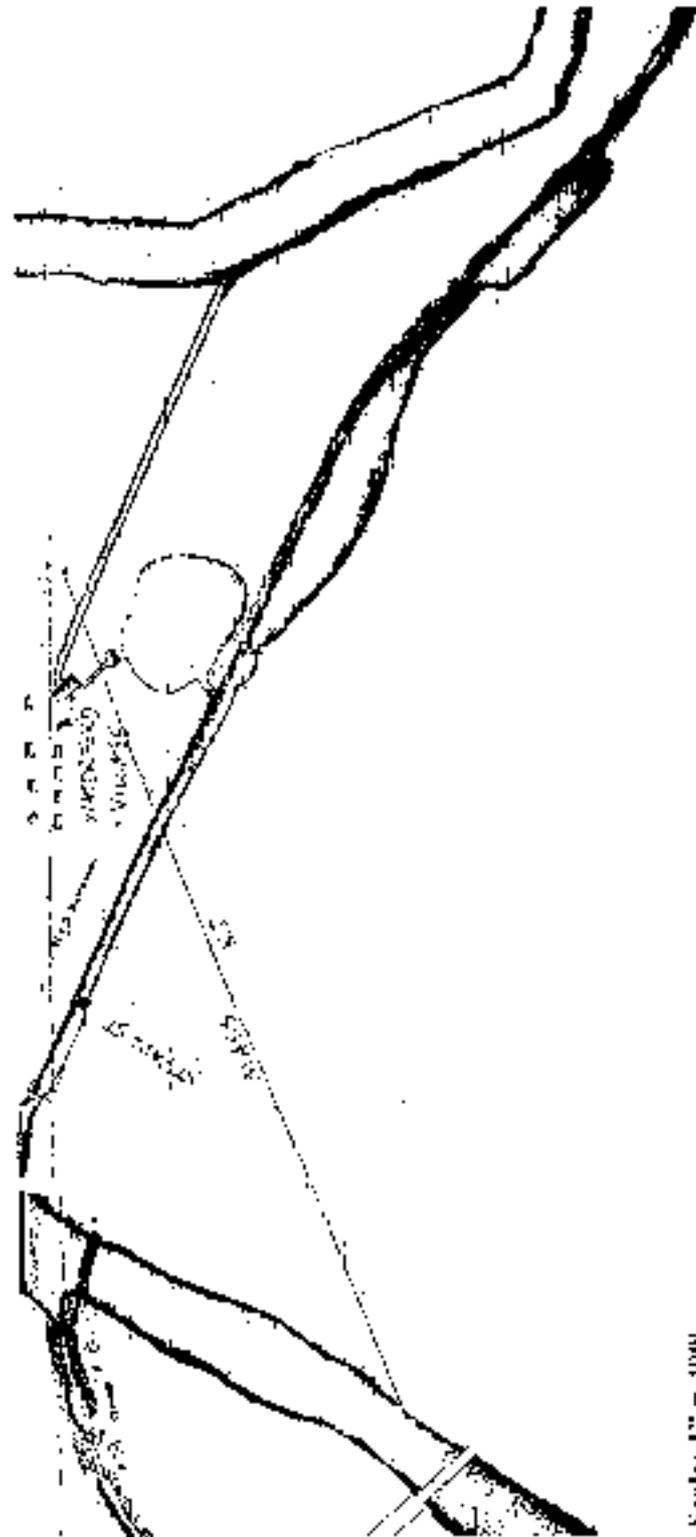
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Figure 1. *Map of the Blackstone Canal and its Appendages.* Edward N. Phelps, 1828.
Rhode Island Historical Society, Providence, RI. [Blackstone Canal Section 13]



Scale: 1" = 400'

Figure 2 1895 Map of Waterford Village, North Smithfield, RI-Blackstone, MA., *Atlas of Surveys, Providence County* Everts and Richards, Philadelphia, PA.

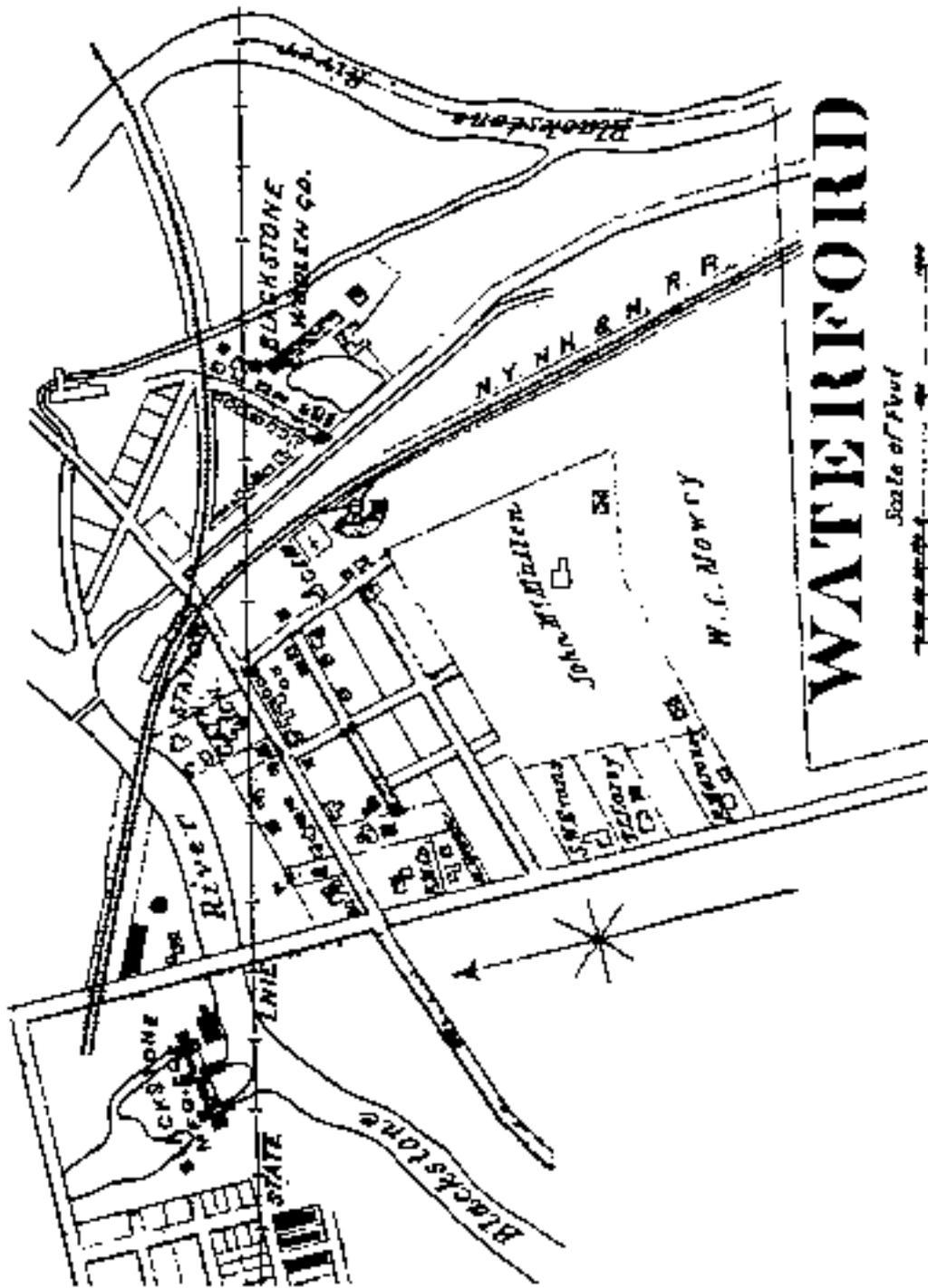


Figure 3. *Map of the Blackstone Canal and its Appendages.* Edward N. Phelps. 1838.
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Figure 4. *Map of the Blackstone Canal and its Appendages*. Edward N. Phelps. 1828.
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Figure 6. 1870 map of Lonsdale, Smithfield, RI. *Atlas of the State of Rhode Island and Providence Plantations*. D.G. Beers.

