

Huntsville / Lower Toby Creek Research and Documentation

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EPCAMR Summer Watershed Outreach Interns
Bobby Hughes, EPCAMR Executive Director



Key:

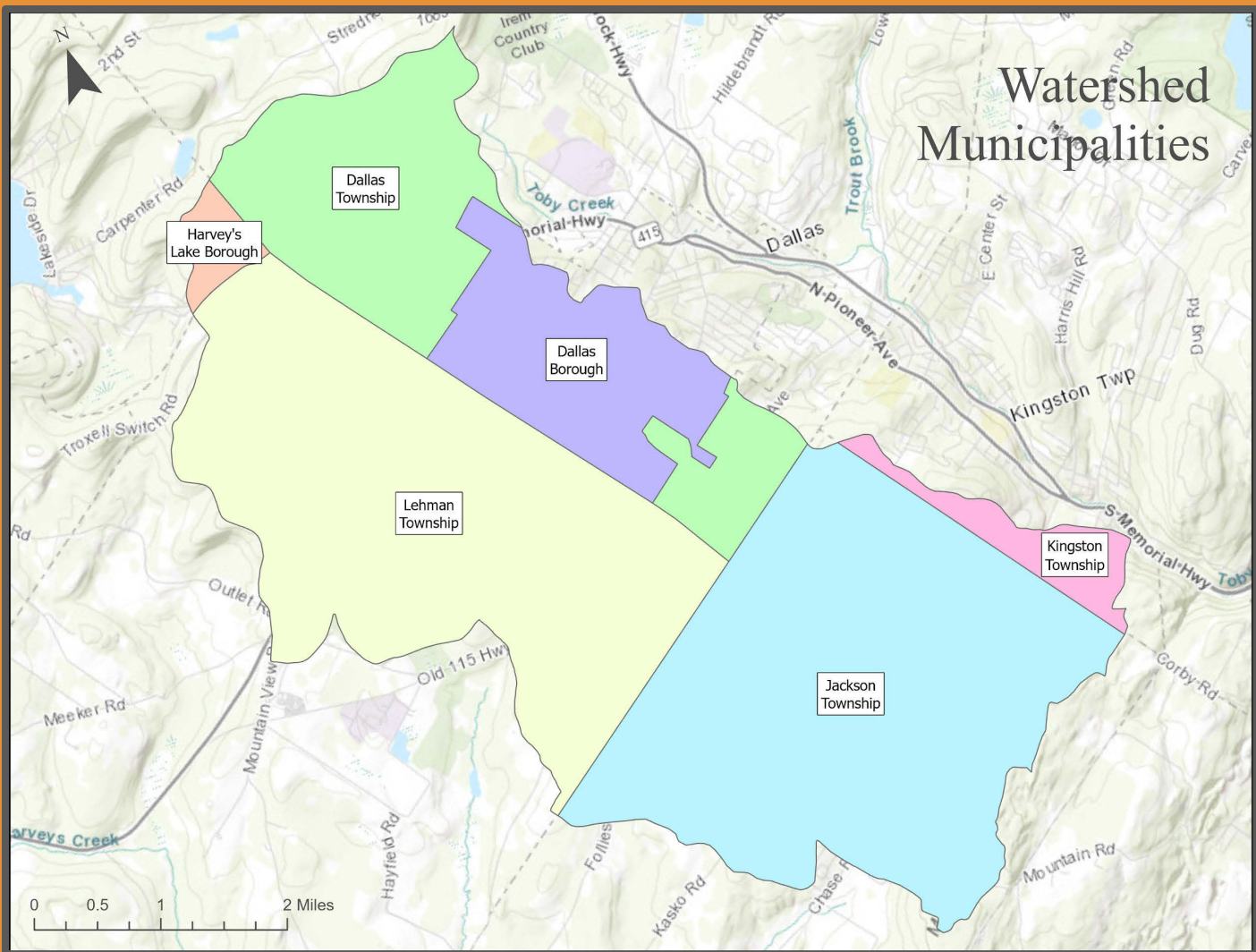
GRAY = CURRENT LANDMARKS, ETC

HISTORICAL = GREEN

GIS Sources:

- [Google Maps Satellite View](#)
- [Google Maps Street View](#)
- [ArcGIS Pro](#)
- [Eastern Brook Trout Joint Venture - Data and Tools](#)
- [Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)
- [National Land Cover Database - Data \(2016\)](#)
- [National Land Cover Database \(NLCD\) 2016 - Legend](#)
- [U.S. Fish and Wildlife Service \(USFWS\), National Wetlands Inventory \(NWI\), National Wetlands Mapper](#)
- [USGS Quadrangle, Pennsylvania, Pittston Sheet, 1893, Surveyed 1890, USGS Historical Map Viewer](#)
- [USGS Quadrangle, Harveys Lake, PA, 1893, Surveyed 1890, USGS Historical Map Viewer](#)

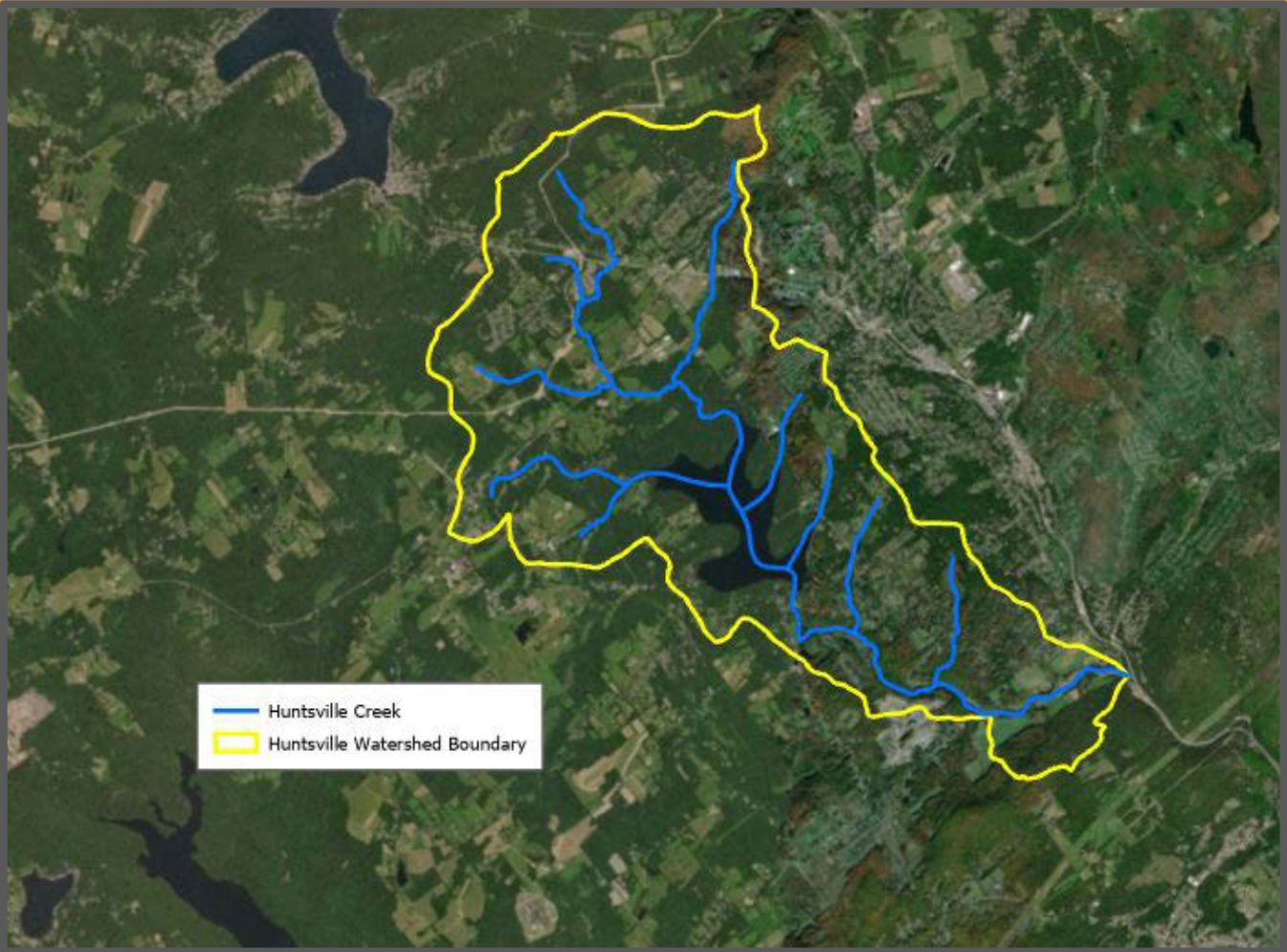
Huntsville Creek Municipalities within the Watershed



[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
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Huntsville Creek Watershed



[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
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Huntsville Creek Watershed Hydrography

Stream Length

- Estimated 20.435 miles (including unnamed tributaries)
 - [ArcGIS Pro](#) Analysis
 - Shapefiles created against USGS National Map

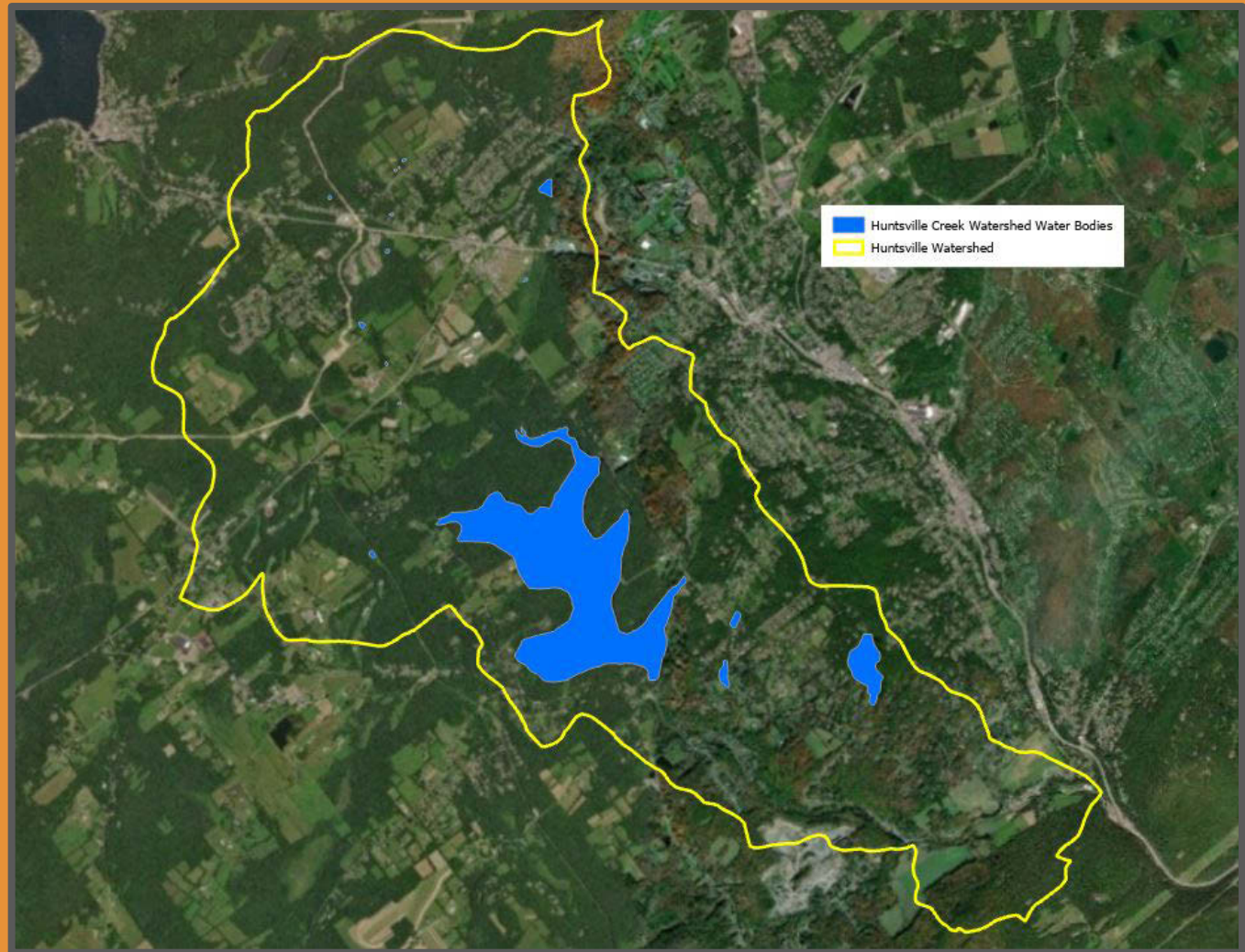
Stream Elevations

- [USGS, The National Map - Viewer](#)
- Mouth Elevation
 - 794.54 ft (DD: 41.29873° -75.92664°)
- Headwaters Elevation(s)
 - 1335.01 ft (DD: 41.35025° -76.00607°)
 - 1317.48 ft (DD: 41.34366° -76.00961°)
 - 1229.50 ft (DD: 41.33324° -76.02207°)

Water Bodies Area

- Estimated 1.213 square miles
 - [ArcGIS Pro](#) Analysis
 - Shapefiles created against USGS National Map

Huntsville Creek Watershed Water Bodies



[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
Clearinghouse](#)

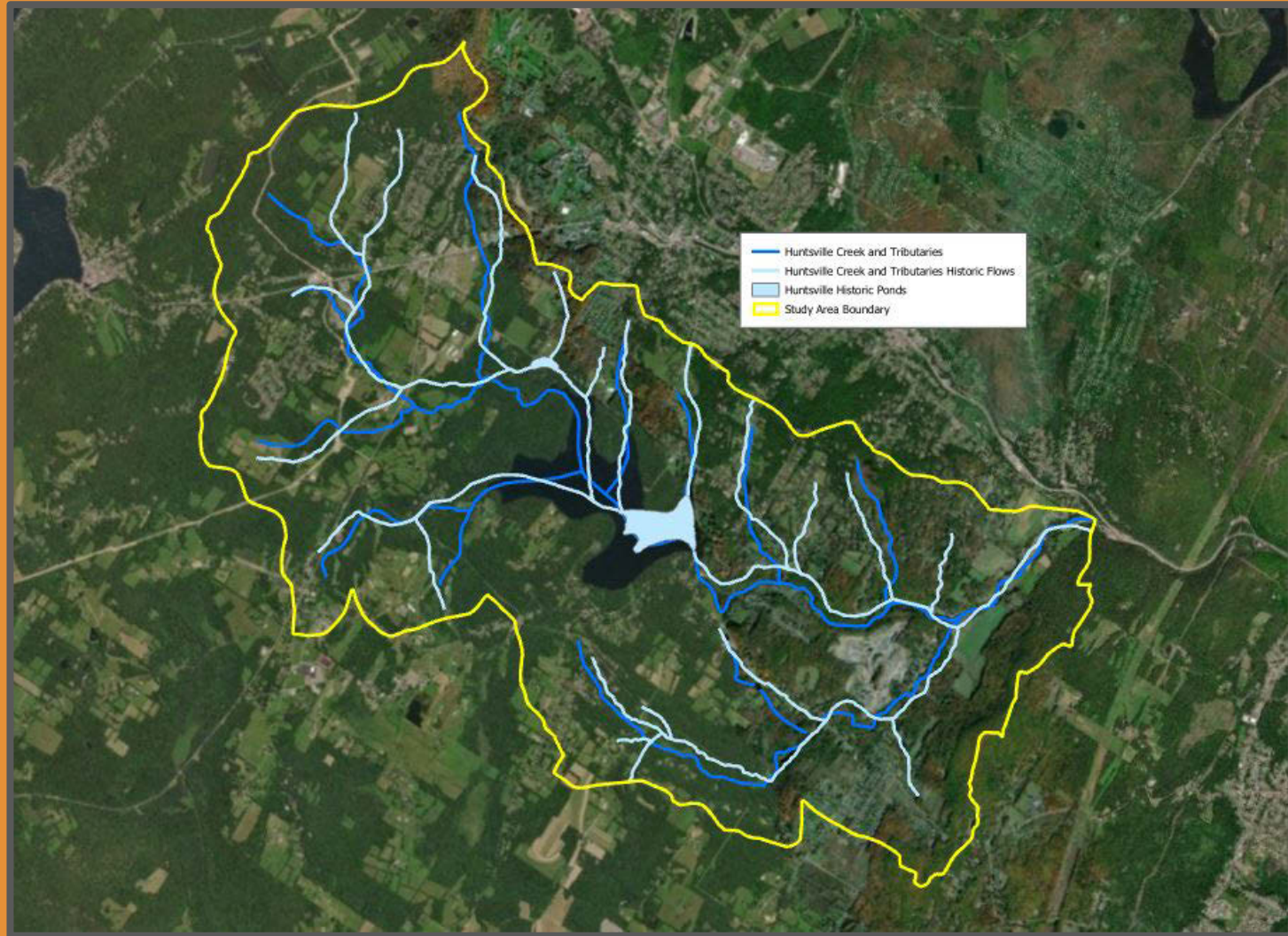
Huntsville Creek Watershed Area Historic Flows

[USGS Quadrangle, Pennsylvania, Pittston Sheet, 1893, Surveyed 1890, USGS Historical Map Viewer](#)

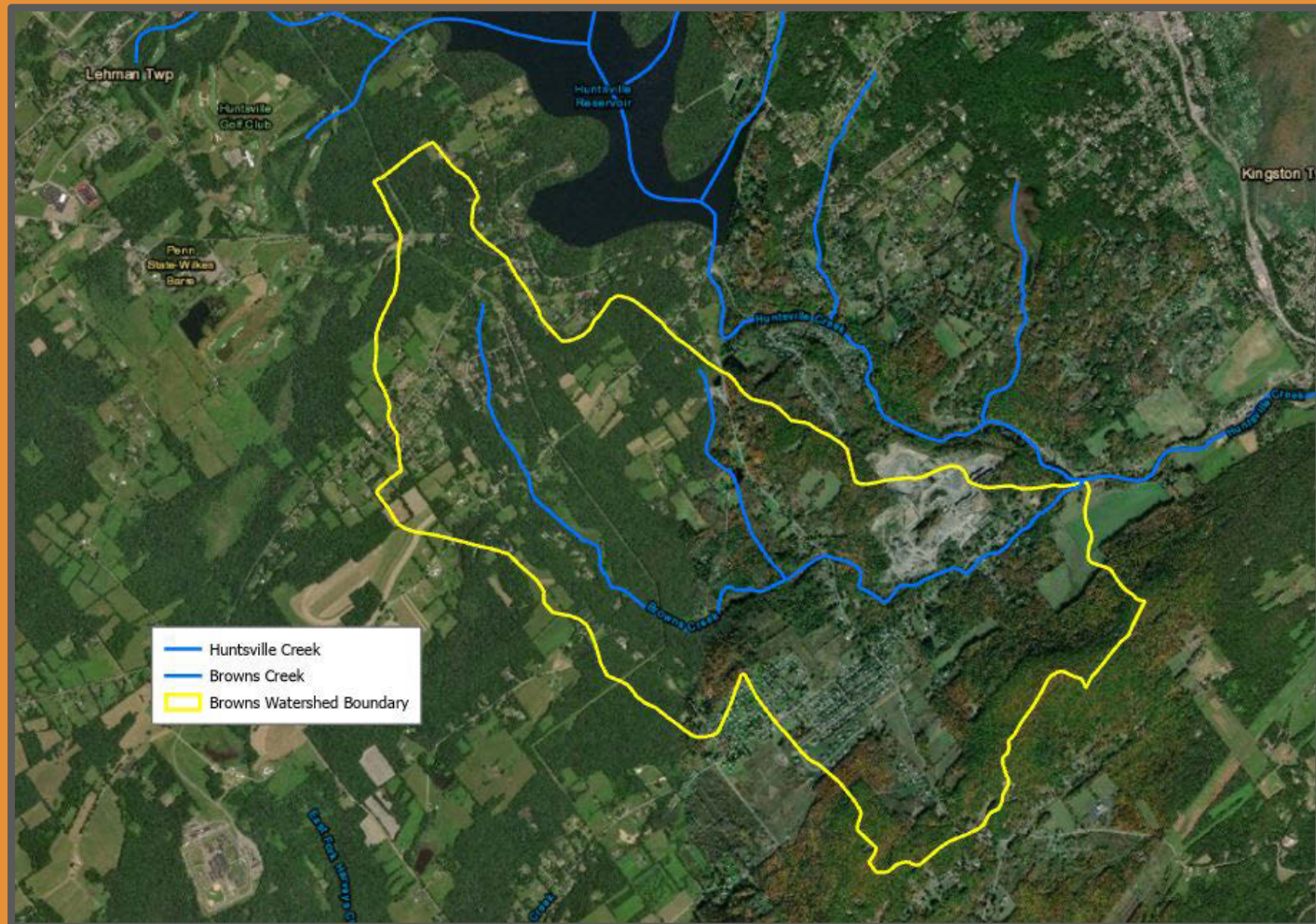
[USGS Quadrangle, Harveys Lake, PA, 1893, Surveyed 1890, USGS Historical Map Viewer](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[ArcGIS Pro](#)



Browns Creek sub-watershed of Huntsville Creek



Browns Creek Watershed Hydrography

Stream Length

- Estimated 5.629 miles (including unnamed tributaries)
 - [ArcGIS Pro](#) Analysis
 - Shapefiles created against USGS National Map

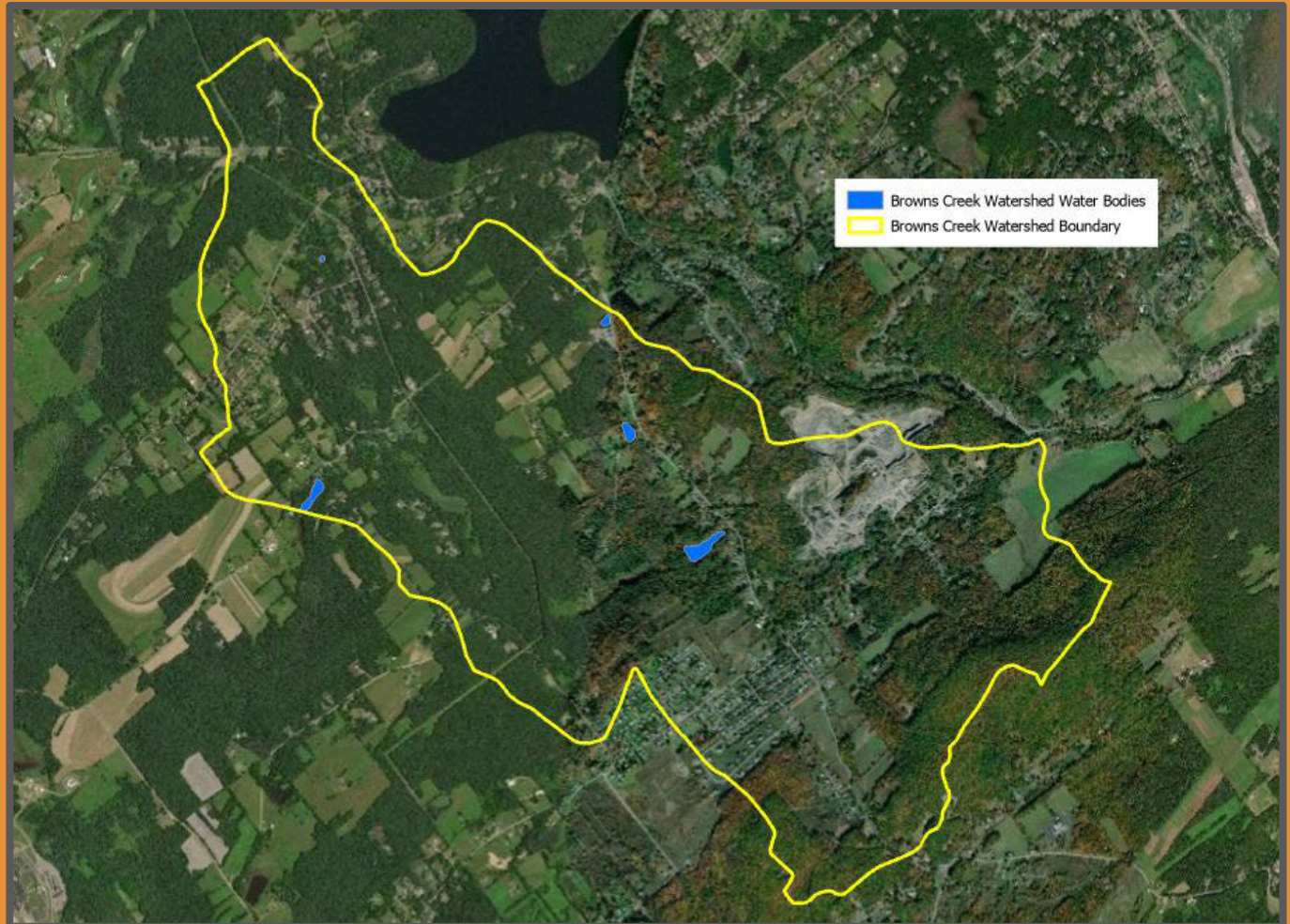
Stream Elevations

- [USGS, The National Map - Viewer](#)
- Mouth Elevation
 - 914.04 ft (DD: 41.29457° -75.94669°)
- Headwaters Elevation(s)
 - 1112.19 ft (DD: 41.29933° -75.97471°)
 - 1133.70 ft (DD: 41.30442° -75.99169°)

Water Bodies Area

- Estimated 0.0189 square miles
 - [ArcGIS Pro](#) Analysis
 - Shapefiles created against USGS National Map

Browns Creek Watershed Water Bodies



[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

Source Water Assessment Public Summary (2002)

- [Pennsylvania Department of Environmental Protection \(DEP\) Source Water Assessment Public Summary for Pennsylvania American Water Company \(Huntsville PWSID 2409013\), 2002, Luzerne County, Pennsylvania, pp. 1 - 2](#)
- “As indicated above, roads, repair shops/bus terminals, on-lot waste disposal and runoff from nonpoint sources of contaminations such as farms, golf courses and residential areas are the most significant potential sources of contamination within the watersheds that contribute water to PAWC Huntsville. “
- May 2002

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Farms, golf courses and residential areas	Pathogens, nitrates, fertilizers and pesticides	Stormwater runoff from farms, golf courses and residential areas	A-B
RV Repair Shop, Truck and Bus Terminals	MTBE, BTEX, Metals	Accidental spill or disposal of products/byproducts	A
On-lot waste disposal	Pathogens, bacteria, turbidity	Malfunctioning septic systems	B

[Pennsylvania Department of Environmental Protection \(DEP\) Source Water Assessment Public Summary for Pennsylvania American Water Company \(Huntsville PWSID 2409013\), Luzerne County, Pennsylvania, pp. 1 - 2](#)

Protection Priority ratings were qualitative susceptibility ratings created by the Pennsylvania DEP to determine priority according to potential water supply impact.

(A = High Priority through F = Low Priority)

- SOC = Synthetic Organic Contaminants
- MTBE = Methyl tert-butyl ether
- BTEX = Benzene, Toluene, Ethylbenzene

Huntsville Reservoir

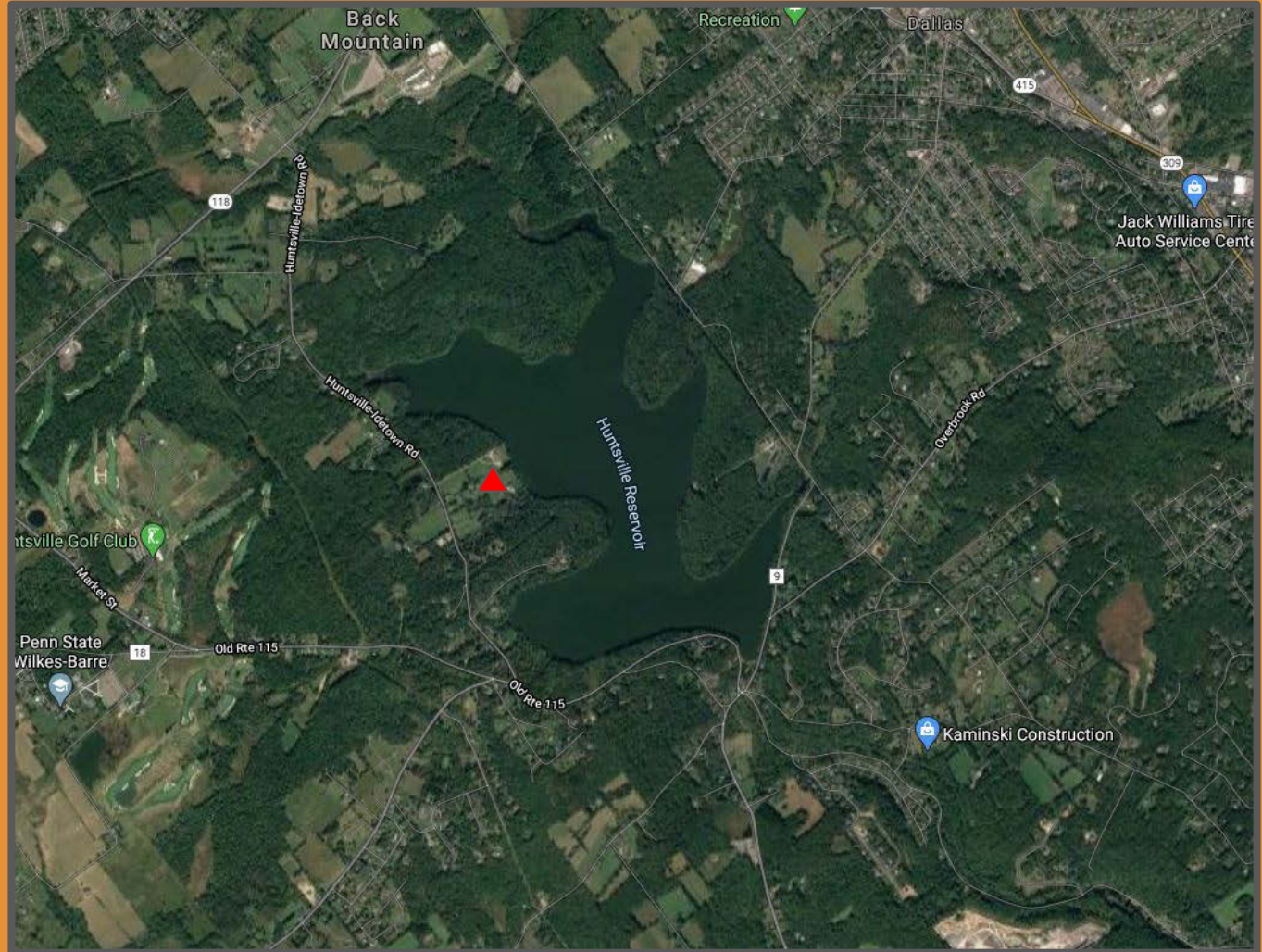


Huntsville Reservoir

- **Large green lawns occupy areas adjacent to the reservoir**
 - **Not owned by North Branch Land Trust**
 - **Paul Lumia of NBLT informed EPCAMR that they are private property**
 - **NBLT verified the need for additional riparian buffers**

- **General Conclusions**
 - **Lawn fertilizers can contribute to overnutrification of water bodies and streams**
 - **Can lead to algal blooms, lower oxygen levels in the water, and higher risk of contaminants**
 - **Properly established riparian buffers can mitigate impacts of overnutrification**

Red triangle indicating location of a few private lawns where riparian buffers could be recommended to increase the buffer widths along unnamed tributaries that empty into the Huntsville Reservoir western shore along Huntsville-Idetown Road.

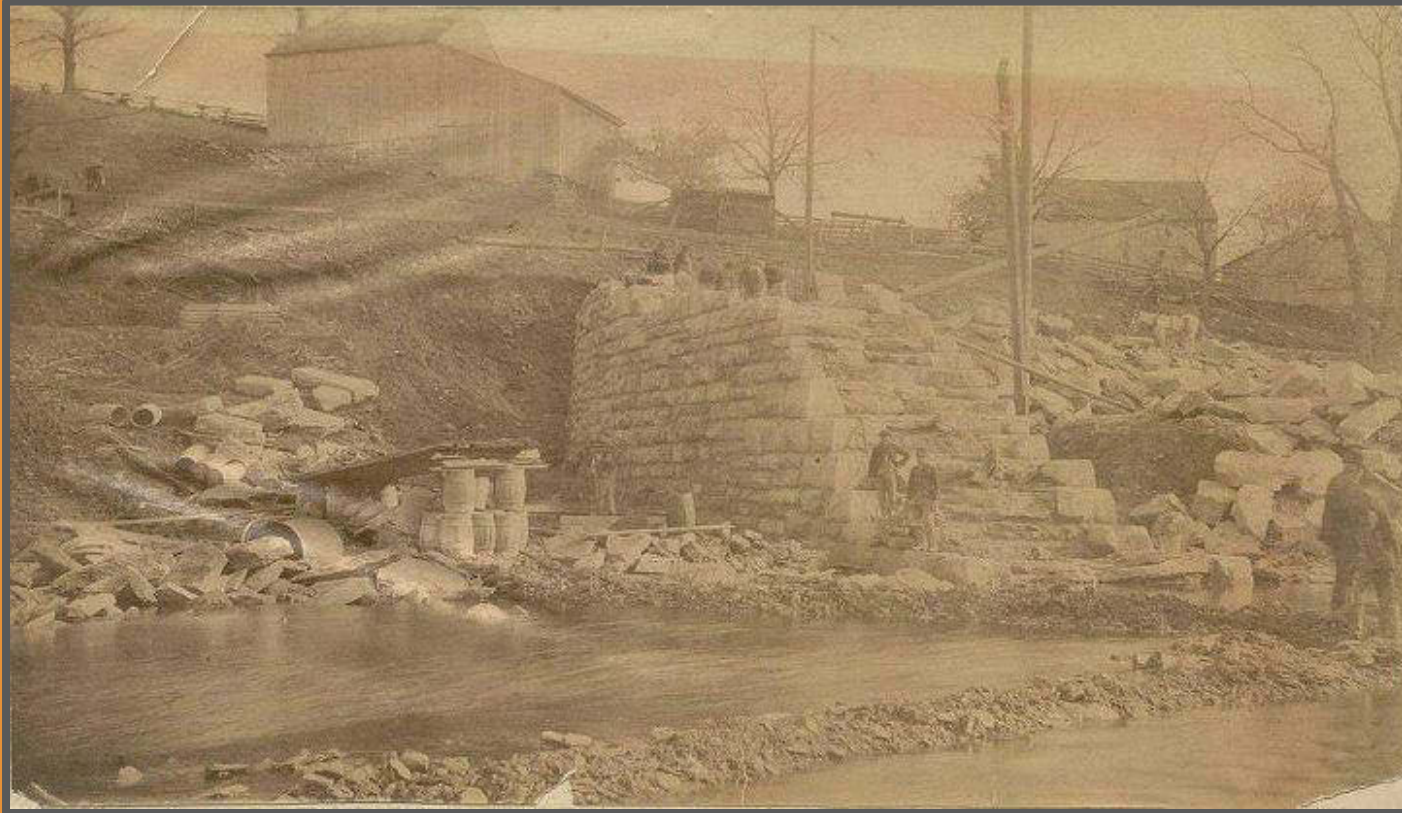


[Google Maps Satellite View](#)

Huntsville Reservoir - Early Days and Construction

- Prior to the dam's construction, the acreage was made up of farmland, forests, and swamps
 - This area was formerly a hunting and trapping hotspot for various small game, according to an article in the Wilkes-Barre Sunday Independent
- The Fuller family were one of the early settler estates, farming in the Huntsville area
 - In 1890, the farm owner, Chester Fuller sold a portion of his land, between Jackson and Lehman Township to what was then the Wilkes-Barre Water Company.
- The dam was completed in 1892, and within 3 months, the reservoir was full to capacity
- The reservoir has changed hands over the years, with water one water company subsuming the next
 - The dam was constructed and owned by the Wilkes-Barre Water Company, then owned by the Spring Brook Water Service Company, and currently by the PA American Water Company
 - This trading of hands was due to one water company subsuming the next

Huntsville Reservoir - Under Construction 1891



(Huntsville Dam under construction, 1891)

<https://www.pinterest.com/pin/559431584932139418/>

Huntsville Reservoir - Public Access and Fishing

- **The reservoir currently spans 402 acres**
- **There are several large, private properties on the west shore of the reservoir**
 - **Although the North Branch Land Trust does not own this protected area, one of these properties is their headquarters**
- **Fishing is highly regulated along the banks of the reservoir**
 - **The reservoir is known to have populations of Bass, Pike, Carp, Crappie, and Panfish**
 - **Shoreline fishing is permitted with proper authorization by PA Water but only in public areas**
 - **According to Terry M. Maenza, director of Communications for PA American Water, all swimming and boating activity on the reservoir is forbidden and trespassers will be reported to the police.**
 - **There have been reports of illegal fishing and trespassing as far back as the 1910s**
 - **Fishing was prohibited during the 1940s as a wartime effort to preserve water resources**

Huntsville Reservoir - Articles on Fishing and Water Usage Pt.1

- [Wilkes-Barre Sunday Independent, 1918, Page 15 - Four men accused of illegal net fishing in the reservoir](#)
- [Wilkes-Barre Sunday Independent, 1919, Page 16 - Four men trespass on reservoir property and attempt to hold up cars driving along next to the reservoir](#)
- [Wilkes-Barre Sunday Independent, 1919, Page 2 - Plymouth man arrested for fishing without a permit](#)

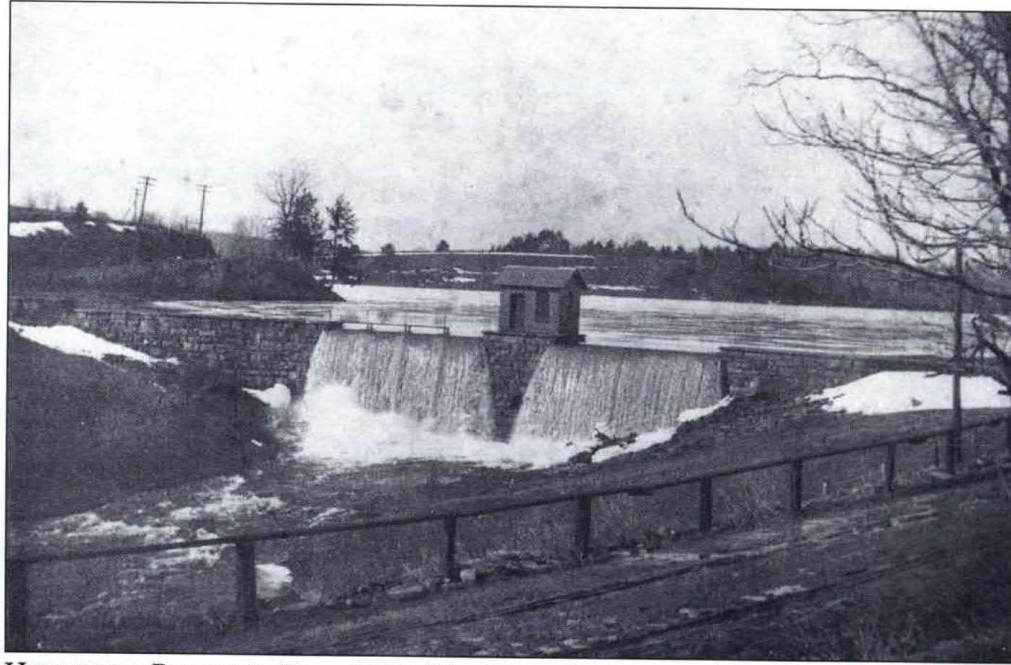


Huntsville Reservoir - Articles on Fishing and Water Usage Pt.2

- [Wilkes-Barre Sunday Independent, 1949, Page 19 - Discussion of Spring Brook Water Service Company](#)
- [Wilkes-Barre Sunday Independent, 1950, Page 22 - Huntsville Dam usage for the Back Mountain and aerial photo of the Huntsville Reservoir](#)
- [Wilkes-Barre Sunday Independent, 1955, Page 30 - Discussion of the use of the Huntsville Reservoir service growing population](#)



Huntsville Reservoir - Circa 1900



HUNTSVILLE RESERVOIR DAM, 1900s. The Huntsville Reservoir dam is located on Huntsville Road near the five corners. Farmland and a cranberry marsh in Dallas Township, Jackson Township, and Lehman Township were flooded to create the 389-acre reservoir. Construction was started in 1890 by the Wilkes-Barre Water Company and completed in 1892. Water flows from the reservoir to the Wilkes-Barre Water Company filter plant on Hillside Road. (Courtesy of the Luzerne County Historical Society.)

