Form 10-300
(Rev. 6-72)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: New Jersey
COUNTY: Multiple
FOR NPS USE ONLY
ENTRY DATE: OCT 1 1974

SEE INSTRUCTIONS

1. NAME

COMMON: Morris Canal

AND/OR HISTORIC:

2. LOCATION

STREET AND NUMBER: Multiple

CITY OR TOWN:

CONGRESSIONAL DISTRICT: 8th, 10th, 11th, 13th, 14th

STATE: New Jersey — CODE: 34

COUNTY: Multiple — CODE:

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
[X] District [ ] Building	[ ] Public	Public Acquisition:	[X] Occupied	Yes:
[ ] Site [ ] Structure	[ ] Private	[ ] In Process	[X] Unoccupied	[X] Restricted
[ ] Object	[X] Both	[X] Being Considered in certain areas	[ ] Preservation work in progress	[ ] Unrestricted
				[ ] No

PRESENT USE *(Check One or More as Appropriate)*

[ ] Agricultural	[ ] Government	[X] Park	[ ] Transportation	[ ] Comments
[ ] Commercial	[ ] Industrial	[X] Private Residence	[ ] Other *(Specify)*	
[ ] Educational	[ ] Military	[ ] Religious		
[ ] Entertainment	[ ] Museum	[ ] Scientific		

4. OWNER OF PROPERTY

OWNER'S NAME: Multiple

STREET AND NUMBER:

CITY OR TOWN:

STATE:

CODE:

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC: See continuation sheet

STREET AND NUMBER:

CITY OR TOWN:

STATE:

CODE:

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6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY: New Jersey Historic Sites Inventory (Morris Canal)

DATE OF SURVEY: 1972 [ ] Federal [X] State [ ] County [ ] Local

DEPOSITORY FOR SURVEY RECORDS: Dept. of Environmental Protection, Historic Sites Section

STREET AND NUMBER: Box 1420

CITY OR TOWN: Trenton

STATE: New Jersey — CODE: 34

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7. DESCRIPTION

CONDITION	(Check One)					
	☐ Excellent	☐ Good	☐ Fair	☒ Deteriorated	☐ Ruins	☐ Unexposed
	(Check One)		(Check One)			
	☒ Altered	☐ Unaltered	☐ Moved	☒ Original Site		

DESCRIBE THE PRESENT AND ORIGINAL *(if known)* PHYSICAL APPEARANCE

When it was completed to Jersey City in 1836, the Morris Canal was 102.30 miles long, with a .67 mile long navigable feeder connecting Lake Hopatcong with the main canal at Landing. In 1837, a navigable 4.26 mile long feeder was added to conduct the impounded waters of Greenwood Lake into the main canal at Mountain View via the Pompton River. The river itself provided slack-water navigation for another 1.75 miles to the foot of Pompton Falls. In about 1845, a navigable spur, approximately .83 miles lomg, enabled boats to service the Stanhope Iron Works. Thus the total length of the Morris Canal can be set at 109.31 miles.

Water for the operation of the canal was impounded at Lake Hopatcong, Greenwood Lake, Stanhope Reservoir (now Lake Musconetcong), Green Pond, Cranberry Lake, Bear Pond, Waterloo Lake, and Saxton Falls. Many rivers and streams were taken into the canal as well; chief among them: the Lopatcong Creek, the Rockaway River, Beach Glen and Granny's Brooks, the Passaic, Pequannock, Ramapo, Wanaque, and Hackensack Rivers. The minor streams are too numerous to recount.

The canal had a total rise and fall of some 1674 feet between Jersey City and Phillipsburg. Only about 225 feet were overcome by oridinary lockage: 10 locks west, and 22 east, of the summit level at Lake Hopatcong. Except for the 18 foot lift of Lock # 17E at Newark, the locks averaged 10 feet of lift per lock. Two other locks served as guard locks. Five of the 22 locks east of the summit were tide locks, or outlet locks. All locks, with the exception of the tide locks, were constructed of stone with wooden gates. The tide locks, because of the corrosive action of salt water, were made entirely of wood.

The remaining 1450 feet of the canal's elevations were overcome by means of 23 inclined planes, averaging 63 feet of vertical lift each.

As first built, the canal held four feet of water in a prism 32 feet wide at the top and 29 feet wide at bottom. Locks 75 feet long, 9 feet wide passed boats of 16 to 18 tons burden. In 1840-41 locks were enlarged to 98 feet by 12 feet in order to pass boats of 45 tons burden, and planes were correspondingly widened two feet. The plane machinery proved unable to handle that much weight, and section boats were brought into use by 1845. Separable at midships, these boats could be passed over the planes one section at a time. Time and water consumption were prohibitive, however, and plane machinery of a new, more powerful design was built, and the prism was enlarged to 40' x 25' x 5'. Thereafter, setion boats of 65 to 75 tons burden could pass the planes in one piece, and in one operation. Locks were further lengthened, ultimately reaching about 90 feet.

The inclined planes originally used on the Morris Canal were of several types. Wet basins, or movable locks were among the first designs. Boats were floated into basins at top or

(cont.)

SEE INSTRUCTIONS

8. SIGNIFICANCE

PERIOD *(Check One or More as Appropriate)*

☐ Pre-Columbian	☐ 16th Century	☐ 18th Century	☐ 20th Century
☐ 15th Century	☐ 17th Century	☒ 19th Century	

SPECIFIC DATE(S) *(If Applicable and Known)* 1830, 1836

AREAS OF SIGNIFICANCE *(Check One or More as Appropriate)*

Aboriginal	☐ Education	☐ Political	☐ Urban Planning
☐ Prehistoric	☒ Engineering	☐ Religion/Philosophy	☐ Other *(Specify)*
☐ Historic	☒ Industry	☐ Science	
☐ Agriculture	☐ Invention	☐ Sculpture	
☐ Architecture	☐ Landscape Architecture	☐ Social/Humanitarian	
☐ Art	☐ Literature	☐ Theater	
☐ Commerce	☐ Military	☒ Transportation	
☐ Communications	☐ Music		
☐ Conservation			

STATEMENT OF SIGNIFICANCE

Transportation/ Engineering/ Industry.