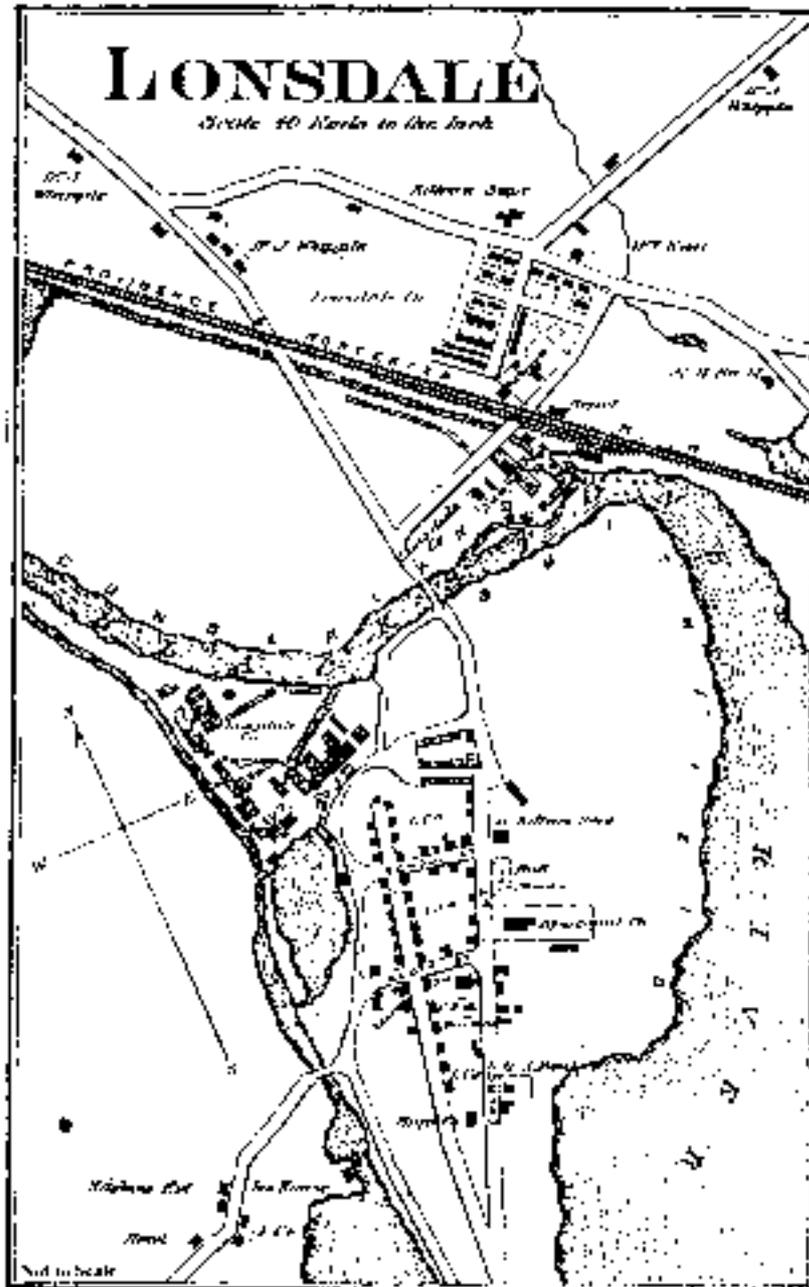


Figure 7. 1923 fire insurance map of Old Louisa mill. Sanborn Map Company, New York.

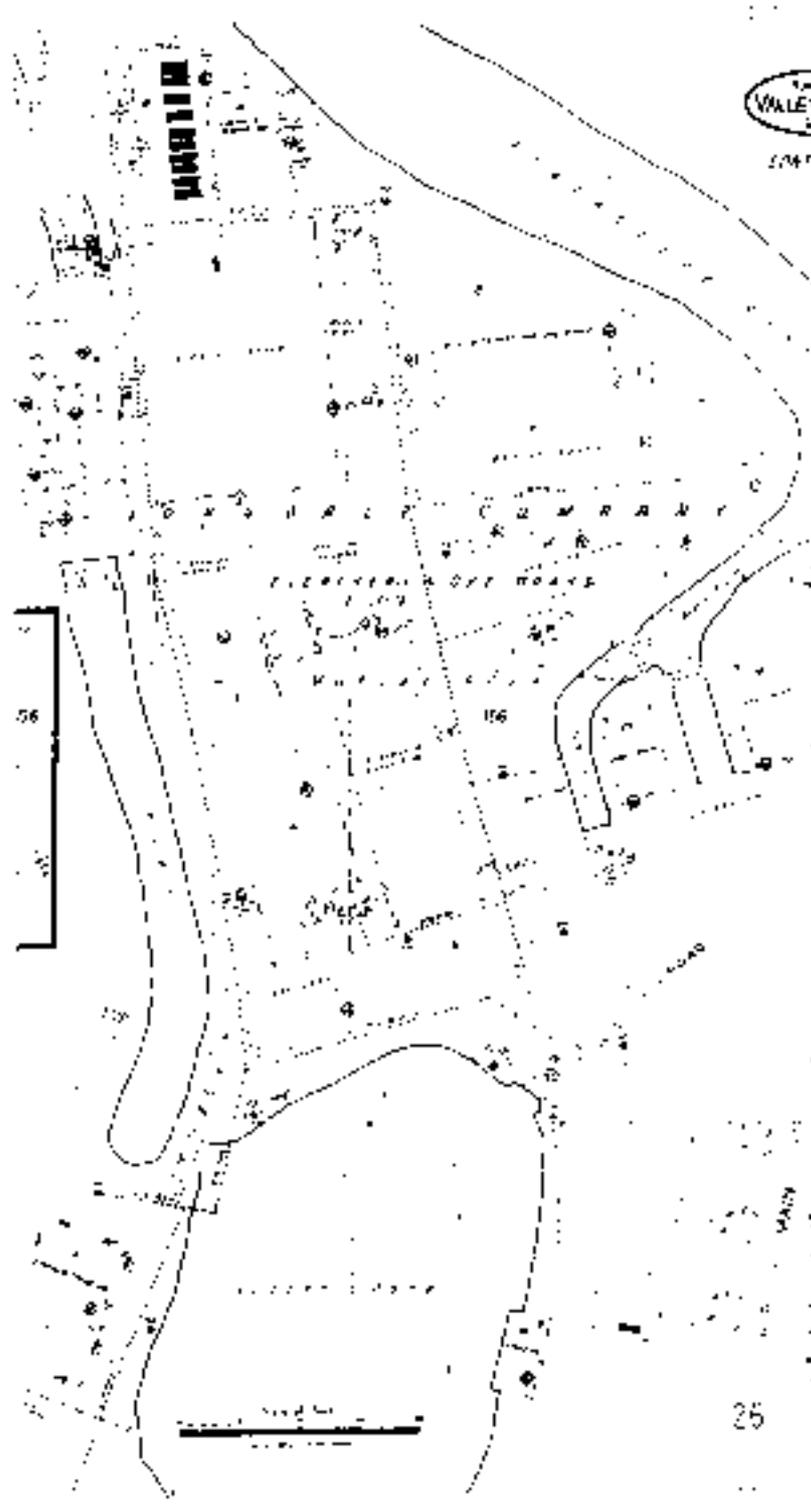


Figure 8. Detail of Old Lonsdale power canal and mill pond, 1923. Based on 1923 fire insurance map of Old Lonsdale mill. Sathorn Map Company, New York.

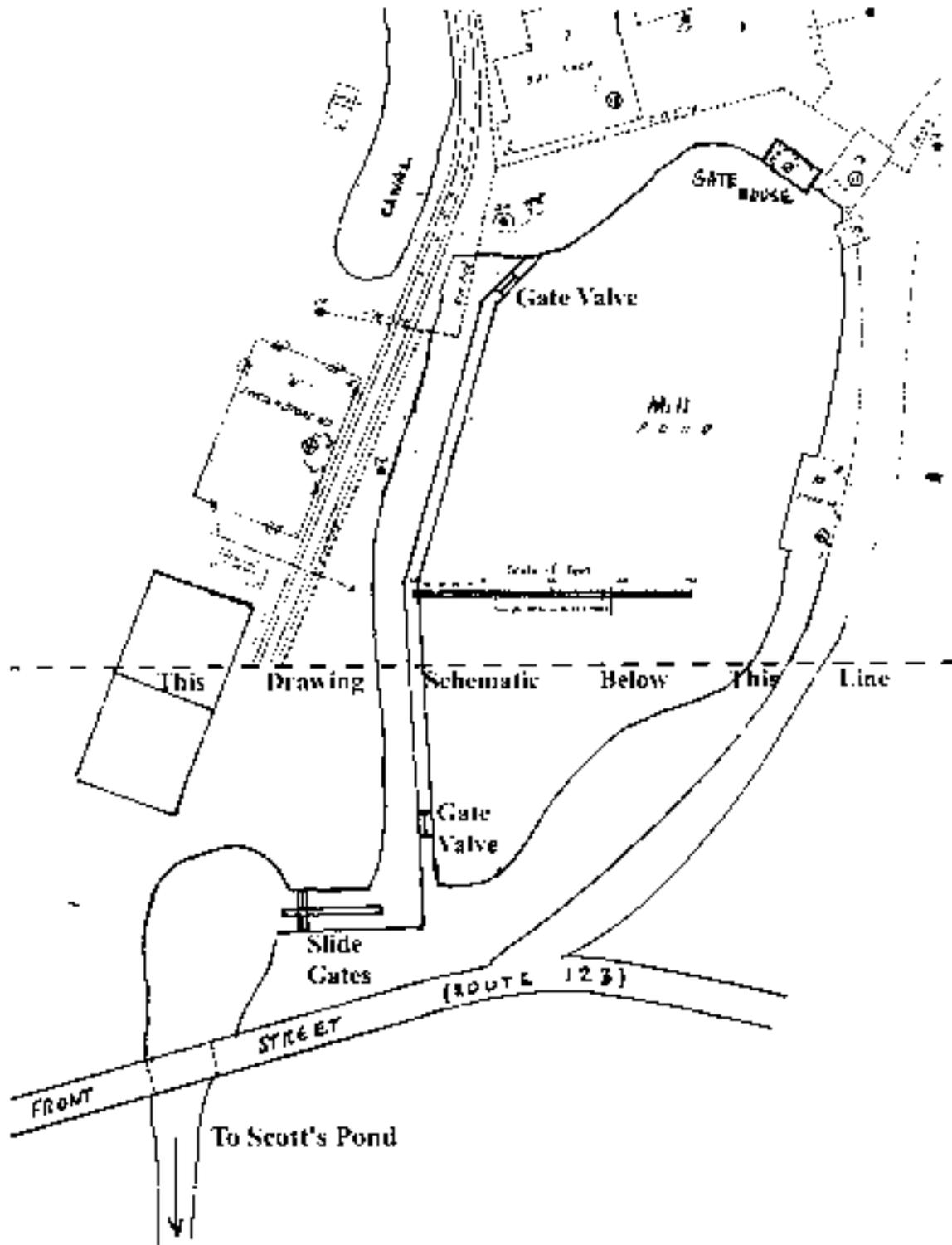


Figure 9. Detail of Lonsdale mills, Lincoln, RI, from 1894 USGS Providence 1:62,500
Quadrangle. U.S. Geological Survey.