Huntsville Reservoir - Circa 1949-1950



(Aerial view of the Huntsville Reservoir, [Wilkes-Barre Sunday Independent \(1950\), pp.22](#))

Huntsville Reservoir - Dam, May 2020



(Present view of Huntsville Dam, Photo credit: Levi Sunday-Lefkowitz - EPCAMR)

Huntsville Reservoir - Water Quality from PA Water

- Report on turbidity, organic carbon, nitrates, chlorine, lead, copper, halogen content, acid content
 - [Pennsylvania American Water Company, Water Quality Report, 2019, pp. 8-11, Water Quality Results](#)

Old Sand and Gravel Quarry

- Overlooked Hillside Farms
- Near Sutton Rd
- 1898



SAND AND GRAVEL QUARRY, c. 1898. The quarry was located near Sutton Road on the farm owned by Wesley David Sutton (1862–1942), pictured in the center. Sutton Road was laid out in 1803 between the Fuller and Baldwin mills bordering property owned by William Trucks. The quarry overlooked Hillside Farms. Hillside Farms purchased the Sutton farm from the estate of Wesley David Sutton in 1946. (Courtesy of Joan Coolbaugh Britt.)

American Asphalt Paving Co.

SMP # 5376SM16

Sandstone quarry

246,948 Tons of Production

Active 100+ acre stone quarry permit

[Pennsylvania Department of Environmental Protection \(DEP\), 2016 Industrial Minerals Surface/ Underground Mines Reporting Production - Listed by County, Luzerne County, Permit 5376SM16](#)

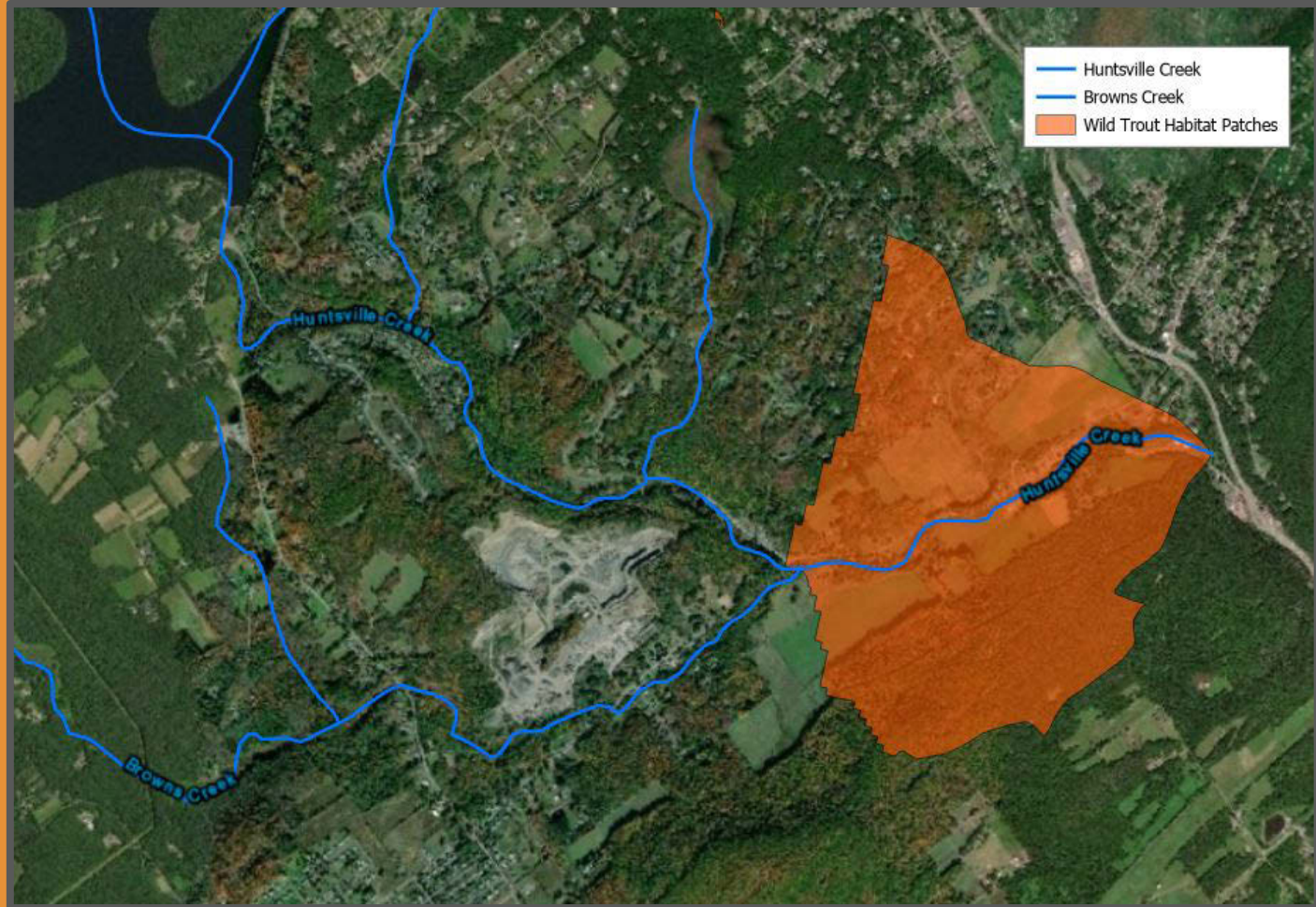
[Google Maps Satellite View](#)



American Asphalt Paving Co.

- Joseph McCarthy is PA Department of Environmental Protection (PA DEP) State Mine Inspector for the Pottsville District Mining Office for American Asphalt
- **NO WATER RELATED VIOLATIONS**
- Browns Creek borders the site, and is a tributary to Huntsville Creek

Wild Trout Habitat Patches



[ArcGIS Pro](#)

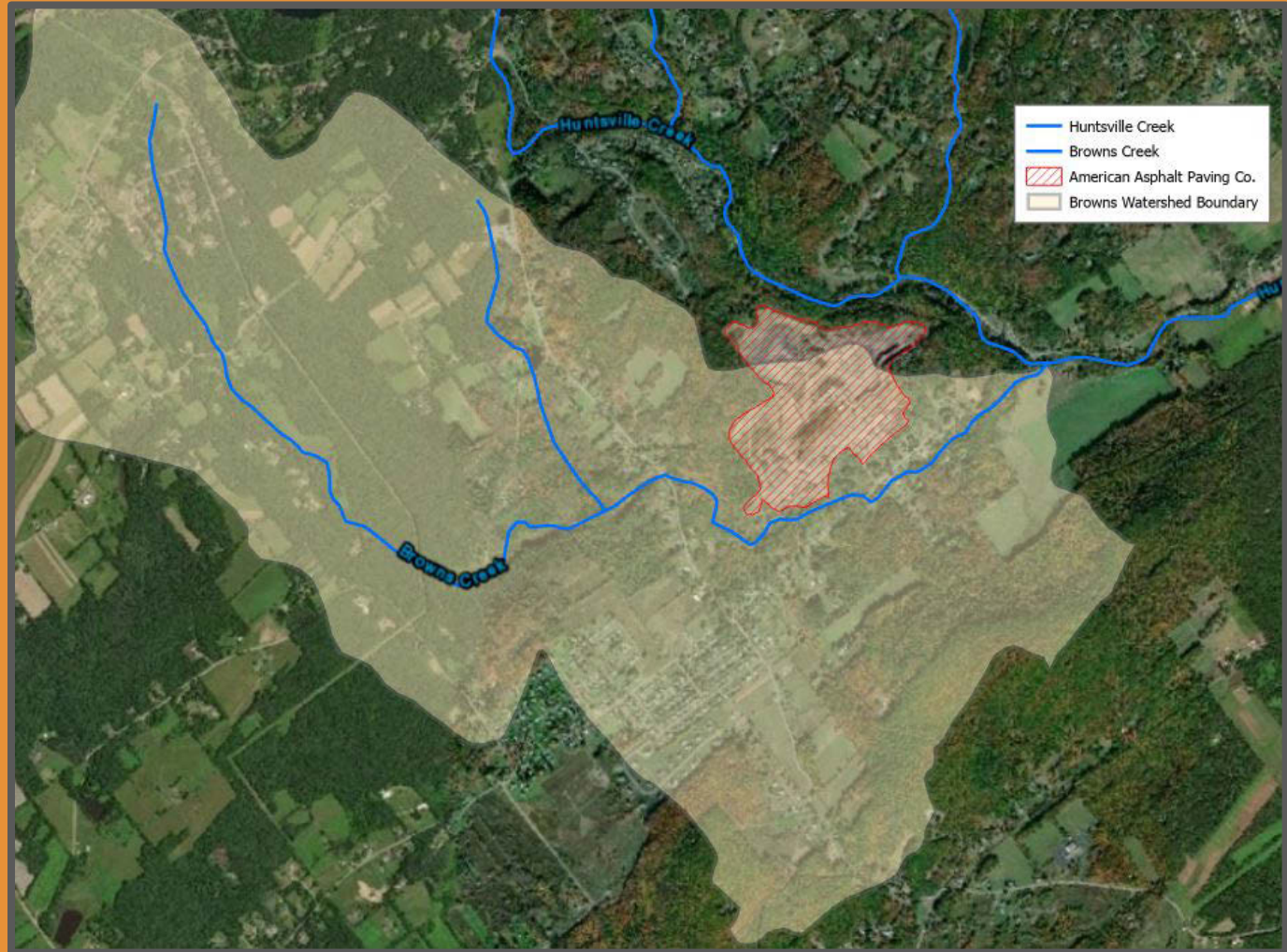
[Eastern Brook Trout Joint Venture -
Data and Tools](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
Clearinghouse](#)

Habitat Patch

- A defined area that is used by a species for reproduction and survival
- Browns Creek is a tributary to Huntsville Creek containing a patch of Wild Trout Habitat, according to Eastern Brook Trout Joint Venture (EBTJV)
 - Browns Creek runs close to the American Asphalt Paving Co. quarry

American Asphalt Paving Co.



[ArcGIS Pro](#)

[Eastern Brook Trout Joint Venture -
Data and Tools](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
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[Google Maps Satellite View](#)

American Asphalt Paving Co. - Background and History



- According to: [American Asphalt Paving Co., About Us - Our History](#)
 - Formed in 1951 with two quarry locations

The Lands at Hillside Farms

- Huntsville Creek runs directly through the 412 acre estate
- The property is 0.5 miles upstream of the Back Mountain Memorial Highway
 - **Huntsville Creek comes to a confluence with Toby Creek along Hillside Road and the Back Mountain Memorial Highway (State Route 309)**



The Lands at Hillside Farms



[ArcGIS Pro](#)

[Google Maps Satellite View](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Hillside Farms - Conyngham Era

- **William L. Conyngham**
 - **Conyngham was a wealthy, well-known coal broker in the Wyoming Valley during the late 19th century**
 - **In 1881, Conyngham purchased 100 acres of farmland from one Joseph Harper, laying the groundwork for would be become Hillside Farms**
- **Over the next hundred years, the Conyngham family acquired more surrounding farmland, building their 412 acre estate, including their family cottage which is still standing and was converted into a bed and breakfast**
- **The Estate became renowned for its excellent quality of livestock, particularly their dairy cows, which is why in 1977 they opened the Dairy Store on the property, selling milk and ice cream products to the general public**
- **Hillside has been a cultural icon, allowing patrons to walk around the grounds, peruse their dairy and mercantile shops as well as the greenhouse, and recline along the bank of the Huntsville Creek**
 - **The greenhouse is one of only a few rare Lord & Burnham still standing and was built prior to Conyngham purchasing the property, additionally being restored in 2011**

Hillside Farms - View from Sutton Rd. 1910-1912



VIEW OF 19-ACRE FIELD AT HILLSIDE FARMS. The Cliffside section of Trucksville is in the background. This photograph from the second decade of the 20th century was taken from Sutton Road. Improved roads and access to railroad and trolley transportation made it easier for families to live in the Back Mountain. Many people moved to the area, and summer homes were often converted into year-round homes. Hillside Farms had grown into a considerable agricultural estate by this time and owned many properties in Trucksville where employees could live. (Courtesy of Louise Schooley Hazeltine.)

Hillside Farms - Conyngham Hillside Cottage



HILLSIDE COTTAGE, 1880s. The two-story Hillside Cottage is shown with the wraparound porch before the addition of the third floor. In 1881, William L. Conyngham (1829–1907) purchased 106 acres in Trucksville from Joseph Harter. This was the foundation for Hillside Farms. This photograph shows William H. Conyngham (1868–1943) driving a team of horses in front of the cottage. Construction of the cottage started in 1882. (Courtesy of the Lands at Hillside Farms.)

Hillside Farms - Changing Hands

- In 2005, the Conyngham family elected to leave the dairy farm business and converted their over 400 acre estate into a nonprofit lease-to-purchase agreement
- In 2009, Dr. Douglas Ayers, cofounder of the North Branch Land Trust, was able to raise \$4.2 million and purchase the estate, founding it as the Lands at Hillside Farm
 - The estate is currently publicly owned and are still paying of a monthly mortgage
 - Dr. Ayers had a passion for ensuring the wellbeing of the flora, fauna, and families of the area, striving for sustainability in a sense of both environmental and social consciousness
- The Lands at Hillside Farms continue to expand
 - The nearly 200 year old greenhouse, which had fallen into disrepair, was restored in 2011 thanks to a large amount of volunteer work
 - In the summer 2019, an expansive new dairy cow barn was built on the north side of Hillside Rd to allow the cows easier access to their pastures
 - This barn was dedicate to the late Dr. Ayers and publicly funded
 - At the beginning of spring 2020, they completed expanding their dairy store building on top of the former parking lot



(Dr. Ayers outside the Hillside Dairy Store. [The Lands at Hillside Farms - Dr. Douglas J. Ayers](#) (2020))

Hillside Farms - The Dr. Ayers Dream Barn

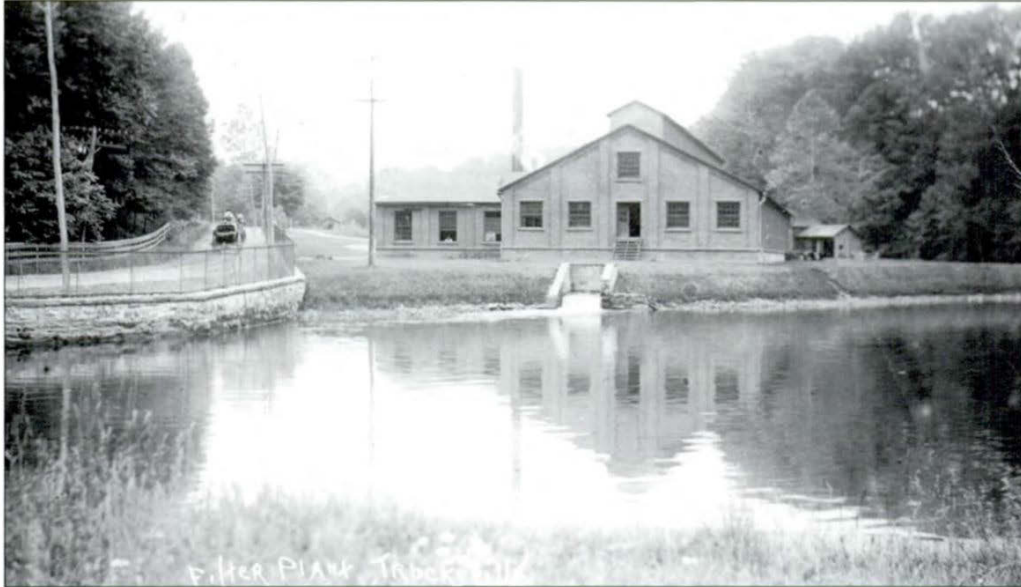


(The Dr. Doug Ayers Dairy Barn, [Discover NEPA](#)) (2019)

Wilkes-Barre Water Company Plant - 1912

- **There is water treatment site is down the road from of Hillside Farms**
 - **This site was built and operated by the former Wilkes-Barre Water Company, using the water coming from the Huntsville Reservoir**
- **This site is also 0.2 miles upstream of Huntsville Creek's confluence with Toby Creek**
- **Facility is still operating today under the authorization of Pennsylvania American Water**

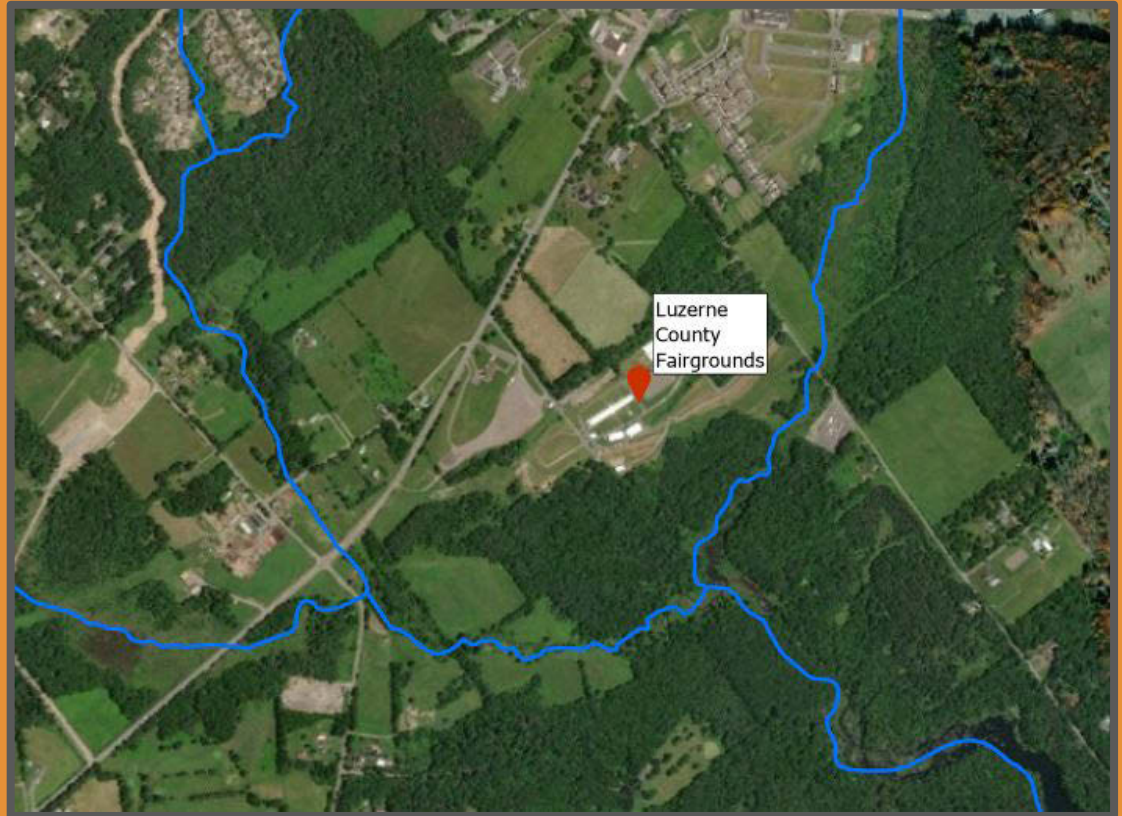
Wilkes-Barre Water Company Plant - 1912



WILKES-BARRE WATER COMPANY FILTER PLANT, 1912. Hillside Road is on the left looking toward Hillside Farms. Water flowed from the Huntsville reservoir to the filter plant to improve the water supply in the Wyoming Valley. The building was completed in 1895, close to the Kingston and Dallas Turnpike. The Hillside trolley station was built nearby. (Courtesy of Howard and Lillian Gola.)

Luzerne County Fairgrounds

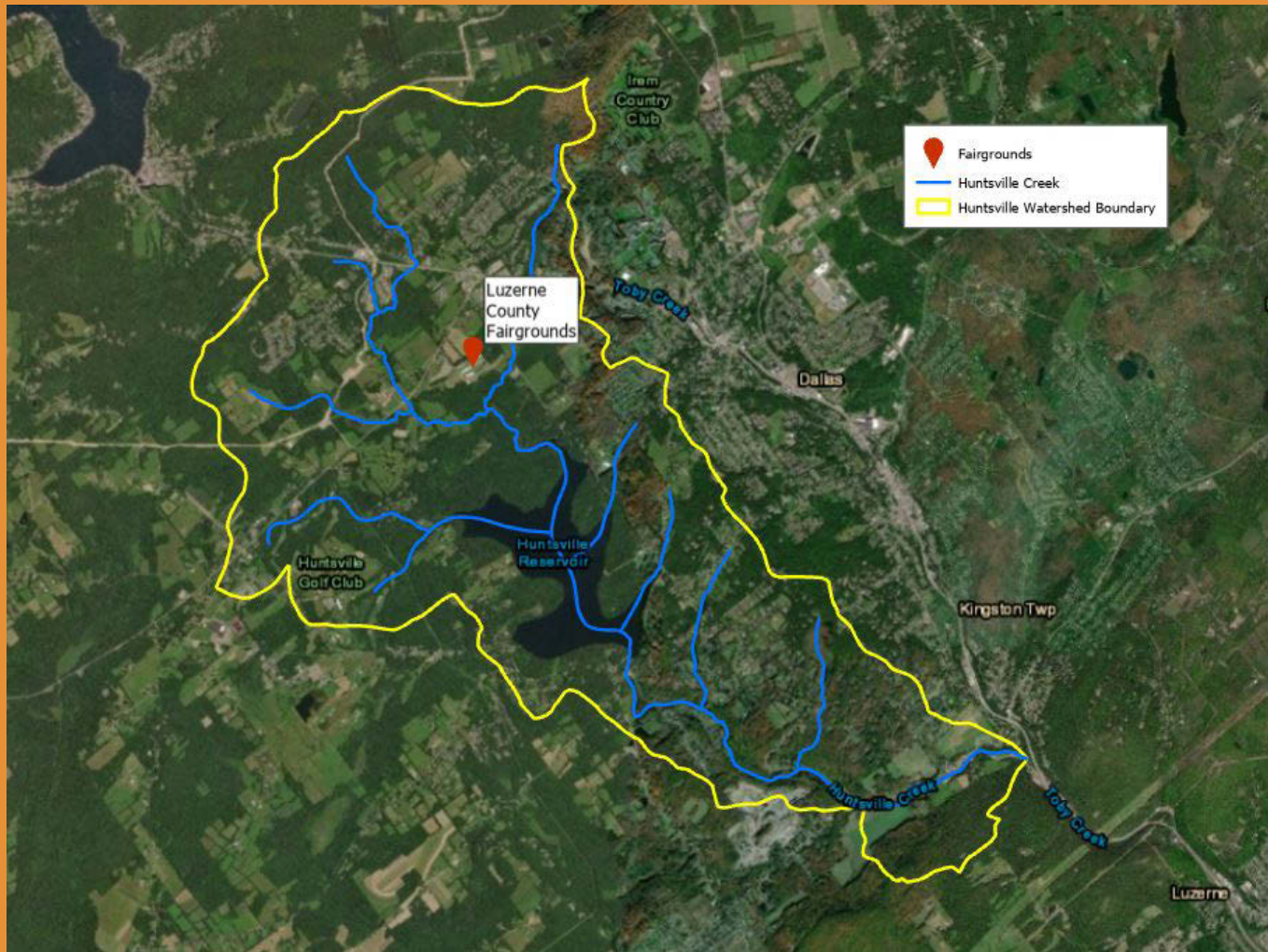
- **Possibility for runoff from parked vehicles, etc.**
- **Fair hosts livestock**
- **Close stream proximity**
 - **Huntsville Creek headwater tributaries are highlighted in blue**



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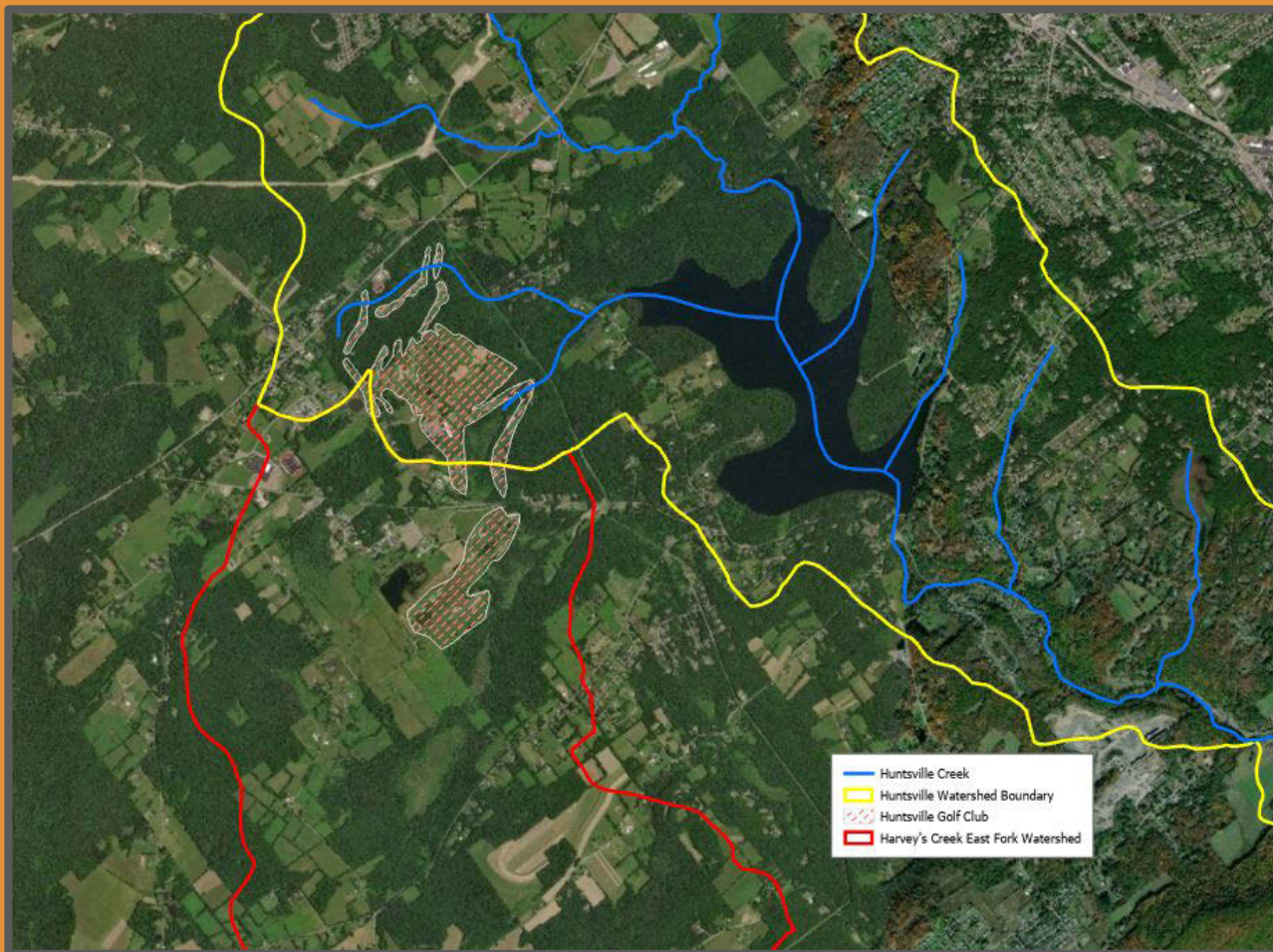
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Huntsville Golf Club

- **The golf club sits on the Huntsville Watershed divide with the Harvey's Creek East Fork Watershed**
- **Two tributary stream branches of the Huntsville Reservoir envelope course**
- **The course has several ponds, with some draining into the tributaries**
- **The golf course is divided in half by Route 115, with the lower half of the course being a part of the Harvey's Creek Watershed**
- **The course is well maintained with excellent riparian buffers below the ponds throughout the property**
- **473 acres total**

Huntsville Golf Club



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Huntsville Golf Club - Laying the Foundation

- In the 1980s, local businessman Richard Maslow set out to create a high class golf course in the Back Mountain
 - Maslow worked with several local organization to secure his vision such as the McLoughlin Group and the Lewith and Freeman Real Estate Agency
 - He also enlisted the help of famed golf course designer Rees Jones
- After 4 years of negotiation they secured 334 acres of land in Lehman, adjacent to the Penn-State Wilkes-Barre Campus
 - Land was purchase from several wealthy Back Mountain families as well and the Pennsylvania Gas and Water Company
- Designer Rees Jones required significantly more land to complete the course so an additional 139 acres were purchased from the Conyngham family
- The course and golf club open in 1994 and has become a highly popular and respected local landmark



(Huntsville Golf Course (2020), [Links Magazine](#))

Huntsville Golf Club - Opening Article

- The Times-Leader, 1994, Page 16C - Article on the opening of the course to massive success

HUNTSVILLE GOLF CLUB SCORES HOLE-IN-ONE WITH CRITICS

Author: CLIFF SCHECHTMAN; Times Leader Staff Writer

Date: October 16, 1994

Publication: Times Leader, The (Wilkes Barre, PA) Page: 16C

Wordcount: 917

LEHMAN TWP. -- Like reviewers at a Broadway opening, connoisseurs from the golf world visited Huntsville Golf Club last week to ponder architect Rees Jones' latest creation.

The reviews are coming in and the course better not be camera shy.

"I see golf courses for a living and this is a great golf course," said Larry Hirsch, who is a member of Golf Digest's Top 100 courses panel.

Hirsch, a 3-handicap golfer, was joined by a few dozen authorities and golf writers at the Back...

Huntsville Golf Club - Pesticide Use

- The Times Leader, 1997, Page 1B article discussing the golf club's decision to use natural predators of golf course pests instead of chemical pesticides

WHEN ON THE GREEN MEANS MORE THAN A PLACE TO GOLF GOLF CLUB AMONG AREA GROUPS AND INDIVIDUALS TO BE HONORED FOR ENVIRONMENTAL EFFORTS

Author: MARY THERESE BIEBEL; Times Leader Staff Writer

Date: October 4, 1997

Publication: Times Leader, The (Wilkes Barre, PA) Page: 1B

Wordcount: 763

Rather than drench its grass with pesticides, the Huntsville Golf Club tries to attract bug-chomping bats and birds.

"Believe me, if you can bring the bats in, they'll eat their share of insects- 10 times their weight in one day," says course superintendent Scott Schukraft.

Rather than mow every blade to manicured stubble, the staff allows picturesque patches of low-maintenance greenery to grow unfettered around ponds and streams. Here it provides a home for birds and butterflies,...

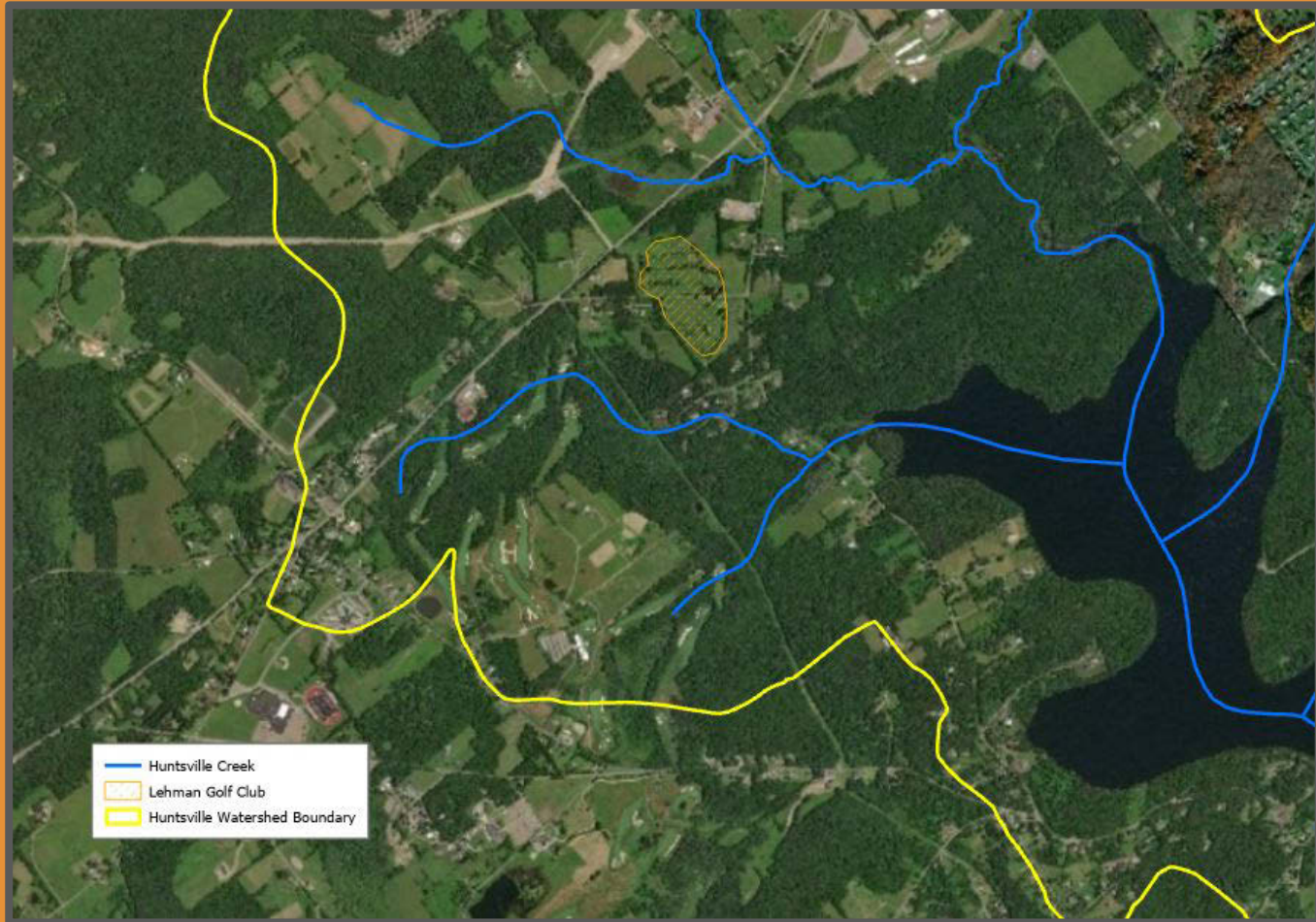
Lehman Golf Club

- Features

- **9 Hole course**
- **39 Acres**
- **Steep and Hilly**
- **Longest Hole is 315 yards**



Lehman Golf Club

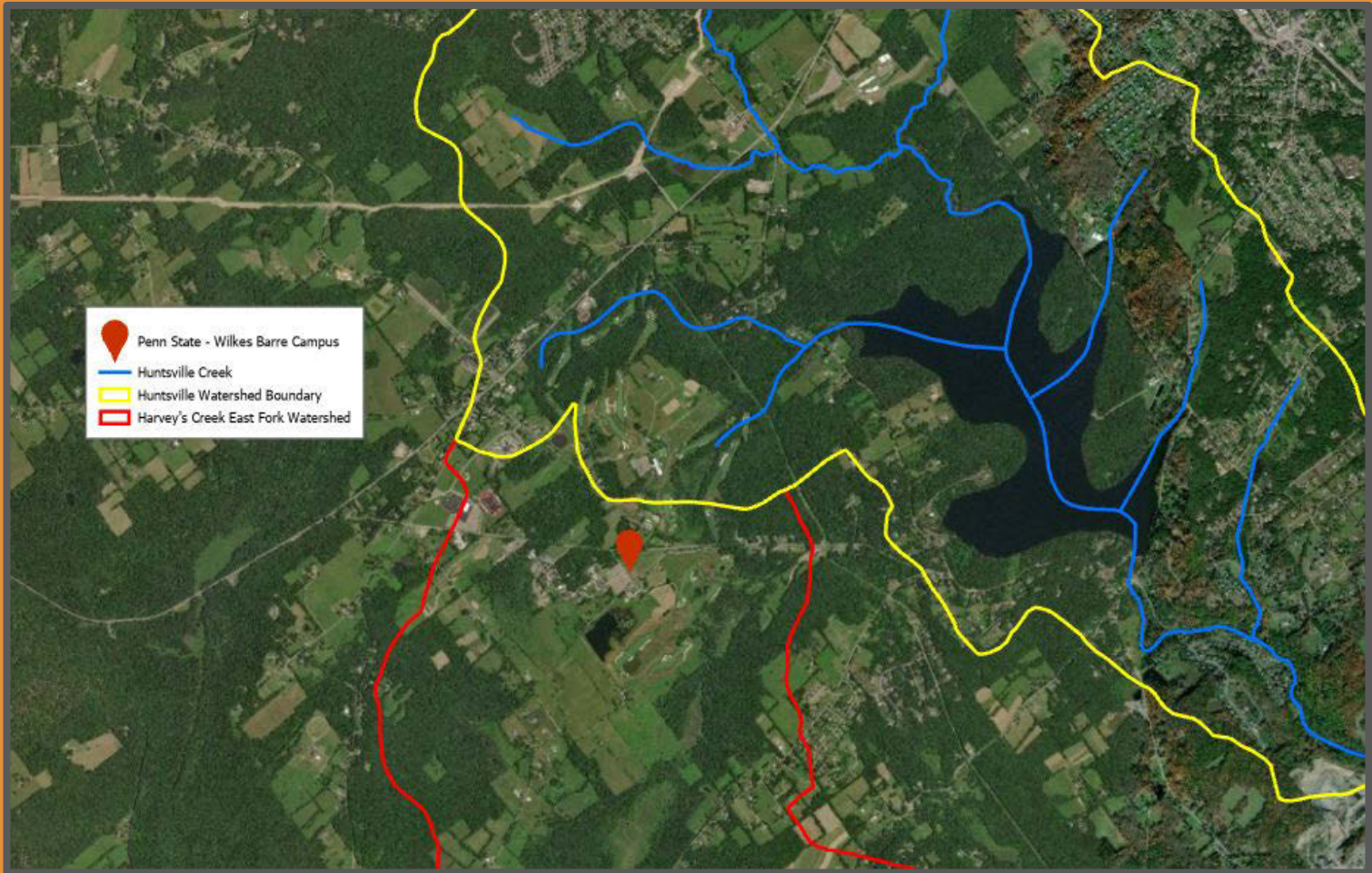


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Penn State - Wilkes-Barre Campus