The political independence gained by America in the Revolution could be maintained only by a country that was economically self-sufficient. Accordingly, far-sighted statesmen and financiers, among them George Washington and Alexander Hamilton, focused on the problems of establishing manufactories and improving transportation. The War of 1812, called by some the "Second War for Independence", reinforced the knowledge that this new nation must become a manufacturing one - particularly of iron goods.

New Jersey's Highlands were the repository of high quality ores, nowhere more generously distributed than in Morris County. Hundreds of mines, forges, and furnaces had had to shut down after the Revolution for want of fuel and markets, enjoying a brief but temporary revival during the War of 1812. Making charcoal, then the only known fuel capable of producing sufficient heat for the making of iron, had denuded most of northern New Jersey's woodland, as more and more acreage had fallen under the collier's axe.

The discovery of anthracite in northeastern Pennsylvania during the last decade of the 18th century was to herald a resurrection of the iron industries, particularly in New Jersey, where they had been such a vital part of the total economy. Once it had been demonstrated that anthracite was a fuel superior to charcoal in both performance and availability, it needed only to be proved more economical. What was needed was a method of transporting the coal, the iron ore, and the iron products subsequently produced by the combination of the two. By 1822, after reviewing the success of the still-unfinished Erie Canal in New York, the advent of the Lehigh Canal, and the promise of availability of fuel from Pennsylvania, plus the potential lucrativeness of the dormant New Jersey iron industries, George P. McCulloch of Morristown arrived at a plan for a coal-carrying canal that would successfully unite all those elements - cheaply.

Originally, McCulloch had thought to construct an artificial waterway using Lake Hopatcong as the sole source of water from the summit level east and west, and connecting the Passaic with the Musconetcong or Pequest Rivers, at points where those streams became (or could be made to be)

(cont.)

SEE INSTRUCTIONS

9. MAJOR BIBLIOGRAPHICAL REFERENCES

Annual Reports of the President of the Morris Canal and Banking Company. All years, 1826 et seq.

Boyer, Charles. Forgotten Forges of New Jersey. 1939.

Cullum, George W. Biographical Register of the Officers and Graduates of the U.S.M.A. 1868.

Cunningham, John. This is New Jersey. 1968.

Dunbar, Seymour. A History of Travel in America. 1915.

Goodrich, Carter, ed. Canals and American Economic Development. 1961.

(cont.)

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY						OR	LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES					
CORNER	LATITUDE			LONGITUDE				LATITUDE			LONGITUDE	
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
NW	°	'	"	°	'	"		°	'	"	°	'	"
NE	°	'	"	°	'	"		See continuation sheets					
SE	°	'	"	°	'	"							
SW	°	'	"	°	'	"							

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: not applicable

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY	CODE
		Essex	013
STATE:	CODE	COUNTY:	CODE
		Hudson	017
STATE:	CODE	COUNTY:	CODE
		Morris	027
STATE:	CODE	COUNTY:	CODE
		Sussex (cont.)	037

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11. FORM PREPARED BY

NAME AND TITLE:
Barbara Kalata, Historian --(minor revisions T. Karschner)

ORGANIZATION: Private Citizen -- (Dept. of Environmental Protection, Historic Sites Section)

DATE: 10-10-1973

STREET AND NUMBER: 7 Pine Brook Rd. (Box 1420)

CITY OR TOWN: Lincoln Park -- (Trenton)

STATE: New Jersey

CODE: 34

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☒ Local ☐

Name [signature]

Richard J. Sullivan

Title Commissioner, Environmental Protection

Date November 26, 1973

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

[signature]

Director, Office of Archeology and Historic Preservation

Date 10/1/74

ATTEST:

[signature]

Keeper of The National Register

Date 7-18-74

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New Jersey, Code: 34

5. Location of Legal Description (cont.)

Hall of Records, Newark, Essex County, New Jersey

Hall of Records, Jersey City, Hudson County, New Jersey

Hall of Records, Court Street, Morristown, Morris County, New Jersey

Hall of Records, Newton, New Jersey, Sussex County

Hall of Records, Belvidere, Warren County, New Jersey

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7. Description (cont.)

bottom of the planes and made secure. Then, boat, basin, and all were transported over the plane atop a triangle-shaped frame set on 8 foot flanged wheels that rode on strap-iron rails laid over the graded slope. Motive power was water, it being let out of the upper level of the canal to turn a wooden water wheel alongside the plane. Wheels were 18 to 20 feet in diameter, according to one early report, and were most likely of the overshot type. Having done its work, the water returned to the canal at the lower level. Once a standardized design had been adopted (c. 1835), all planes were of the above lock-type. By 1861, they were all converted to summit types.

The summit types planes in use at the time of the abandonment of the canal were put into play beginning in 1848. The design was radically different in that it put the water wheel - cast iron, not wood- in a pit about 30 to 50 feet underground. The 12- foot diameter turbines had four arms at their outer edges, ending in openings 15½ inches high by 3½ inches wide, through which the working water exited into a tailrace culvert to be carried back into the canal at the lower level. The force of the exiting water forced the wheel to revolve, in turn rotating a drive shaft which terminated in a clutch mechanism above ground, in a sort of control house, or tower. From the tower the plane tender had an overall, unobstructed view of the plane, plus control over the machinery and the water which operated it.