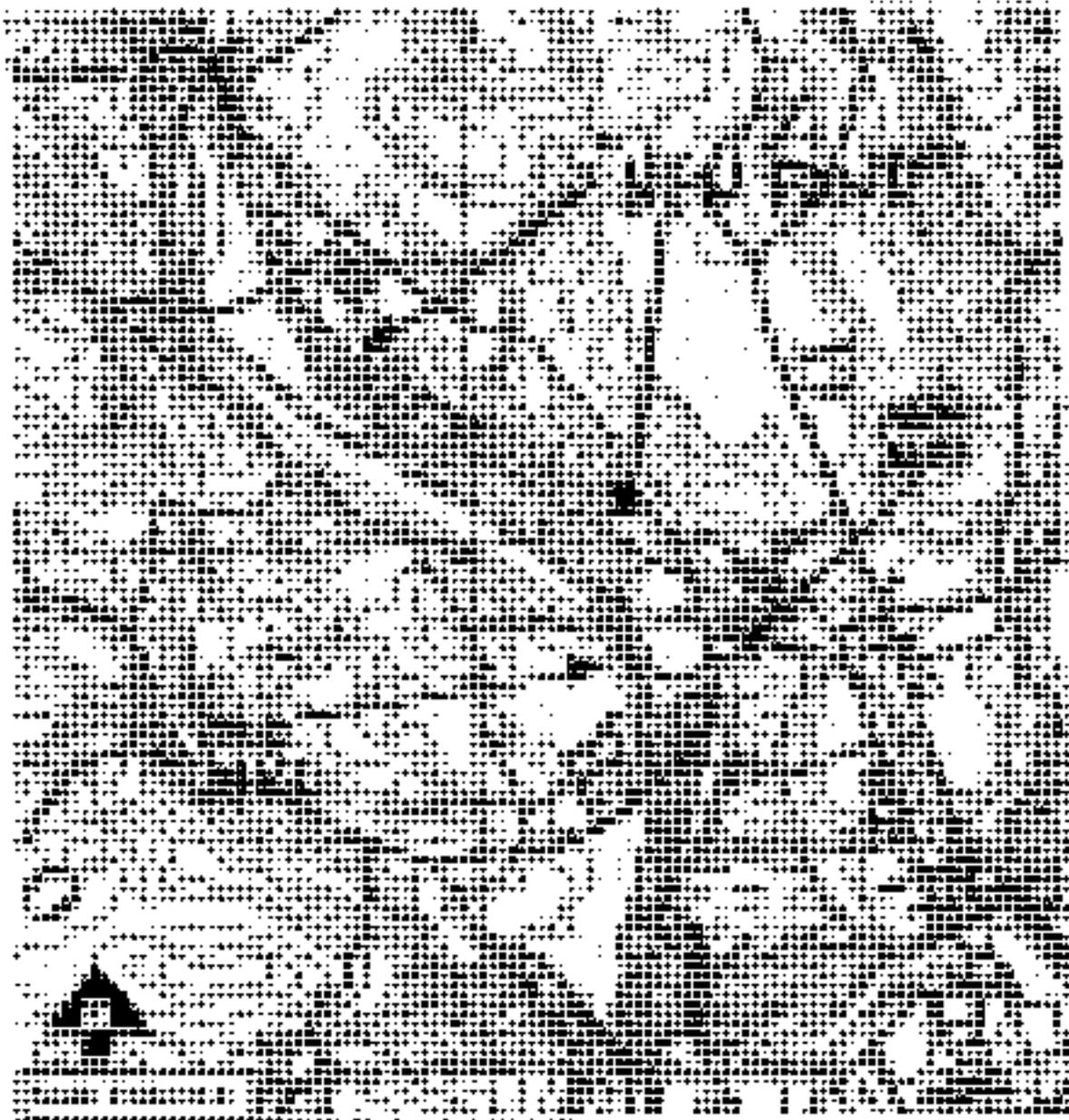


Figure 10. Detail of Lonsdale mills, Lincoln, RI, from 1944 USGS Providence 1:31,680
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Figure 11. Detail of Lonsdale mills, Lincoln, RI, from 1975 USGS Providence 1:24,000
Quadrangle. U.S. Geological Survey, Reston, VA.

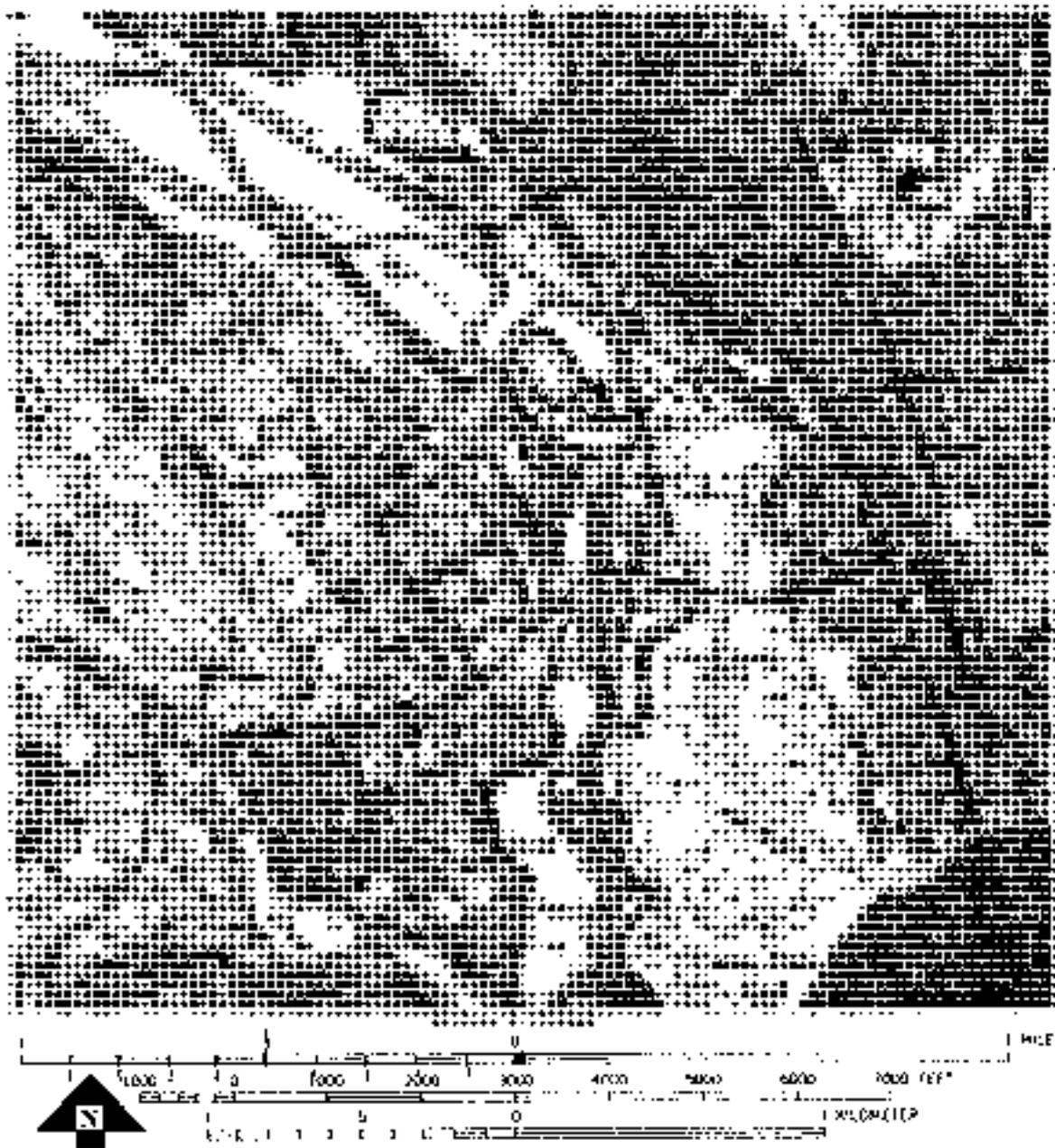


Figure 12. *Map of the Blackstone Canal and its Appendages.* Edward N. Phelps 1828.
Rhode Island Historical Society, Providence, RI. [Blackstone Canal Section 4]