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Penn State - Moving to the Back Mountain

- Penn State Wilkes-Barre was founded in 1916 by former Penn State graduates, recognizing the need for more highly educated engineers and mining experts to improve the booming coal industry
 - For the next 50 years Penn State Wilkes-Barre didn't have a consistent home, moving between school buildings in the Wilkes-Barre area
- It wasn't until the mid 1960s that Penn State Wilkes-Barre found a permanent home in the Back Mountain
- The wealthy Conyngham family owned a large amount of property in Lehman known as the Hayfield farms, the centerpiece of the estate being the massive Hayfield House
 - This farmland was home to an eclectic assortment of livestock including Clydesdale horses, cows, pigs, sheep, and even buffalo
 - The acreage was also used to cultivate fruits, vegetables, and hay
 - After the death of the Mrs. Bertha Conyngham in 1964, she left the estate to her nephew Richard Robinson
 - Soon after Richard gifted Hayfield House and 50 acres of surrounding farmland to Penn State Wilkes-Barre



Penn State - Current Campus

- In past 50 years, the campus has since expanded and to include 9 new academic builds, with the Hayfield House being converted in administration offices and classrooms
- The campus currently sits on the edge of two watersheds, situated between a western tributary of the Huntsville reservoir and the East Fork of Harvey's Creek
 - The campus is not in direct contact with either stream
 - The east side of campus is encircled by the Huntsville Golf Club range, which contains two unnamed Huntsville tributaries as well as drainage that flows toward the E. Fork of Harvey's Creek, which is not in the purview of this Conservation Plan

(Hayfield House (2020) [Penn State Wilkes-Barre Virtual Tour](#))



Penn State - Hayfield House, 1932



PennState
Wilkes-Barre

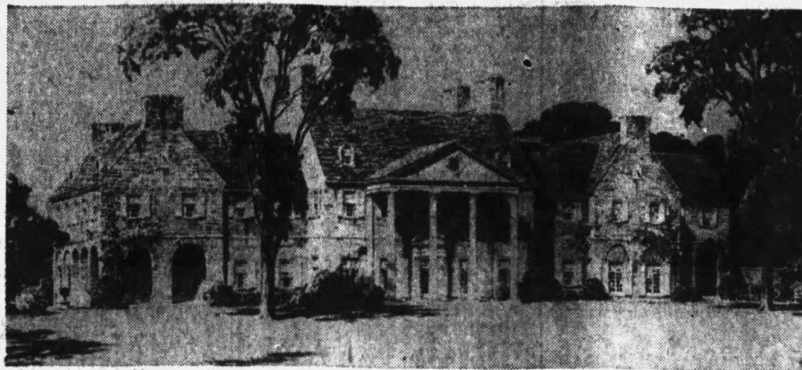
World Collection

Wilkes-Barre Times Leader, the Evening News (Wilkes-Barre, Pennsylvania) · Wed, Sep 28, 1932 · Page 1

<https://newscomwc.newspapers.com/image/136148207>

Downloaded on Apr 5, 2017

New Home Of Mr. And Mrs John N. Conyngham



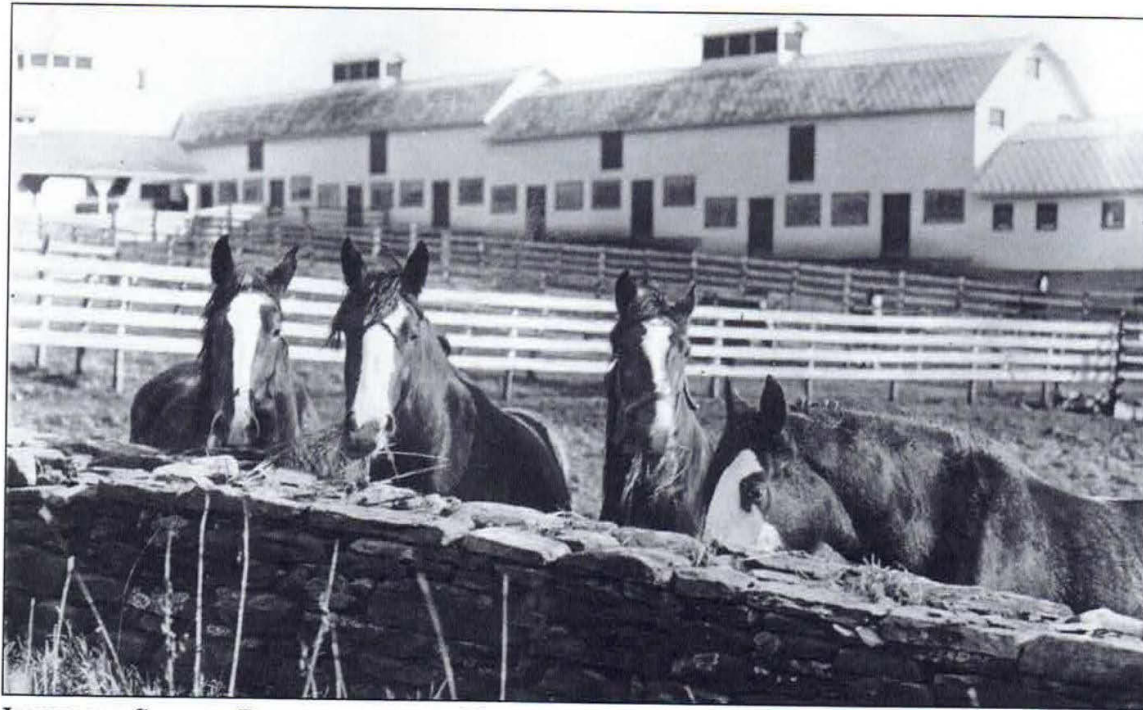
The palatial home being erected for Mr. and Mrs. John N. Conyngham at their Hayfield Farms near Lehman, is pictured here. It is now well under construction.

The building when finished will cost \$200,000 exclusive of furnishings, and will be one of the handsomest residences in this section of the State. Three months were consumed in construction of the cellar and cellar walls. The outside material of the building, which is to be three stories, 200 feet long and 60 feet wide, will be field stone gathered from the fields of Hayfield and adjacent farms.

Its location is a high elevation on the farm which provides a handsome view of green pastures and hillsides.

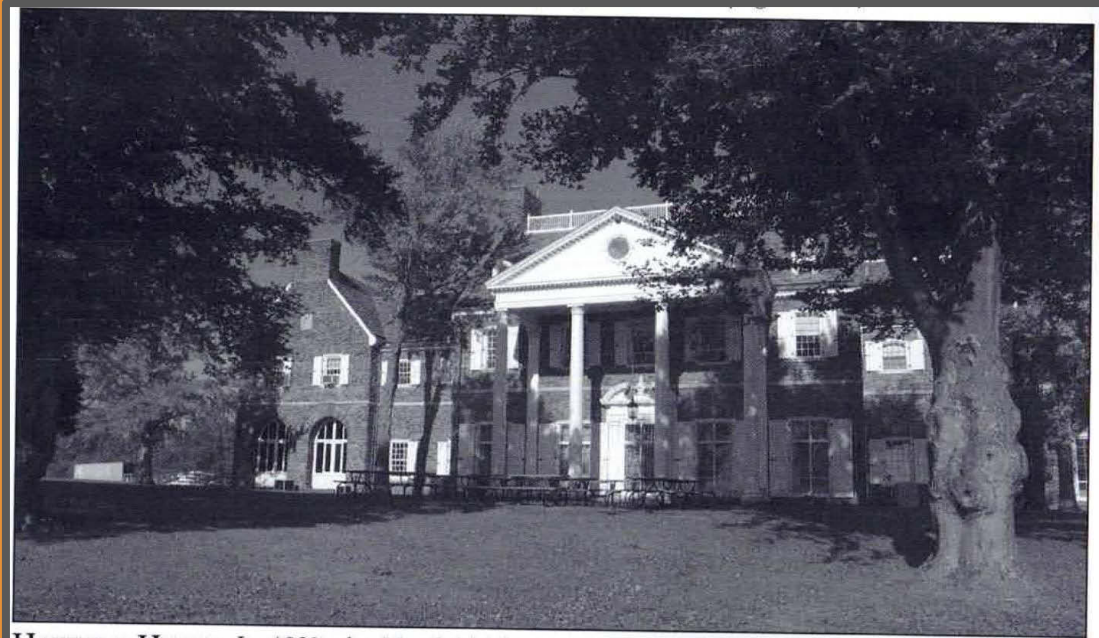
The plans were prepared by Architect Francis A. Nelson of New York City, and the contract was awarded to the New York construction firm of Skinner, Cook and Babcock. The owners of the property, however, demanded that as far as possible local labor be employed in the erection of the building and this request is being carried out. It is expected the building will not be ready for occupancy before a year.

Penn State - Hayfield Barns 1930s



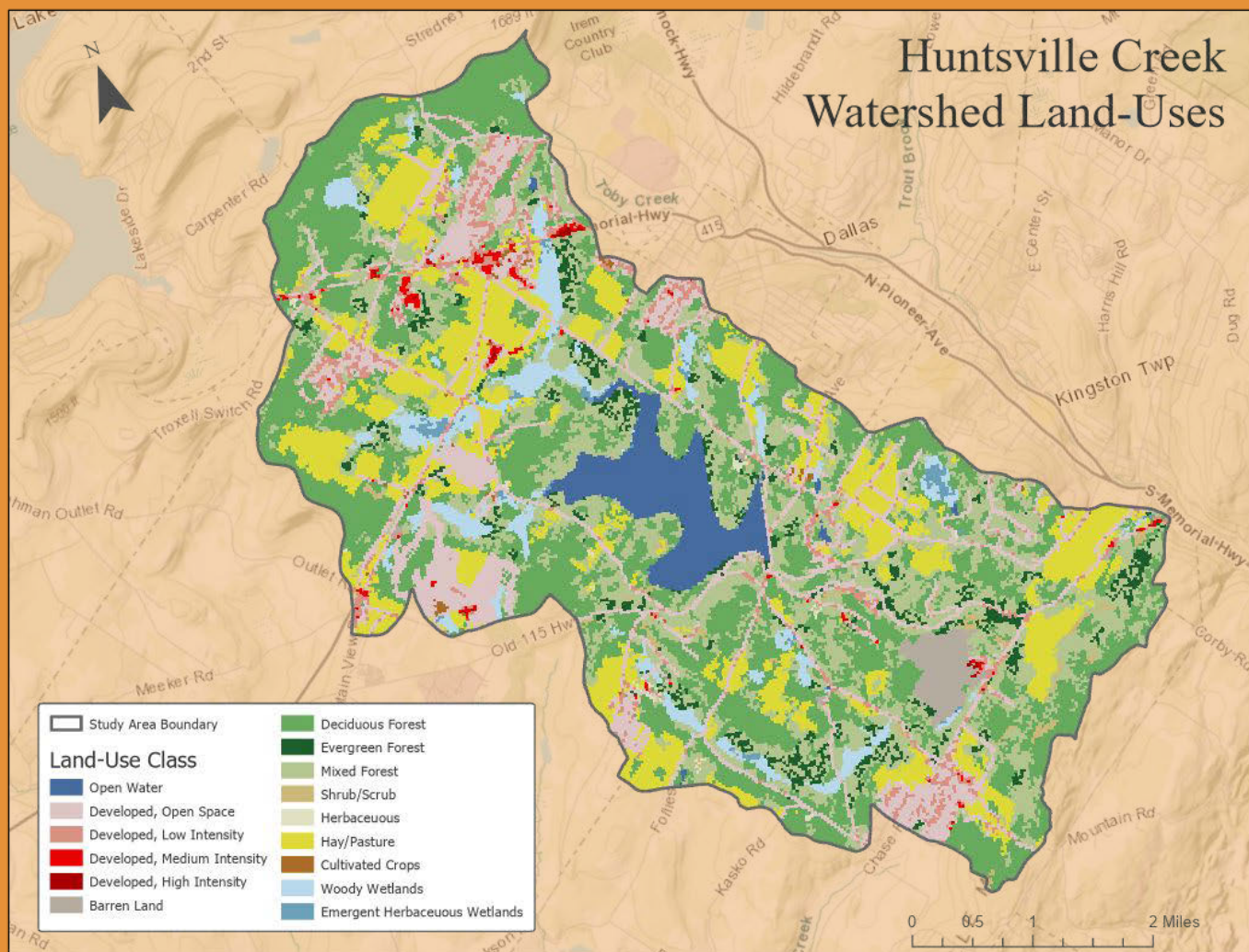
JENNINGS STUDIO PHOTOGRAPH OF THOROUGHBRED HORSES IN FRONT OF THE BARNs AT HAYFIELD FARM, 1930s. In 1910, Hayfield Farm was founded by John N. Conyngham II, son of William L. Conyngham. He purchased the property from Robert Major, George Major, and David Major on Old Route 115 in Lehman. Golden Knight was one of the award-winning Clydesdales raised at Hayfield Farm. (Courtesy of John N. Conyngham III.)

Penn State - Hayfield House, 1960s



HAYFIELD HOUSE. In 1932, the Hayfield House was designed by architect Francis Nelson and constructed by Skinner, Cook and Babcock. In 1933, John N. Conyngham II and his wife Bertha Robinson Conyngham moved into the house. After the death of Bertha Robinson Conyngham in 1964, Hayfield House was donated to Pennsylvania State University and converted into offices and classrooms for Pennsylvania State University Wilkes-Barre. (Courtesy of Mark Gregario and Pennsylvania State University.)

Huntsville Creek Watershed Land-Uses



[ArcGIS Pro](#)

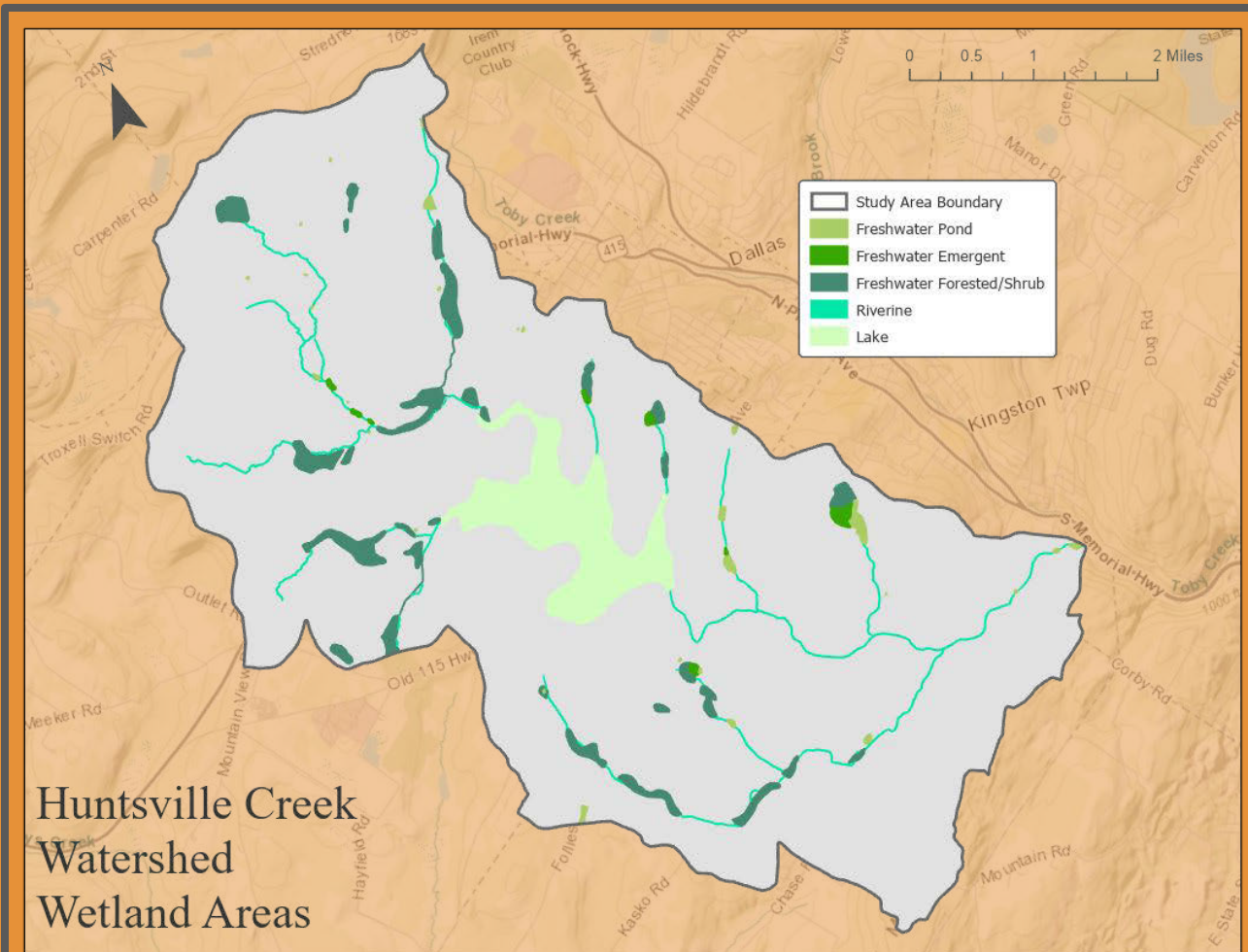
[National Land Cover Database - Data \(2016\)](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Huntsville Creek Watershed Land-Use

Land-Use	Count	Area (Square Meters)	Percentage of Land Cover
Developed, High Intensity	37	33300	0.09%
Herbaceous	84	75600	0.20%
Cultivated Crops	86	77400	0.20%
Developed, Medium Intensity	220	198000	0.52%
Emergent Herbaceous Wetlands	224	201600	0.53%
Shrub/Scrub	295	265500	0.70%
Barren Land	562	505800	1.33%
Evergreen Forest	1,320	1188000	3.12%
Developed, Low Intensity	1,466	1319400	3.47%
Open Water	1,774	1596600	4.20%
Woody Wetlands	1,788	1609200	4.23%
Developed, Open Space	5,444	4899600	12.88%
Hay/Pasture	6,694	6024600	15.84%
Mixed Forest	9,403	8462700	22.25%
Deciduous Forest	12,856	11570400	30.43%

Huntsville Creek Watershed Wetland Areas



Huntsville Creek Watershed Wetland Areas

Wetland Type	Area (Square Meters)	Percentage of Land Cover
Freshwater Emergent Wetland	140565.48	0.21%
Freshwater Pond	223310.77	0.33%
Riverine	321895.63	0.48%
Freshwater Forested/Shrub Wetland	1718394.12	2.56%
Lake	2874034.38	4.28%

- Estimated via GIS analysis

Roadway Statistics

Road Type	Length (Meters)	Length (Miles)
State	44058.307	27.377
Local	109808.755	68.232

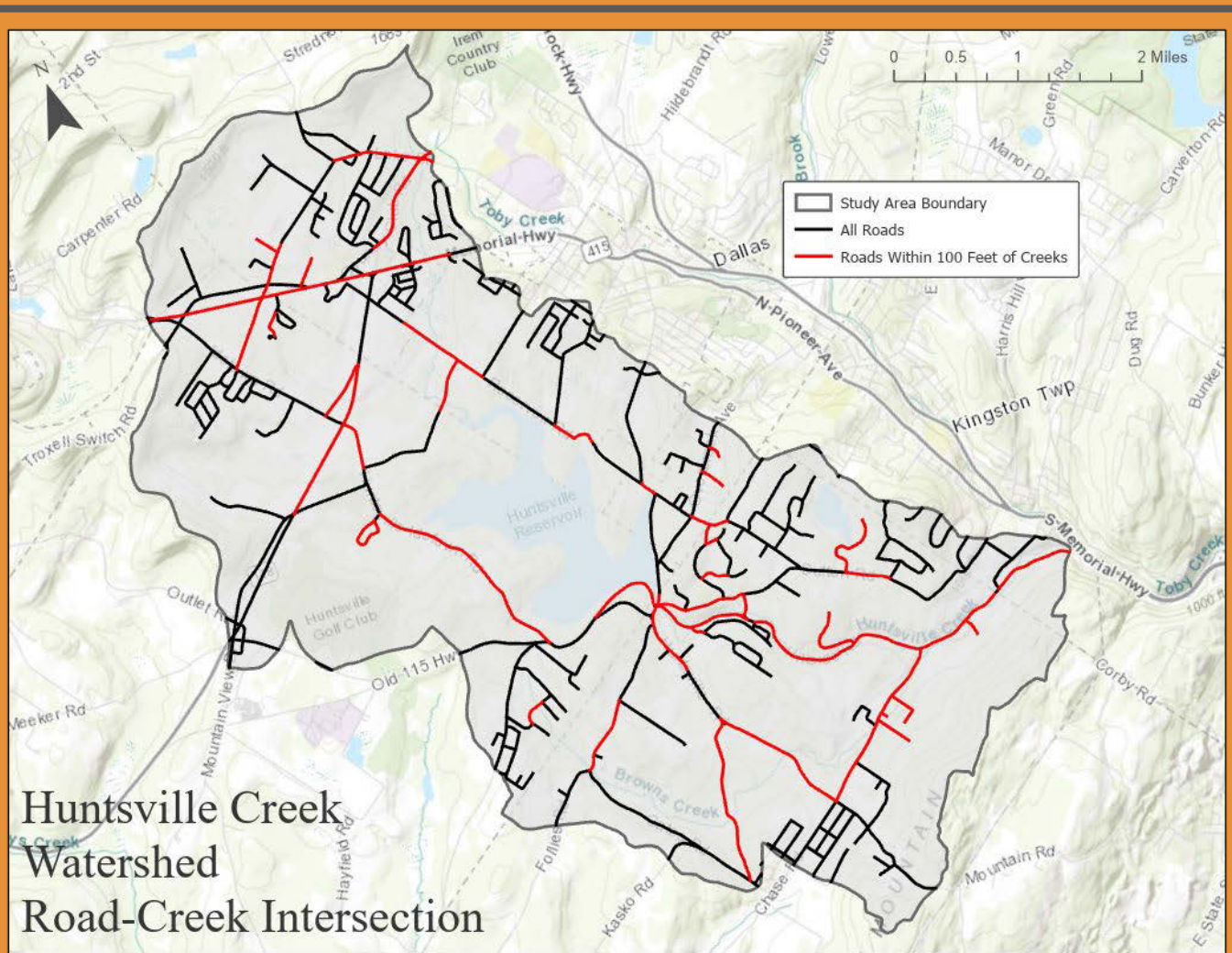
- Estimated via GIS analysis

Huntsville Watershed Road-Creek Intersections

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
Clearinghouse](#)

Huntsville Creek
Watershed
Road-Creek Intersection



Japanese Knotweed

- <http://www.paenvironmentdigest.com/newsletter/default.asp?NewsletterArticleID=22404&SubjectID=>
 - PA American Water granted PA Environmental Council (PEC) money to remove knotweed along American Water's property on Huntsville Creek
- Grant was awarded in 2012 and most of knotweed was removed
- Unsure if all has been eradicated

Back Mountain Trolley - Laying the Foundation

- **The first rail line connecting Luzerne with the Back Mountain towns of Dallas and Alderson, on the north shore of Harvey's Lake, was completed on June 16, 1887**
 - **Organized by Albert Lewis, local lumber and ice entrepreneur as well as major land owner**
 - **Lewis formed the Wilkes-Barre and Harvey's Lake Railroad Co. which he later sold to Lehigh Valley Railroad in August 1887**
 - **It would later be extended to Towanda New York State in 1893**
- **This line was run by lightweight steam engines and, being intended for as a resort line, meant it saw fairly irregular traffic throughout the year**
- **In 1893, John Reynolds wanted to form an electric trolley service to the Back Mountain and Harvey's Lake**
- **For three years, Reynolds struggled to lay the official groundwork, constantly being met with opposition**
 - **In 1895, Lewis, who owned a majority of the land in Dallas forbade the construction the trolley line through the Toby Creek gorge**
 - **With no other easy way into the Back Mountain, construction was halted again**

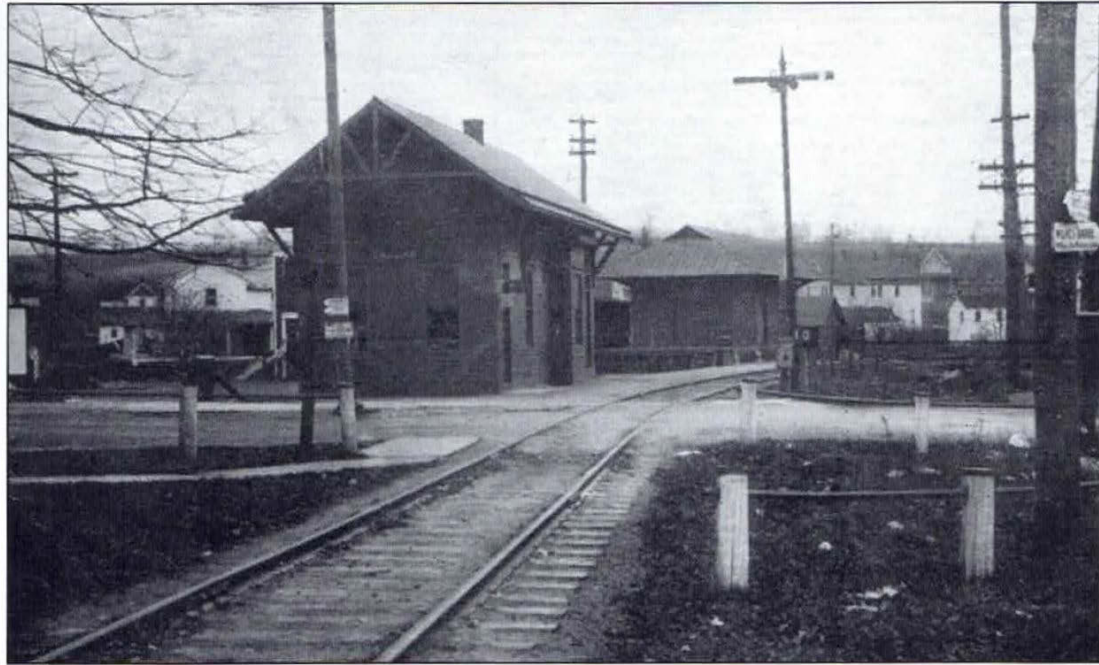
Back Mountain Trolley - Alderson Station at Harvey's Lake



ALDERSON STATION, 1892. The original 12-mile railroad between Luzerne and Harvey's Lake was sold to the Lehigh Valley Railroad by Albert Lewis on August 5, 1887. Regular passenger train service between Wilkes-Barre and Harvey's Lake started on November 23, 1891. In 1888, the Alderson Methodist Episcopal Church was constructed on Harvey's Lake. The Alderson station and the Lehigh Valley Railroad picnic grounds were constructed in 1891. (Courtesy of the FCP collection.)

(Alderson Station. (1892) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - Lehigh Valley RR Dallas Station

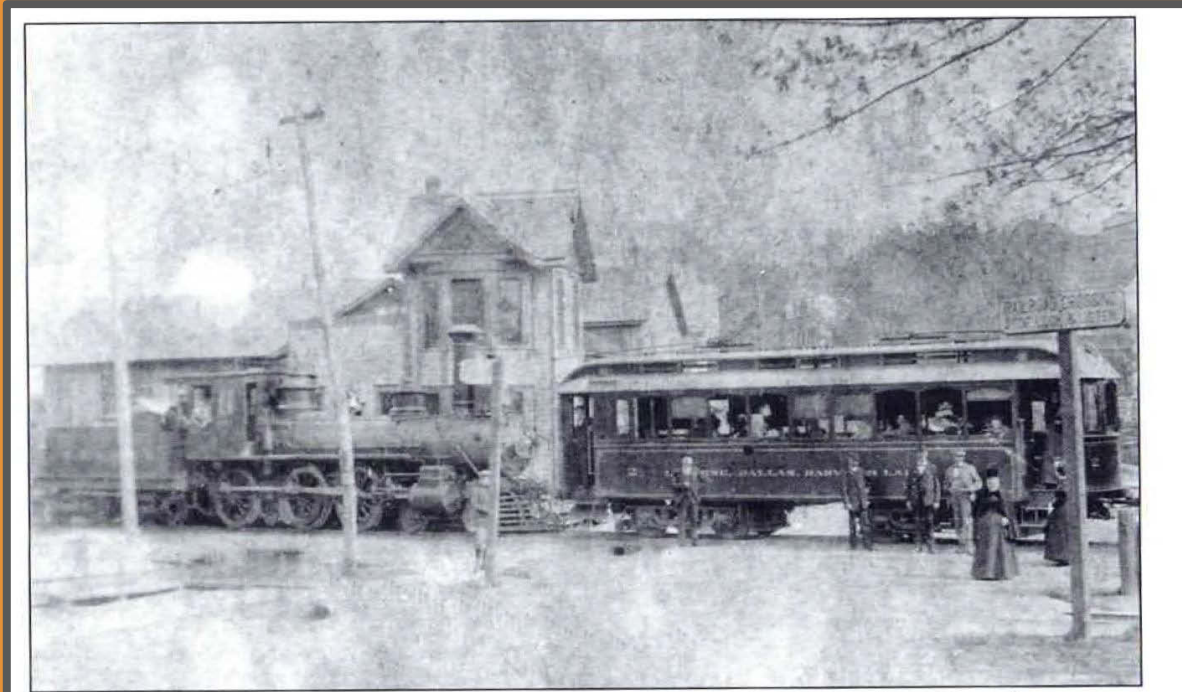


LEHIGH VALLEY RAILROAD STATION AND TRAIN DEPOT, 1920s. At this time, the main roads to Dallas were Main Street and Pioneer Avenue. This postcard shows the railroad tracks next to the road that became the Dallas Memorial Highway. The first steam engine reached Dallas on December 9, 1886. Passenger service was reduced to one train each way daily on December 19, 1928. (Courtesy of Stephen B. Killian.)

Back Mountain Trolley - Wilkes-Barre and Northern RR

- In order to lay the groundwork for his electric trolley project, Reynolds chartered the Wilkes-Barre and Northern Railroad in January 1896
 - Although Reynolds was permitted to build on Lewis' land without crossing over the Lehigh Valley RR property, Lewis was displeased with another company building on his land
 - One night after construction of the new track, the Lehigh Valley rail gang ripped up the new rails and blocked the path by dumping two gondolas on the railbed
 - Reynolds immediately took them to court and that summer the WB&N purchased the property and rights of the Wilkes-Barre and Harvey's Lake RR, allowing them full access build and operate into the Back Mountain, through the Toby Creek gorge and on toward the lake
- The WB&N purchased three steam locomotives, with Reynolds vision being that they would open the line and they would transition to electric trolleys as they became more financially feasible
 - With the line from Luzerne to Harvey's Lake completed in 1896, there were plans to build branch lines along Harvey's Creek and from Luzerne to Plymouth, as well as a connection
 - These plans would not come to fruition due to the company's constant state for financial instability

Back Mountain Trolley - Steam Engine No. 3 of the WB&N



LUZERNE, DALLAS AND HARVEY'S LAKE RAILWAY, c. 1897-1898. A Baldwin locomotive pushing trolley No. 2 is coupled to another trolley at the Dallas corners. The trolleys were built by Jackson and Sharp and were delivered to the trolley company on October 8, 1896. This photograph was taken from the Raub's Hotel and shows the Dallas trolley station in the background. (Courtesy of the Edward S. Miller collection.)

(Luzerne, Dallas, and Harvey's Lake Railway. (1897-1898) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - WB&N Foreman and Rail Gang



FOREMAN EDWARD BAER AND WORKMEN, c. 1897-1898. The men are pictured on a flatbed and trolley No. 106 near the Harvey's Lake trolley station. The trolley line was built by the Wilkes-Barre, Dallas and Harvey's Lake Railway Company to attract tourists to Harvey's Lake. Several stockholders in the company incorporated the Harvey's Lake Hotel and Land Company to construct the Oneonta Hotel on April 20, 1897. (Courtesy of the Misericordia University Archives.)

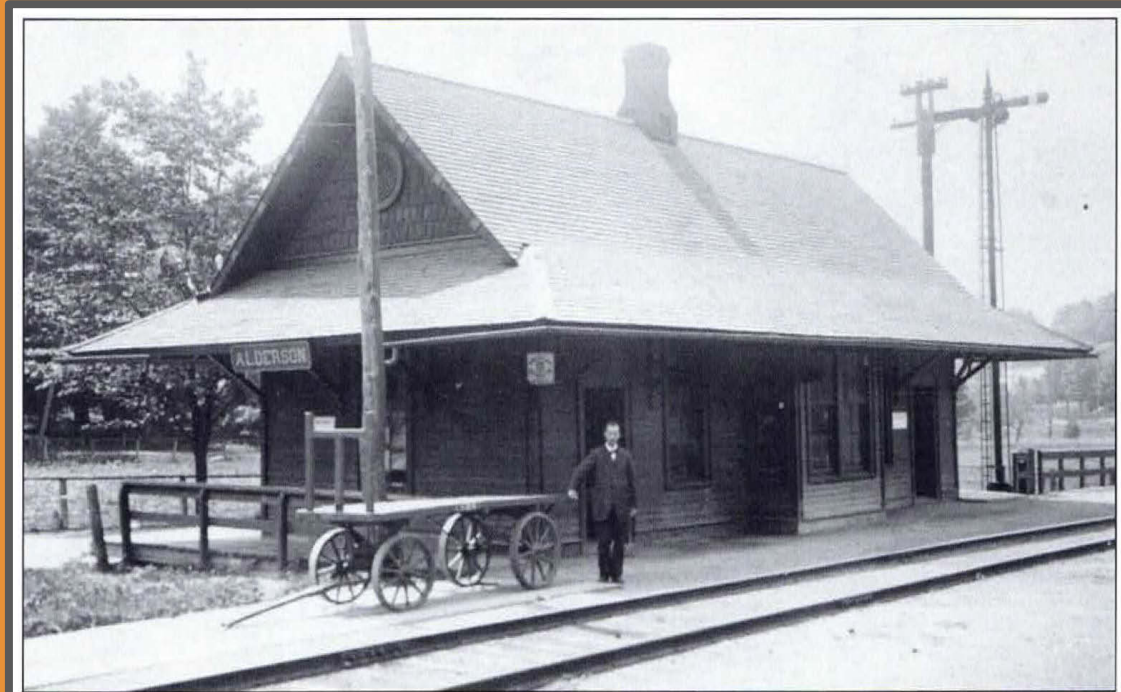
(Foreman Edward Baer and workmen. (1897-1898) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - Trolley Along Toby Creek



TROLLEY BETWEEN DALLAS AND HARVEY'S LAKE NEAR TOBY'S CREEK, 1907. Before the days of automobiles, the trolley and the Lehigh Valley Railroad brought passengers to Harvey's Lake. Travelers came from New York and Philadelphia to enjoy the lakeside attractions. This photograph was taken by William J. Harris, and the postcard was sold at the Hill's pavilion on the inlet iron bridge. (Courtesy of Howard and Lillian Gola.)

Back Mountain Trolley - Alderson Station at Harvey's Lake



ALDERSON STATION, c. 1910. Standing in front of the station is stationmaster George M. Young. The Alderson station was utilized by the Albert Lewis Lumber and Manufacturing Company sawmill, the ice-cutting industry, and the Mosser tannery in Noxen. In 1891, the Lehigh Valley Railroad built a direct line between Wilkes-Barre and Harvey's Lake. The Alderson station was dismantled in 1958. (Courtesy of the Misericordia University Archives.)

