Warren County has become a leader in the protection of the remains of the Morris Canal by promoting a greenway corridor and preserving the historic remains of the canal as an important part of the County’s transportation history.

The vision is to have this greenway extend across Warren County with the canal as a link to recreational, cultural, and historic areas including state park trails, and municipal and county public open space. This greenway will extend between Phillipsburg and the historic Waterloo Village – a restored canal town.

In some places the towpath will become a recreational trail open to the public for non-motorized activities. In other places pocket parks will be established for the public’s enjoyment. When completed, this greenway will be a living reminder of the County’s transportation history while promoting the economic benefits of cultural and heritage tourism.

Warren County offers a wide range of recreational opportunities and its rural nature and scenic beauty are worthy of long-term preservation.

**For Further Information Contact:**

**WARREN COUNTY PLANNING DEPARTMENT**
County Administration Building
165 County Road 519 South
Belvidere, NJ 07823
908-475-6532

**WARREN COUNTY MORRIS CANAL COMMITTEE**
c/o Warren County Planning Department

**WARREN COUNTY BOARD OF RECREATION COMMISSIONERS**
c/o Warren County Office of Land Preservation
908-453-2650

**PUBLIC INFORMATION AND TOURISM DEPARTMENT**
908-475-6580
800-554-8540

**WEB SITES:**
www.co.warren.nj.us
www.morriscanal.org
www.canalsoceitynj.org

**Prepared by:**

**WARREN COUNTY MORRIS CANAL COMMITTEE**
Funding provided by Warren County Board of Chosen Freeholders

**Historic Photos:** Courtesy of James Lee

Design: MacGraphics

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**The Morris Canal**
Listed on the State and National Registers of Historic Places

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**Morris Canal Inclined Plane 9 West**
Warren County, New Jersey

**A Link to Our History**
A Pathway to Our Future

Morris Canal Inclined Plane was a huge and powerful machine that provided the power to move a canal boat up or down the plane. It took two men to operate the plane. The plane tender could see the brakeman’s signals from either the top or the bottom of the plane. When a boat was secured in one position, the plane tender could see the brakeman’s signals from either the top or the bottom of the plane. When a boat was secured in one position, the plane tender raised the tub valve at the top of the plane, and unloading of the boats and operated a brake when needed.

From his perch in the cupola atop the power house, the brakeman rode the cradle car, organized the loading and unloading of the boats and operated a brake when needed.

Power House
A historic view of the power house once housed the machinery that provided the power to raise and lower canal boats 100 feet in about 15 minutes. RIGHT: A modern view looking up the inclined plane.

**REACTIOn TURBINE**

A PAThWAY To our FuTure
Warren County, New Jersey

**PREPARED BY:**

**WARREN COUNTY MORRIS CANAL COMMITTEE**
Funding provided by Warren County Board of Chosen Freeholders

**Historic Photos:** Courtesy of James Lee

Design: MacGraphics

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**POWER HOUSE**

A PAThWAY To our FuTure
Warren County, New Jersey

**PREPARED BY:**

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Design: MacGraphics
The Inclined Plane

To help the canal climb over the New Jersey Highlands on its way from Phillipsburg to Jersey City, the Morris Canal & Banking Company developed inclined planes to raise and lower its canal boats up to 100 feet at a time. Built in the 1830s and redesigned in the 1850s, these huge machines were up to 1,400 feet long and capable of moving boats loaded with 75 tons of cargo from one canal level to the next. The canal used 23 of these inclined planes and 23 lift locks to overcome an elevation change of almost 1,700 feet, an unbroken world record. After years of service, the canal was abandoned in 1923 and much of its infrastructure was dismantled. However, at Inclined Plane 9 West the plane tender’s house, turbine chamber and tailrace tunnel are still in place making this site one of the best remaining examples of these engineering marvels.

1. The Power House
The stone foundation of the power house is still intact with its opening covered with iron bars. You can see the reaction turbine that once powered the plane still in place in the chamber below. Nearby are assembled pieces of the penstock and parts of the machinery. Across the driveway is the plane itself marked by a double row of sleeper stones. A modern reconstruction shows how the plane rails were supported on heavy wooden timbers that provided a flexible cushion between the rail and the sleeper stones.

2. The Tailrace
Downhill from the power house is the iron arch that frames the end of the tailrace tunnel. Here, used water from the turbine chamber and water from the bypass flume joined to flow down the tailrace channel and into the lower level of the canal at the bottom of the plane. When tours are being offered, it is possible to walk up the tailrace tunnel and into the turbine chamber. The huge reaction turbine that once powered the plane almost completely fills the room. When the plane tender opened the tub valve above, the pressure of thousands of tons of water would send the head of the turbine spinning at about 62 revolutions per minute. Water from the turbine’s four nozzles would fill the chamber and send a river surging down the tailrace tunnel.

3. The Plane Summit
At the top of the plane the summit acted as a dam to contain the water in the upper level of the canal and divert it into the headrace flume. A double set of tracks came up the plane, over the summit and back down into the water. The 92-foot-long canal boats and cradle cars were built in two hinged sections that could flex as they crossed the summit of the plane. Plane 9 West’s double set of tracks and two cradle cars, allowed boats to go up and down the plane at the same time.

The Water

The water to power the inclined plane was brought to the powerhouse from the upper level of the canal in a headrace flume supported on a wooden trestle and stone piers. At the power house the water was dropped 47 feet to turn a reaction turbine located in a chamber below. Used water exited the turbine chamber through a tailrace tunnel and flows into the lower canal level to be used to power the next inclined plane. When the inclined plane was not in operation, water was routed through a bypass flume and channelled directly to the lower level of the canal.

The Cradle Cars

Canal boats were transported up and down the inclined plane on wheeled cradle cars riding on iron rails. To facilitate loading and unloading the boats the rails extended down into the bottom of the canal at both ends of the plane. The cradle cars rolled down into the water and the boats were floated on. A brakeman supervised the loading, rode the cradle car up and down the plane, and applied a brake to keep the car under control. Both the boats and cradles were built in two sections so that they could flex as they crossed the summit of the plane. A cradle car and canal boat on its way up the inclined plane.

The Cable

The two-inch-diameter wrought iron cable formed a loop traveling on idler pulleys from the cable winding drum in the power house to sheave wheels located under water in the upper and lower levels of the canal. As the cable drum turned it pulled the cable and moved the cradle cars loaded with canal boats up and down the plane.