The average grade of a plane was 10%, or one foot lift for every ten feet. The slope was laid with parallel rows of large flat stones, or sleepers, embedded in the ground and chiseled level to receive 6" x 8" wooden stringers which were spiked in place. Atop the longitudinal stringers were rails (introduced in in the 1860's) laid 12'4½"from center to center. The rails themselves were 3 1/8" broad at top, 3½" high, and weighed 76 pounds to the yard. The tracks ran a short distance along the bottom of the canal at the foot and the top of the plane, terminating at sheaf wheels, laid horizontally in the canal bed and totally submerged. These wheels guided 2½" twisted wire cable which was attached to both ends of a cradle car and to a 12-foot winding or cable drum in the control house.

The winding drum had a continuous spiral groove of 3" pitch in its periphery. The cable ends were fastened at opposite ends of the drum so that as one end of the cable wound, the other unwound. Passing around the sheaves at top and bottom of the plane, while winding and unwinding around the drum, the cable pulled up or let down boats that were passing the plane. The motions were reversible by means of a

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7. Description (cont.)

clutch mechanism on the drive shaft in the control tower.

The cradle cars, like the canal boats, were hinged in the middle so that they could negotiate the summit of the planes, the summit being that 18 inch mound of dirt at the top of the plane which kept the water in the upper level of the canal from running out. Each section of the car had eight double-flanged wheels which rode on the plane tracks. Each car was equipped with brakes in case of mishap.

Passage over the inclines was accomplished in an average 8 minutes. While the average for a 10-foot lift by lock was also eight minutes, the average lift per plane was 63 feet in the same time. The value and superiority of planes over locks in time and water consumption is clear in comparison.

The Canal Company built and maintained some 140 highway and road bridges over the canal, as well as 3 foot and 3 change bridges. Many other bridges were built by municipal, state, or even private agencies, but always in accordance with Canal Company specifications.

The eastern terminus of the canal was at Hudson and Green Streets, Jersey City, on the Hudson River, opposite Manhattan. Entering through Lock #22E, boats roughly followed the shoreline of old Communipaw Cove, going southward to the Bayonne-Jersey City border. The canal turned at about 4?rd Street - so sharply that the spot became known as "Fiddler's Elbow" because the canal resembled the bent arm of a fiddler about to play. Heading northwest, the canal reached Newark Bay, which it followed to William Street, where a basin and Lock #21E were located just south of the old Newark Plank Road and Communipaw Avenue.

Beyond Lock 21E the canal entered the Hackensack River, crossed South Kearney, then crossed the Passaic River. Boats were towed cross-current, first by mule and cable ferry, later by steam tug.

In Newark, the canal began with Lock #20E, at the foot of present-day Raymond Boulevard. About 1000 feet westward, near Blanchard Street, was Lock #19E. Then, beyond Market and Canal Streets, the canal sent a branch or spur directly into the Passaic River, where Lock #18E gave boats access to the city's docks.

The main canal continued westward through Lock #17E, an 18-foot lift lock, and went underground, as the floor of Center Market, built in the space above the canal (1858), formed an 1100-foot tunnel from Mulberry Street to Broad. The canal then crossed Halsey, Washington, and Plane Streets to the foot of Plane #12E. At High Street, from the head of the

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7. Description (cont.)

plane, the canal coursed northwestward to Lock and Searing Sts., the location of Lock #16E. Then, heading north, the canal skirted the west side of Branch Brook Park and paralleled the Second River, which it crossed by aqueduct, to arrive at Lock #15E, near Howe Street, Bloomfield.

A mile beyond lay Plane #11E, near East Passiac Avenue and Hoover Avenue. From the head of this plane, the canal began its longestlevel of 17⅓ miles, on which no planes or locks interupted navigation. Beyond the Oakes' Pond and Mill the canal crossed Third River by aqueduct, and ran parallel to that stream through the Brookdalesectionof Bloomfield.

Following the Orange Mountains through Clifton, the canal route was more-or-less that of Borad Street, then Marshall Street, into Paterson. Both the canal and the Delaware-Lackawanna Railroad rounded Garret Mountain on the way to West Paterson, roughly in the path of present-day Route 80, half-way up the mountain. Intersecting Route 46 at Browertown Road, the canal coursed into Little Falls, crossing over the Peckamin River aqueduct about ½-mile south of Main Street. Then, on the canal's most impressive structure, 60 feet above the water, the canal crossed the Passaic River on the brownstone arch known as the Little Falls Aqueduct.

Between Little Falls and the Mountain View section of Wayne, the canal crossed Singac Brook (Preakness Brook) on another, but much less impressive, aqueduct. About 2½ miles to the northwest lay Mead's Basin, (present-day Mountain View), where the canal went under Route 23 at its intersection with Route 202. About 250 yards beyond Mead's Basin lay the entrance to the Pompton Feeder, a 4.26-mile long branch of the canal which enabled boats to navigate as far as Pompton Falls. The main canal continued through a cantilevered DL&W Railroad bridge to croos the Pompton River on the system's longest aqueduct, to arrive in Lincoln Park.

Following Route 202 (Boonton Road, Lincoln Park), the canal's 17½-mile level ended at Lock #14E, near Ryerson Road, about a mile beyond the Pompton River. Still another mile to the west, the canal intersected the town of Lincoln Park at Main and Beaver Brook Road. Then, continuing westward for another mile, the canal climbed Plane #10E at the Lincoln Park-Towaco border.