(Alderson Station. (1910) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - Building the Back Mountain

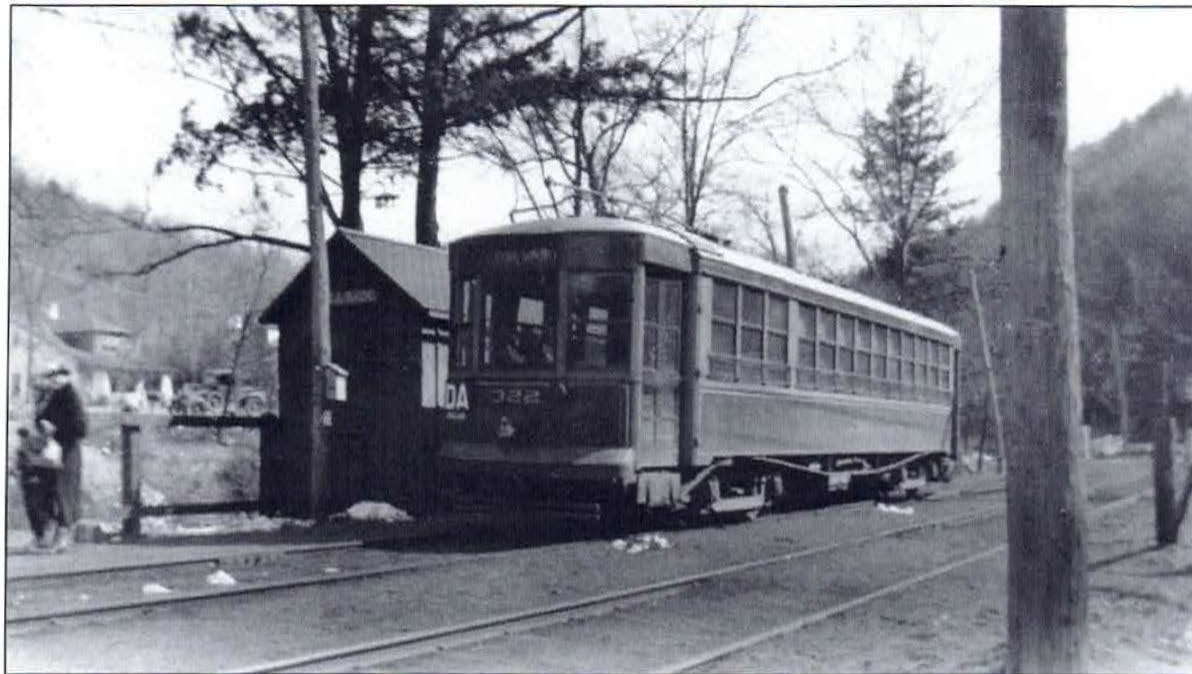
- The Luzerne-Harvey's Lake line began regular service on January 3, 1897
 - The line ran through the Toby Creek gorge and followed the creek through Dallas and then curved west toward Harvey's Lake
 - The WB&N did not begin service in a flattering light, with a runaway coach and subsequent collision during its opening week
- The Lake Line was later extended to curve around the east bank to Idetown
- There was a desire to bring another attraction to the Back Mountain to boost passengers, so the Fernbrook Amusement Park was constructed between Shavertown and Dallas in the summer of 1897
- Financial constraints continued to slow Reynold's plan for an electrified trolley service on his line
 - After multiple bad dealings, Reynold's resigned as WB&N's president and was replaced by John Graham, businessman and major shareholder for WB&N
- Graham, amidst several delays reorganized the WB&N as the Wilkes-Barre, Dallas, and Harvey's Lake Railway and got the electric trolleys running regularly on December 22, 1898
- The line serviced Harvey's Lake, Fernbrook Park, Hillside and extended to several local cemeteries including Mt. Greenwood in 1910 and St. Nicholas in 1914
- Additionally, the WBD&HL constructed a direct line from Division st. in Kingston to the terminal in Luzerne, dubbed the Short Line, beginning operation in 1912

Back Mountain Trolley - Trolley at Dallas Corners



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 280 AND THE HARVEY'S LAKE BUS. These vehicles are pictured between the trolley station and the Lehigh Valley Railroad station. The photograph was taken by Edward S. Miller from the Dallas corners on April 21, 1939. A fire destroyed 13 trolleys stored in Dallas on October 24, 1934. The final day of trolley service to Dallas was on April 30, 1939. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Stop at Hillside



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 322, MARCH 1, 1938. This trolley, pictured at the Hillside trolley station in Trucksville, was bound for Dallas, where passengers could take the bus to Harvey's Lake. In 1931, trolley service from Dallas to Harvey's Lake was discontinued. The Hillside trolley station was located close to Toby's Creek and the Kingston and Dallas Turnpike. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Shavertown Station



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 328, SHAVERTOWN STATION. This trolley is seen on March 25, 1938, at the Center Street crossing next to the Fairlawn store. After the trolley tracks were removed, this became part of the highway. The Shavertown Shopping Center was built on the left. The Shaver movie theater was behind the Fairlawn store, and the theater became the Snowdon Funeral Home. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Harris Hill Overpass



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 332, MARCH 25, 1938. This photograph shows the underpass of the Harris Hill Road concrete bridge after the stone bridge was rebuilt and the second arch was removed. Toby's Creek was diverted through the arch after trolley service was discontinued and the trolley tracks were removed. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Toby Creek Gorge



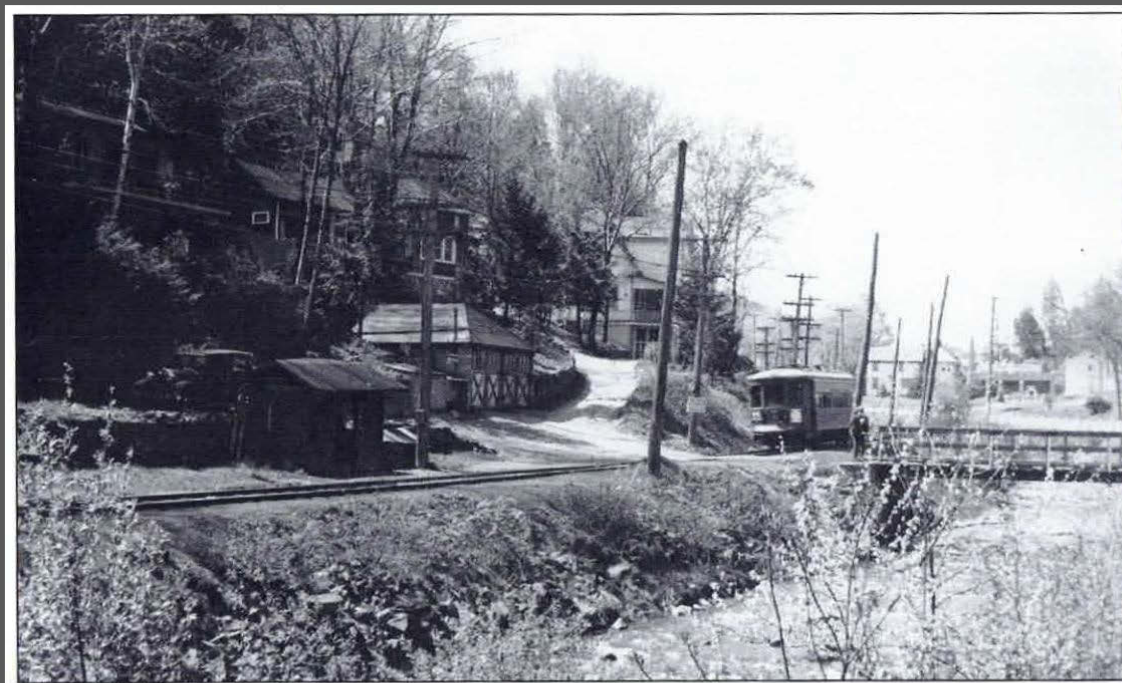
WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 360. Trolley No. 360 is seen traveling along Toby's Creek between Luzerne and the Birch Grove station in Kingston Township. This photograph was taken by Edward S. Miller on September 26, 1938, and shows Toby's Creek between the trolley tracks and the paved road before the highway was constructed. The Lehigh Valley Railroad tracks appear to the right of the paved road. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Between Shavertown and Trucksville



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 778. This trolley was photographed between Shavertown and Trucksville after going through the Harris Hill Road underpass in Trucksville. This was a special excursion trolley for the National Railway Historical Society in 1938. In 1933, trolley No. 778 was delivered secondhand to the Wilkes-Barre Railway Corporation. The trolley company became the Wilkes-Barre Transit Corporation on August 29, 1947. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Leaving the Toby Creek Gorge



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 788. Trolley No. 788 is shown near the Birch Grove station in Kingston Township. In the background is the intersection of Hillside Road and the Kingston and Dallas Turnpike. This photograph was taken by Edward S. Miller on May 1, 1938. The trolley tracks were next to Toby's Creek. The Kingston and Dallas Turnpike was across the bridge on the right. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Fernbrook Park Roller Coaster



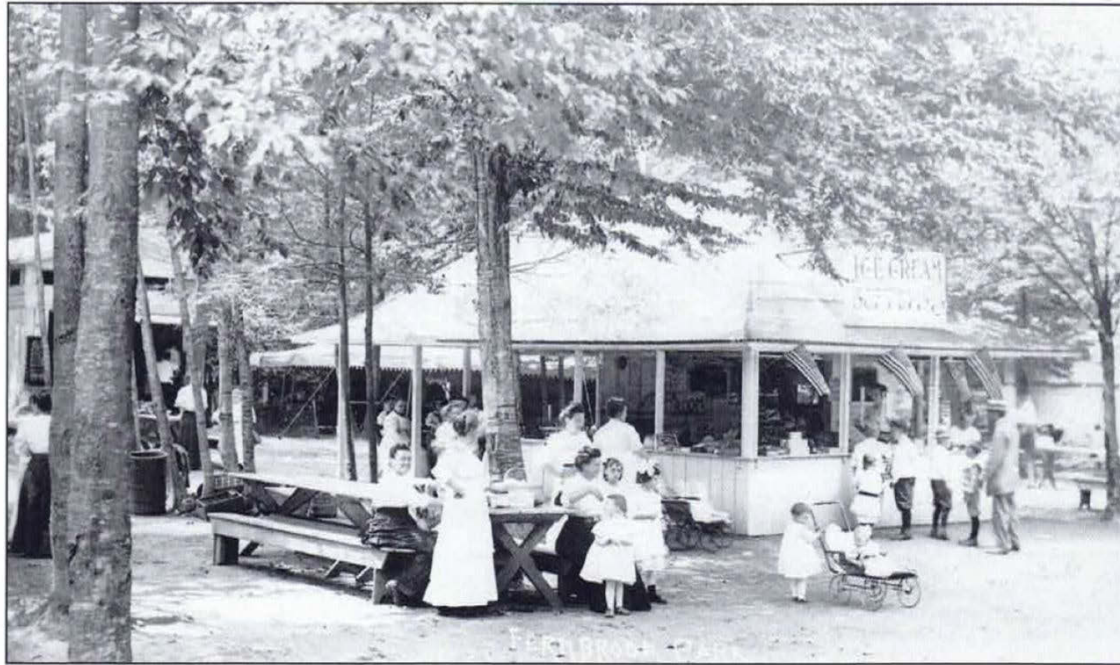
WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 322, FERN BROOK PARK, MARCH 25, 1938. This photograph was taken by Michael J. Lavelle and shows the trolley next to the Wildcat roller coaster near the passing track. Frank Sudol was killed on the roller coaster while attending a United Mine Workers picnic on July 18, 1929. The roller coaster and dance hall were demolished in the 1940s. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Fernbrook Park Ride



FERN BROOK PARK AMUSEMENT PARK RIDE, 1911. The Starlight Dance Hall opened in 1926, and it could accommodate 2,500 people. In the 1930s, the dance hall attracted bandleaders such as Eubie Blake (1883–1983), Cab Calloway (1907–1994), Duke Ellington (1899–1974), and Rudy Vallee (1901–1986). In 1936, the park was acquired by Fern Brook Park, Inc. Trolley service to Fern Brook Park was discontinued in 1939. (Courtesy of Howard and Lillian Gola.)

Back Mountain Trolley - Fernbrook Park Ice Cream Booth



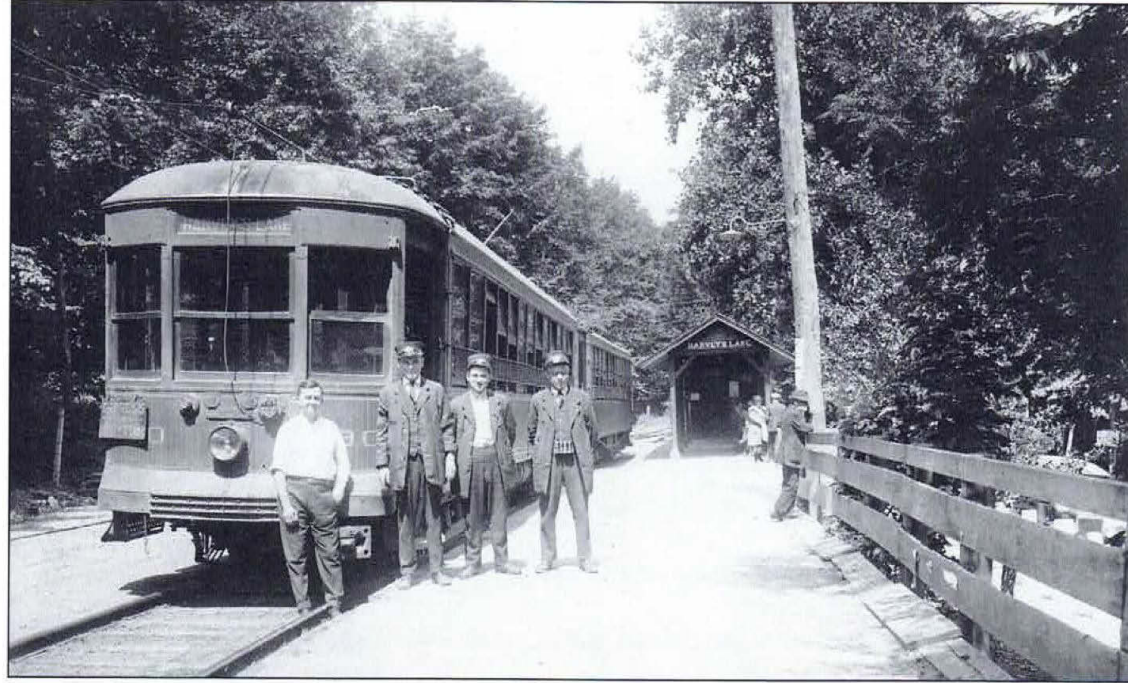
FERN BROOK PARK, c. 1913. This postcard shows the ice-cream stand and the growing popularity of Fern Brook Park. The park offered dancing, food and entertainment, rides, and a swimming pool. The 75-foot-high Wildcat roller coaster was designed by Herbert Paul Schmeck and built by the Philadelphia Toboggan Company in 1926. In 1946, the same architect and company designed and built the Comet roller coaster at Hershey Park. (Courtesy of Howard and Lillian Gola.)

(Fernbrook Park. (1913) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - Steady Decline

- The WBD&HL did not seem to have better financial luck than its predecessor railway during the 1910s and 1920s
 - The Harvey's Lake line continued to experience uneven passenger counts throughout the year
- Accidents continued throughout its operation in the 1920s with a head on collision between two trolleys in 1921
- The 1930s saw a number of closures and financial drawbacks
 - The line above Idetown was closed in 1931
 - In 1931, the Lake Line was split into two trolley services, with the regular trolley to Dallas from the valley operating all year and the Dallas to Harvey's Lake line operating only in the summer
- The Short Line from Kingston to Luzerne was closed on September 25 1938
- The last train from the Wyoming Valley to Dallas ran on April 30 1939
 - The last trolley ride was cut short when the carriage ran over an automobile on a level crossing

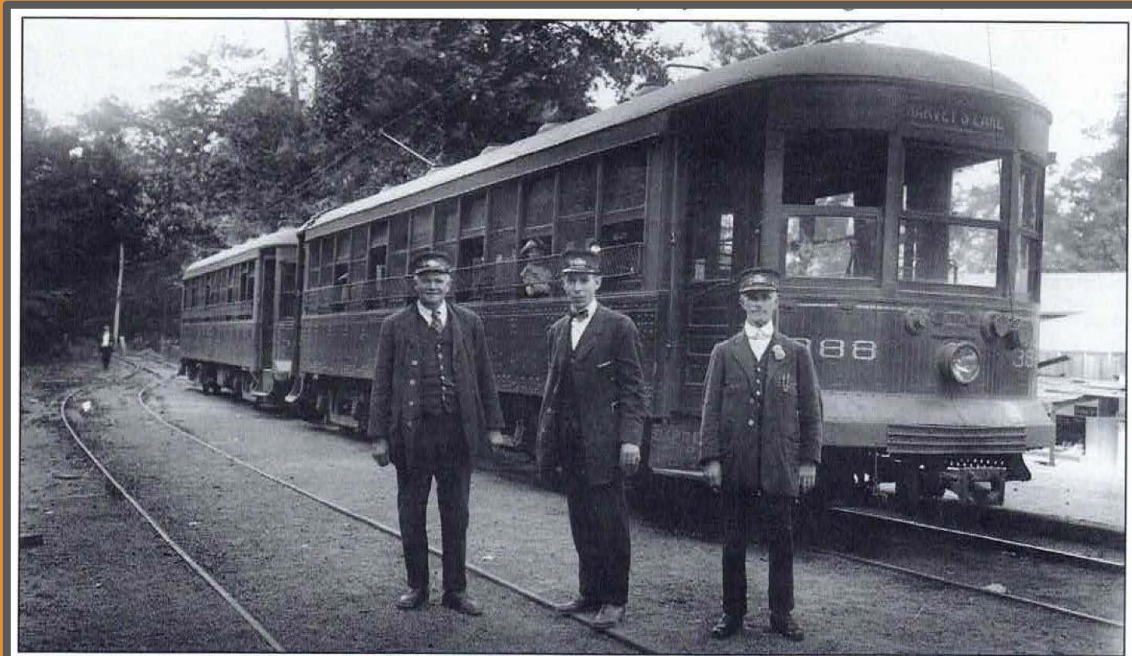
Back Mountain Trolley - Harvey's Lake Station



EXPRESS TROLLEY NO. 380 AT THE TROLLEY STATION, 1920s. This photograph includes, from left to right, trolley operators Mr. Keithline, Charles Reid, and Johnson Van Buren Coolbaugh. It shows two trolleys connected by Tomlinson couplers forming a doubleheader to accommodate more passengers. Doubleheaders were prone to accidents. Both trolleys were delivered to the Wilkes-Barre Railway Corporation in 1913. (Courtesy of Joan Coolbaugh Britt.)

(Express Trolley No. 380 at the Trolley Station. (1920s) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - Doubleheader Near Harvey's Lake Station



DOUBLEHEADER LED BY TROLLEY NO. 388, 1920s. This Wilkes-Barre Railway Corporation trolley is pictured near the passing track at the Harvey's Lake trolley station. The trolley station was close to the Hill's refreshment stand on Oneonta Hill. This photograph includes, from left to right, trolley operators Jim Evans, Jonah Woods, and Mr. Metzger. Due to financial restraints and increased automobile traffic, trolley service to Harvey's Lake was discontinued in 1931. (Courtesy of Joan Coolbaugh Britt.)

Back Mountain Trolley- Idetown Station at Harvey's Lake



WILKES-BARRE RAILWAY CORPORATION TROLLEY NO. 360 AT THE IDETOWN STATION, 1936. Idetown was named for Nehemiah Ide (1746–1823). After regular trolley service to Harvey's Lake was discontinued on September 16, 1931, special excursions like this one for Works Progress Administration workers operated to the Idetown station. Leaning against the station is a cowcatcher or pilot used to move livestock off the trolley tracks. (Courtesy of the Edward S. Miller collection.)

Back Mountain Trolley - Closing Crash



ACCIDENT ON THE LAST DAY OF TROLLEY SERVICE TO DALLAS, APRIL 30, 1939. Wilkes-Barre Railway Corporation trolley No. 356, bound for Dallas, collided with an automobile at the Mount Greenwood crossing in Kingston Township. Note the chain attached to the wrecked automobile. Emergency trolley No. 390 was on the scene to remove the wreck from underneath the trolley. (Courtesy of the Edward S. Miller collection.)

(Wilkes-Barre Railway Corporation Trolley No. 356. (1939) Images of America: Pennsylvania's Back Mountain (2009))

Back Mountain Trolley - News Articles

Tourism:

<https://www.citizensvoice.com/arts-living/2.223/trolleys-were-life-blood-of-harveys-lake-tourism-1.749019>

Trolley Closure:

<http://digitalcollections.powerlibrary.org/cdm/compoundobject/collection/wbsunind/id/30484/rec/2>

Trolley Lines for Highway:

<http://digitalcollections.powerlibrary.org/cdm/compoundobject/collection/wbsunind/id/28453/rec/5>

<http://digitalcollections.powerlibrary.org/cdm/compoundobject/collection/wbsunind/id/33132/rec/6>

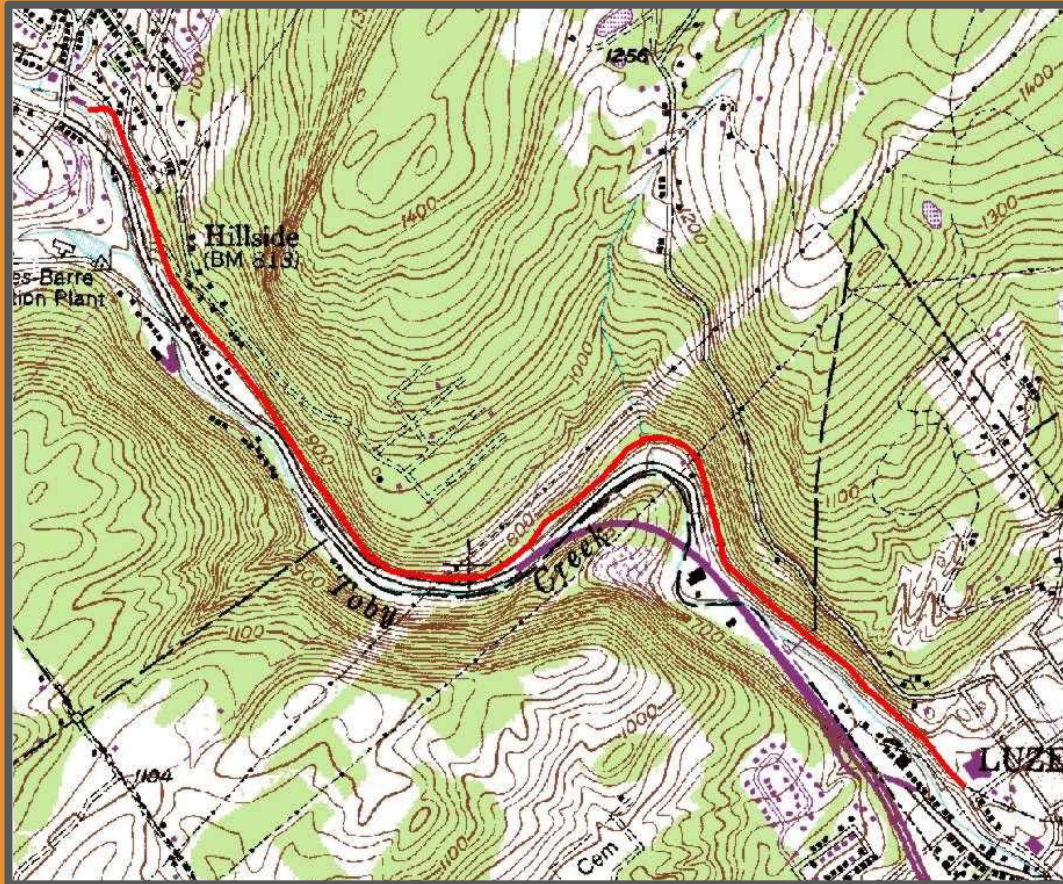
Back Mountain Trail

- **Between the 1940s and 1960s, a majority of the rail lines travelling into the Back Mountain were taken out of service**
 - **By 1963, the WBD&HL line running through the Toby Creek gorge had fallen into disuse**
- **In 1987, the Presidential Commission on American Outdoors recommended the creation of national trails and greenways**
 - **The Rails to Trails Conservancy offered the use of former railroad corridors as the foundation for these greenways**
- **In 1996, the Anthracite Scenic Trails Association began construction on the Back Mountain Trail on top of the old track bed of the WBD&HL & line**
- **The Back Mountain Trail is esteemed as the first operational rail/trail in the county**

Back Mountain Trail

- **Presently the trail spans 5.6 miles from Luzerne into the Back Mountain**
 - **The trail begins at Buckingham and Tenet streets, behind the Luzerne Fire Department**
 - **The trail terminates on S Lehigh street with the remaining 2 miles of trail continuing along develop neighborhood roads**
 - **The majority of the trail follows the old trolley lines, passing through the Toby Creek Gorge and overlooking the Memorial Highway 309**
- **The ultimate goal is to complete a 14-mile walking trail connecting Wilkes-Barre and Harvey's Lake**
 - **The trail would begin in Riverfront Park in Wilkes-Barre to the lakefront at Harvey's Lake**

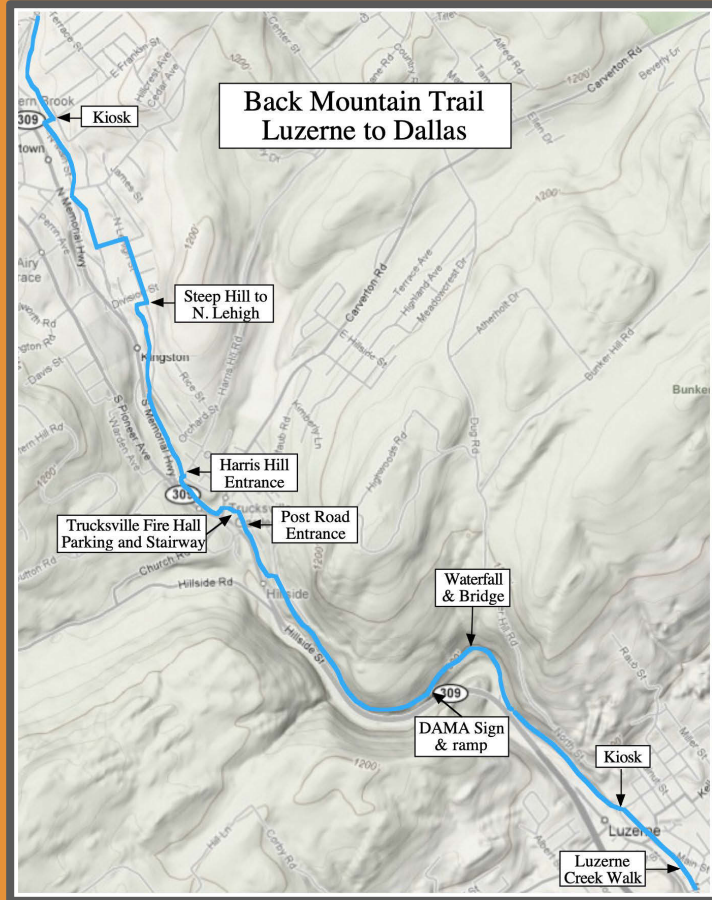
Back Mountain Trail - Original Trail Map



Koch, J. (2009, December 18). *Maps*. Retrieved from The Back Mountain Trail:

<http://course.wilkes.edu/bmt/Maps>

Back Mountain Trail - Present Trail Map



Koch, J. (2009, December 18). *Maps*.
Retrieved from The Back Mountain Trail:
<http://course.wilkes.edu/bmt/Maps>

Back Mountain Trail - Stairway at Carverton Rd.



Rails to Trails Conservancy.
(2020). *Back Mountain Trail*. Retrieved from Trail Link:

<https://www.traillink.com/trail/back-mountain-trail/>

Back Mountain Trail - Trail Straightaway in Summer

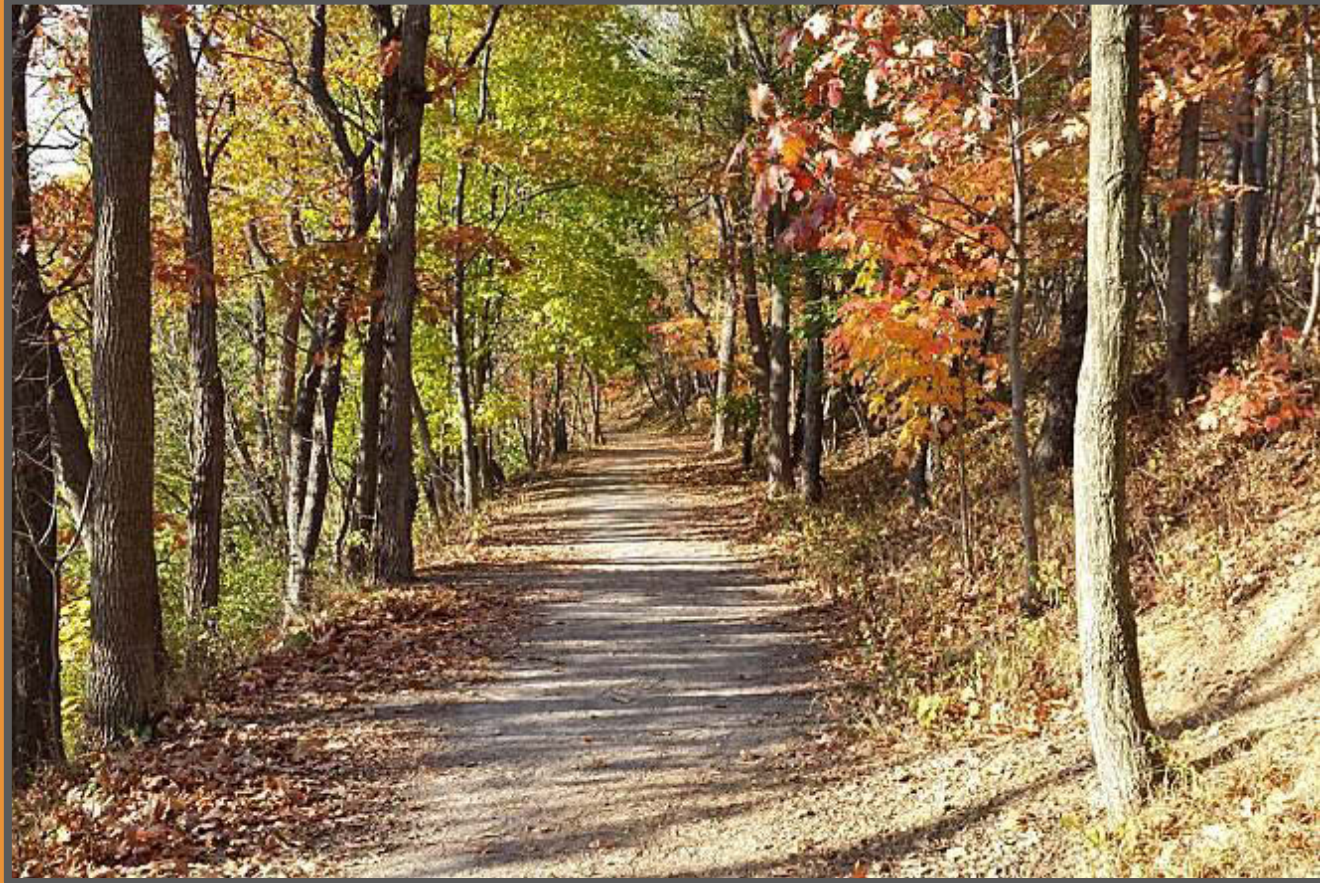


Rails to Trails Conservancy.
(2020). *Back Mountain Trail*.

Retrieved from Trail Link:

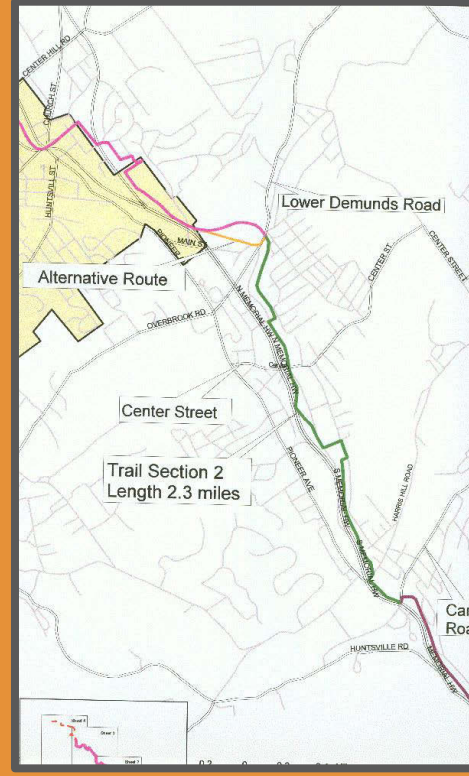
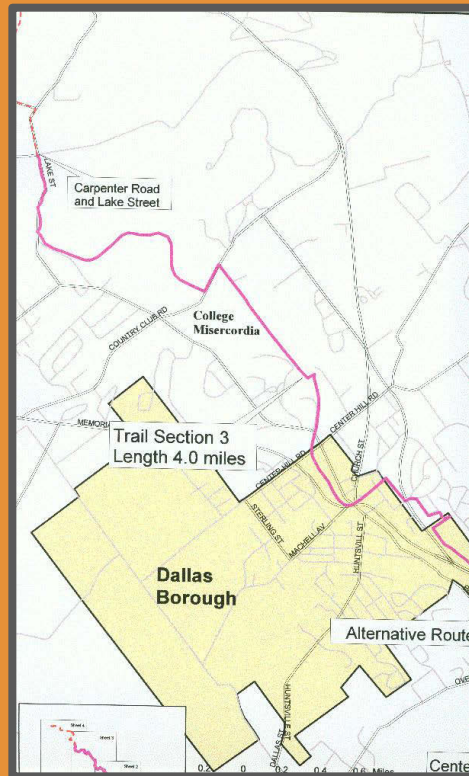
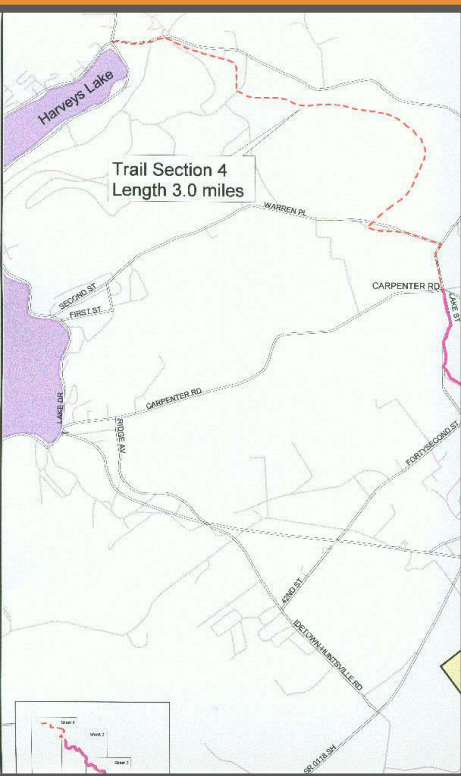
<https://www.trailink.com/trail/back-mountain-trail/>

Back Mountain Trail - Trail Straightaway in Fall



Rails to Trails Conservancy.
(2020). *Back Mountain Trail*.
Retrieved from Trail Link:
<https://www.traillink.com/trail/back-mountain-trail/>

Back Mountain Trail - Expansion Maps



Dallas Area Municipal Authority - History

- **DAMA, formerly named the Back Mountain Municipal Authority, was founded in 1967 in an effort to bring public sewares to Dallas and Kingston Township**
 - **The company was renamed the Dallas Area Municipal Authority in 1969 to “more clearly define the service area”**
- **Their current headquarters, in the Toby Creek gorge connecting Luzerne to Trucksville, were constructed in 1972**
- **Over the next 20 years, DAMA expanded their purview**
 - **1976 - Harvey’s Lake connected to DAMA**
 - **1987 - Lehman Township connected to DAMA**
 - **1989 - Jackson Township connected to DAMA**
- **In 1990, DAMA closed their sewage treatment facility in favor of connecting their Back Mountain with the Wyoming Valley Sanitary Authority**

DAMA - Compost Center

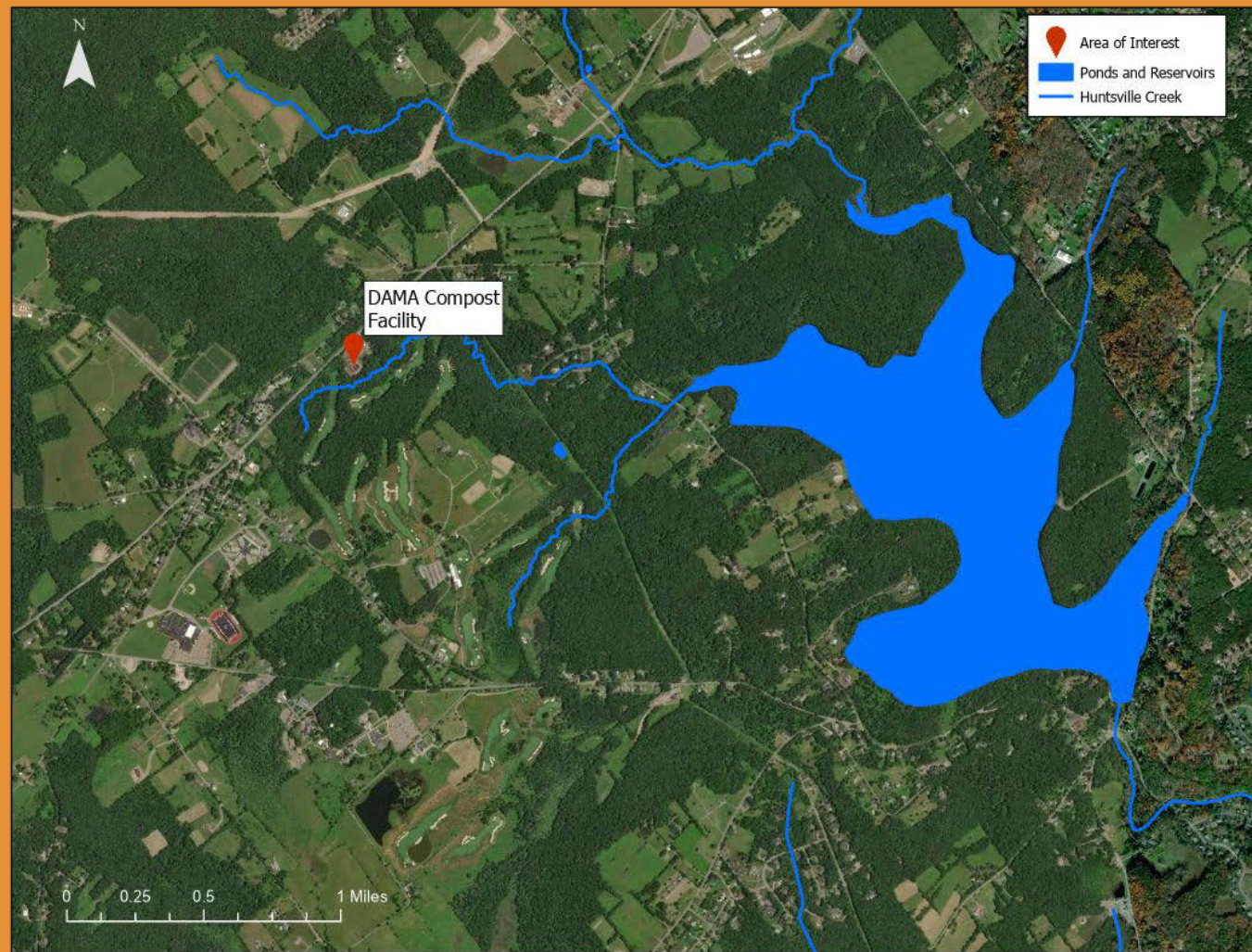
- In 2000, DAMA responded to the public's desire to eliminate yard waste by searching for a secondary headquarters to house a potential composting site
 - In 2014, DAMA purchased land in Lehman Township along Route 118 to become their base of operations for composting
- This composting site is located next to a tributary of the Huntsville Reservoir, creating the possibility of solid waste runoff into the stream
- DAMA additionally does solid waste management, assembling a fleet of garbage trucks in 2012
 - Between 1987 and 2012, DAMA had contracted trucks doing the solid waste hauling

DAMA - Overhead view of composting site



(Yard Waste Composting (2019) [Dallas Township](#))