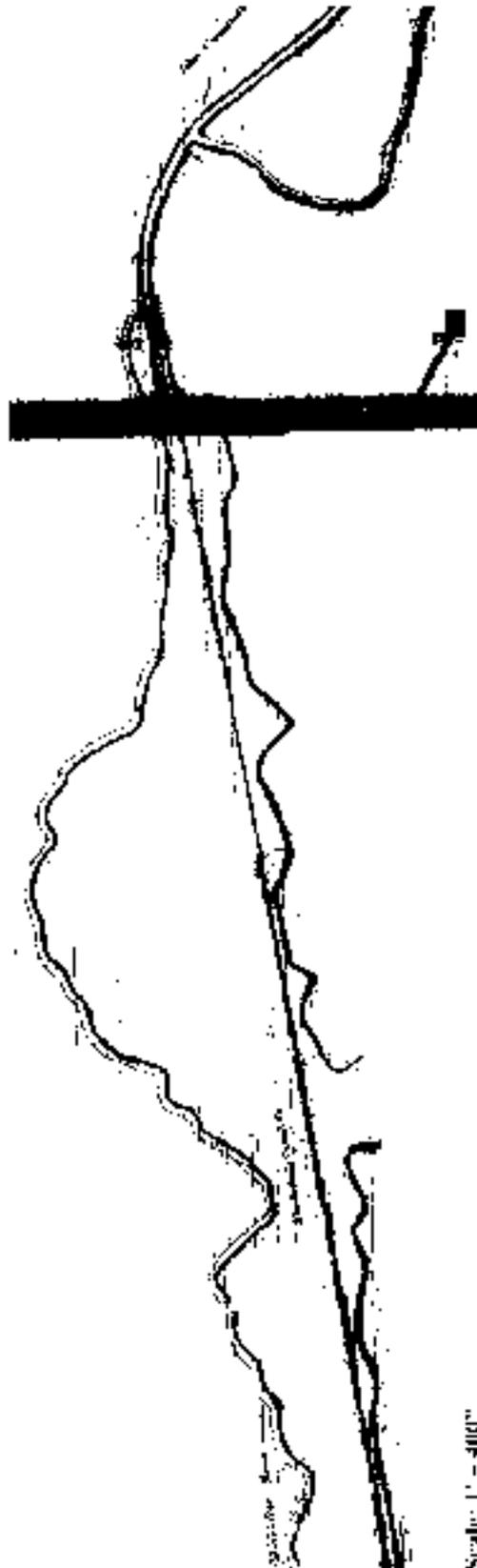


Figure 13. 1882 map of Sayles Bleachery, Lincoln, RI. *Atlas of Providence and Environs*.
O.M. Hopkins. Philadelphia, PA.



Figure 14. 1923 fire insurance map of Saylesville Bleachery, Lincoln, RI. Sanborn Map Company, New York



Figure 15. 1997 aerial photograph of Weeden Street area, Pawtucket, RI. Rhode Island Ortho Server.



Figure 16. 1882 map of Weeden Street area, Pawtucket, RI *Atlas of Providence and Environs*. O.M. Hopkins, Philadelphia, PA.

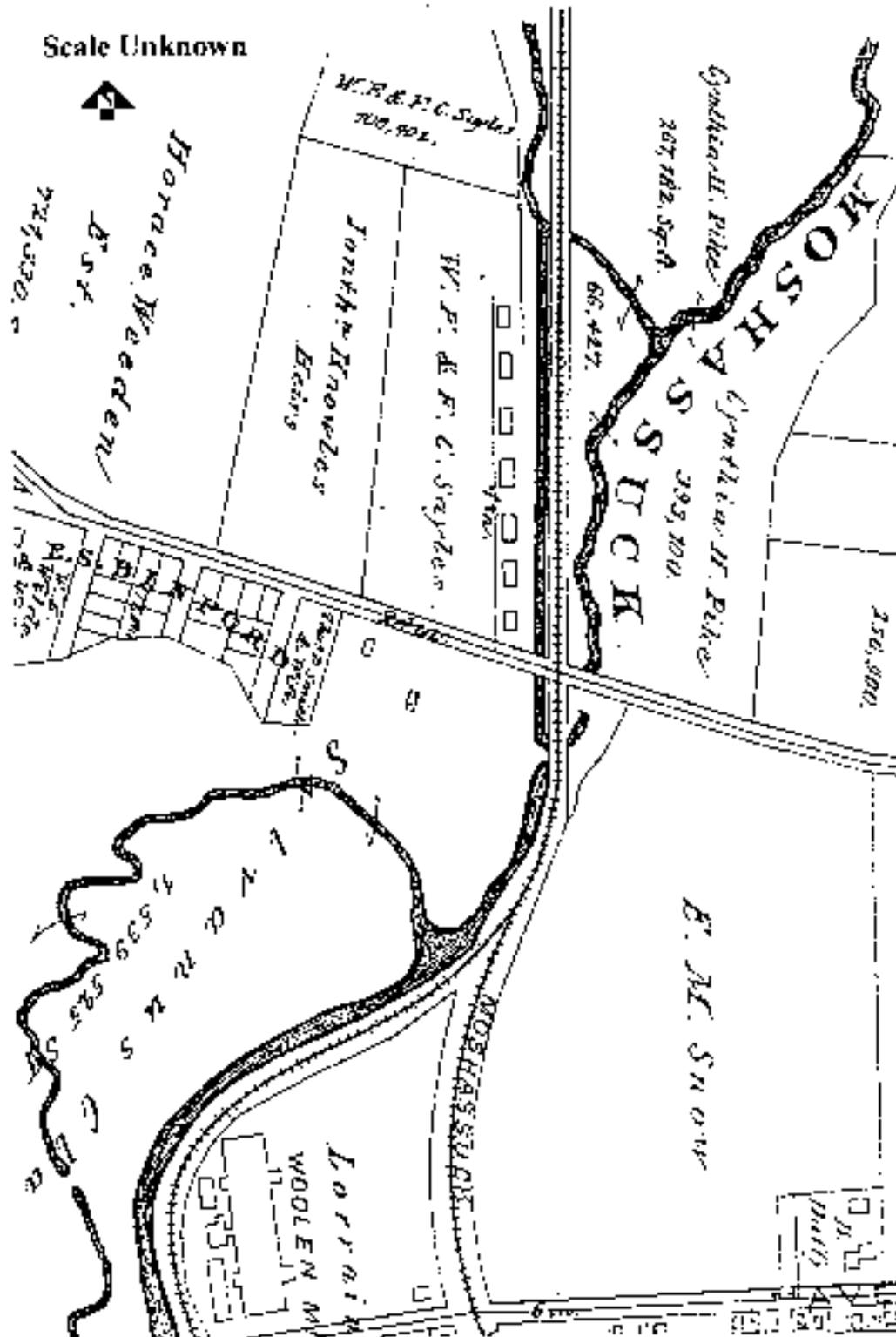


Figure 17. 1895 map of Weeden Street area, Pawtucket, RI. Providence County, Rhode Island. Everts & Richards, Philadelphia, PA.

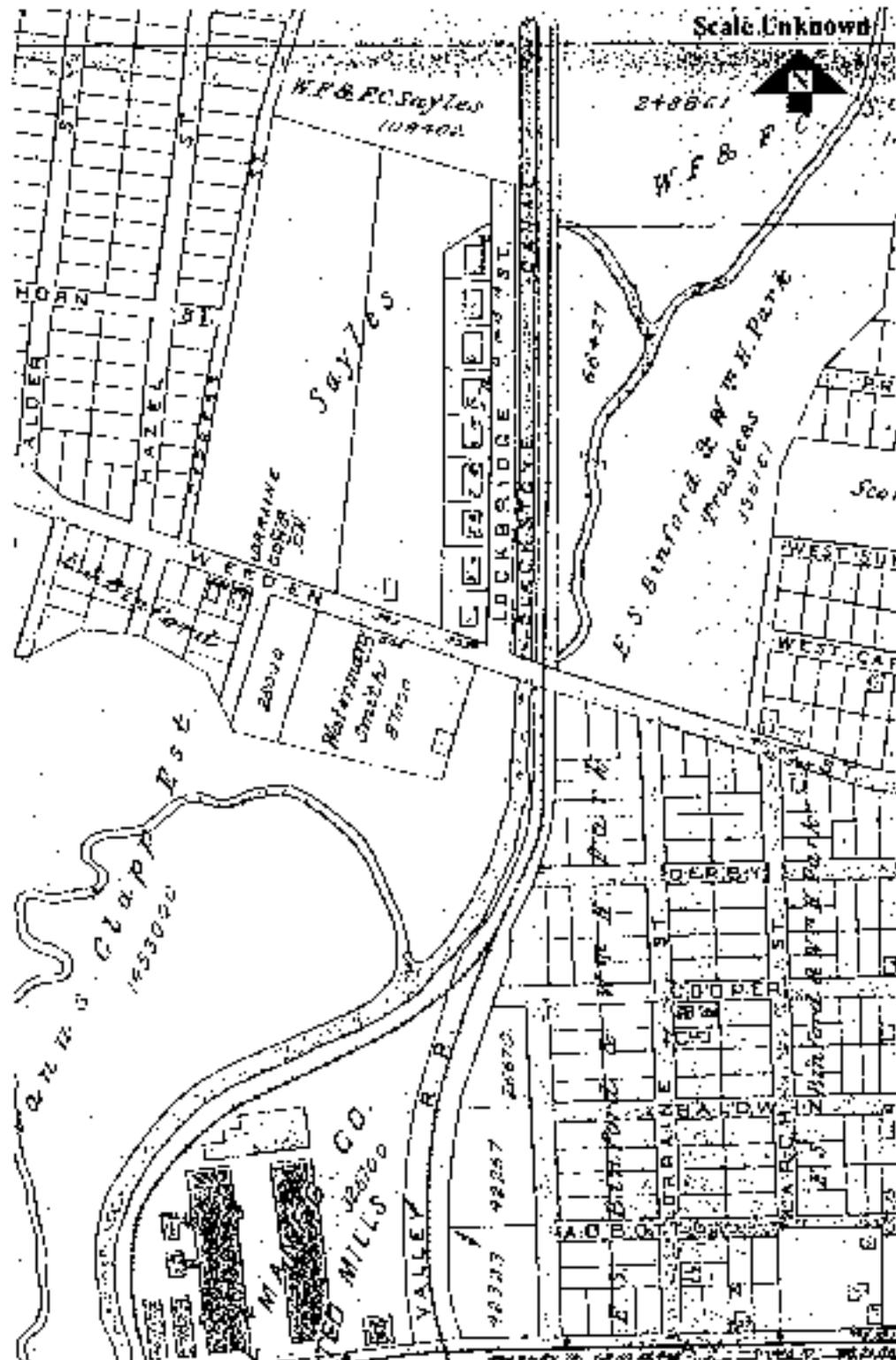


Figure 18. 1917 map of Weeden Street area, Pawtucket, RI Richards, Philadelphia, PA