Still following Route 202, the canal entered Montville. It exited the town by means of Plane #9E which intersected Route 202 at River Road, and Plane #8E which intersectected Route 287, near present-day Myrtle Avenue exit. Here the canal arrived at the level of the town of Boonton.

(cont.)

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7. Description (cont.)

Near Maple and Main Streets, Boonton, lay Lock #13E. Then, making a sharp turn to the west and departing from Route 202, the canal climbed Plane #7E on the south side of Main Street, then locked through Lock # 12E. Beyond a 1-mile level, the canal locked through #11E into the Rockaway River at Powerville Basin. Here, mules walked across a wooden towpath bridge, towing boats across the river current to Lock #10E and, 400 feet beyond, Lock #9E. Coursing through the Rockaway Valley, the canal again crossed the Rockaway River on the Denville Aqueduct, 1000 feet east of Diamond Spring Road near its intersection with the Denville-Boonton Road. At Diamond Spring Road was Lock #8E, which began a level terminating at Rockaway. Crossing Beaver Brook near Beach Street, north of Main Street, via aqueduct, the canal then made its way up Plane #6E in the center of Rockaway. At the head of the plane, beyond the basin, the canal followed North Main Street out of town and into Dover, crossing Route 46 beyond the present-day Shop Rite.

Roughly paralleling Route 46, the canal entered Dover Basin, located where Dover Common is today. Then, by means of five locks (#s 7, 6, 5, 4, and 3 East), it passed through Dover via Bassett Highway and Princeton Avenue. Crossing Route 46 again, the canal turned northwestward toward Wharton and Plane #5E, then Lock #2E and, about 1½ miles farther, Plane #4E. Following Dewey Avenue, the canal then made its way past Hercules Powder Works, passed through Kenvil, crossing Route 46 once more, and made for Lock #1E, about 200 feet eats of the Ledgewood Circle (Routes 10 and 46). Passing under Route 10, the canal paralleled Ledgewood's Main and Canal Streets to the foot of Plane #3E. At the head of that plane lay Ledgewood Basin and Plane #2E. Once more passing under Route 46, the canal took a sharp northerly turn to Plane #1E at Shippenport (present-day Landing).

At Landing, from the head of Plane #1E, the canal had reached the summit level, within ½ mile of Brooklyn Lock into Lake Hopatcong. Here, a navigable feeder leading to and from the lake enabled boats to use the lake as far as Woodport. The main canal, however, continued along Centre Street, Port Morris, and on to Plane #1W.

Port Morris Plane lowered boats to Lake Musconetcong, where the canal entered the lake and crossed it by means of a narrow strip of land barely elevated above the water's level. Boats were conveyed thus to Lock #1W at the westernmost end of the lake. About ½ mile beyond the lock was a short spur known locally as the "Furnace Slip", or Singer Spur, which turned south off the main canal to service industries located on the spur. The main canal continued down Plane #2W along Plane Street, then crossed the Musconetcong River into a 1½ mile level which brought the canal to Lock #2W.

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7. Description (cont.)

Beyond the lock, and through another railroad lift bridge, the canal passed about 1 mile to Plane #3W. Plane #4W lay another 3/4-mile farther, and here the canal was lowered into Waterloo Basin, or Lake.

At the westernmost point of the basin lay Lock #3W, which locked boats through into the 3-mile level. The canal then entered Sayton Lake through Lock #4W, and left it at Lock #5W. Then, making a wide sweep to follow the Allamuchy Mountain, the canal began an 11 mile level that took it through Hackettstown and Rockport, and Port Murray, to Plane #5W. Then the course was southwesterly to Plane #6W and Lock #6W at Port Colden. From Port Colden, the canal continued southwestward into Washington, beyond which lay Plane #7W. From there, the waterway would follow Route 57, crossing the Pohatcong, Brass Castle, and Broadway Creeks by aqueduct, and make its way to Lock #7W at New Village.

Crossing Route 57 at that point, the canal remained south of the highway for the remainder of the route - about seven more miles. Just beyond New Village, and west of it, lay Stewartsville and Plane #8W. Another 1½ miles brought the canal to Plane #9W, and still another 2 miles, to Plane #10W. The canal both crossed and absorbed the Lopatcong Creek at both those places. Lock #8W lay about ½ mile farther, where the Greensbridge Section of Phillipsburg began. Then, turning north-northwest, the canal passed quickly through Lock #9W and Lock #10W to follow the Delaware River for about 2½ miles. At Port Delaware, the basin and Plane #11W marked the western terminal of the canal at Phillipsburg as it emptied into the Delaware River.

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7. Description (cont.)

Present Condition of the Morris Canal

The eastern terminus of the canal at Hudson and Green Streets, on the Hudson River in Jersey City, is still in evidence. In addition to the existence of the Little Basin, there is the Big Basin, of a later date, alongside the Jersey Central Railroad Terminal in Jersey City.

From this point to Paterson there is little surface evidence of the Morris Canal, except for a small section between Clifton and Bloomfield. This does not eliminate the possibility that segments of the canal exist in this heavily urbanized area of New Jersey. Recent highway development and private quarrying has indicated that the canal was covered over by urban development, but not destroyed.

At Little Falls in Essex County there are ruins of the overflow at Browertown Road. Water ran off this stone overflow into the stream below when the canal water level was excessively high. This section is currently being replaced by a cement culvert.

Northwest of Little Falls at the intersection of Routes 202 and 23 in Wayne is the Isaac Mead Canal Store. This 2½ story frame building , circa 1830, is one of the very few canal store left along the canal and possibly the oldest. It is located at Mead's Basin. Also at the Basin is a Smithy, a 2½ story brick building, located immediately alongside the Route 23 overpass of Route 202.