DAMA Compost Facility



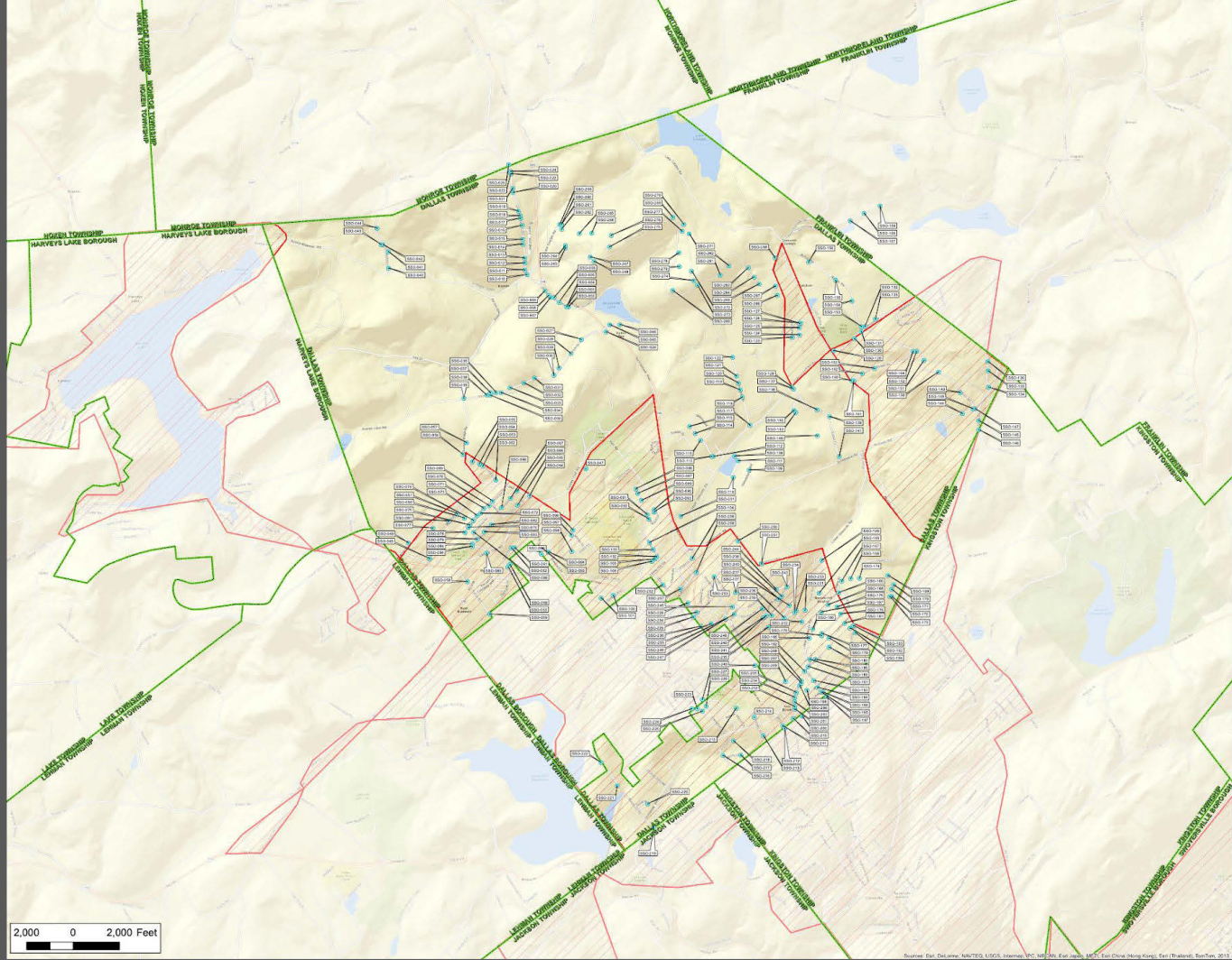
[ArcGIS Pro](#)

[Google Maps Satellite View](#)

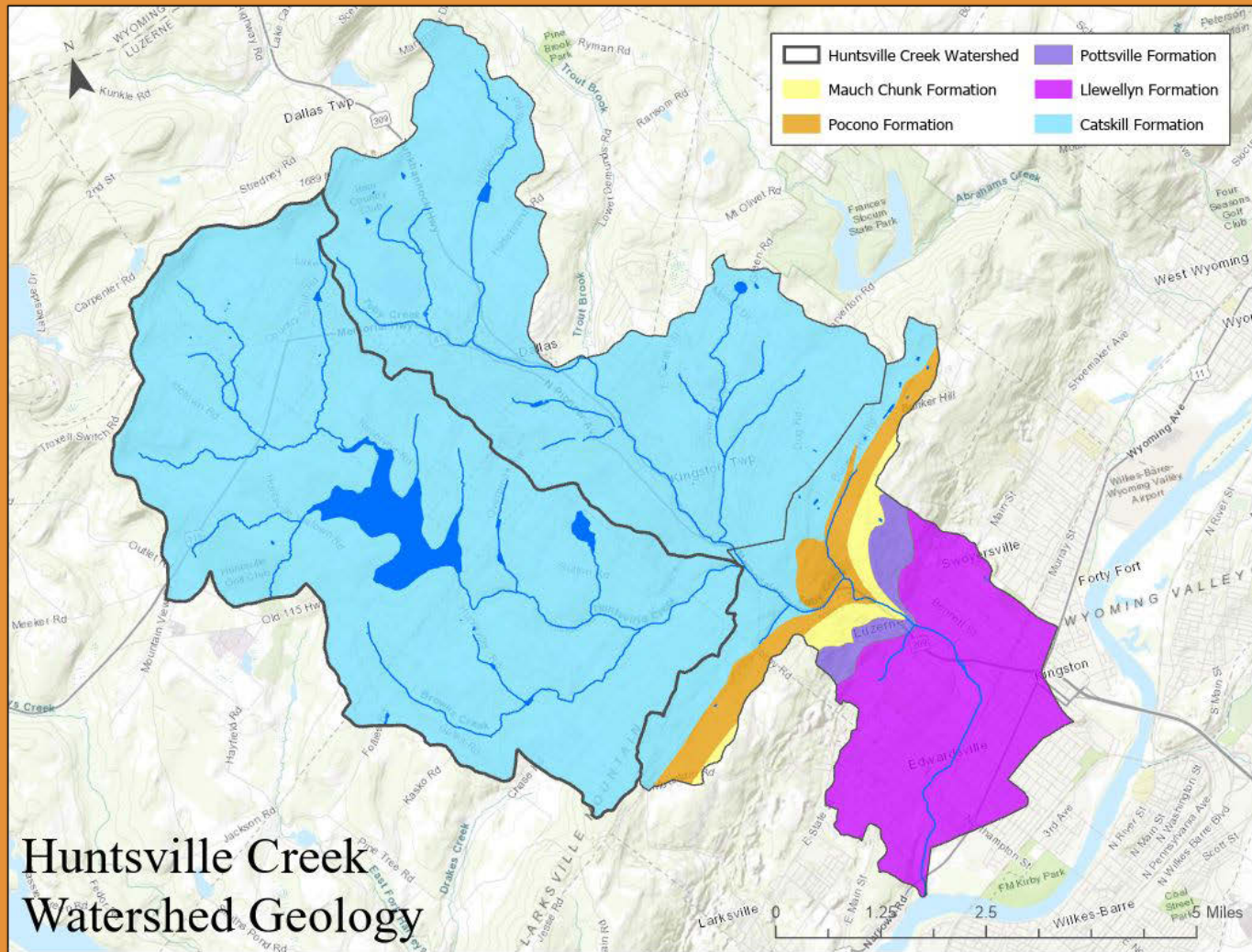
[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

DAMA - Dallas Outfall Map

(Dallas Township Storm
Sewer Outfalls (2014)
[Dallas Township](#))



Geology



[DCNR, Geology of Pennsylvania](#)

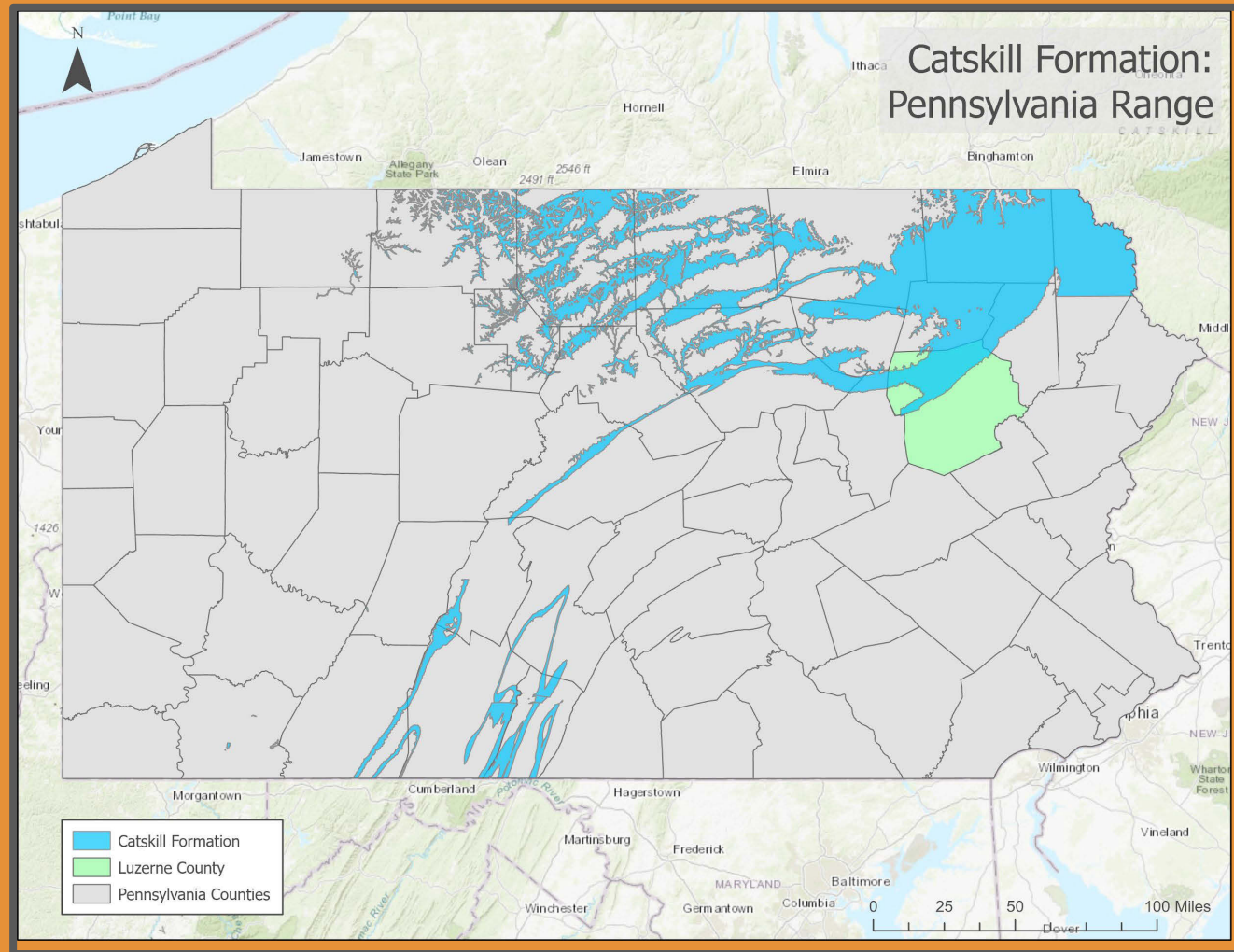
[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
Clearinghouse](#)

Geology

Huntsville Creek Watershed

- **Catskill formation**
 - **Sandstone**
 - **Siltstone**
 - **Mudstone**



[DCNR, Geology of Pennsylvania](#)

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Surrounding Watershed Geology

- Upper Toby Creek Watershed
 - Catskill Formation
 - Pocono Formation
 - Mauch Chunk Formation
 - Pottsville Formation
 - Llewellyn Formation

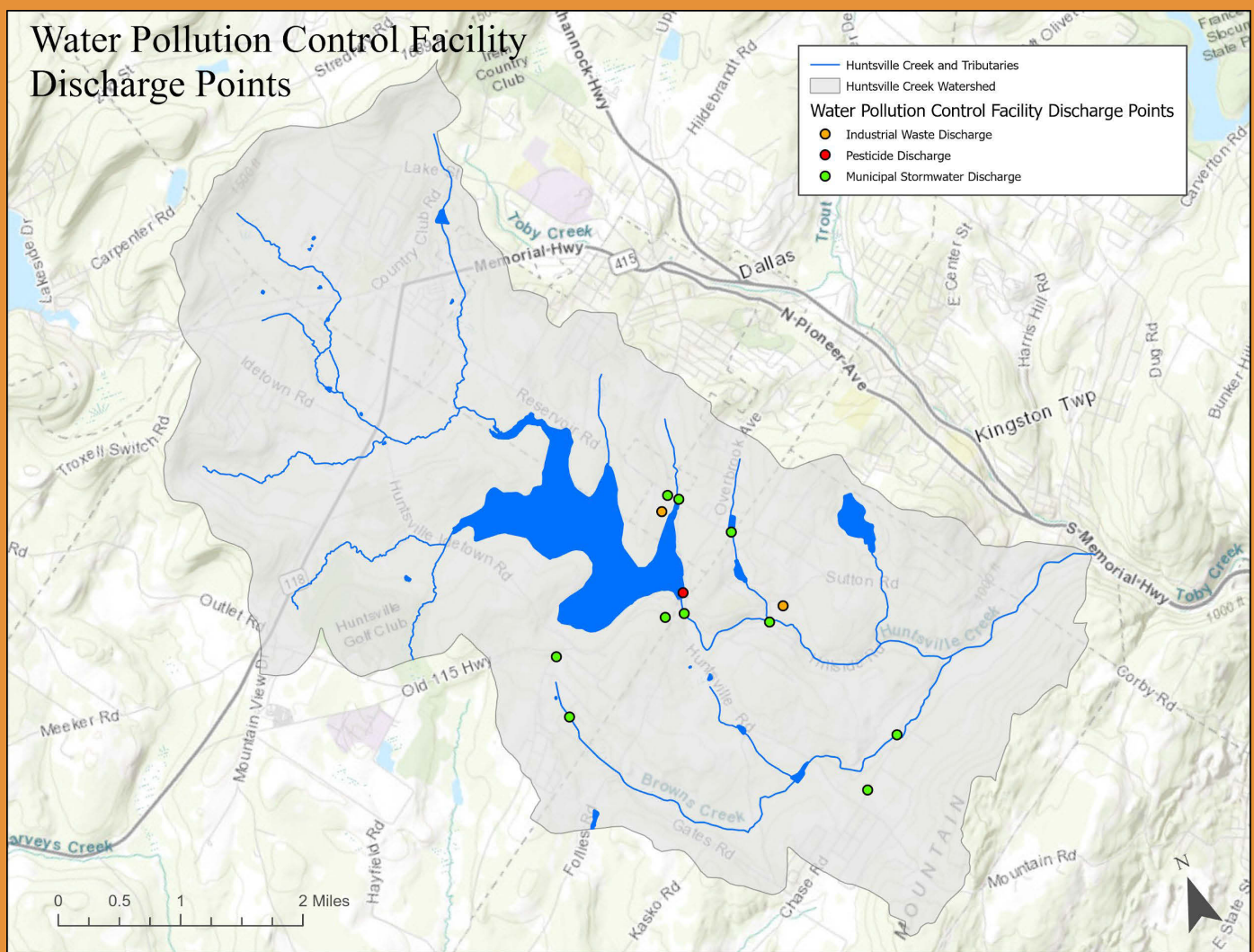
- Lower Toby Creek Watershed
 - Mauch Chunk Formation
 - Pottsville Formation
 - Llewellyn Formation

Water Pollution Control Facilities (DEP)

- DEP Primary Facility related to Water Pollution Control Program (WPCP)
- Includes
 - Treatment Plants and Storage Units
 - Land and Stream Discharges
 - Conveyance Systems and Conduits
 - Cooling Water Intake Structures
 - Biosolids Treatment and Processing
 - Agricultural Activities, Pesticide Treatment Areas, Manure Management, CAFOs
 - Internal and Groundwater Monitoring Points

Discharge Points

Water Pollution Control Facility Discharge Points



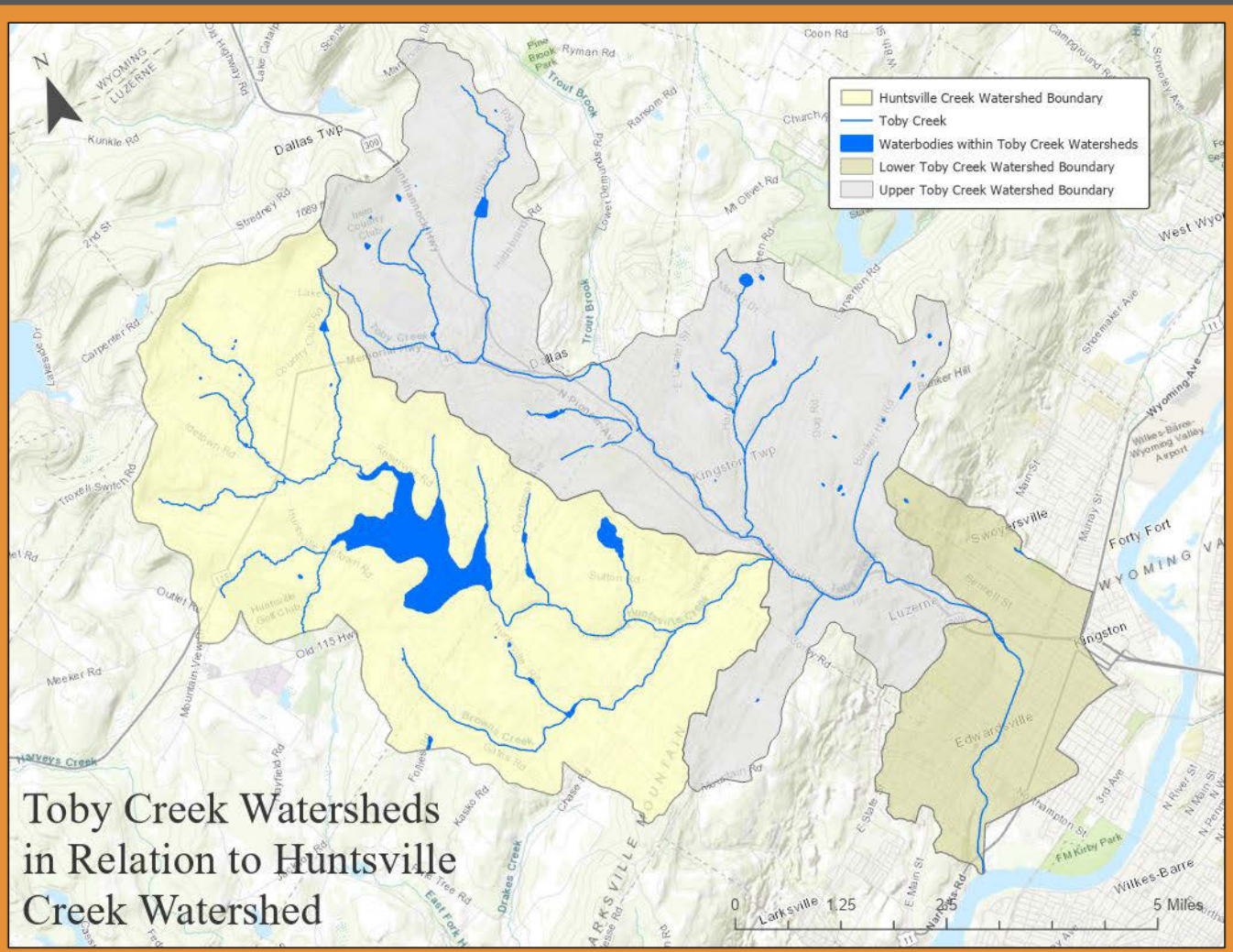
[ArcGIS Pro](#)

[Google Maps Satellite View](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Toby Creek Watershed Overview

Huntsville Creek Downstream Watersheds



Toby Creek Watersheds
in Relation to Huntsville
Creek Watershed

[ArcGIS Pro](#)
[Pennsylvania Spatial Data
Access - The Pennsylvania
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Toby Creek Hydrography

Stream	Stream Length (meters)	Stream Length (miles)
Toby Creek	50866.427	31.607

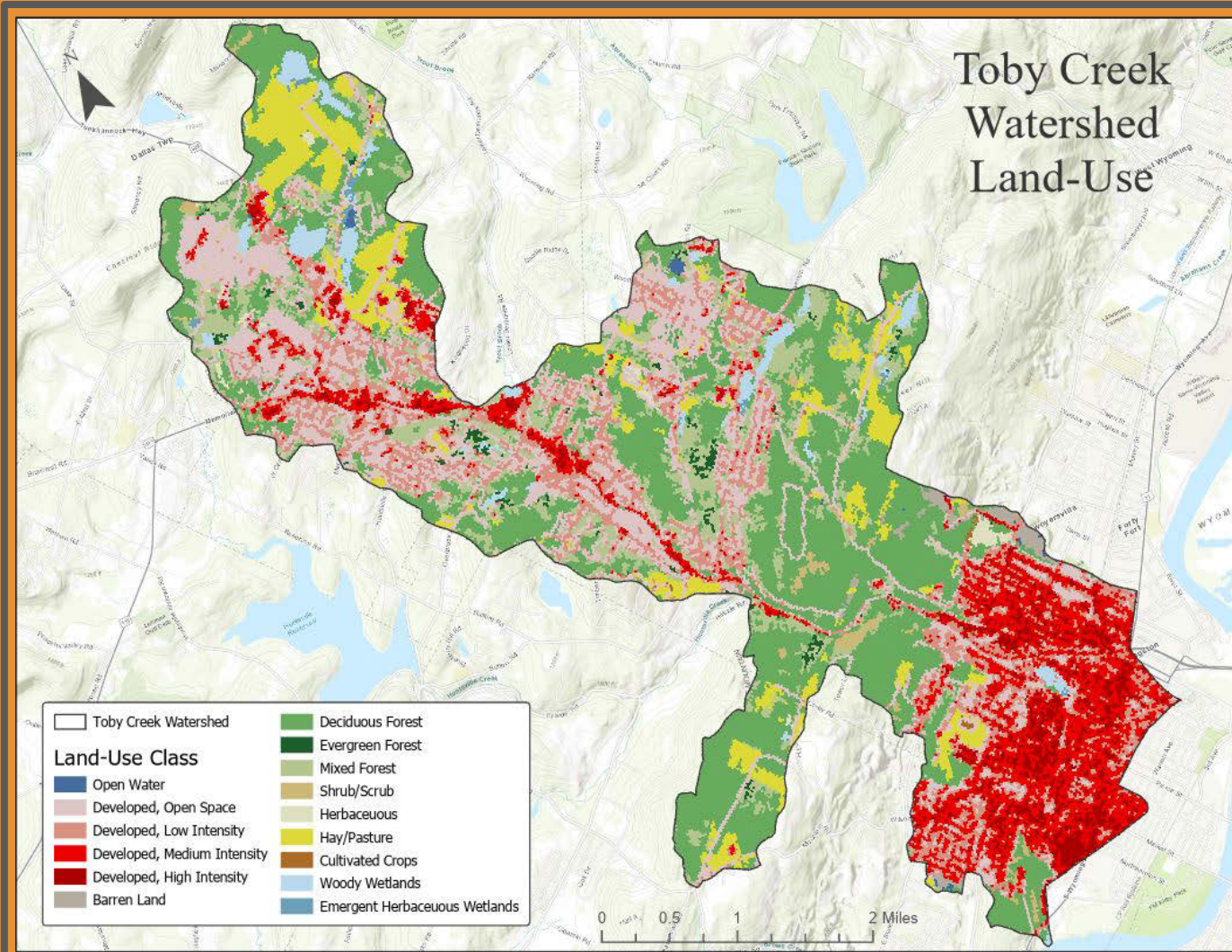
Number of Waterbodies	Waterbody Area (square meters)	Waterbody Area (square miles)
37	249486.014	0.096

Toby Creek Watershed Land-Use

[ArcGIS Pro](#)

[National Land Cover Database - Data \(2016\)](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

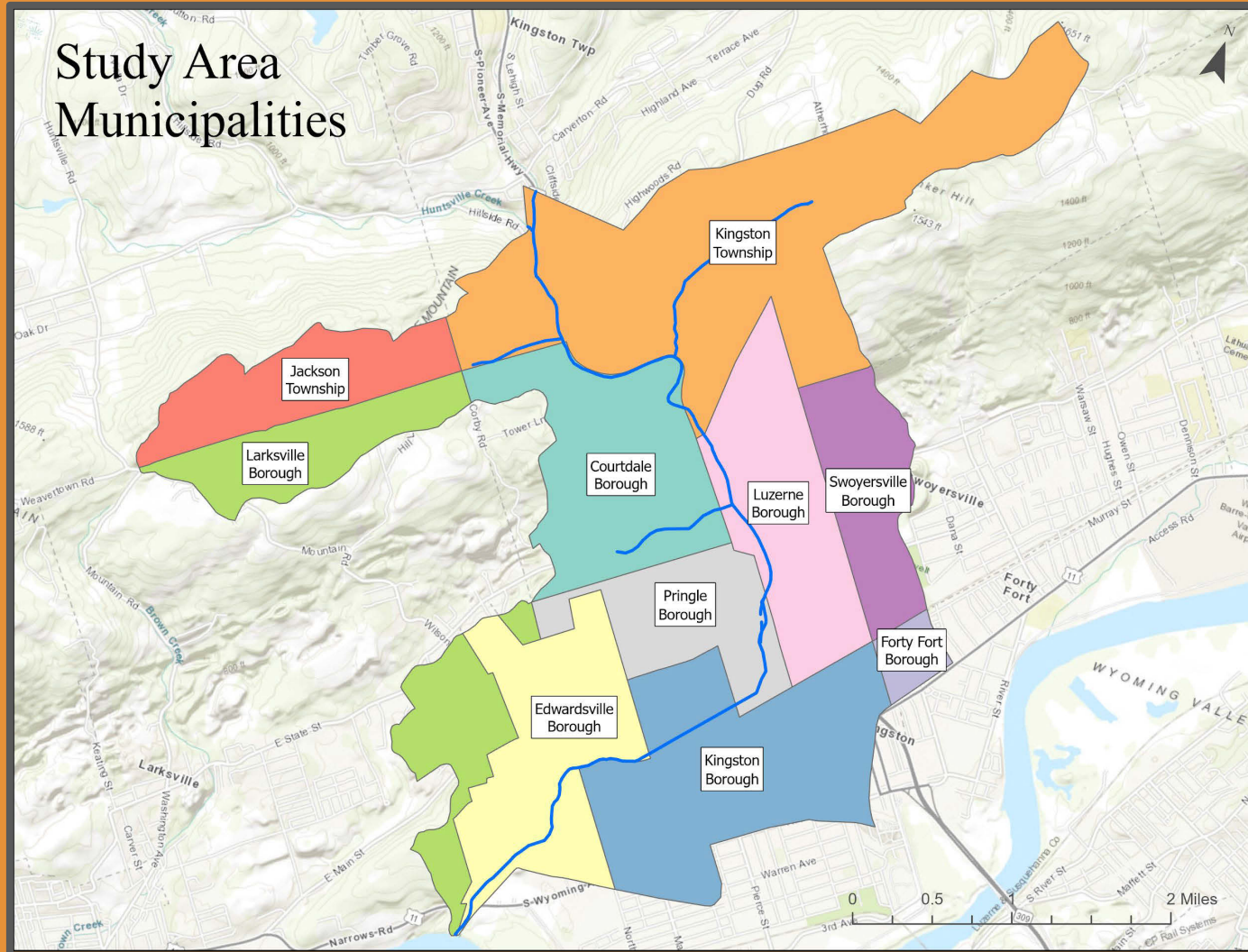


Toby Creek Watershed Land-Use

Land-Use	Count	Area (Square Meters)	Percentage of Land Cover
Cultivated Crops	70	2100	0.14%
Open Water	80	2400	0.16%
Emergent Herbaceous Wetlands	138	4140	0.27%
Herbaceous	265	7950	0.52%
Evergreen Forest	326	9780	0.64%
Barren Land	393	11790	0.78%
Shrub/Scrub	464	13920	0.92%
Woody Wetlands	1087	32610	2.14%
Developed, High Intensity	2100	63000	4.14%
Hay/Pasture	3878	116340	7.65%
Mixed Forest	5026	150780	9.91%
Developed, Medium Intensity	5546	166380	10.94%
Developed, Low Intensity	6853	205590	13.52%
Developed, Open Space	8965	268950	17.68%
Deciduous Forest	15,512	465360	30.59%

Lower Toby Creek Watershed Study Area

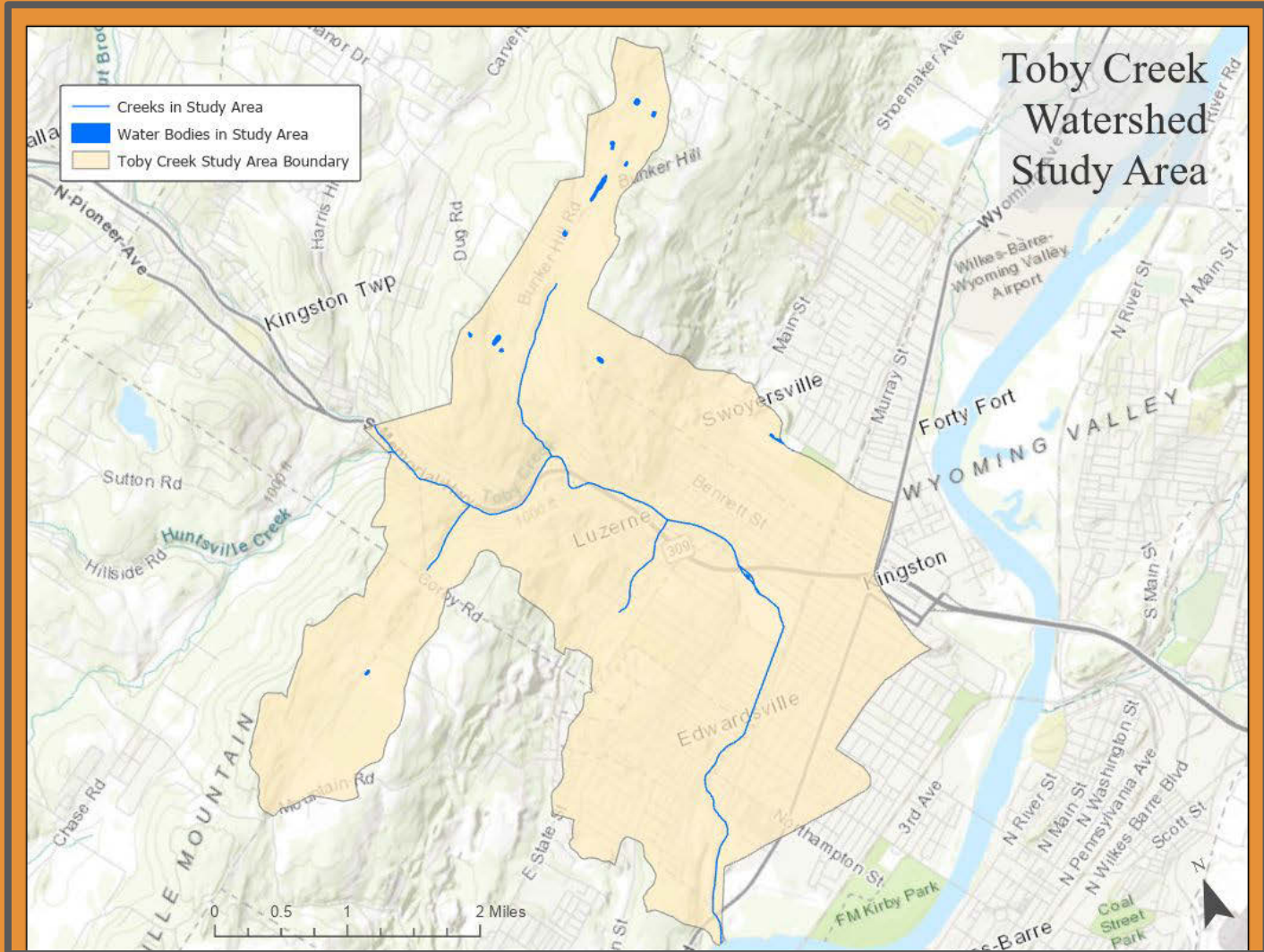
Study Area Municipalities



[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

Toby Creek Watershed Study Area



[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Toby Creek Study Area Hydrography

Stream Length (meters)	Stream Length (miles)
16,149.153	10.0346

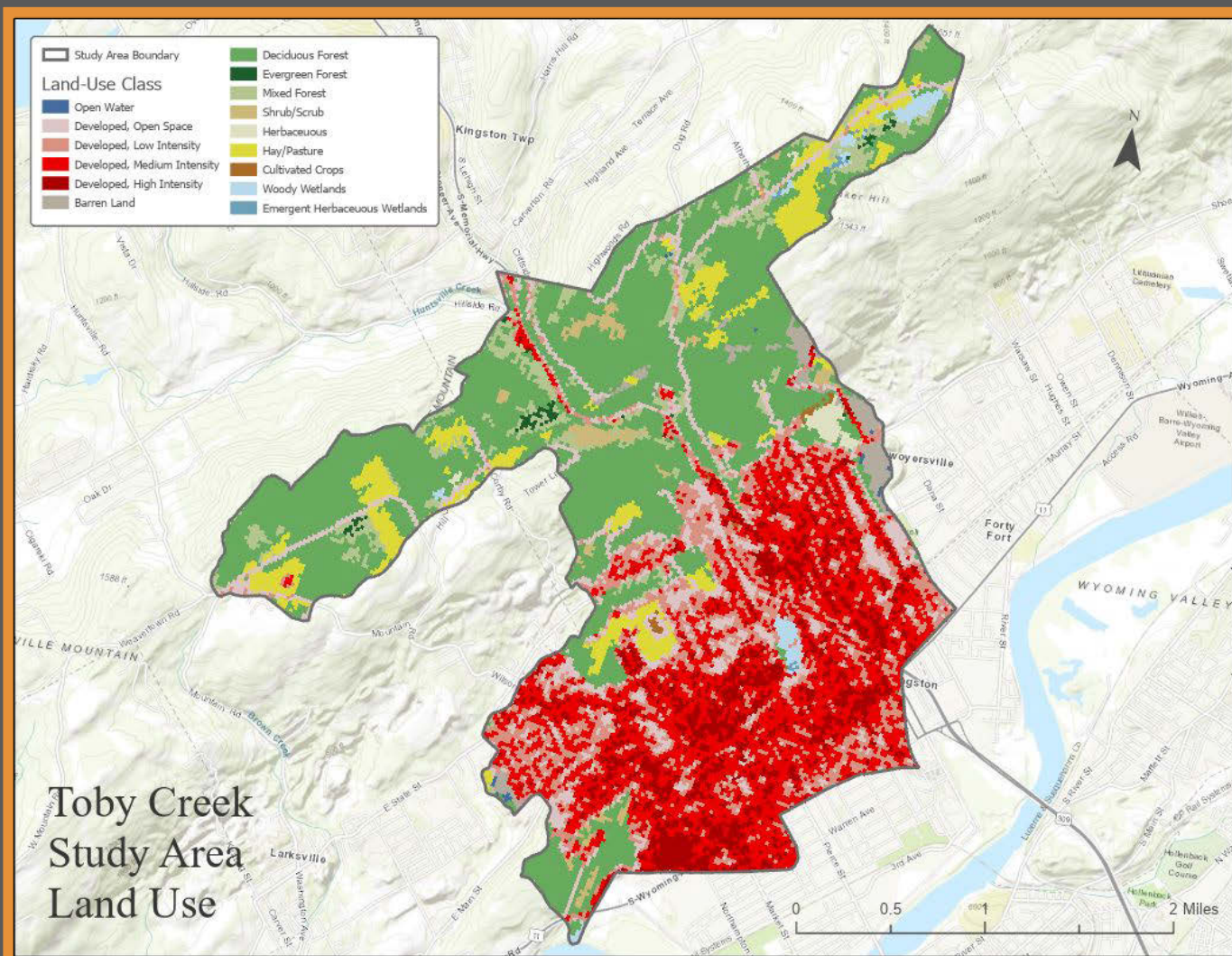
[USGS, The National Map - Viewer](#)

[ArcGIS Pro](#)

Number of Waterbodies	Waterbody Area (square meters)	Waterbody Area (square miles)
15	55886.562	0.022

Headwater Elevation (feet)	Headwater Elevation (meters)	Latitude	Longitude
815.73	248.64	41.30167	-75.92765
1386.59	422.63	41.30715	-75.90375
718.56	219.02	41.28004	-75.90951

Study Area Land-Use



[ArcGIS Pro](#)

[National Land Cover Database
- Data \(2016\)](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

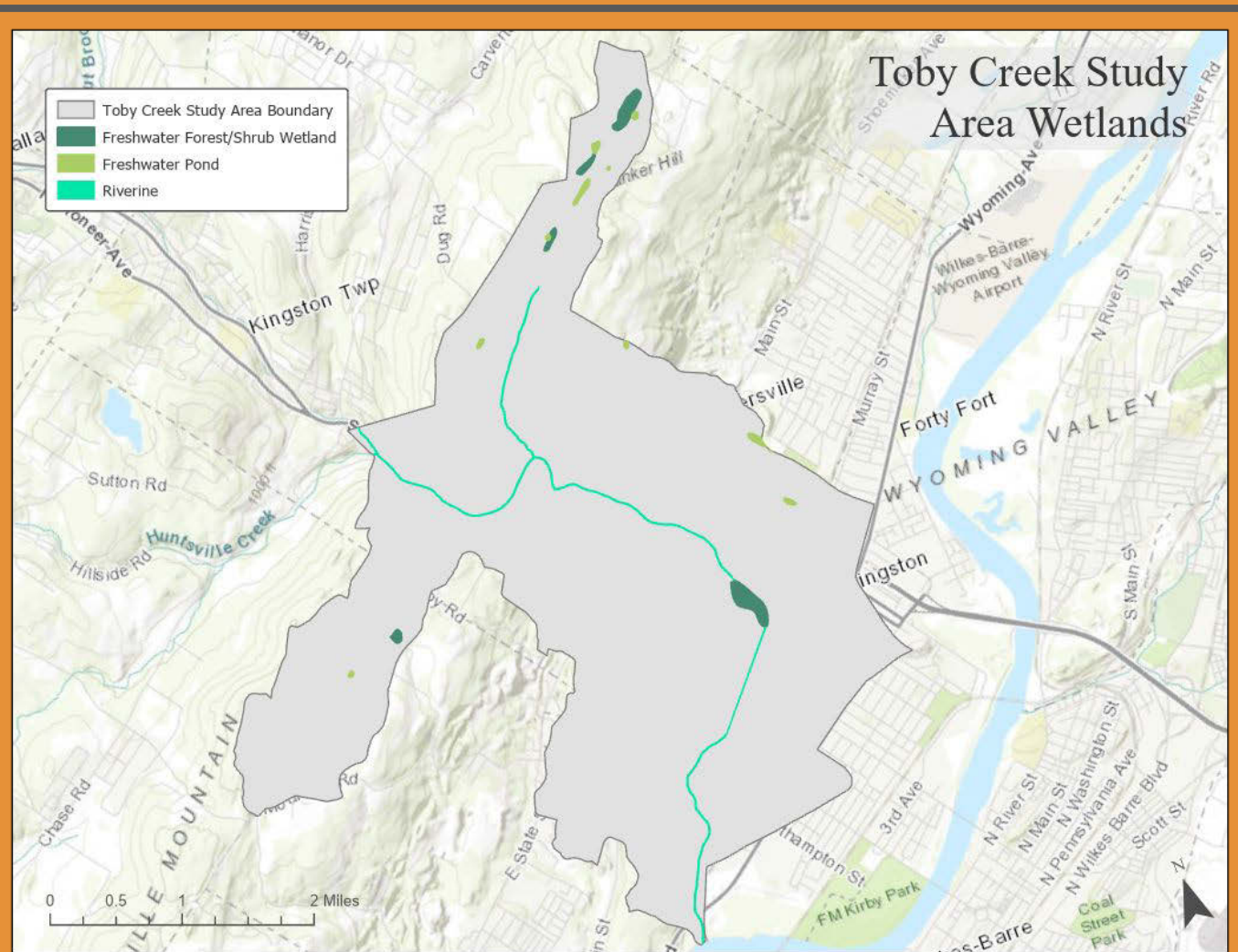
Toby Creek Study Area Land-Use

Land-Use	Count	Area (Square Meters)	Percentage of Land Cover
Open Water	22	19800	0.10%
Emergent Herbaceous Wetlands	24	21600	0.11%
Cultivated Crops	37	33300	0.17%
Evergreen Forest	69	62100	0.32%
Herbaceous	116	104400	0.53%
Woody Wetlands	191	171900	0.88%
Shrub/Scrub	312	280800	1.43%
Barren Land	351	315900	1.61%
Mixed Forest	956	860400	4.40%
Hay/Pasture	1,297	1167300	5.96%
Developed, High Intensity	1,802	1621800	8.28%
Developed, Open Space	1,866	1679400	8.58%
Developed, Low Intensity	2,603	2342700	11.97%
Developed, Medium Intensity	4,334	3900600	19.93%
Deciduous Forest	7,771	6993900	35.73%