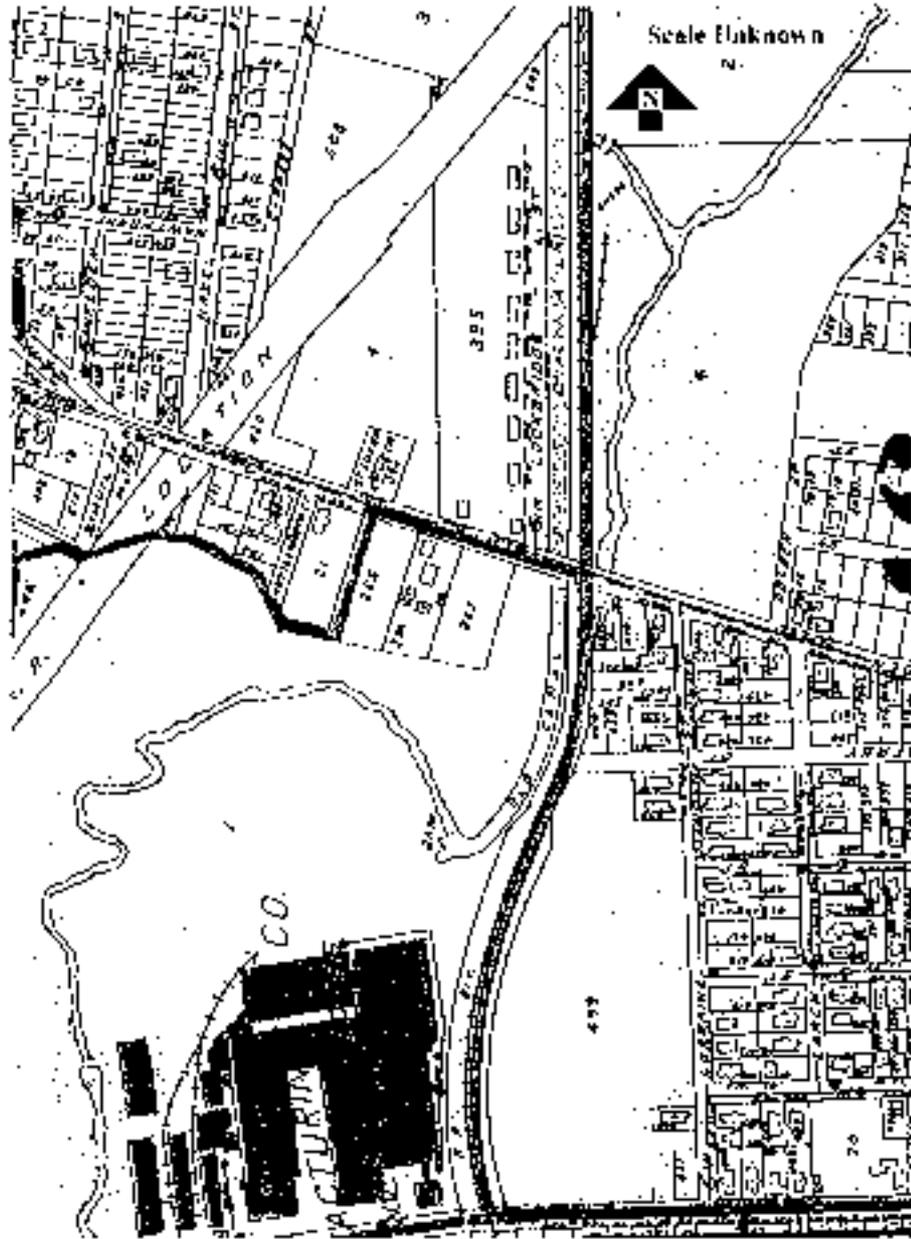


Figure 19. *Map of the Blackstone Canal and its Appendages.* Edward N. Phelps, 1828.
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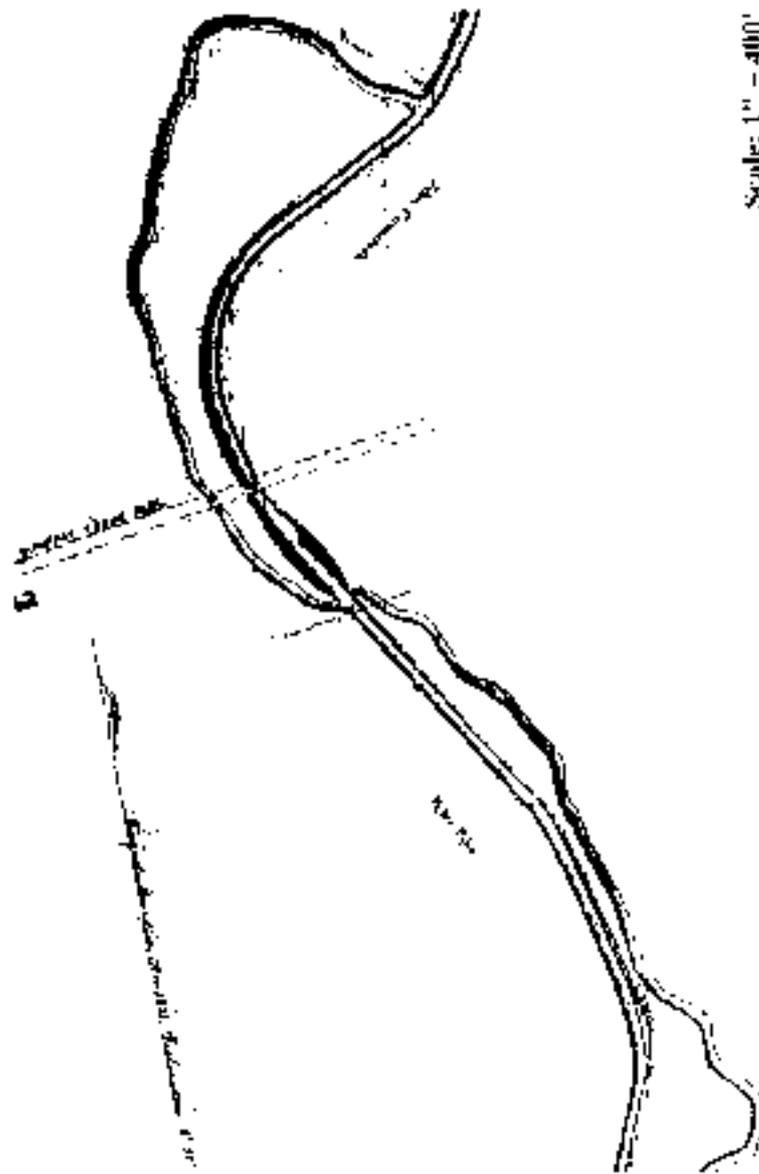


Figure 20. 1882 map of Lorraine Mills area, Pawtucket, RI *Atlas of Providence and Environs*. O.M. Hopkins, Philadelphia, PA.

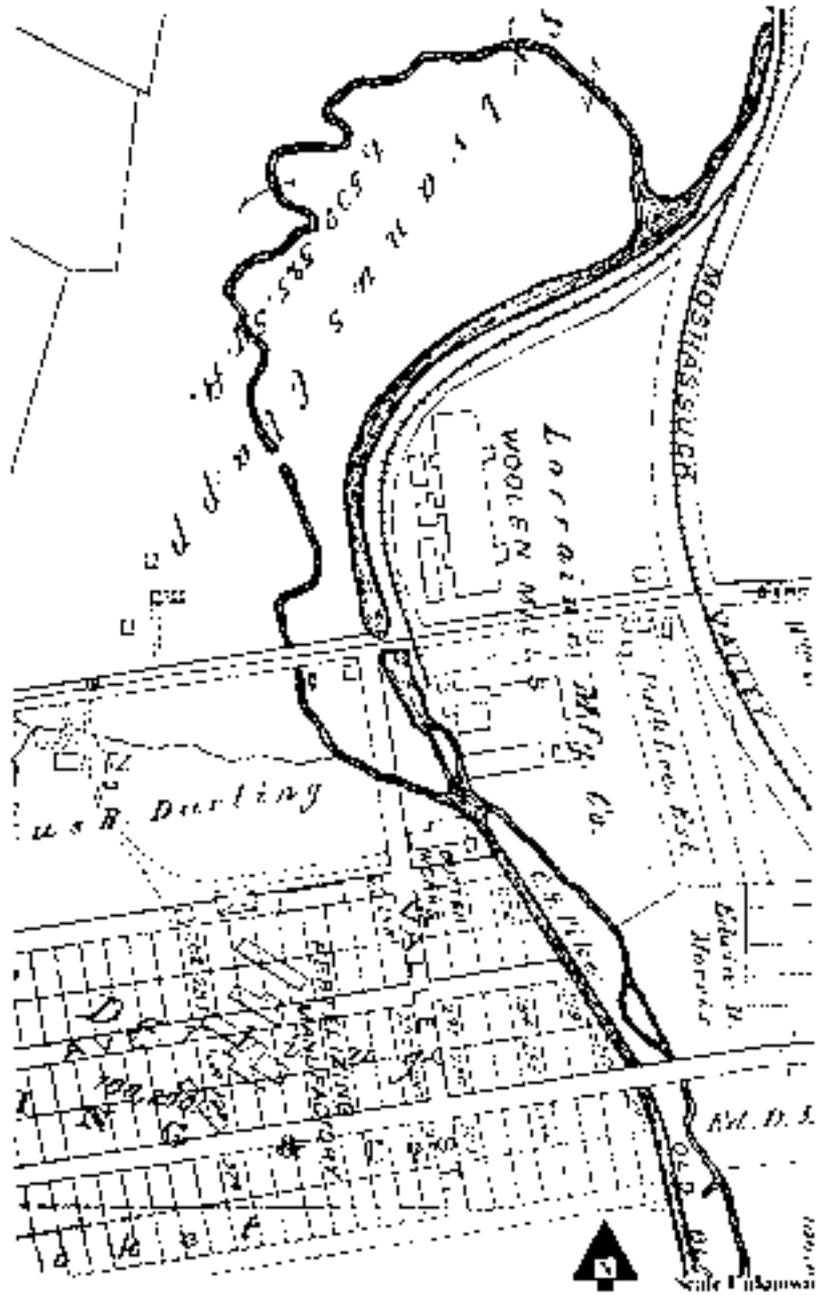


Figure 21. 1890 fire insurance map of Lorraine Mills, Pawtucket, RI. Sanborn Map Company, New York