Through Morris County the canal prism is well defined , although a new highway threatens the canal bed from Lincoln Park to Montville.

In Towaco on Route 202, at Alpine Road is a 2½ story frame building with exposed cellar. This house, reputed to have been a canal store or hotel, was at the head of Plane 10E. Also in Towaco is a section of the canal prism still filled with water (now known as Dorsey's Pond).

In Montville at Emery Road Plane 9E is in evidence. This plane has one of the few pieces of plane track left anywhere on the canal system. The grade of the plane, some stonework, and a few stone sleepers are present. There is also a plane tender's house at Emery Road for Plane 9E.

Plane 8E is very badly overgrown, but from a bad vantage point the bridge and tail race are visible. The culvert arch of the wheel pit is in good condition. This section is a fine specimen of canal masonry.

Boonton still has the canal bank support, the stone sleepers, and the stone retaining wall from Plane 7E. The plane slope is clearly discernable as is the canal prism.

At the Powerville Basin the stone work of Lock 11E is currently visible. The canal bed is discernable, but several houses are built in the bed. Across the Rockaway River is Lock 10E, perhaps buried under the fill.

The canal prism from Denville to Boonton is clearly visible. The tow path also exists. Lock 8E at Denville also exists. The aqueduct is

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7. Description (cont.)

still intact, but the original stone-work has been cemented over. Near the lock is a tender's house; a 2½ story frame building, circa 1830, typical of early canal buildings. The house may also have been a store.

Plane 6E at Rockaway has been paved over and only the grade of the plane can be discerned. Two aqueducts are still there. Sections of the canal prism are still there.

The city of Dover had five locks, but none exist today. Only a small section of the canal bed and tow path are recognizable in Dover.

Of Plane 5E in Wharton there is nothing left on the surface.

Recent salvage excavation by a wrecking company has partially exposed the stone-vaulted wheel pit of Plane 4E which housed the water wheel. This area, however, is privately owned and will soon be destroyed.

Lock 1E at Ledgewood has been filled in, but the fill has settled, exposing the stone walls of the lock.

Plane 2E in Ledgewood is in excellent, if overgrown, state of preservation. The plane is nearly completely intact with a double row of stone sleepers, canal walls, wheel-pit, and several canal-related buildings. Ledgewood hopes to eventually incorporate this section of the canal into a park.

The Shippenport Plane is in good condition with clear evidences of the stone aqueduct, or tail race, the prism, and the basin.

At Lake Hopatcong (Landing), the summit of the Morris Canal, there is one of the few remaining gatekeeper's houses. This 2½ story house was built around 1830 of fieldstone and is typical of canal houses of the period. The canal itself at Lake Hopatcong is in good condition and hopes are high that eventually the canal bed be again filled with water to the Musconetcong River. At Lake Hopatcong State Park there is on display one of the original Scotch Turbines which operated the plane machinery.

From Lake Hopatcong to the eastern part of Phillipsburg the canal bed is easily distinguishable and it is physically possible to walk along the bed (Several private homeowners frown on it, however.).

The Port Morris Plane (1W) has the plane track sleepers; double rows intact for a short distance. There is also some plane cable at the site. The site has been built upon and sections were destroyed by a sewage pipe across the foot of the plane.

Lock 1W at Stanhope was filled in, but the coping stones are visible through the grass. The canal spur at Stanhope is recognizable. The canal prism is still filled with water. The stop gate and water gate are in good shape. At the foot of Plane Street is a canal building, reputed to be one of Stanhope's oldest homes. Traditional accounts state that the 1½ story frame building with an exposed stone cellar, was built around 1750. Perhaps the foundation pre-dates the Revolution, but the building appears to have been built in the second quarter of the 19th century. Since the house was

(cont.)

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7. Description (cont.)

a boatman's stop, it became also a hotel.

The Waterloo Lock (3W) is in good condition, but incomplete. The walls are still present, but the gates are missing, as is the bridge over the tail race at the end, or foot, of the lock. Plane 4W at Waterloo, at the opposite end of the Waterloo Lake (Basin) is quite evident, if overgrown.

The Saxton Falls Lock (5W) and prism are almost completely intact and in good condition, although some recent repairs have covered parts of the original mason work.

At Rockport is a well preserved portion of the canal prism still filled with water.

There is a water wheel pit at Plane 5W in Port Murray. This plane has enormous potential pending industrial archeological work. The rest of the canal in Port Murray has remains of the towpath and the basin.

Little exists on the surface for Plane 6W.

Of Lock 6W at Port Colden there still exists the Lock Tender's house. It is a 1½ story frame rectangular building covered with modern asbestos shingles. The house is deteriorating.

The grade of Plane 7W, at Bowerstown, is paved over by Route 57. The aqueduct, however, which originally carried the plane over the creek is still present, now carrying the highway over the creek. The aqueduct is an excellent example of canal mason's work.

Lock 7W at New Village is in ruins.

Plane 8W is unrecognizable except for the grade of the slope. Presently used for agriculture.

Plane 9W, the longest and highest inclined plane on the Morris Canal, is flanked on either side by trees, clearly marking the canal path. The owner, a canal fan, has recently excavated the plane house wheel pit to reveal the turbine which operated the plane machinery. There is also a plane tender's house near the top of the rise.

Plane 10W can still be easily distinguished as a canal plane. The stone sleepers (only one row, though), tar drippings, the wheel pit adit, and the tail race exit into Lopatcong Brook are still very much in evidence. The summit, unfortunately, has been leveled somewhat.

Lock 8W is currently a road, but the Lock Tender's House is still standing. The house, built circa 1835, is a 1½ story rectangular frame building typical of the canal houses of that period. Except for two 20th century dormers, the house is essentially as it was originally built.