Developed Land

Developed	Area (Square Meters)	Percentage of Land Cover
High Intensity	63,000	4.14%
Medium Intensity	166,380	10.94%
Low Intensity	205,590	13.52%
Open Space	268,950	17.68%
Total	703,920	46.28%

Toby Creek Study Area Wetlands



[ArcGIS Pro](#)

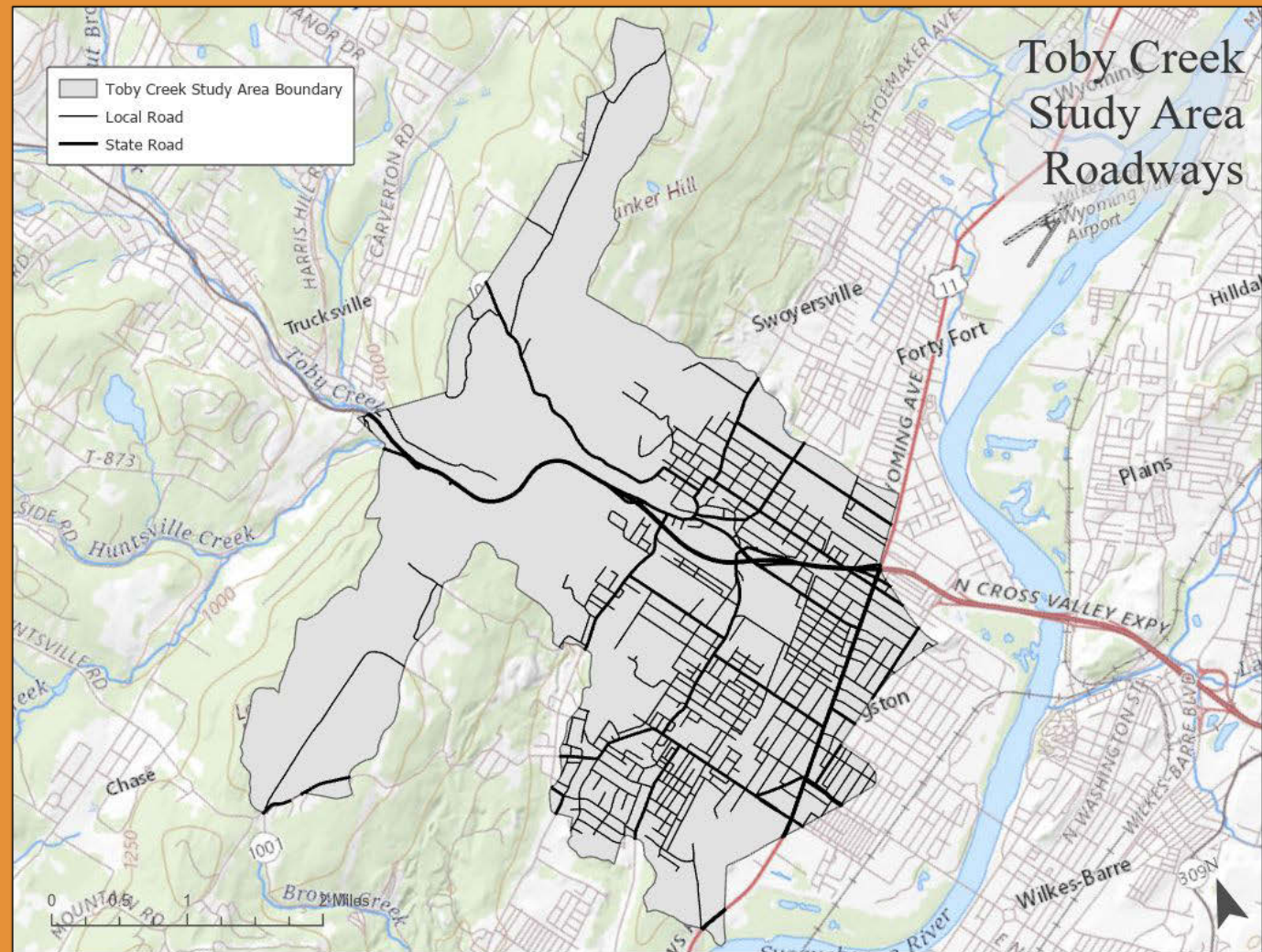
[U.S. Fish and Wildlife Service \(USFWS\), National Wetlands Inventory \(NWI\), National Wetlands Mapper](#)

Toby Creek Study Area Wetlands

Wetland Type	Area (Square Meters)	Percentage of Land Cover
Freshwater Pond	78,075.34	0.23%
Riverine	132,197.76	0.38%
Freshwater Forested/Shrub Wetland	252,915.47	0.73%

[U.S. Fish and Wildlife Service \(USFWS\), National Wetlands Inventory \(NWI\), National Wetlands Mapper](#)

Toby Creek Study Area Roadways



[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

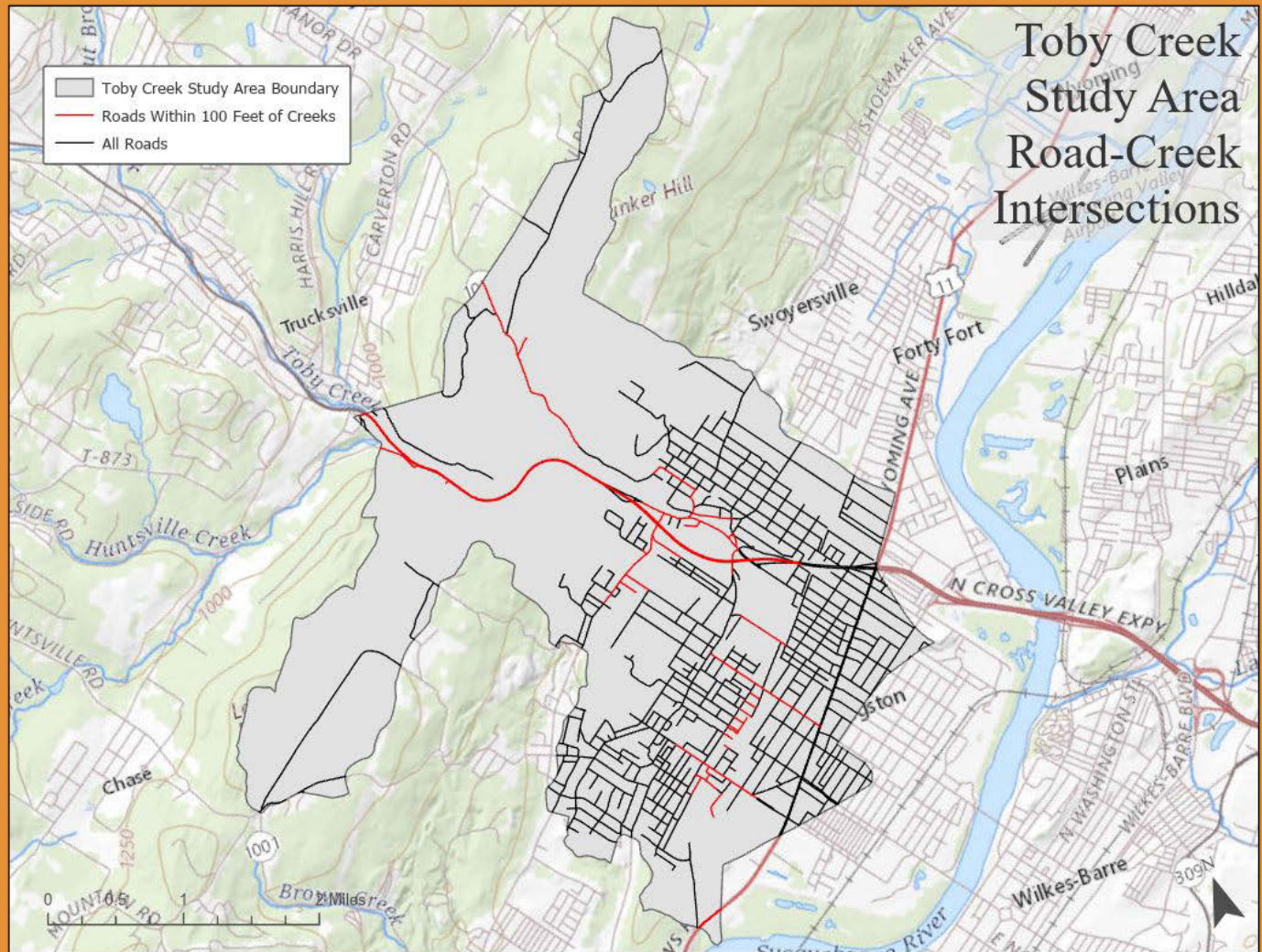
Roadway Statistics

Road Type	Length (Meters)	Length (Miles)
State	58133.493	36.122
Local	130766.507	81.255

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

Study Area Road-Creek Intersections



[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

Active Railway Statistics

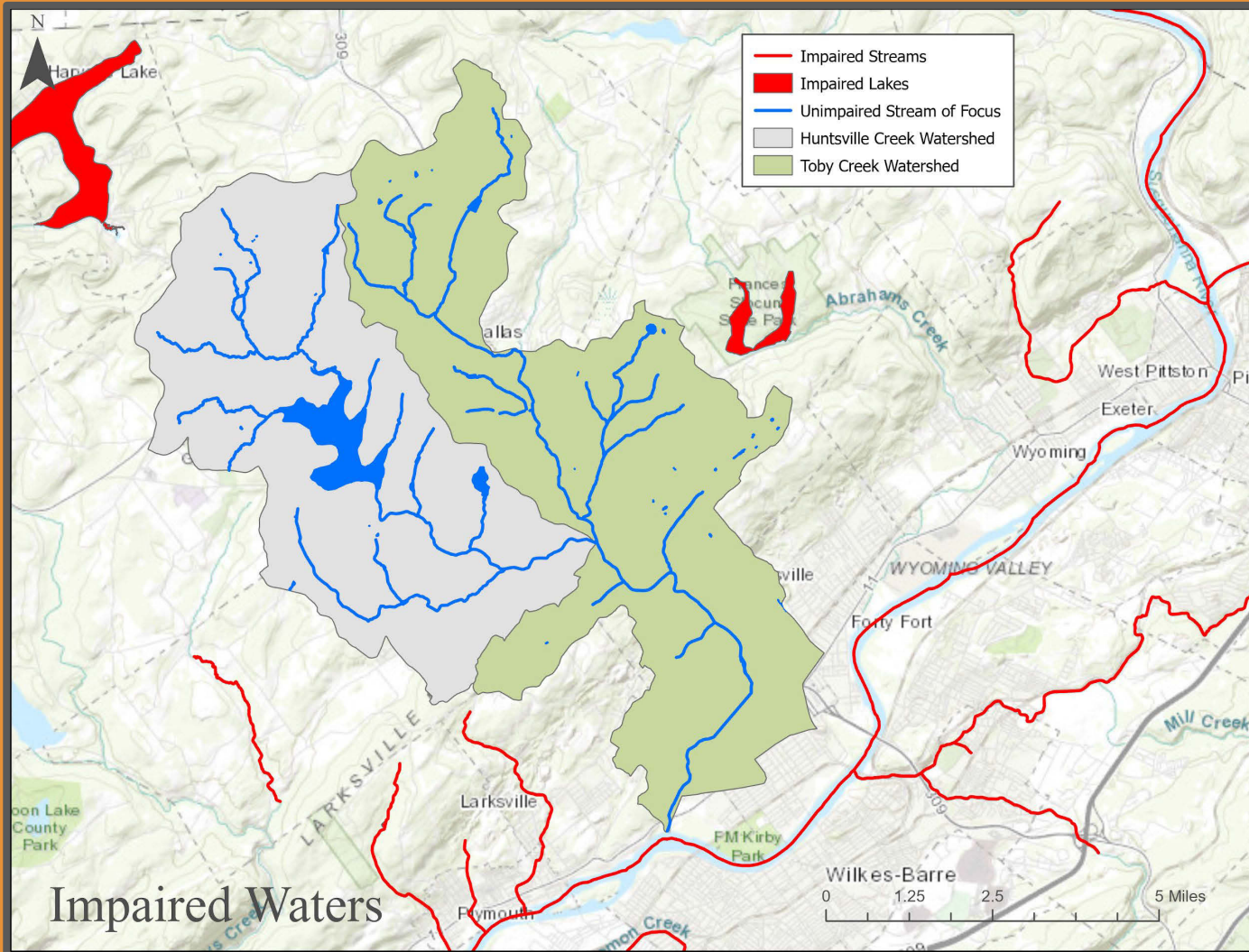
Length (Meters)	Length (Miles)
4725.952	2.937

[ArcGIS Pro](#)

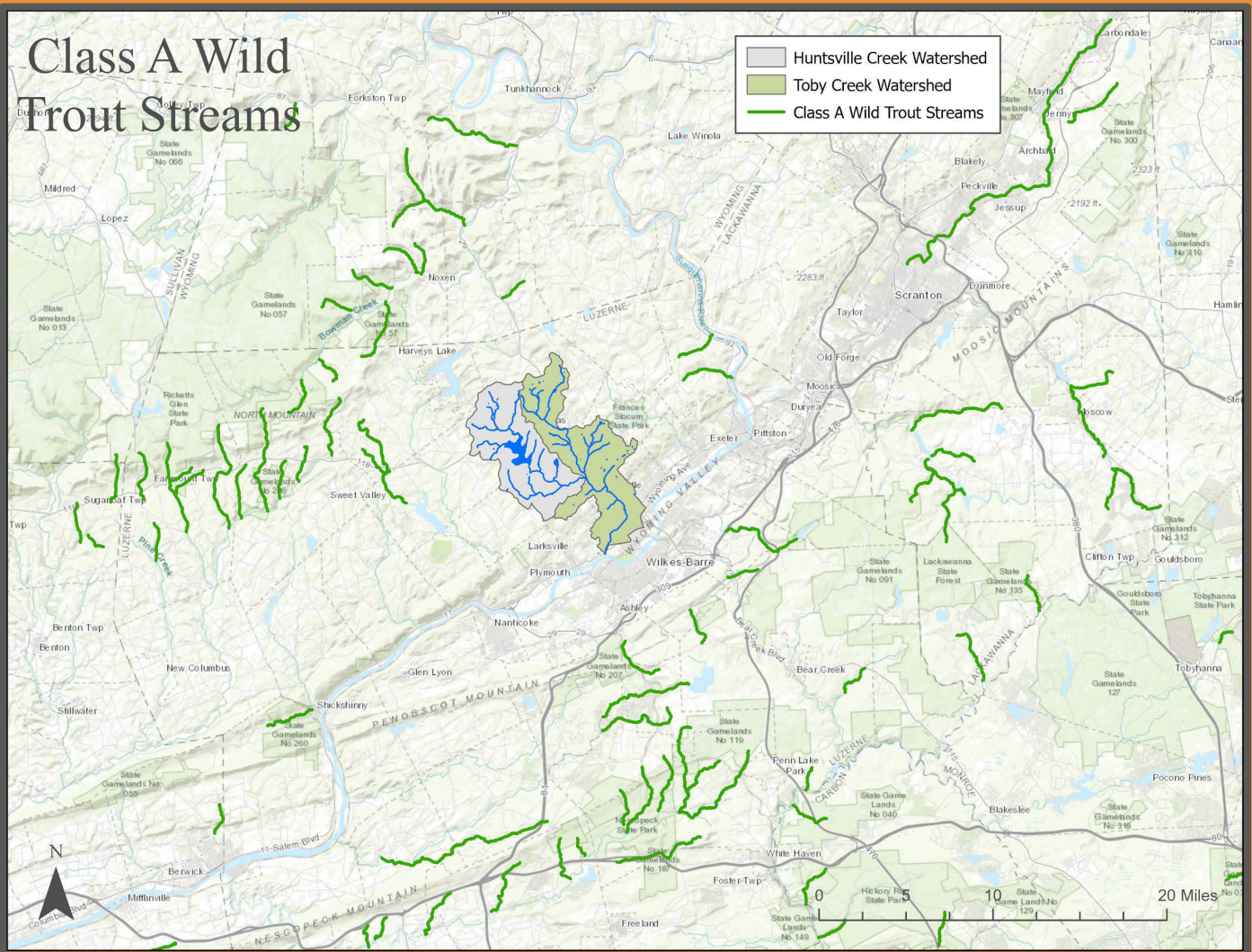
[Pennsylvania Spatial Data Access](#)
[- The Pennsylvania Geospatial](#)
[Data Clearinghouse](#)

Impaired Waters surrounding the Toby Creek and Huntsville Creek Watersheds

[ArcGIS Pro](#)
[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)
[Google Maps Satellite View](#)
[Department of Environmental Protection, GIS Portal](#)



Wild Trout Streams in the Wyoming Valley and Back Mountain Area



[ArcGIS Pro](#)

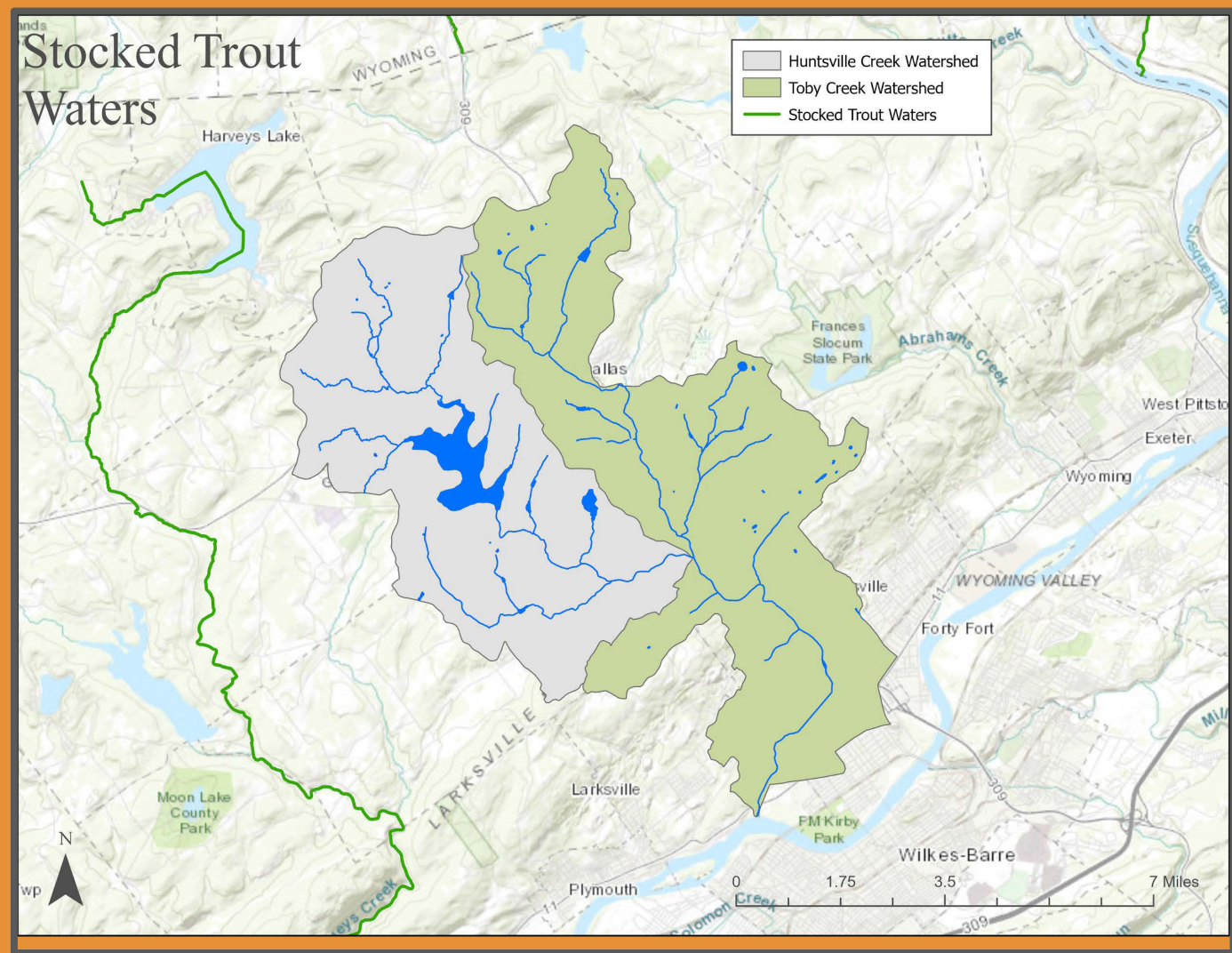
[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

Class A Wild Trout Fisheries

- Definition of Class A Waters:
 - Streams that support a population of naturally produced trout of sufficient size and abundance to support a long-term and rewarding sport fishery.
- Management:
 - Natural reproduction, wild populations with no stocking.

No Stocked Trout Waters in the Huntsville Creek and Toby Creek Watersheds



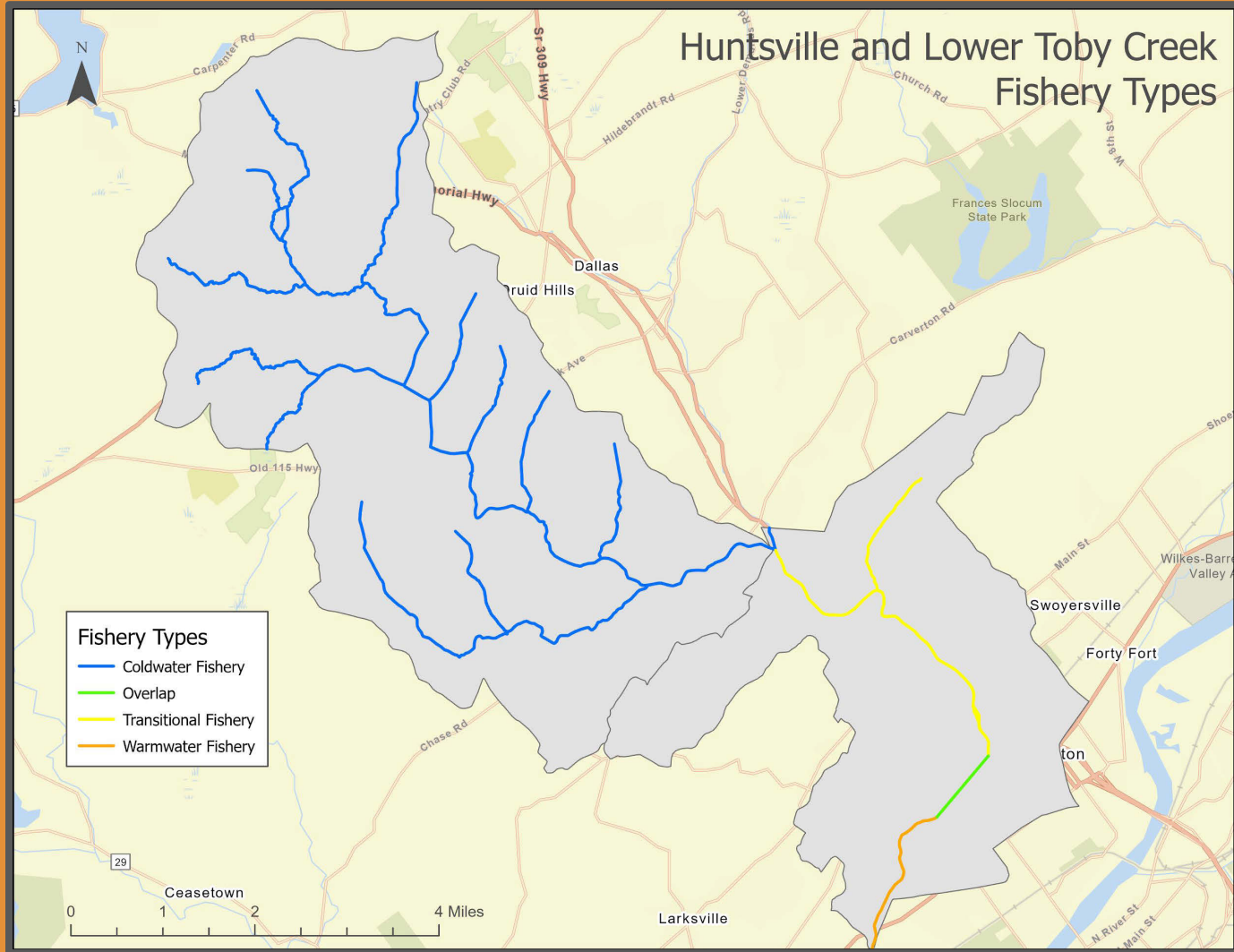
[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

Huntsville Creek and Lower Toby Creek Creek Fishery Types

Huntsville and Lower Toby Creek Fishery Types



[ArcGIS Pro](#)

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Access - The Pennsylvania
Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

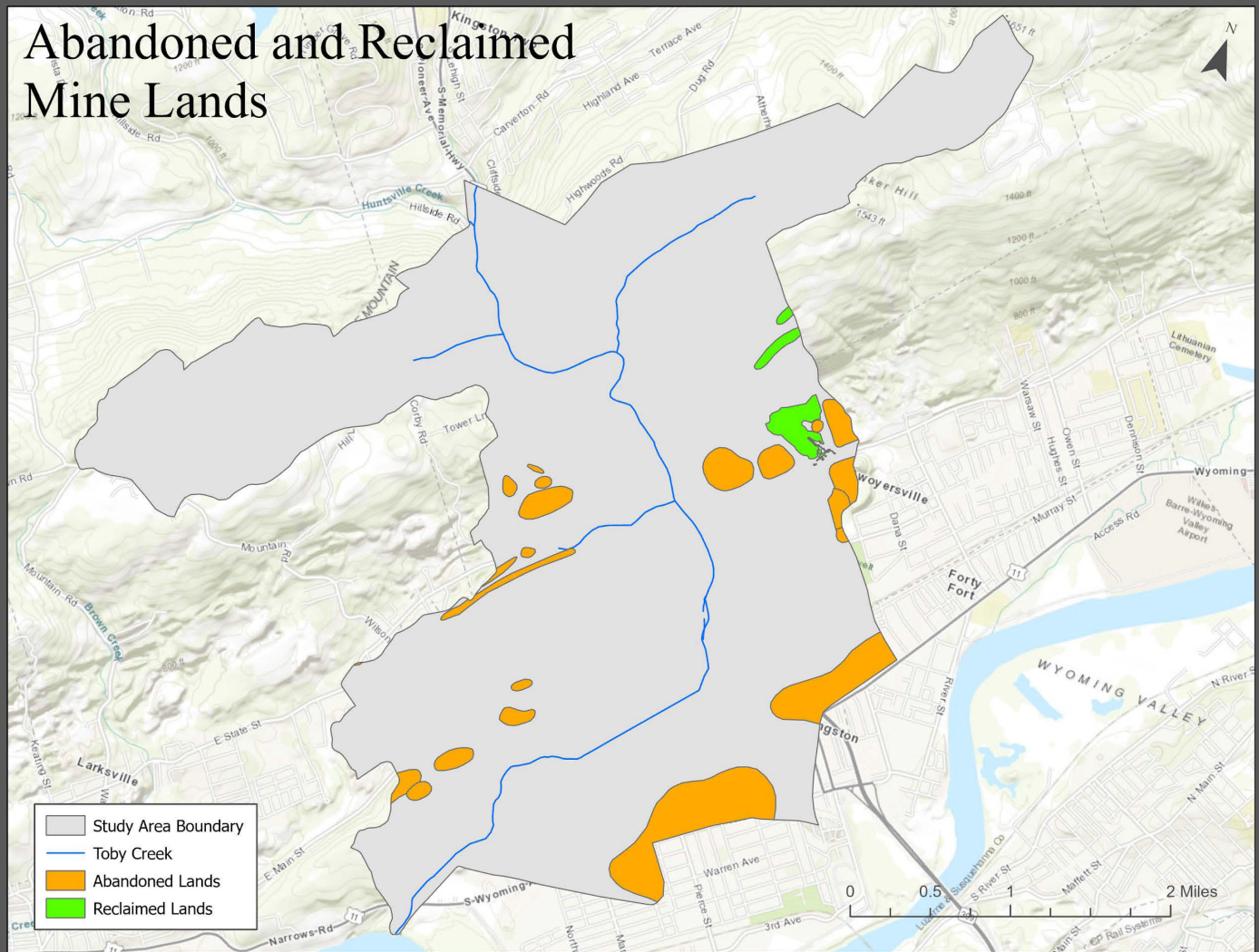
[Department of Environmental
Protection, GIS Portal](#)

Study Area Abandoned and Reclaimed Abandoned Mine Lands

[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

[Google Maps Satellite View](#)

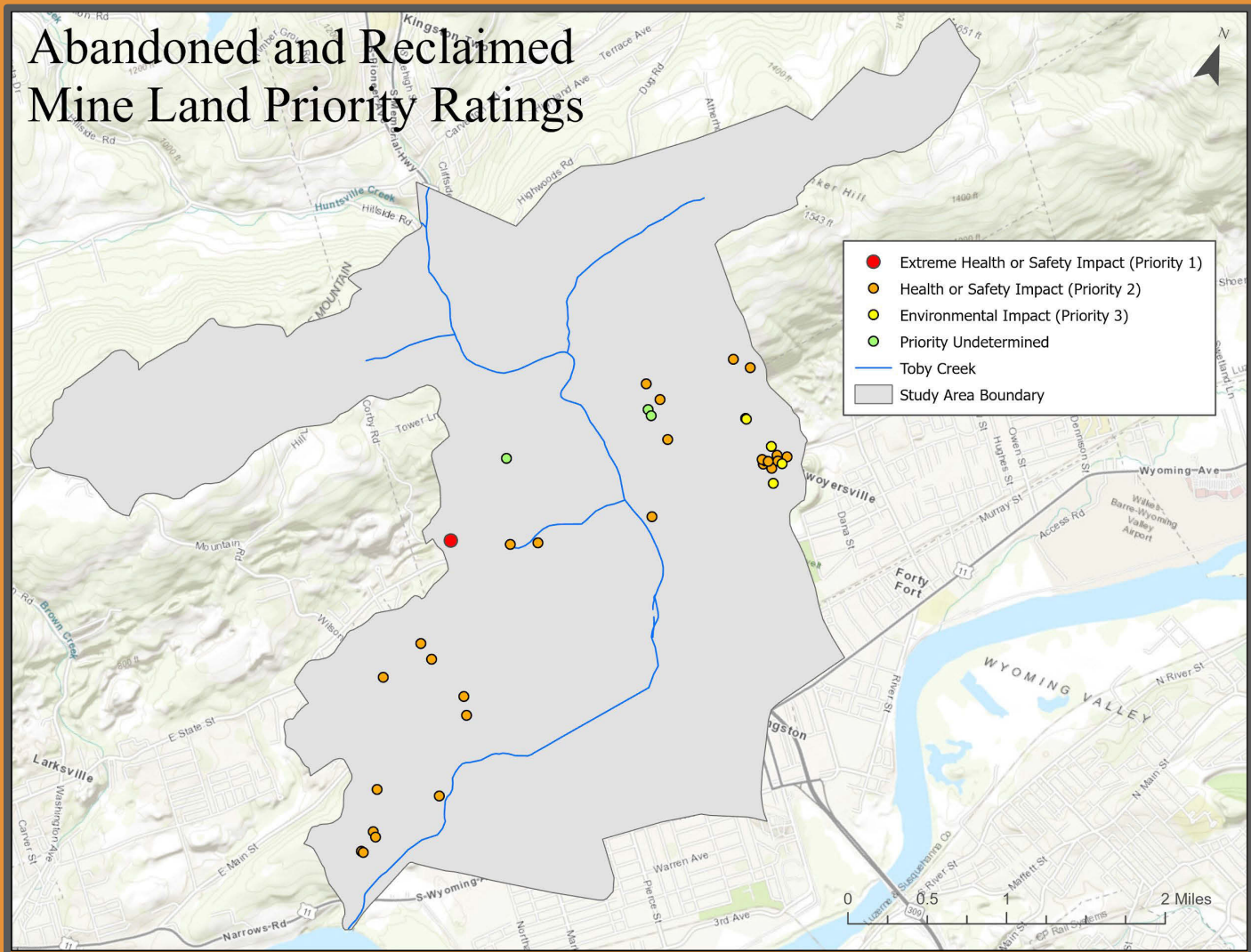


Study Area Abandoned and Reclaimed Abandoned Mine Lands Statistics in the Lower Toby Creek Watershed

Mine Land Type	Area (Square Meters)	Area (Acres)	Percentage (Land Cover)
Reclaimed	266,938.443	65.962	0.77%
Abandoned	2,274,461.238	562.032	6.58%

Abandoned Mine Land Priority Status

Abandoned and Reclaimed Mine Land Priority Ratings



[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

Major Coal Feature Categorization Statistics

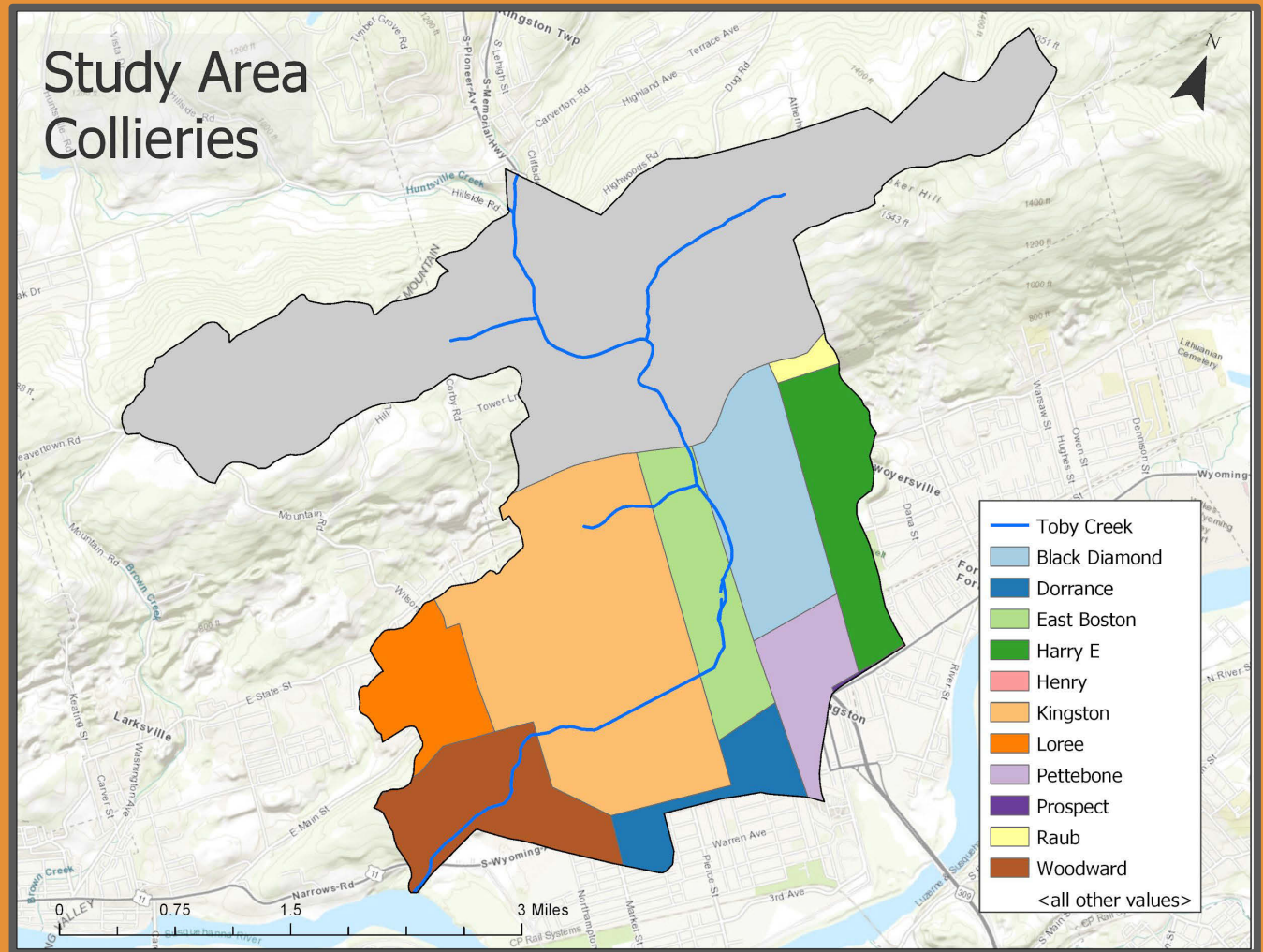
Feature Type	Area (Square Meters)	Area (Acres)	Percentage (Land Cover)
Surface Mine	182,332.862	45.055	< 1.00 %
Subsidence Area	1,866,358.414	461.187	5.40%

Stormwater (SMP) Fees

- Fees are imposed to sustain MS4 plans, water quality, etc.
- Calculated by amount of Impervious Area (IA)

Tier 0:	0 to 99	Square Feet of IA
Tier 1:	100 to 499	Square Feet of IA
Tier 2:	500 to 6999	Square Feet of IA
Tier 3:	7000 and Greater	Square Feet of IA

Lower Toby Creek Historic Coal Company Collieries



[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access
- The Pennsylvania Geospatial
Data Clearinghouse](#)

[Google Maps Satellite View](#)

[Pennsylvania Northern Coal Field](#)