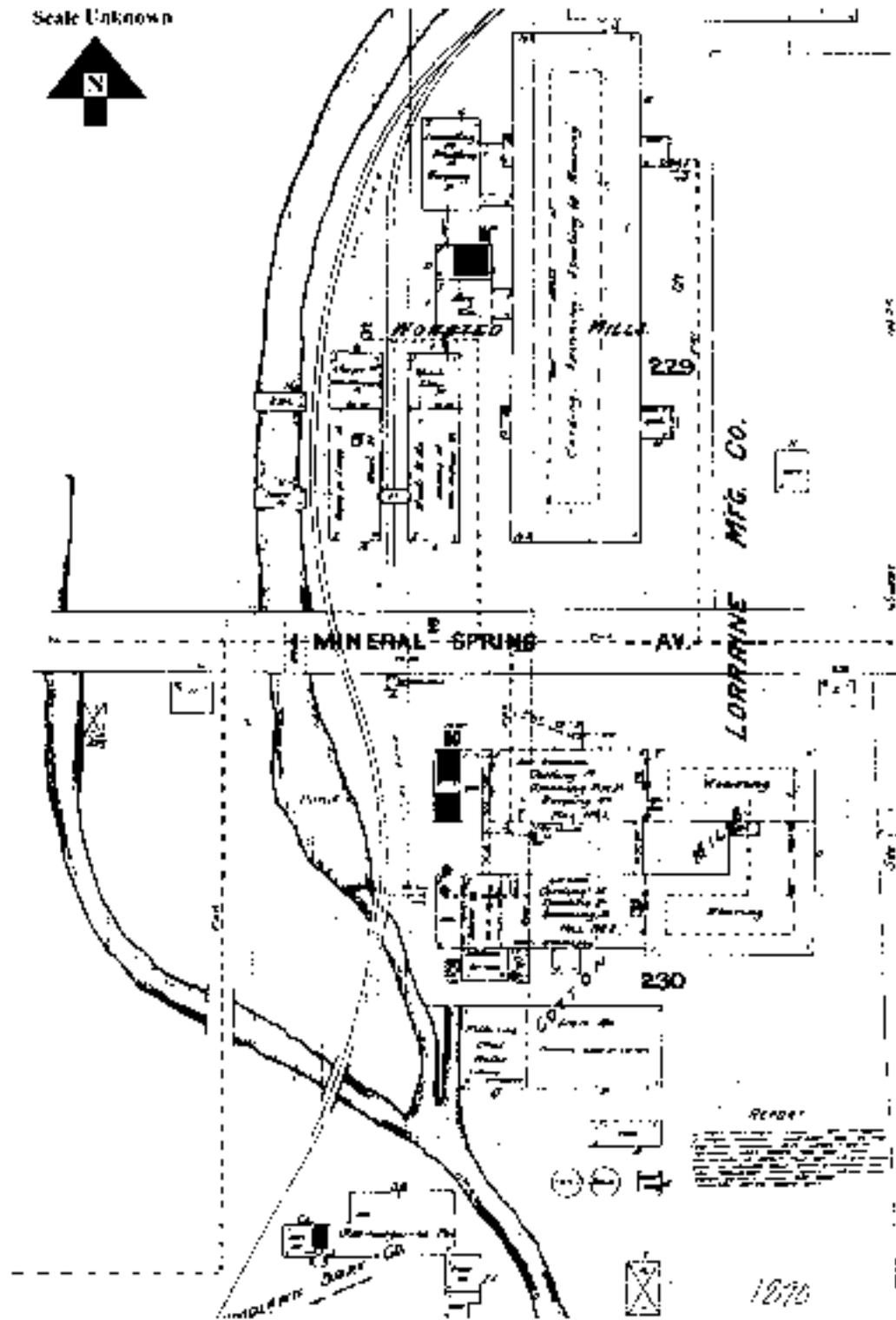


Figure 22. 1895 map of Lorraine Mills, Pawtucket, RI. *Atlas of Surveys, Providence County*. Everts and Richards, Philadelphia, PA.

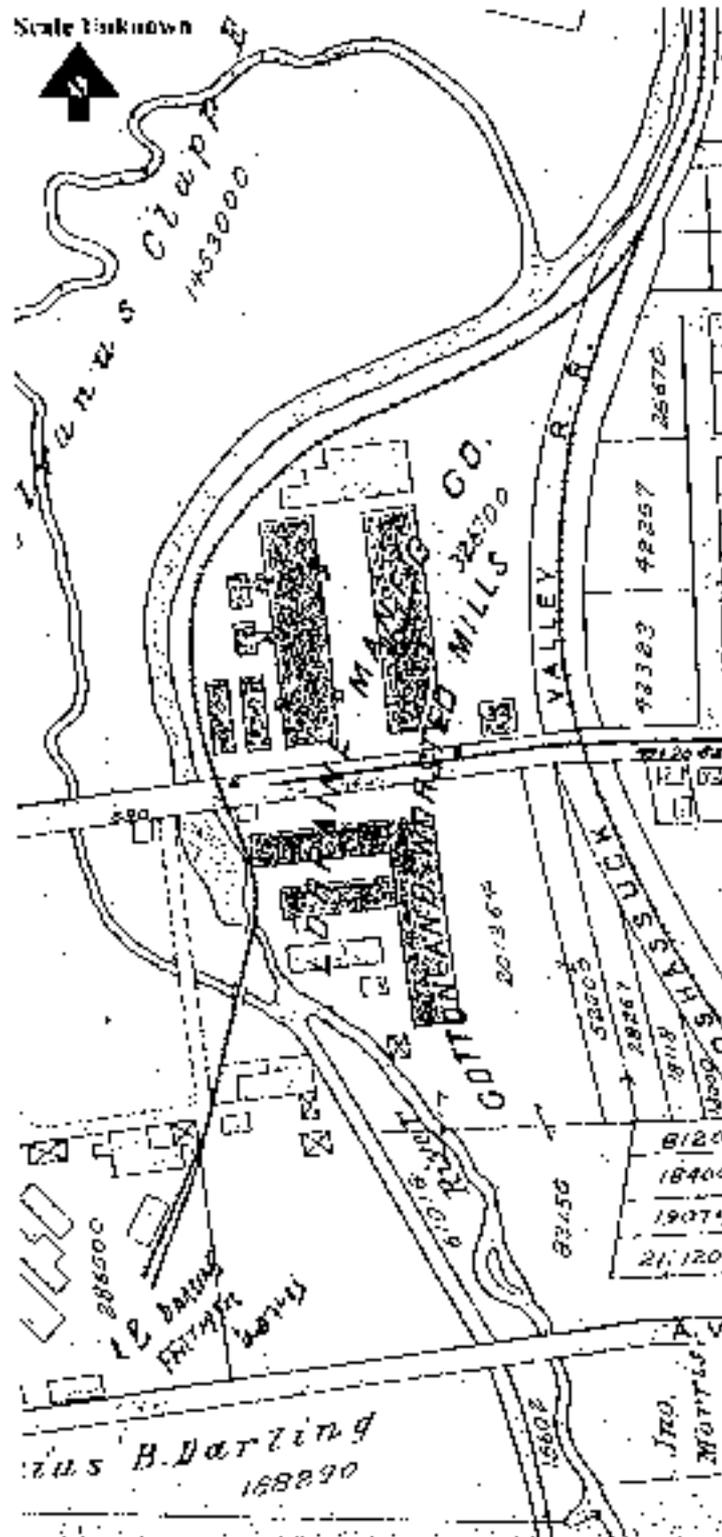


Figure 23. 1902 fire insurance map of Lorraine Mills, Pawtucket, RI. Sanborn Map Company, New York.