Locks 9W and 10W in Phillipsburg are also paved over and no evidence of the two locks are visible.

The slope of Plane 11W out of the Delaware River is still visible and basically intact. Much of the brownstone wall of the Lehigh Valley Railroad bridge abutment straddling the plane is intact.

8. Significance (cont.)

navigable. However, preliminary surveys conducted during 1823 indicated a somewhat different and better route for the canal. Moreover, pressures exerted by various capitalists, whose support for the canal depended upon its servicing of their particular industries, further modified the shape, direction, and location of the waterway. Consequently, as it was finally mapped, the canal was to connect Easton, Pennsylvania with Newark, passing through Warren, parts of Sussex, Morris, Passaic, Essex, and Hudson Counties. Thus, coal could be brought directly from the anthracite fields to the Sussex, Warren, and Morris County iron mines and forges for smelting. Then, coal, plus the pig or bar iron, would be floated to Dover, Rockaway, Boonton, and Paterson for manufacturing. The finished products, plus coal, would then be shipped to tidewater and the waiting markets at Newark and beyond.

After considerable advertising and lobbying, McCulloch and his supporters were successful in obtaining a charter for a private corporation, and the Morris Canal and Banking Company came into existence on December 31, 1824. By July, 1825, enough stock had been sold to finance construction, and in October, 1825 official ground-breaking ceremonies were held at Lake Hopatcong, the summit level and principal reservoir.

That summit level was found to be 914 feet above sea-level, and some 760 feet above the mouth of the Lehigh River, the source of coal shipments. Making a canal to ascend and descend this height in less than 100 miles was beyond the economical capacity of ordinary lockage. As a result, the use of water-powered inclined planes was adopted, based upon principles laid down by Robert Fulton and others, then in use on various canals in England and Europe. The incline plane was a short stretch of railroad, built to connect an upper and a lower level of canal that was interrupted by the intervening elevation of the terrain. Unique to this country, the Morris Canal's planes are the basis for its lasting fame in engineering annals and canal histories.

The Morris Canal's inclined planes provided an ideal training ground for a number of engineers who later used the experience gained on them to go on to help build many of the nation's early railroads which would subsequently replace canals. In 1831, Ephraim Beach, the first of the Morris Canal's chief engineers, surveyed the route of the Susquehanna and Delaware Railroad, which was later incorporated into the Delaware, Lackawanna, and Western system. In 1832 he surveyed the route of the New Jersey Railroad and Transportation Company's road, and served briefly as its chief engineer. By 1835 he was employed by the Morris and Essex Railroad to map out its path, and still later, laid out the extension of that road to Dover. He died, just short of the age of 74, while surveying for the Catskill and Canajoharie road.

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8. Significance (cont.)

Lorenzo A. Sykes and Roswell B. Mason, both Morris Canal engineers, served on the New Jersey Railroad, Sykes becoming its chief engineer after Mason left that post to distinguish himself as the dynamic chief of construction of the Illinois Central.

Ephraim Morris, designer and builder of Bloomfield's first experimental plane, served as chief engineer of the planes of the Morris Canal. Later, in 1838, he was granted the first United States patent for a railroad braking mechanism. Morris also invented a mud dredger that was used by the Morris, the Delaware and Hudson, and the Pennsylvania Canals, and by the Pennsylvania Railroad. Another of his inventions was the automatic weighing machine that weighed coal while in the holds of canal boats.

Moreover, many of the Morris Canal's first engineers were men enrolled at or graduates from the United States Military Academy at West Point. For the half century following the War of 1812, the services of the Army Corps of Engineers had been solicited for the development of internal improvements. The contributions of those men cannot be overstated. During that half century, a handful of free and independent states became welded into a nation, with full continental status, united by a system of transportation, a system which was largely the contribution of the Army Engineers. The part played by the Morris Canal in the development of the nation must also be recognized, if only by virtue of its participation in the training of the men of West Point.

Whereas the military sciences and skills were taught at the Point, it was in the field, on the nation's early roads, canals, and railroads that the lessons of civil engineering were learned. West Point training was supplemented by practical knowledge of civil engineering that was gained through experience on large public works. The Morris Canal was such a work.

Major David Bates Douglass resigned his post as head of the Department of Civil and Military Engineering at West Point in 1831. He had already served for more than a year as Chief Engineer of the Planes on the Morris Canal. After leaving that position he returned to teaching engineering and architecture, but not before he had made a substantial contribution to the design of the canal planes. Later, he assumed the pesidency of Kenyon College, then a professorship at Geneva College, New York, where he died in 1849.

Another prominent West Point man, Daniel Tyler, resigned

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8. Significance (cont.)

the Army in 1834 to become a working civil engineer. Later he became president of a Pennsylvania iron and coal company, for which he built what is reputed to have been the first coke hot-blast furnace in America. Then, in 1840, Tyler took over as head of the bankrupt and unfinished Norwich and Worcester Railroad. By the time he left that position the road had not only been completed, but was extended to connect with New York City, and had been brought back beyond solvency to prosperity. Having established his reputation as a competent railroad manager as well as an able engineer, he was made president of the Morris Canal and Banking Company in 1844.

Tyler's job was to enlarge the canal so that it could compete successfully with the larger anthracite-carrying canals of New Jersey, New York, and Pennsylvania. The plan was to widen the prism of the canal, and deepen it, so that larger boats could navigate the waterway. Tyler was to redesign and rebuild the inclined planes so that they, too, could handle heavier traffic. His contibution to the Morris Canal lies in the introduction of cast-iron plane machinery to replace the former wooden works. After successfully rebuilding two planes, and having begun a third, Tyler left the canal to assume presidency of the Macon and Western Railroad.