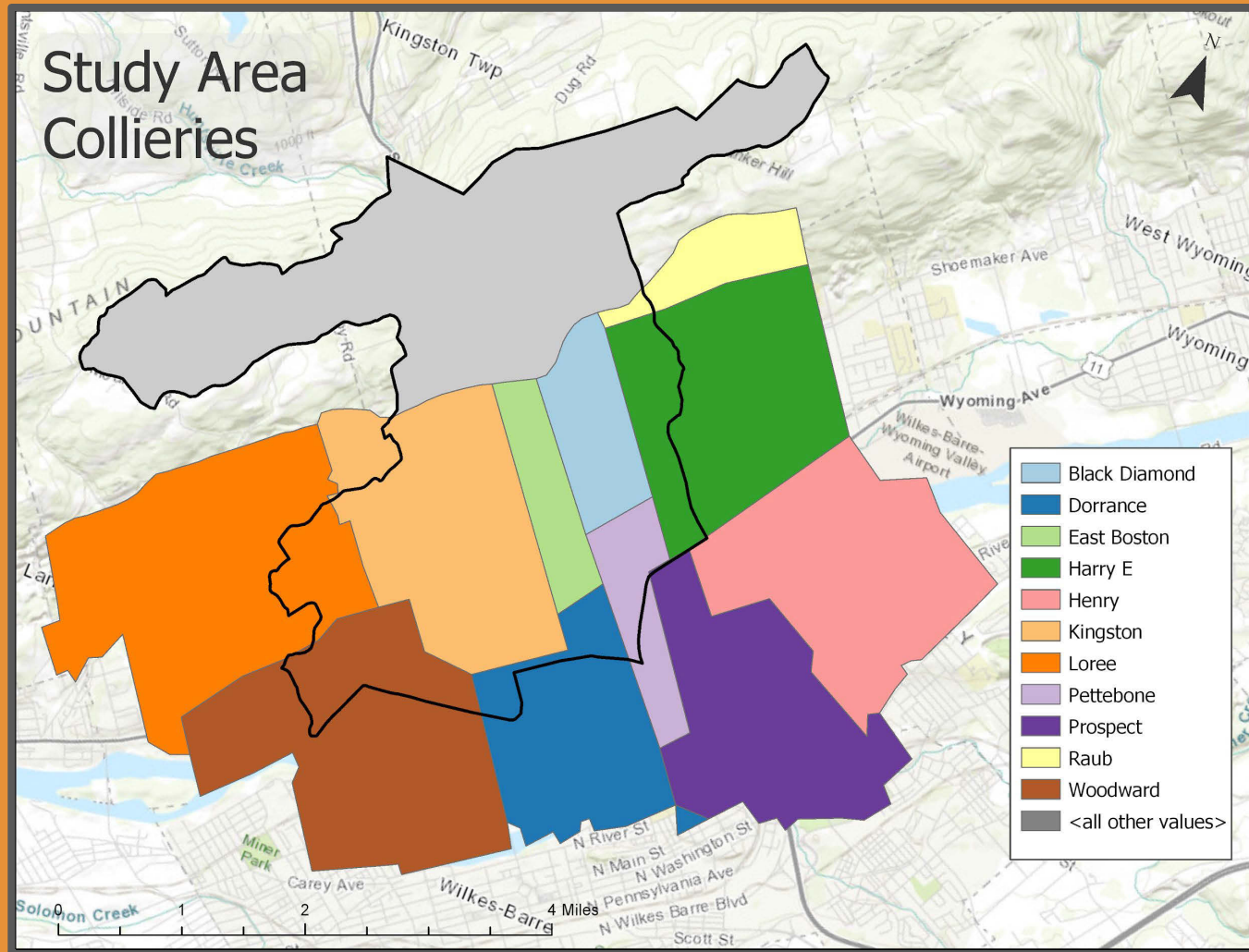
Full Property Boundary Extents Of Former Coal Company Collieries

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access -
The Pennsylvania Geospatial Data
Clearinghouse](#)

[Google Maps Satellite View](#)

[Pennsylvania Northern Coal Field](#)

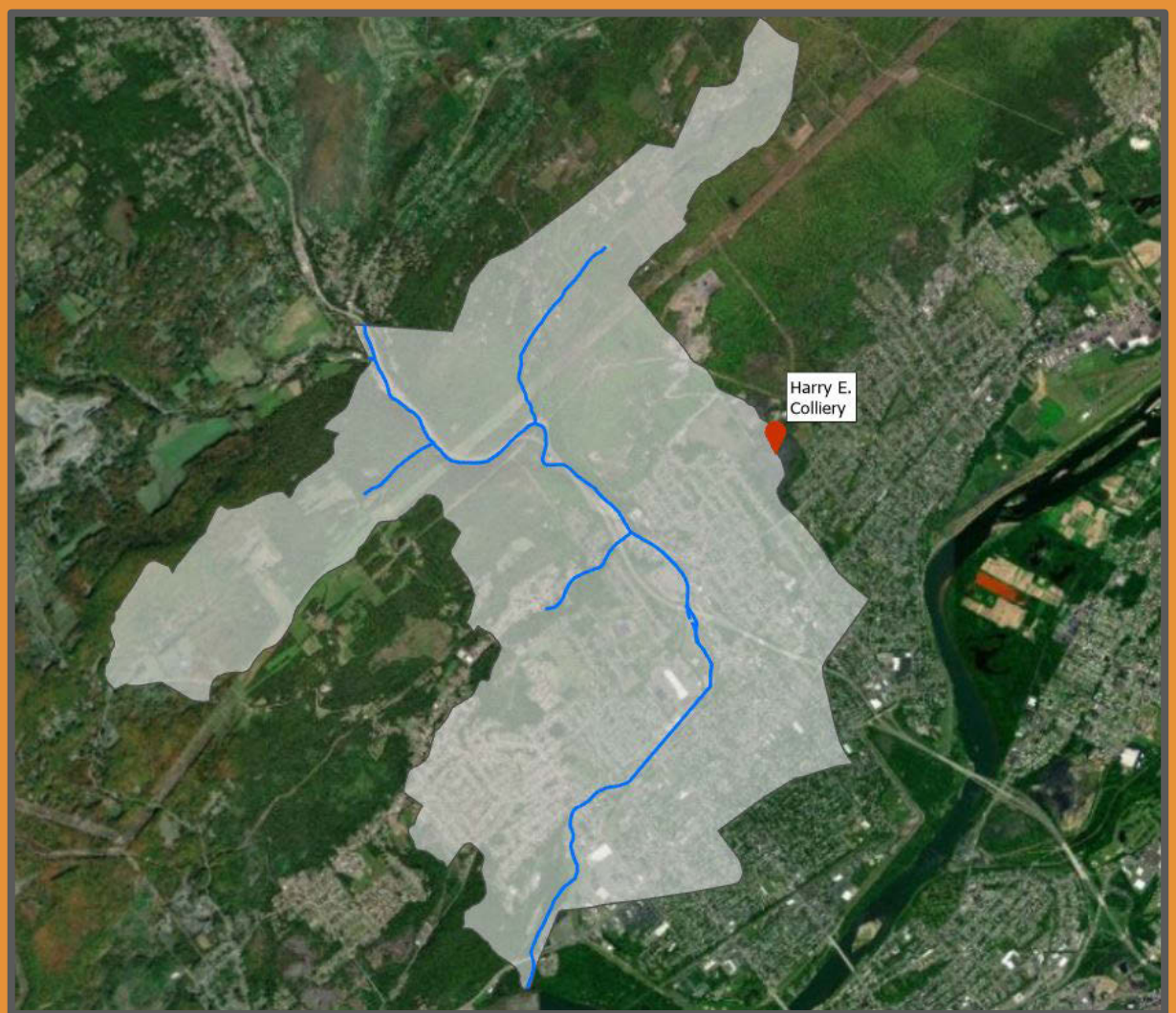


Harry E. Colliery

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The Pennsylvania Geospatial Data
Clearinghouse](#)

[Google Maps Satellite View](#)



Harry E. Colliery Property, Swoyersville, PA



[ArcGIS Pro](#)

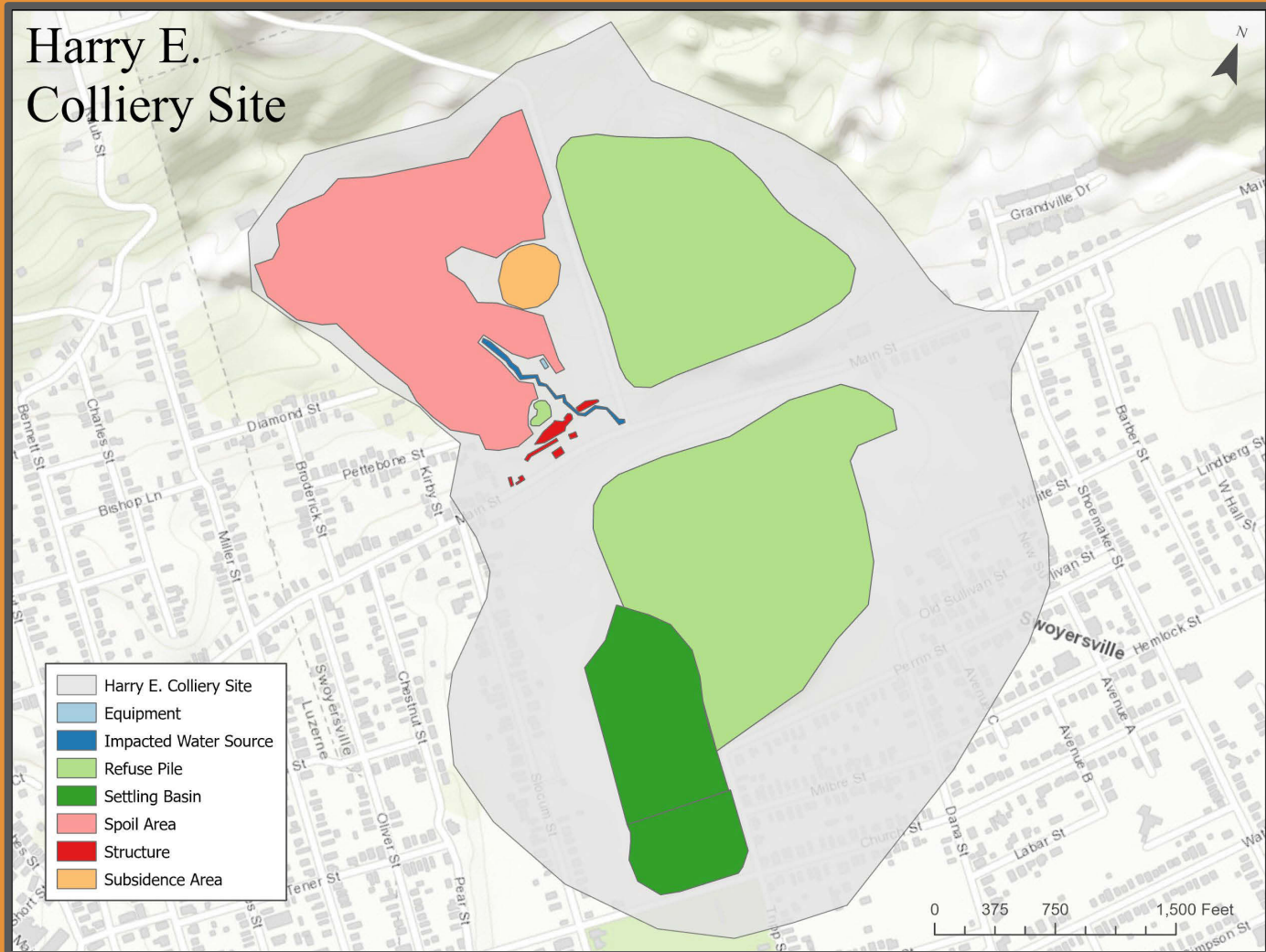
[Pennsylvania Spatial Data
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Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

[Frank's Photography Site -
Wilkes-Barre area abandoned
rails - Summer 2013](#)

Harry E. Colliery Features

Harry E. Colliery Site



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[Google Maps Satellite View](#)

Harry E. Colliery

[Swoyersville Culm Pile Removal
AML Pilot Project](#)

**Active coal breaker until
1970s**

55 acre site

Culm bank = ~80 feet high

[Frank's Photography Site -
Wilkes-Barre area abandoned
rails - Summer 2013](#)



Current Reclamation Initiatives

[Swoyersville Culm Pile Removal AML Pilot Project](#)

- Project began in 2018 by EPCAMR
 - Completed over a 5 year period
- Paid for by Government Financed Construction Contract (GFCC), AML Funds, & PA AML Pilot
- Work area is 28 acres total
 - 500,000 T of coal & rock waste removal
 - Removed by Keystone Reclamation Fuel Management, LLC
 - Trucks used travelling state highways
- Cost estimated at \$12 million



Swoyersville Culm Bank Removal and Restoration Project



[Swoyersville Culm Pile](#)

[Removal AML Pilot Project](#)

Harry E. Colliery History

- ["Harry E. breaker was ahead of its time". Citizens Voice](#)
 - "It replaced previous breakers that had stood at the site, which received anthracite coal from the Harry E. and Forty Fort mines."
 - Named after Harry E. Broderick, the son of an anthracite founding family
- *"The Black Diamond", J.K. Dering and Dering Coal Company, 1905, Vol. 34. No. 1, pp. 244.*
 - Original breaker built in 1873 and new was constructed in early 1900s
 - The Temple Iron Co.
 - Produced 2,000 tons of coal daily
 - Cost \$150,000
 - Described as "immense" by authors of The Black Diamond

Harry E. Colliery History

- Nicknamed “The Bucket of Blood” by local miners
- Numerous deaths and maimings
- Demolished in 1995



[Reclaiming history: Work begins at Swoyersville coal waste site](#)

["Harry E. breaker was ahead of its time". Citizens Voice](#)

[New Topographics: changing the landscape of photography | Art and design](#)

Harry E. Breaker



[Northeast Pennsylvania](#)
[Photos of Local Places](#)

Harry E.
Breaker,
1988



[Eastern Pennsylvania
Anthracite Coalfields](#)

Harry E. Colliery History



"Harry E. breaker was ahead of its time", Citizens Voice

Harry E Colliery - Culm Back, 2013

DellaMea, C. (2019). *Eastern Pennsylvania Anthracite Coalfields*.

Retrieved from Coalfields of the Appalachian Mountains:

<http://www.coalcampusa.com/eastern-pennsylvania-anthracite/eastern-pennsylvania-anthracite.htm>



Harry E. Colliery - News Articles

[Wilkes-Barre Sunday Independent, 1939, Page 2 - Harry E Colliery Reopening](#)

[Wilkes-Barre Sunday Independent, 1940, Page 11 - Back Wages Dispute](#)

[Wilkes-Barre Sunday Independent, 1949, Page 15 - Harry E Colliery Slowdown](#)



Harry E. Colliery - News Articles

SUNDAY INDEPENDENT, WILKES-BARRE, PA., SUNDAY, SEPTEMBER 3, 1967

On Swoyersville's Back Road

Dismal Reminders of Heyday of Deep-Mining



Among the most dismal reminders of the deep-mining days when King Coal reigned can be found at the Harry E. Colliery, Main and Slocum Sts., Swoyersville. At left is an enclosed conveyor line that crosses Main St.—also known as the Back Road—and at right are crumbling ruins of a fan house, all that is left of a once gigantic air shaft.

Also nearby is a drab little office, now used only by a foreman and a watchman, but at one time the scene on pay days when miners by the hundreds came to collect their pay

envelopes in amounts that over 90 years ran into millions of dollars.

The present breaker, which was rebuilt after two serious fires, is still used in part to prepare coal from stripping operations of the present owners, Pagnotti Enterprises.

Harry E. Colliery dates back 91 years. It was started by J. W. Swoyer, after whom Swoyersville Borough was named. Later the operation was taken over by Simpson and Watkins. The profitable days came when the Harry E. and the Forty Fort mines were operated by Temple Coal and Iron Co.

Coal royalties involved millions and many more millions went to the Lehigh Railroad for hauling coal to the large metropolitan centers on the Atlantic Seaboard.

Swoyer in planning the original operation in 1876 took a lesson from the Avondale Disaster of 1869 when 110 miners were suffocated when fire destroyed the breaker, which was built around the shaft. Such was not the case at Harry E. Colliery, where the coal was taken to the breaker by conveyor route. As a result, there were no deaths or injuries when the Harry E. was twice destroyed by fire.—(Photos by Paul Bielej)

Loree Colliery - History

- The Delaware and Hudson Canal Company owned fines major mines and collieries in the Wyoming Valley
 - By 1876 colliery no.5 “the Loree Colliery” was operational at its original location at the intersection of Washington Ave. and Vine St. in Larksville
- After being destroyed in a fire, in 1895, the original site was abandoned and the Loree Colliery was moved to Nesbitt St in Larksville
 - In 1919, this colliery caught fire once again and was demolished
 - With 4000 tons of coal being output per day, another colliery was commissioned on the grounds of the previous one
- In its first year of operation the colliery produced over 1.3 million tons of coal and employed over 2000 people

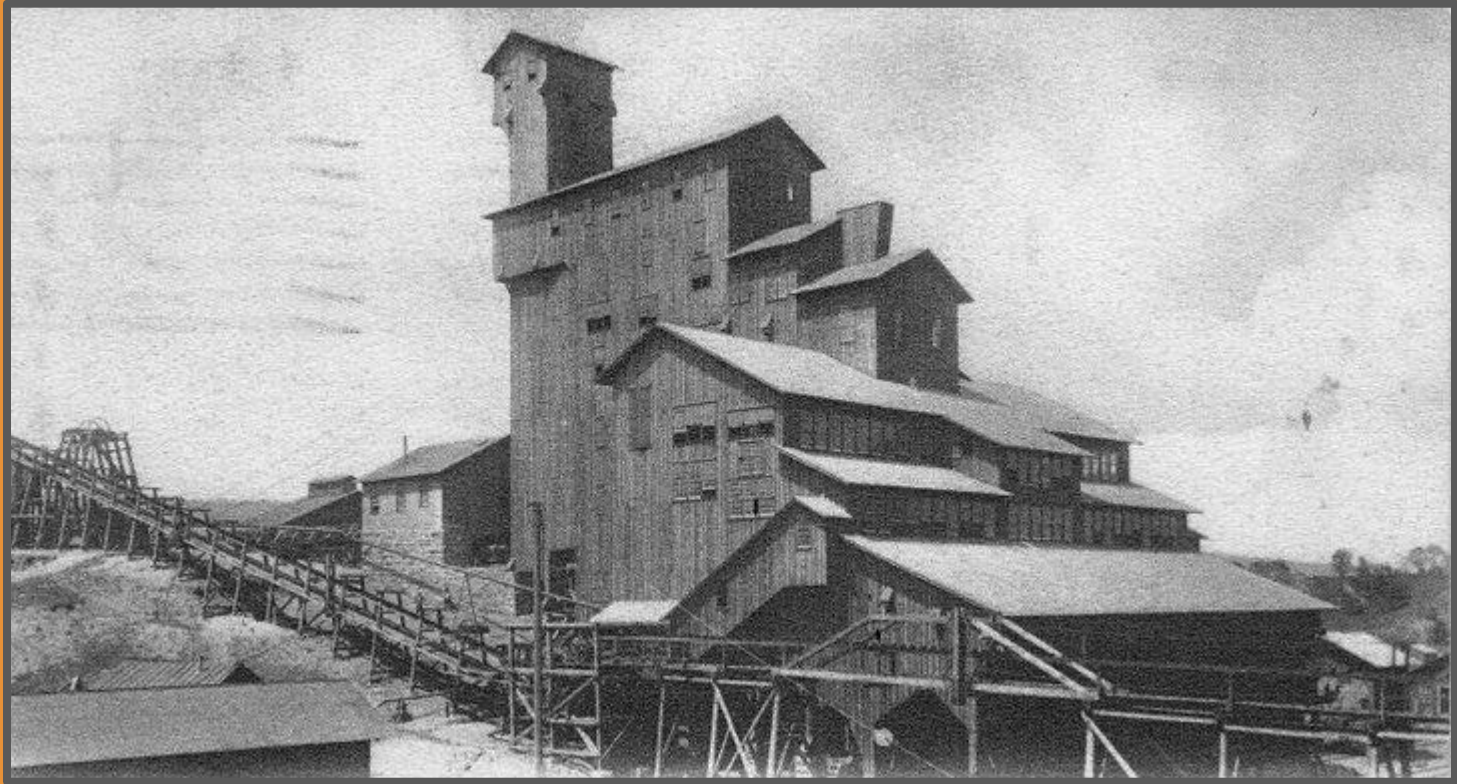
<http://www.northernfield.info/moreinfoReport.php?oname=Loree&lldir=Loree&addInfo=>
<http://www.undergroundminers.com/lore.html>

Loree Colliery - History

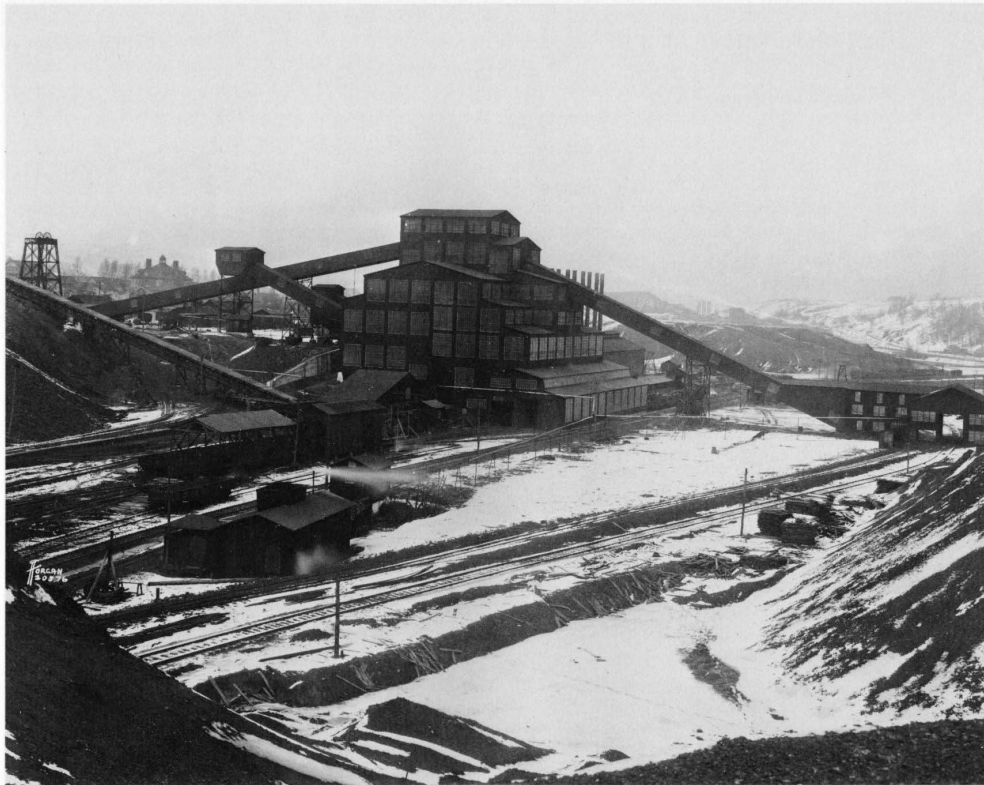
- Breaker production slowed and came to a stop in the 1960s with coal often being prepared at other local breakers, such as the Huber Breaker
- During the 1970s, the Loree Colliery was used as for fine coal recovery, but the breaker remained idle
- It wasn't until 1993 that the breaker was torn down
- There are still remnants of the colliery visible today
 - The culm bank is still visible to surrounding neighborhoods and is currently being reclaimed
 - Mineshaft no. 2 is still visible from Church St.

<http://www.undergroundminers.com/lore.html>

Loree Colliery - Original Colliery



Loree Colliery - New Loree Colliery 1920



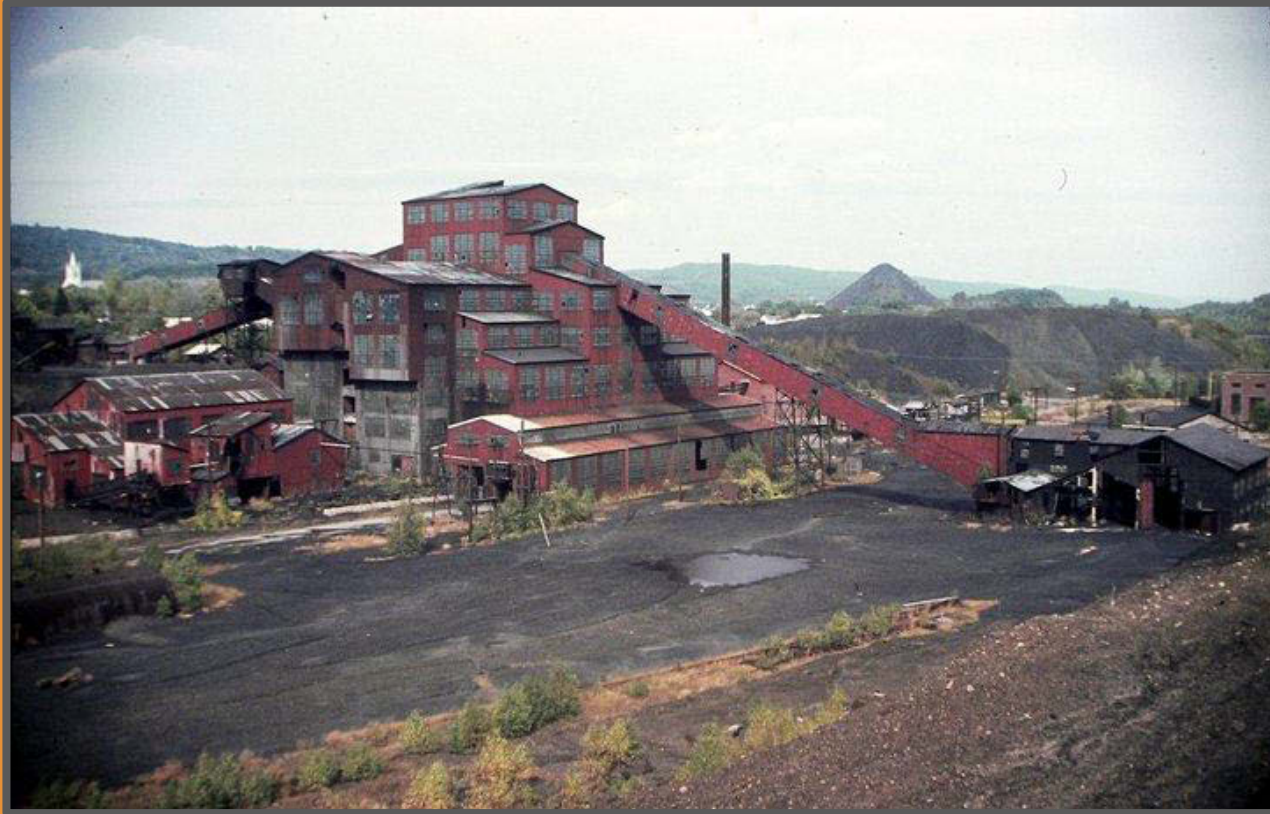
BIRDSEYE VIEW OF LOREE BREAKER
Loree Colliery, Larksville, Luzerne County, PA
HORGAN #20576, 1920

Loree Colliery - Aerial view 1939



[http://www.northernfield.info/moreinfoReport.php?
oname=Loree&ldir=Loree&addinfo=](http://www.northernfield.info/moreinfoReport.php?oname=Loree&ldir=Loree&addinfo=)

Loree Colliery - Circa 1970



https://www.facebook.com/pg/Wyoming-Valley-Anthracite-Coal-Mining-114981521912909/photos/?tab=album&album_id=114982095246185

Loree Colliery, 1976



<http://www.northernfield.info/moreinfoReport.php?oname=Loree&lldir=Loree&addInfo=>

Loree Colliery - Circa 1990



<http://www.undergroundminers.com/lore.html>

Woodward Colliery - History

- In 1881, the Delaware, Lackawanna, and Western Railroad company began to construct two mines into the Red Ash coal vein
 - In 1883, construction of the Woodward breaker was underway
- After break up of Plymouth Township, in 1884, the Woodward Colliery now found itself located in Edwardsville
- Between 1916 and 1917, DL&W tore down the original breaker to make way for a new concrete and steel one
- In 1921, the colliery traded hands to the Glen Alden Coal Company
- Throughout the first half of the 20th century the colliery produced, on average, over 700,000 tons of coal per year

https://en.wikipedia.org/wiki/Coal_mining_in_Plymouth,_Pennsylvania#cite_ref-87

<http://www.northernfield.info/operationReport.php?oname=Woodward&cid=20750&cpage=listOperations>

Woodward Colliery - History

- The Woodward Colliery experienced several explosions while in operation
 - 1916 - Three miners were killed in a gas pocket explosion
 - 1925 - Five killed and five burned in gas explosion
 - 1927 - Two miners were killed and five were buried alive after another gas explosion
 - The fan house for the mine was out of commission meaning that air could not be pumped into the mine
- The colliery was ultimately ceased all coal output in 1969 after years of declining production

https://usminedisasters.miningquiz.com/saxsewell/woodward_1927.htm

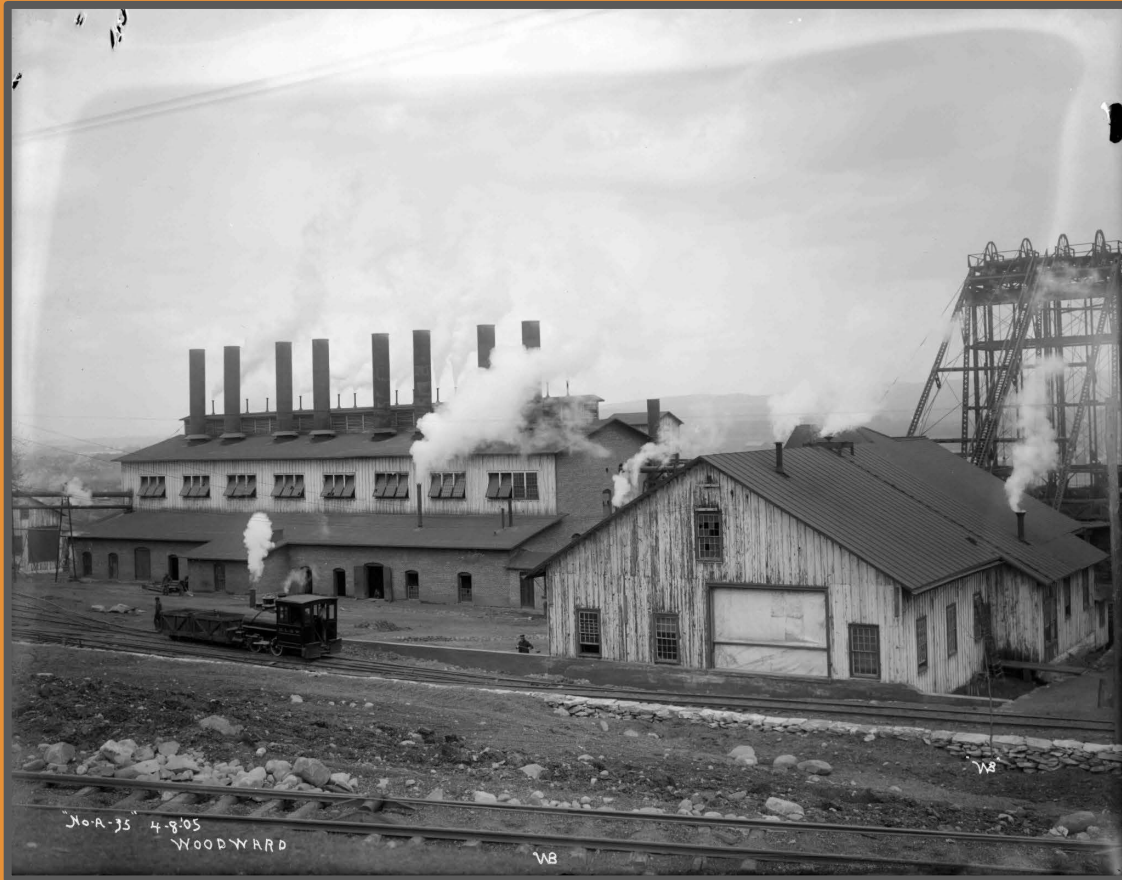
<http://www.northernfield.info/operationReport.php?oname=Woodward&cid=20750&cpage=listOperations>

Woodward Colliery - Breaker 1905



<http://www.northernfield.info/moreinfoReport.php?oname=Woodward&ldir=Woodward&addinfo=>

Woodward Colliery - Steam Plant and Shunter 1905



<http://www.northernfield.info/moreinfoReport.php?oname=Woodward&l1dir=Woodward&addInfo=>

Woodward Colliery - Breaker and Toby Creek 1907



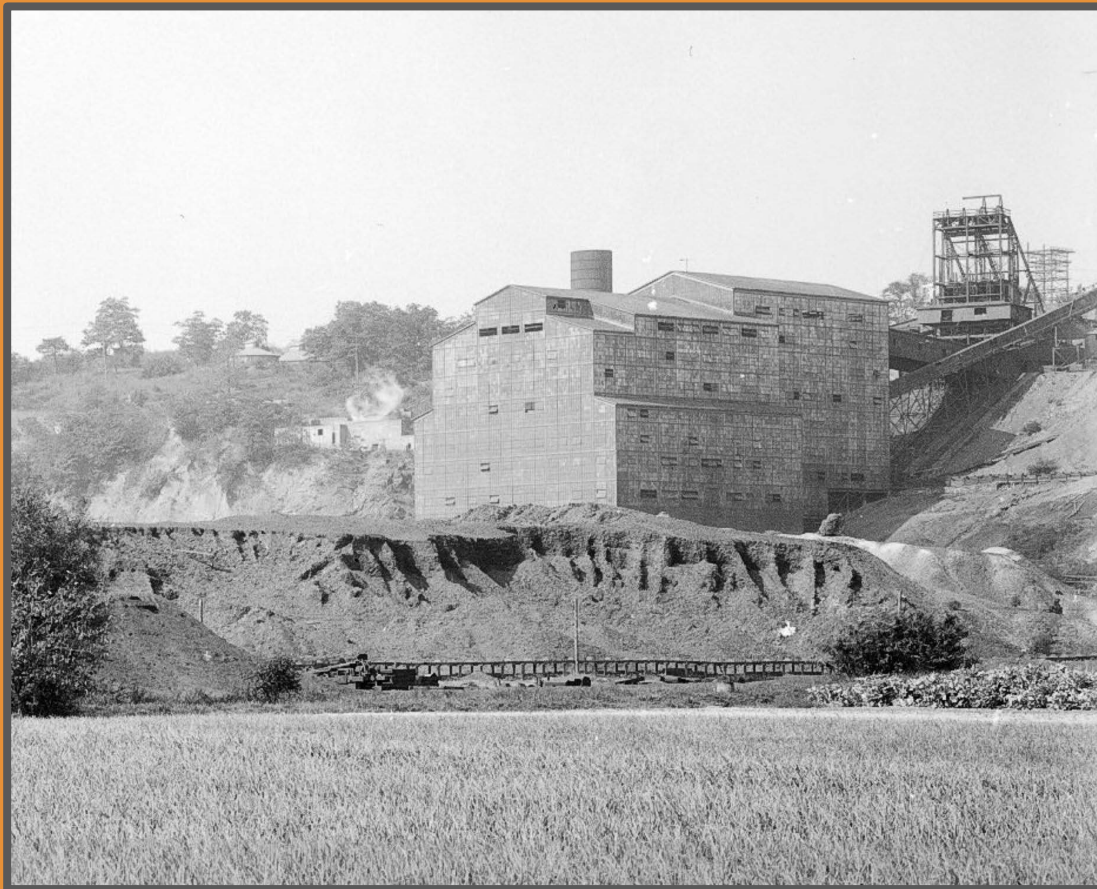
<http://www.northernfield.info/moreinfoReport.php?oname=Woodward&ldir=Woodward&addinfo=>

Woodward Colliery - Illustration of New Breaker

GLEN ALDEN COLLIERY, OPERATING IN NANTICOKE, PITTSBURGH,
PLYMOUTH AND WILKES-BARRE, PA.