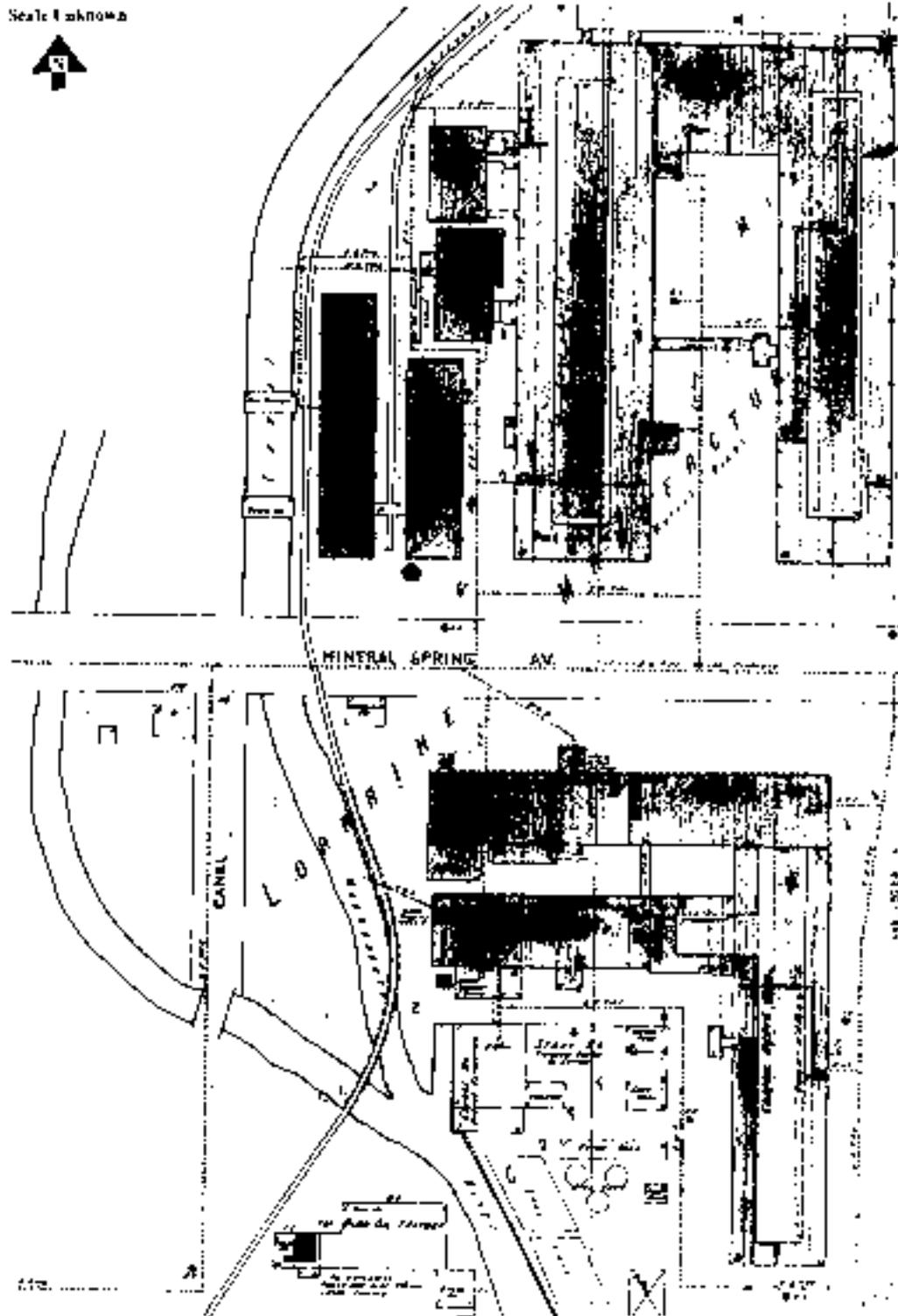


Figure 24. 1917 map of Lorraine Mills, Pawtucket, RI. Richards, Philadelphia, PA.

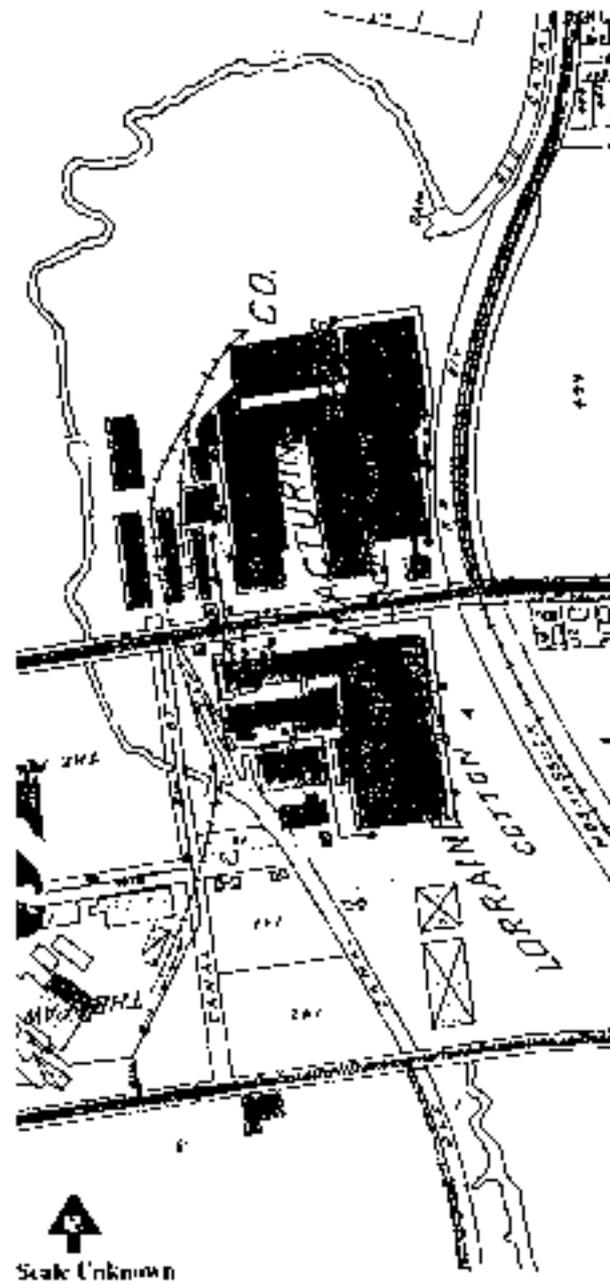


Figure 25. 1925 fire insurance map of Lorraine Mills, Pawtucket, RI. Sanborn Map Company, New York.