Aside from helping to bring about a revolution in American technical education and in transportation, the Morris Canal was effective in creating demographic and industrial explosions. By delivering coal and iron to Dover, Boonton, Paterson, and other towns along the canal route, those places experienced growth that would not otherwise have been probable at that point in time. In point of fact, Paterson, with the coal and iron delivered by canal became the world's largest producer of locomotives during the 1860's, surpassing even the Philadelphia Baldwin Works. Paterson also became a leading manufacturer of heavy textile machinery and of bridge-building materials.

Newark, before the advent of the Morris Canal, was a minor town known locally as "the swamp". It was a leather tanning community, located at the mouth of the Passaic River in order to take advantage of the then pure water. Almost overnigth, Newark became both a city and a port of entry, so that by 1836, it was fair to say that the canal had made Newark out of a swamp.

Paulus Hook, before the canal's extension from Newark to the Hudson River, had been a mere farm community, distinguished because of the location of Robert Fulton's forge and river ferry there. With the construction of the canal basin

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8. Significance (cont.)

opposite Courtland Street, New York, industry and shipping were attracted to the town to such an extent and degree that the town suddenly became Jersey City. Like Newark, Jersey City also became a city and port of entry overnight. Its harbor facilities and geographical location then enabled Jersey City to rival New York.

As for New York, it is fair to state that with the canal's delivery of coal for industry, domestic use, and illumination, not to mention steam-powered vessels and locomotives, New York City was given incalculable impetus to industrial, commercial, and demographic supremacy.

The Morris Canal did not only help New York and New Jersey in their rapid rise to prosperity and prominence. Deliveries of Morris and Sussex County ores via the canal to various iron works located along the Lehigh River helped to bring into existence some of the nation's largest iron and steel manufacturers. One of those giants survives in the form of Bethlehem Steel, which, when it was receiving ores by means of the Morris Canal, was the Bethlehem Iron Company.

The Morris Canal and Banking Company began to fail soon after the Civil War. By the turn of the 20th century it was barely operating as a canal and in the 1920's it was disbanded and drained. Extensive development and use of the railroads were the main cause of the canal's decay. In short, the railway was so much more economical and convenient for transporting industrial materials.

Noteworthy, however, was the fact that the communities created by the Morris Canal were much too important to the industrial development of the east to be disgarded. Thus, the railroad constructed tracks nearly parallel to the canal, and, consequently, further insuring the canal's ruin.

The real significance of the Morris Canal lay in this historical background. Before the Appalachians had been overcome by rail; before the pneumatic tire; before petroleum; before bituminous-based coke for making steel; before the discovery of the Mesabi and Vermilion iron ore ranges; before Bessemer - there was Pennsylvania anthracite; there was New Jersey iron ore; and there was the Morris Canal - which in a very real sense helped make all else possible.

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9. Bibliography (cont.)

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Joseph Lum, 727 Centre Street, Easton, Pa. age: 97
Peter Wendt. 159 Lake Avenue, Boonton, NJ age: 70+

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10. Geographical Data (cont.)

County:
Warren, Code: 041

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10. Geographical Data

Square #1 - Phillipsburg.

	Latitude	Longitude
NW	40°41'40"	75°07'31"
NE	40°41'40"	75°12'06"
SE	40°40'35"	75°12'06"
SW	40°40'35"	75°07'31"

Square #2 - Broadway.

	Latitude	Longitude
NW	40°46'20"	75°00'00"
NE	40°46'00"	74°59'45"
SE	40°41'30"	75°07'31"
SW	40°41'47"	75°07'45"

Square #3 - Port Colden.

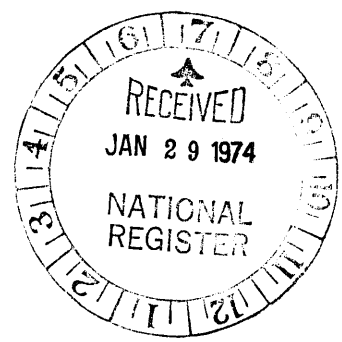
	Latitude	Longitude
NW	40°46'~~28~~ 17"	75°00'00"
NE	40°46'~~29~~ 17"	74°56'00"
SE	40°45'~~40~~ 42"	74°56'00"
SW	40°45'~~40~~ 42"	75°00'00"

Square #4 - Hackettstown.

	Latitude	Longitude
NW	40°53'29"	74°48'25"
NE	40°53'03"	74°47'48"
SE	40°45'57"	74°55'37"
SW	40°46'25"	74°56'14"

Square #5 - Atlas Sheet #25.

	Latitude	Longitude
NW	40°55'37"	74°48'00"
NE	40°55'37"	74°12'00"
SE	40°52'35"	74°12'00"
SW	40°52'35"	74°48'00"



Square #6 - Clifton.

	Latitude	Longitude
NW	40°54'32"	74°12'00"
NE	40°54'32"	74°10'00"
SE	40°44'00"	74°10'00"
SW	40°44'00"	74°12'00"

Square #7 - East Ferry Street.

(cont.)

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Square #7 - East Ferry Street (cont.)

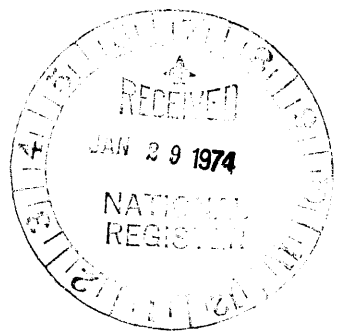
	Latitude	Longitude
NW	40°44'08"	74°10'00"
NE	40°44'08"	74°06'00"
SE	40°43'35"	74°06'00"
SW	40°43'35"	74°10'00"

Square #8 - Greenville.

	Latitude	Longitude
NW	40°44'00"	74°06'15"
NE	40°44'00"	74°05'33"
SE	40°40'53"	74°05'33"
SW	40°40'53"	74°06'15"

Square #9 - Lafayette.

	Latitude	Longitude
NW	40°43'27"	74°02'32"
NE	40°42'35"	74°01'56"
SE	40°41'10"	74°05'33"
SW	40°42'07"	74°06'07"



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PROPERTY MAP FORM

(Type all entries - attach to or enclose with map)

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New Jersey	
COUNTY	
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ENTRY NUMBER	DATE
OCT 1 1974	

SEE INSTRUCTIONS

1. NAME

COMMON:

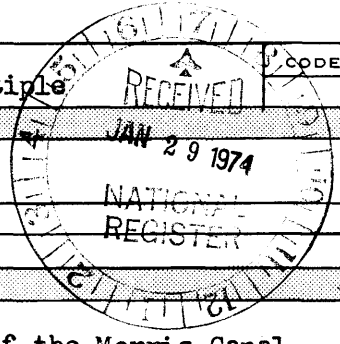
AND/OR HISTORIC: Morris Canal

2. LOCATION

STREET AND NUMBER:

CITY OR TOWN:

STATE:	CODE	COUNTY:	CODE
New Jersey	34	Multiple	



3. MAP REFERENCE

SOURCE: Rand McNally and Company, New York

SCALE: 1 inch equals approximately 7 miles

DATE: 1921

4. REQUIREMENTS

TO BE INCLUDED ON ALL MAPS

1. Property broundaries where required.
2. North arrow.
3. Latitude and longitude reference.

General map of the Morris Canal

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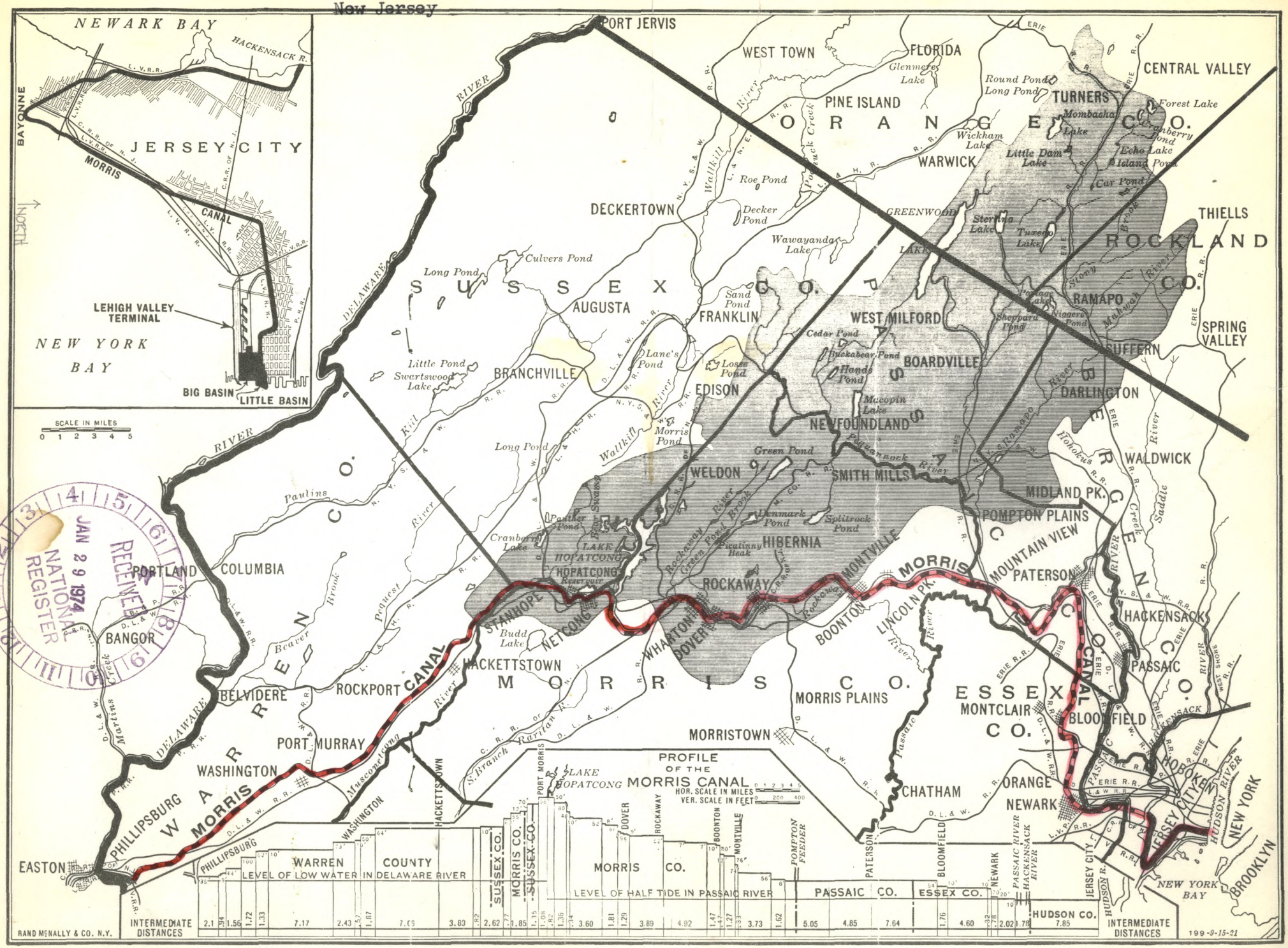
Morris Canal
New Jersey



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