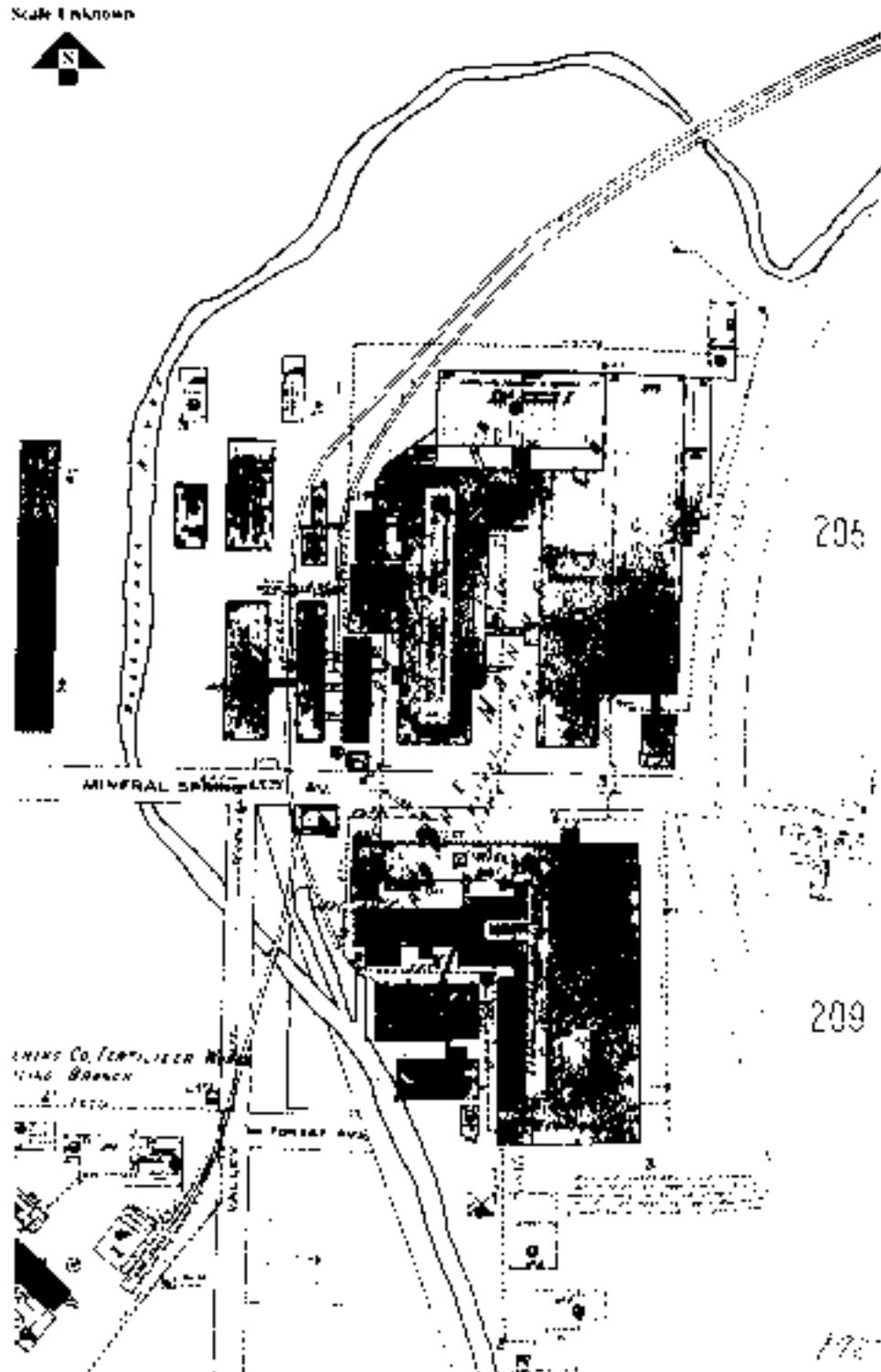
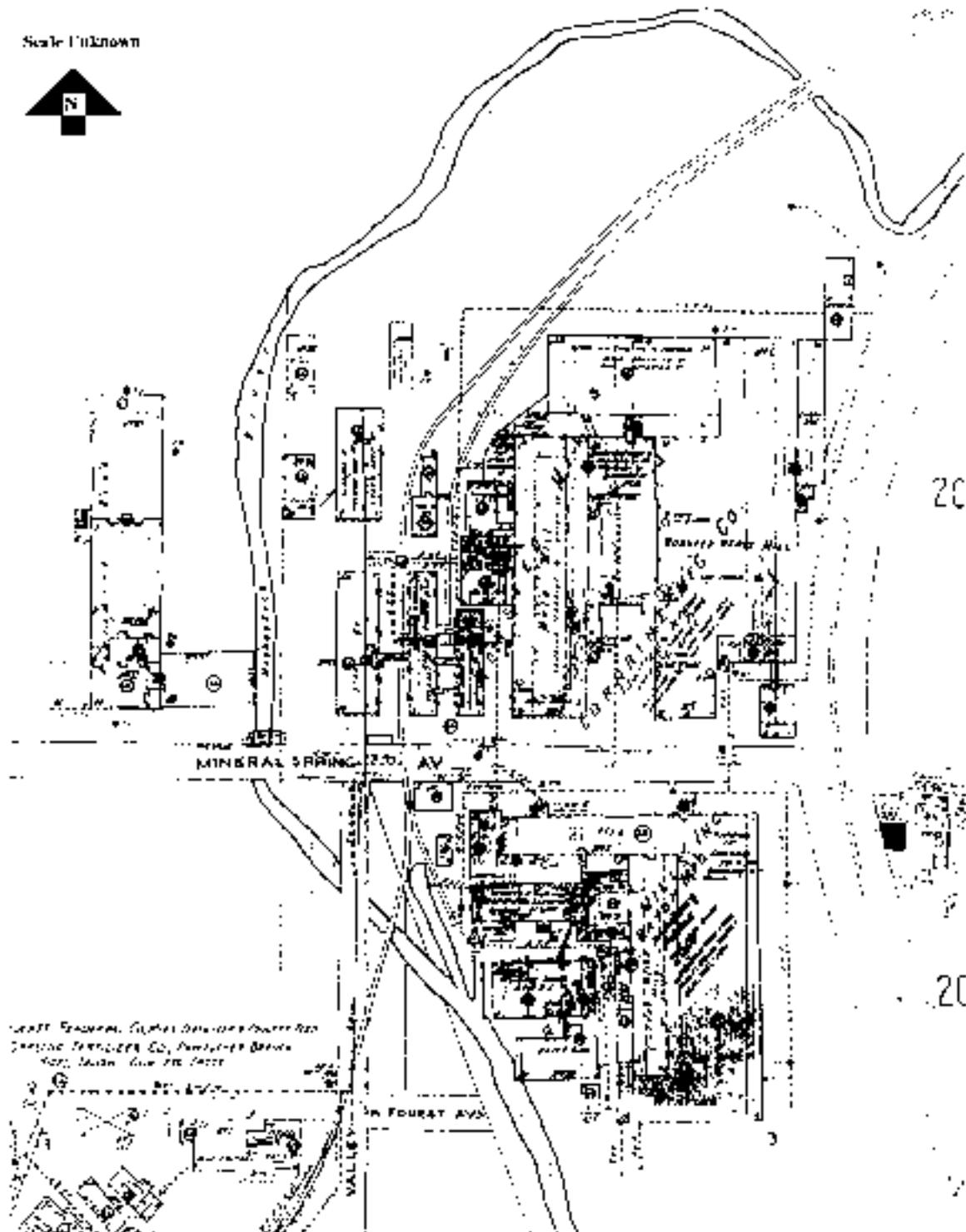


Figure 26. 1949 fire insurance map of Lorraine Mills, Pawtucket, RI. Sanborn Map Company, New York



Appendix H

List of Locks on the Blackstone Canal in Rhode Island and Massachusetts

Because many features of the Blackstone Canal, such as mile markers and locks, are no longer extant, researchers interested in the locations of these features have relied heavily on the 1828 map of the canal drawn by the engineer E.W. Phelps, in the collection of the Rhode Island Historical Society. The Phelps map is, however, an imperfect source. It depicts the route of the canal and the location of canal-related features, but provides very little geographic context, making it difficult to pinpoint the locations of these features in the modern-day landscape. In addition, access to the original map is limited and researchers have thus relied heavily on microfilm and Xerox copies, which are of poor quality. As a result, writings about the canal, including previous reports and the National Register nominations, include conflicting information about the number and locations of the locks on the Blackstone Canal.

As part of the research undertaken for the Blackstone Canal Preservation Study for Rhode Island, the Phelps map was reviewed carefully and compared with secondary sources about the canal, such as the National Register nominations, in an effort to clarify the number and locations of canal locks. The table below reflects this research and represents the most accurate information to date. Subsequent research and fieldwork, beyond the scope of this report, might provide additional information.

Blackstone Canal Lock Study

<u>Lock No.#</u>	<u>1828 Lock Location & Name</u>	<u>Current Lock Location & Name</u>
RI	Wooden Tidal Lock	Wooden Tidal Lock
#1	Prov - Charles & Mill St	Prov - Charles & Mills St
#2	Prov - Sheddon & Mason	Prov - <u>N</u> of Randall St.
#3	Prov - Heirs of Moses Dexter	Prov - <u>N</u> of North Burial Ground
#4	NProv - <u>N</u> Peter Pike	NProv - Mineral Springs lock
#5	Smifd - John Cumstock	Smifd - Cumstock / Weeden St.
#6	Smifd - A & I Wilkinson	Smifd - Saylesville Lock 1
#7	Smifd - A & I Wilkinson	Smifd - Saylesville Lock 2
#8	Smifd - Scott Pond Lock	Smifd - Saylesville Lock 3
#9	Smifd - Albion Lock	Smifd - Albion Lock
#10	Manv - A. Lapham	Smifd - Manville Lock 1
#11	Manv - Heirs J. Gully	Smifd - Manville Lock 2
#12	Manv - Heirs J. Gully	Smifd - Manville Lock 3
#13	Woon - Hamlet Mill Lock	Woon - Hamlet Mill Lock
#14	Woon - Court St Bridge Lock	Woon - Court St. Bridge Lock
#15	Woon - End of Allen St Lock	Woon - End of Allen St. Lock
#16	Woon - Market Square Lock	Woon - Market Square Lock
#17	Smifd - River Rd. Lock	Smifd - River Rd. Lock
MA		
#18	Blac - Monument Square	Blac - Monument Square
#19	Blac - Canal St. <u>W</u> Monument Sq	Blac - Canal St. <u>W</u> Monument Sq
#20	Blac - Canal St & Old Mendon Rd	Blac - Canal St & Old Mendon
#21	Millv - Millville Lock	Millv - Millville Lock
#22	Uxbrg - Scull Rock Lock	Uxbrg - Scull Rock lock
#23	Uxbrg - Lower Taft Lock	Uxbrg - Lower Taft lock
#24	Uxbrg - Bazaleel Taft Lock	Uxbrg - Bazaleel Taft Lock
#25	Uxbrg - Goat Hill Lock	Uxbrg - Goat Hill Lock
#26	Nthbg - Plummer's Landing	Nthbg - Plummer's Landing
#27	Nthbg - Dunn's Lock	Nthbg - Dunn's Lock / Riverdale
#28	Nthbg - Holbrook Village Lock	Nthbg - Rockdale Lock
#29	Graft - Farnumsville Lock	Graft - Farnumsville Lock
#30	Graft - Fisherville Lock	Graft - Fisherville Lock
#31	Graft - Leland's Landing Lock	Graft - Leland's Landing Lock
#32	Graft - Leland Lock 2	Graft - Leland Lock 2
#33	Graft - Saundersville Lock	Graft - Saundersville lock
#34	Suttn - Wilkinsonville Lock	Suttn - Wilkinsonville Lock
#35	Millb - A. L. Goodell Lock	Millb - <u>N</u> Cross St
#36	Millb - Lock at J&J Waite	Millb - <u>S</u> 1831 Dam
#37	Millb - Goodell Pond Lock 1	Millb - Rivelin St. Lock 1
#38	Millb - Goodell Pond Lock 2	Millb - Rivelin St . Lock 2
#39	Millb - N & A March Lock 1	Millb - <u>N</u> Canal St. Lock 1
#40	Millb - N & A March Lock 2	Millb - <u>N</u> Canal St. Lock 2
#41	Millb - N & A March Lock 3	Millb - <u>N</u> Canal St. Lock 3
#42	Millb - N & A March Lock 4	Millb - <u>N</u> Canal St. Lock 4
#43	Millb - Moses Park Lock	Millb - Rt. 20 Lock
#44	Worc - Elijah Burbank Lock	Worc - River Rd Lock

#45	Worc - Lincoln Lock - <u>S</u> MM42	Worc - Lochwan St / Washburn Moen Mill Lock
#46	Worc - Burbank Mill Lock	Worc - Quinsigamond Village Lock
#47	Worc - Isreal Whitney lock mm43	Worc - Brosnihan Sq Lock
#48	Worc - Flagg Pond Lock	Worc - Kelly Sq Lock