Woodward Colliery - New Breaker 1931



<http://www.northernfield.info/moreinfoReport.php?oname=Woodward&lldir=Woodward&addInfo=>

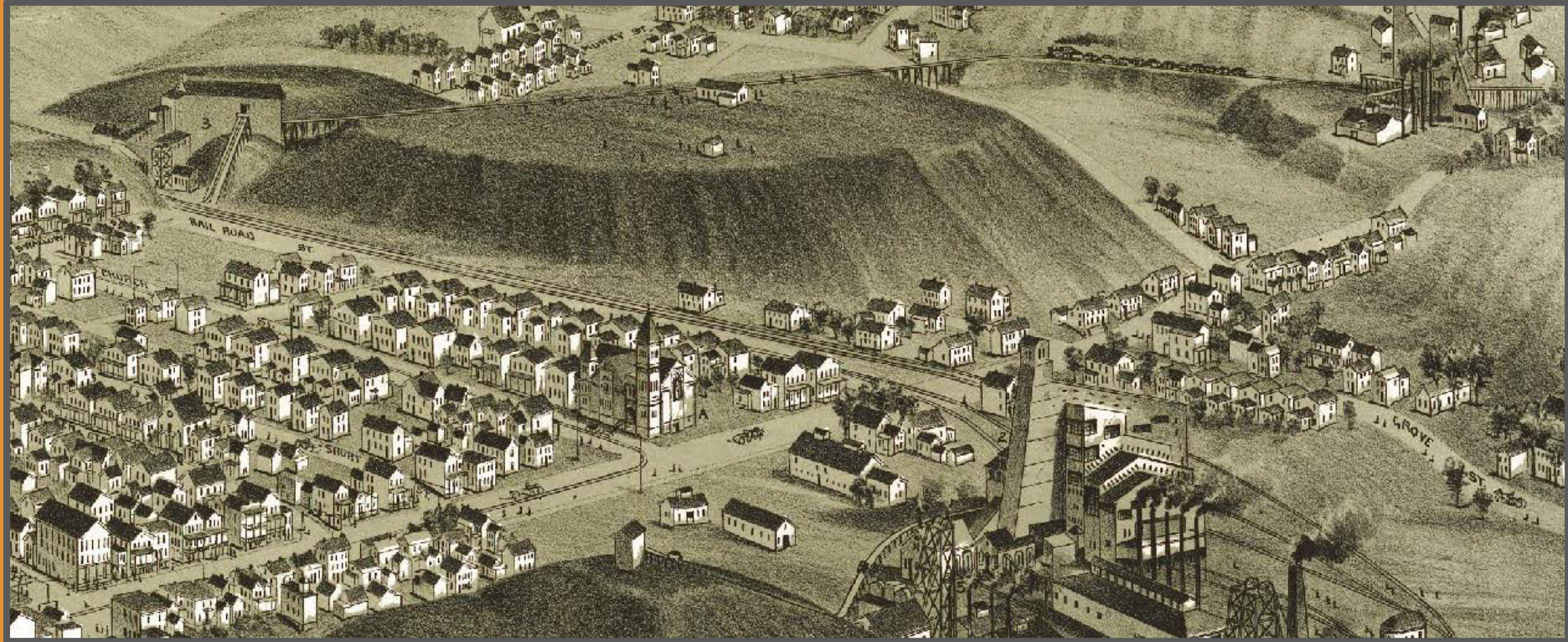
Kingston Colliery - History

- The Kingston Coal Company, originally the Waterman & Beaver Company, first broke ground in 1864 with the excavation of shaft No.1 and the construction of breaker No.1
 - The company proceeded to construct several collieries on throughout the present towns of Kingston and Edwardsville
- In 1872, the No.2 mine and breaker were constructed in Edwardsville
- Through the next twenty years, Kingston Coal built two more collieries to collect the wealth of anthracite coal beneath the town
 - In 1886, one year after its completion, the No.4 breaker was rebuilt

Kingston Colliery - History

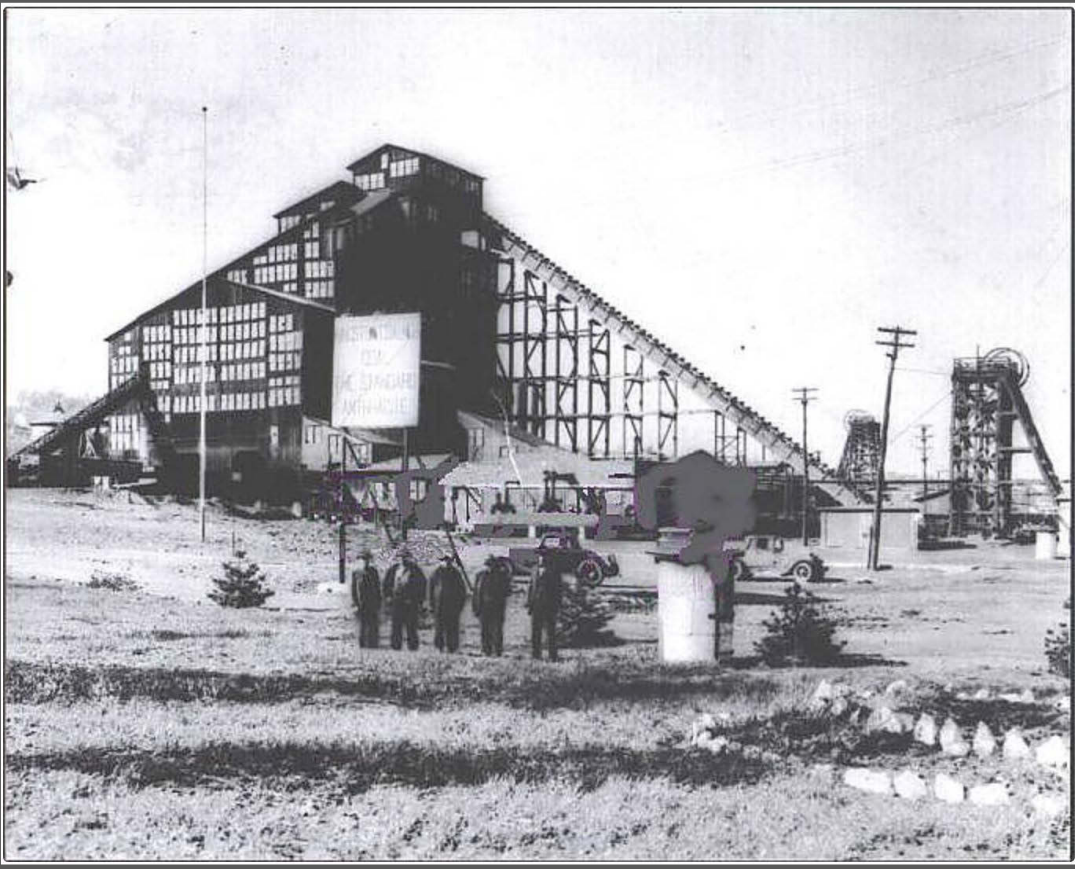
- During their time in operation, the collieries produced nearly 500,000 tons of coal each year
 - These collieries mined from the major mine shafts in their territory as well as several coal drifts and tunnels
- In 1891, the No.1 and No.4 collieries were destroyed in fires
 - No.4 was rebuilt again after the fire and it mined out of the No.4 and No.1 mine shafts
- The other collieries saw nearly another 50 years of operation, No.2 and No.4 closing their doors between 1939 and 1940

Kingston Colliery - Colliery Map Illustration



https://en.wikipedia.org/wiki/Coal_mining_in_Plymouth,_Pennsylvania#cite_ref-87

Kingston Colliery - No.1 Breaker



Kingston Colliery - No.2 Breaker



<http://www.northernfield.info/listOperations.php?search=K>

Kingston Colliery - First No.4 Breaker

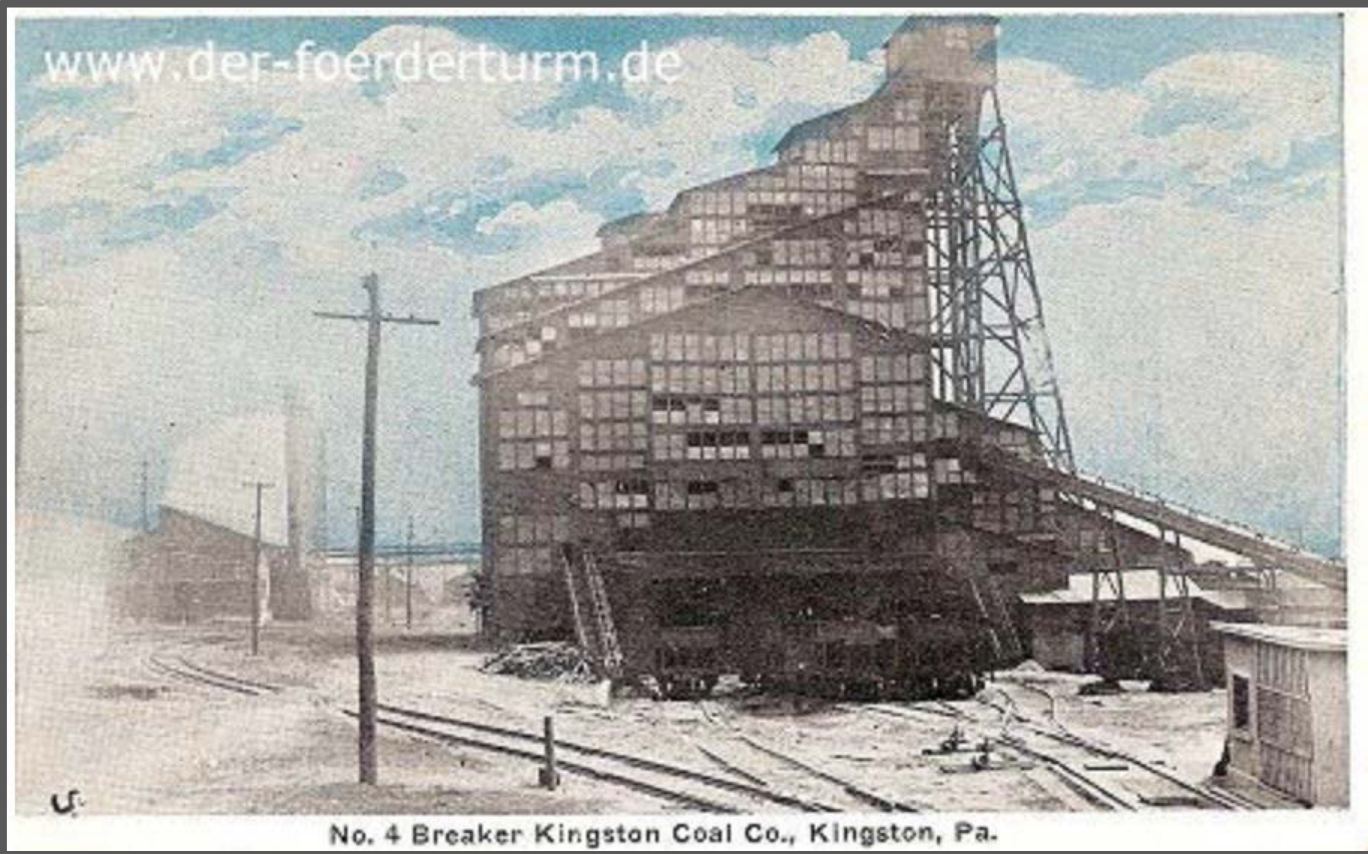


Grand Hotel of Penn. Canal, Elgerton and Vicksburg

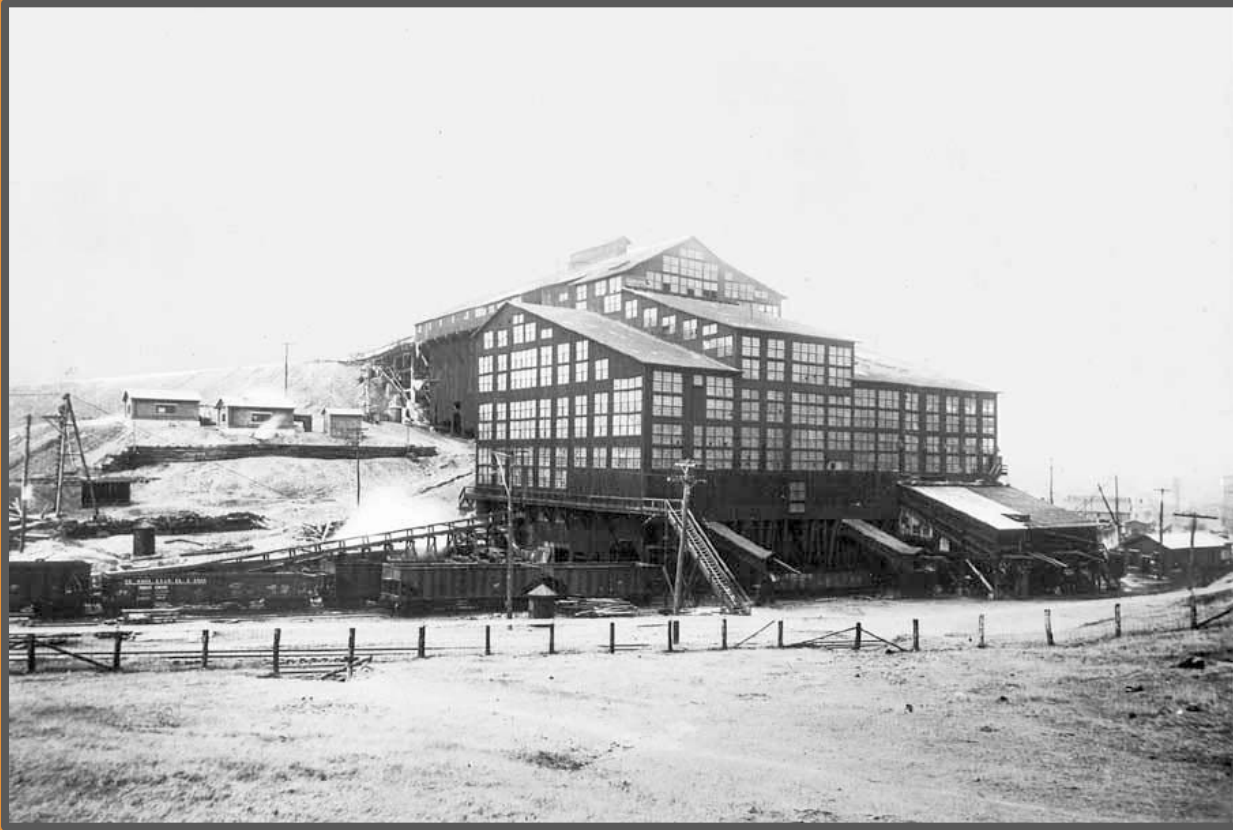
BREAKER NO. 4, KINGSTON COAL CO. NEAR KINGSTON, PA. 7484

<http://www.northernfield.info/listOperations.php?search=K>

Kingston Colliery - Second No.4 Breaker



Kingston Colliery - Third No.4 Breaker

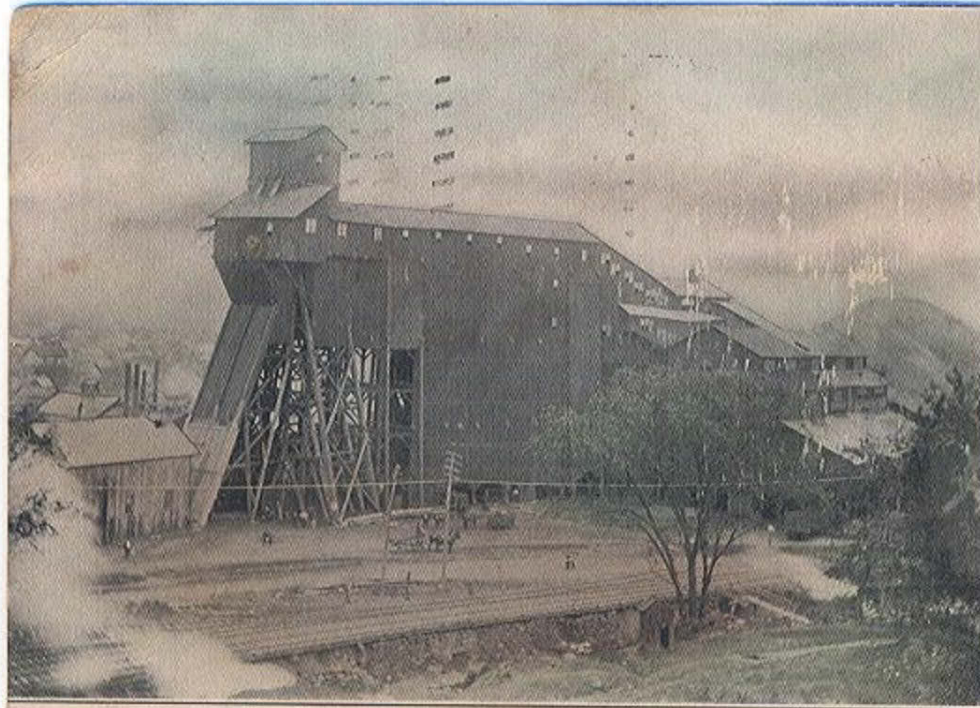


<http://www.northernfield.info/listOperations.php?search=K>

Black Diamond Colliery - History

- The Black Diamond colliery, located in the present Luzerne Borough, began coal production in 1880
- This colliery traded hands several times
 - For its first few years of operation it was own by Haddock and Steel Co.
 - It later owned by just Haddock, then claimed by the People's Bank of Wilkes-Barre, later by the Plymouth Coal Company, and then back to Haddock Mining Company
 - It was later renamed the Black Diamond Corporation and then later the Black Diamond Colliery Company
- The colliery output just over 100,000 tons of coal per year on average
- Production ultimately shut down in 1947

Black Diamond Colliery - Postcard, 1908

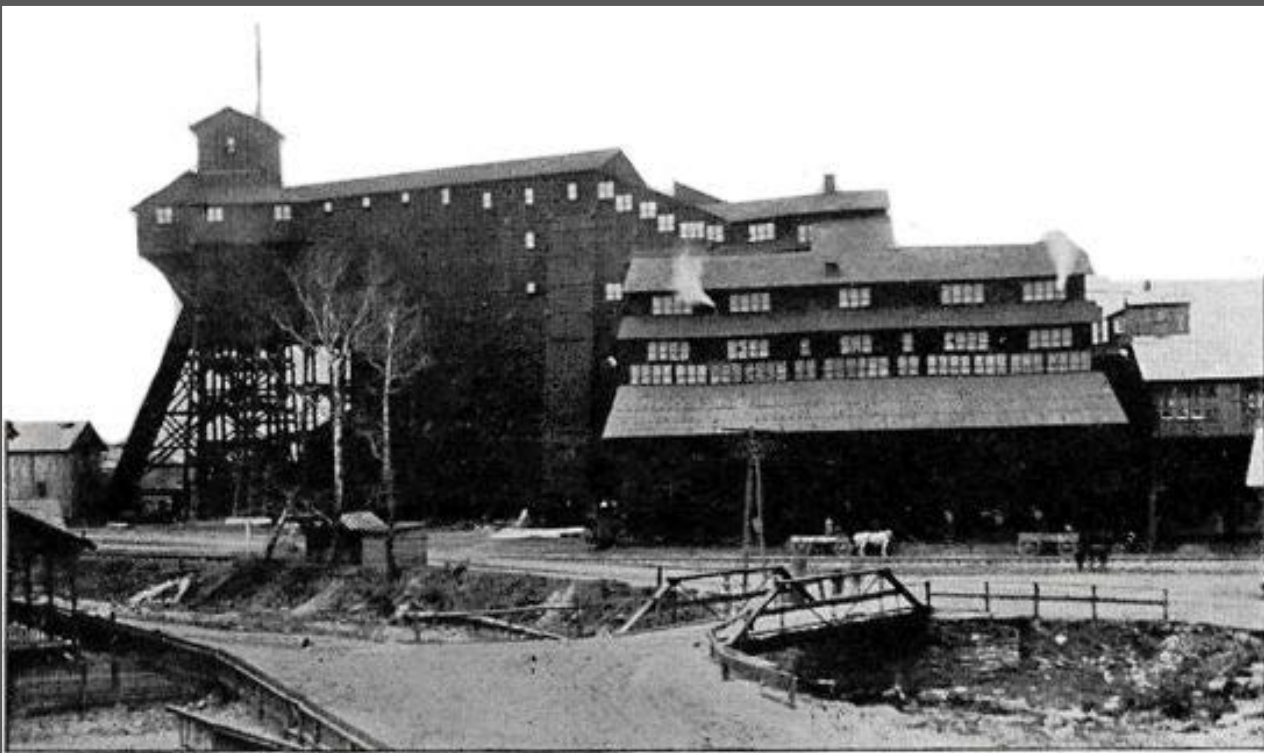


How is
Mrs Taylor
I hope she
is better
I do not
feel well
at present
will write
soon
from
Luzerne

Published for Ross and Co.

BLACK DIAMOND COLLIERY, LUZERNE, PA. 7141

Black Diamond Colliery - Circa 1910



Black Diamond Breaker, Luzerne, Pa.

https://www.facebook.com/pg/Wyoming-Valley-Anthracite-Coal-Mining-114981521912909/photos/?tab=album&album_id=974143212663398&ref=page_internal

East Boston Colliery - History

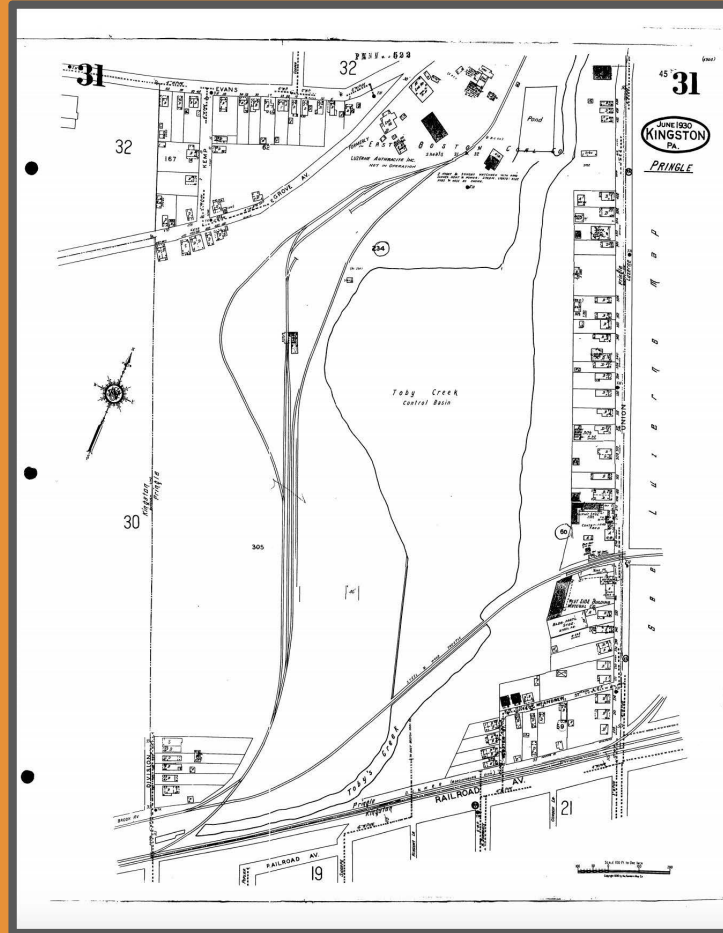
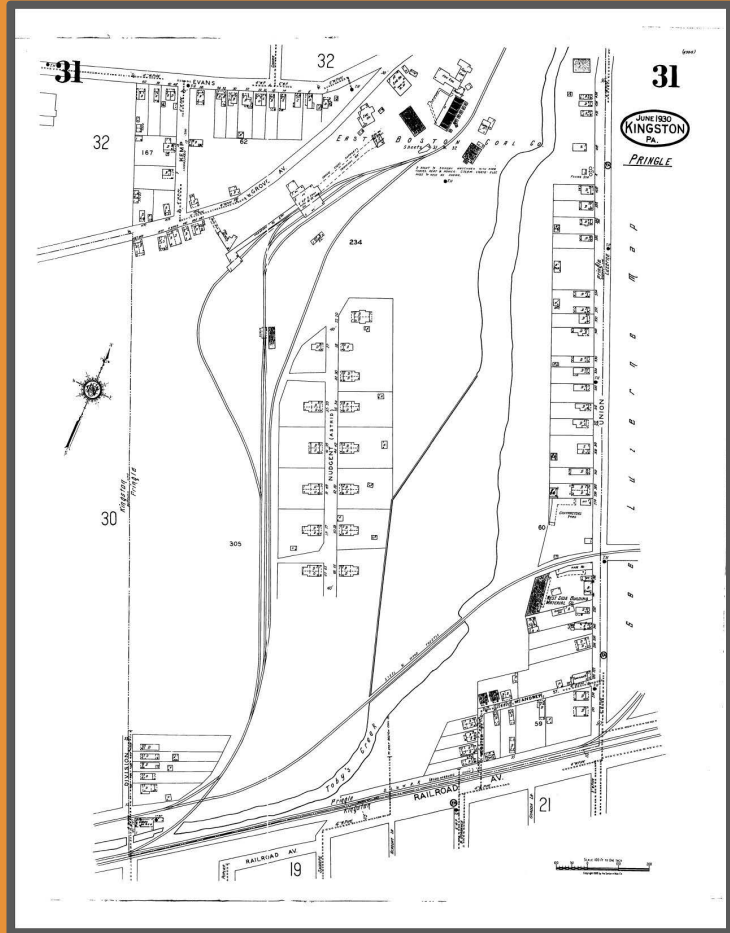
- The East Boston Colliery was founded in 1870 by the Consumer Coal Company
 - The breaker and mine were constructed in the present town of Pringle
 - Five years after construction, the colliery changed hands to W. G. Payne & Co.
- The colliery produced about 125,000 tons of coal per year
- The colliery was constructed on the west bank of Toby Creek
 - In 1943, as a part of the Flood Prevention Act of 1936, an impounding basin was constructed at the site of the East Boston colliery
- Soon after the impounding basin was completed the breaker was taken down
 - From 1947 onward the site was used solely as a mine until its closure in 1956

East Boston Colliery - Coal yard and Colliery 1910



<http://www.northernfield.info/moreinfoReport.php?oname=East%20Boston&ldir=East%20Boston&addInfo=>

East Boston Colliery - Colliery Maps 1930 & 1950



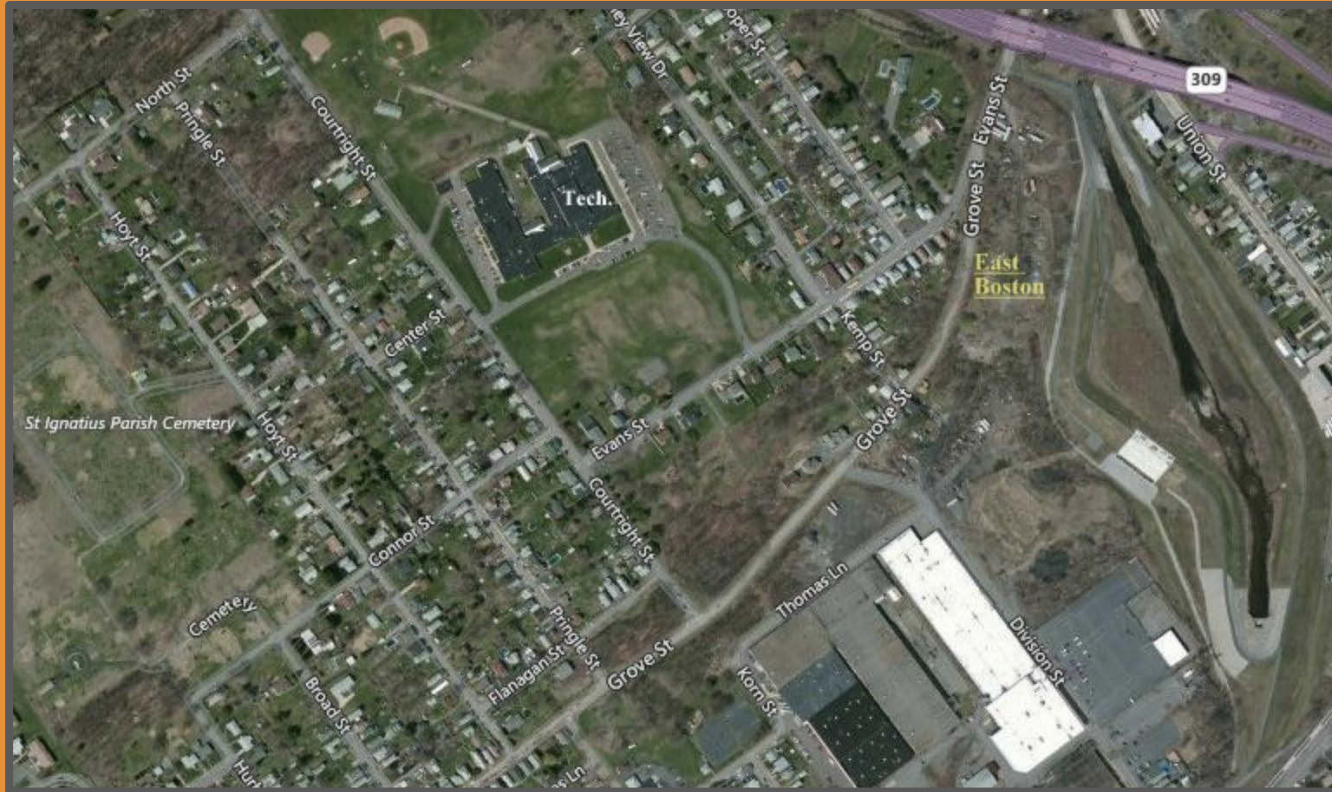
<http://www.northernfield.info/moreinfoReport.php?oname=East%20Boston&ldir=East%20Boston&addInfo=>

East Boston Colliery - Overhead view of colliery and Toby Creek, 1939



https://www.facebook.com/pg/Wyoming-Valley-Anthracite-Coal-Mining-114981521912909/photos/?tab=album&album_id=973224642755255&ref=page_internal

East Boston Colliery - Overhead view of colliery and Toby Creek basin, present



https://www.facebook.com/pg/Wyoming-Valley-Anthracite-Coal-Mining-114981521912909/photos/?tab=album&album_id=973224642755255&ref=page_internal

Pettebone Colliery - History

- The Pettebone Colliery began mining and refining operations in 1882, under the ownership of the Delaware, Lackawanna, and Western Railroad company
 - The colliery was located in between Kingston and Forty Fort
 - The colliery averaged a yearly output of 225,000 tons of coal
- In 1921, the Colliery changed hands and was owned by the Glen Alden Coal Company
- Five years later, a cave in occurred 700 feet below the surface, possibly due to a gas leak, killing 7 workers
- In 1931, the colliery ultimately shut down, though production had not gone down by a vast amount
- The colliery reopened for one year, in 1948, for bank usage by Cardoni & Nardone

<http://www.northernfield.info/operationReport.php?oname=Pettebone&addInfo=Peach%20Orchard&cid=17970&cpage=listOperations>
<https://usminedisasters.miningquiz.com/saxsewell/pettebone.htm>

Pettebone Colliery - Breaker circa 1910



<http://www.northernfield.info/operationReport.php?oname=Pettebone&addInfo=Peach%20Orchard&cid=17970&cpage=listOperations>
<https://usminedisasters.miningquiz.com/saxsewell/pettebone.htm>

Pettebone Colliery - Breaker 1905



<http://www.northernfield.info/operationReport.php?oname=Pettebone&addInfo=Peach%20Orchard&cid=17970&cpage=listOperations>
<https://usminedisasters.miningquiz.com/saxsewell/pettebone.htm>

Pettebone Colliery - Breaker and Steamhouse circa 1910



<http://www.northernfield.info/operationReport.php?oname=Pettebone&addInfo=Peach%20Orchard&cid=17970&cpage=listOperations>
<https://usminedisasters.miningquiz.com/saxsewell/pettebone.htm>

Pettebone Colliery - Aerial view from over Wilkes-Barre



Henry Colliery

- Owned by Lehigh Valley Coal Co.
- Plains Township, Luzerne County
- 614, 596 tons produced in 1937
 - 574,864 tons railroad shipments
 - 710 Employees

Dorrance Colliery

- Owned by Lehigh Valley Coal Co.
- 499,170 tons coal produced in 1945
 - 727 Employees
 - 323,794 tons railroad shipments
- 10 veins mined from vertical shaft
- Utilized a fan complex to divert gases from mine
 - 76 gas explosions between 1870 and 1950



[Dorrance Colliery: Northernfield.info](http://Northernfield.info)

[Dorrance Colliery Fan Complex](#)

[Dorrance Colliery | View taken in 1953 of the Dorrance Colli...](#)

Dorrance Colliery



Dorrance Coal Breaker, Wilkes-Barre, Pa.

Dorrance Colliery

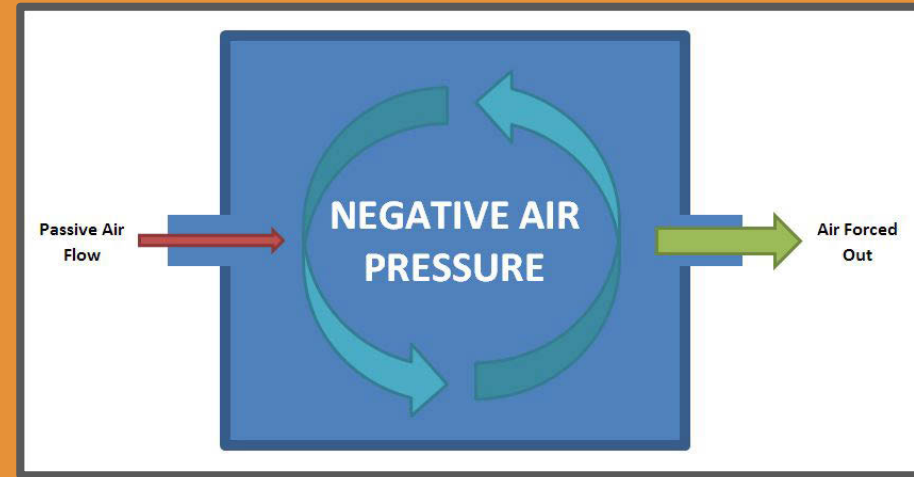


Dorrance Colliery

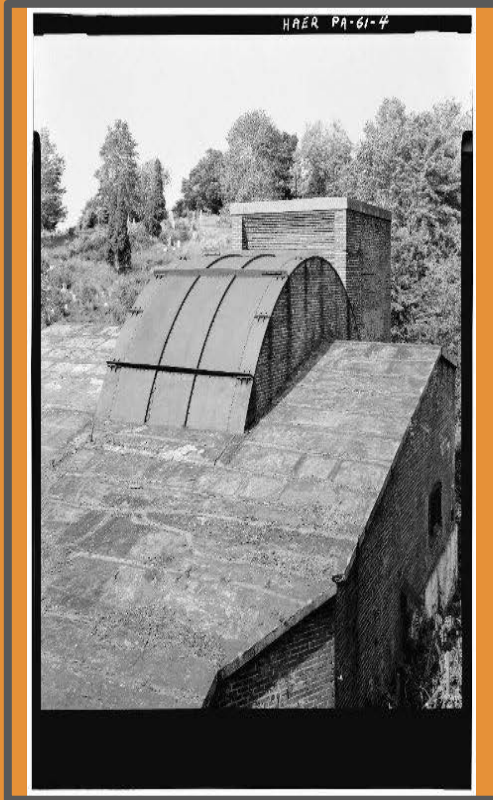


Dorrance Fan Complex

- Spanned entire existence of colliery
- Consisted of main fan in exhaust stack
 - 35 feet wide
 - 49 Revolutions Per Minute
 - Used negative pressure to pull air through mine
 - Air pulled through mine shafts due to fan exhaust, removing gases



Dorrance Fan Complex

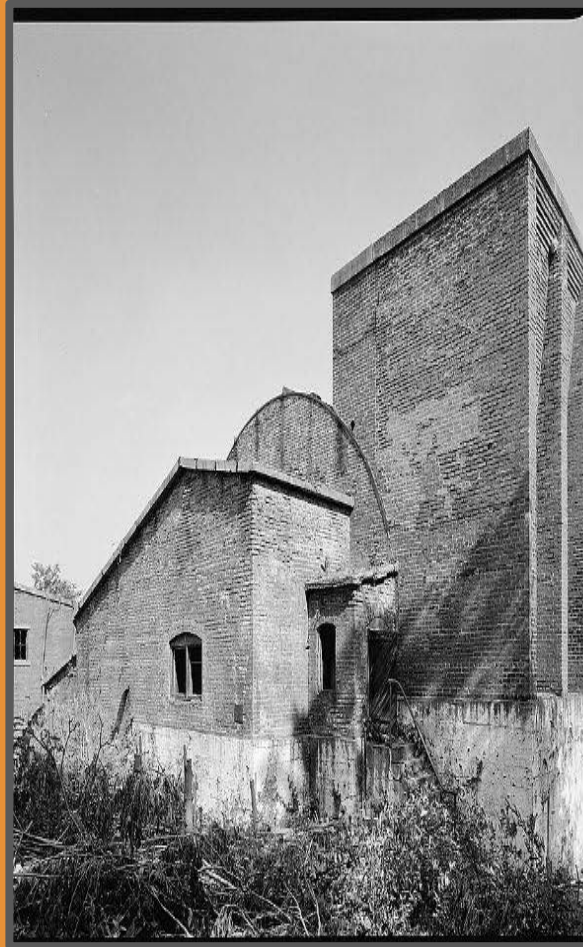


[Dorrance Colliery Fan Complex, South side of Susquehanna River at Route 115 & Richard Street, Wilkes-Barre, Luzerne County, PA](#)

**Dorrance
Fan
House
Colliery
Exhaust
Fan**



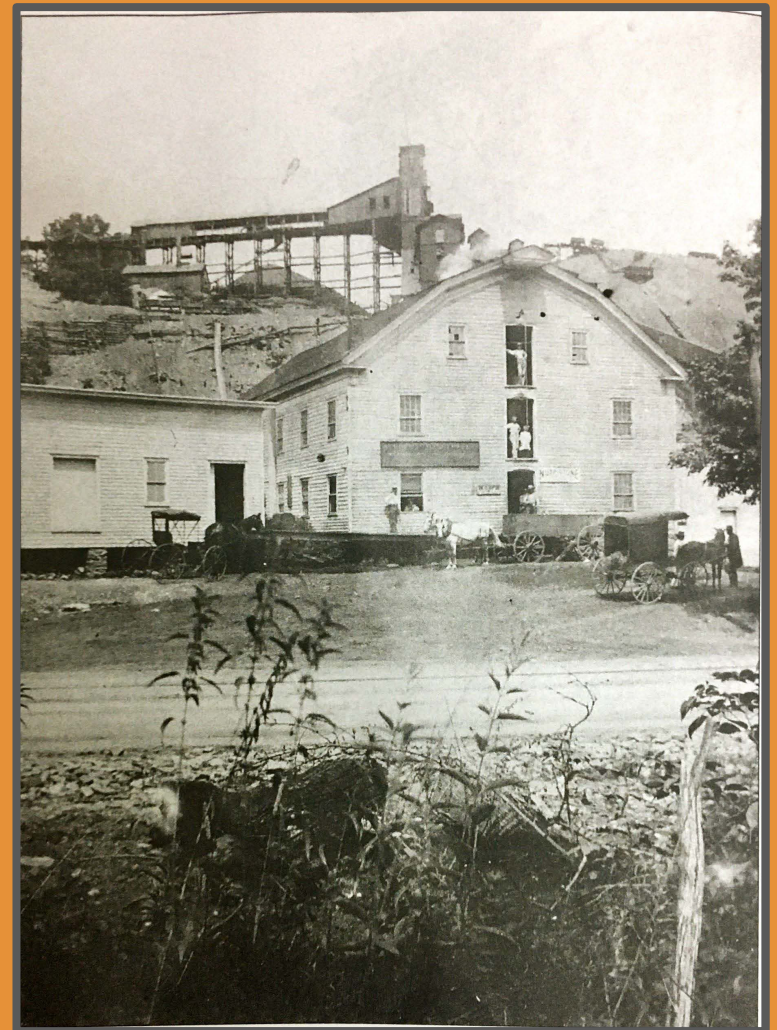
**Hillman
Fan
House
Colliery
Exhaust
Fan**



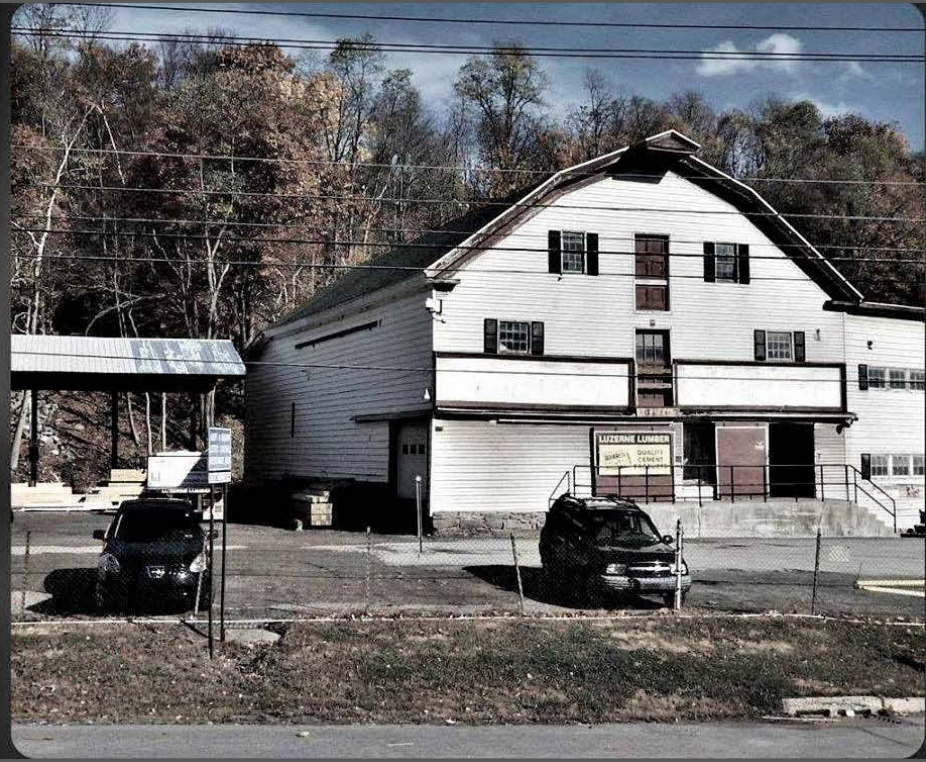
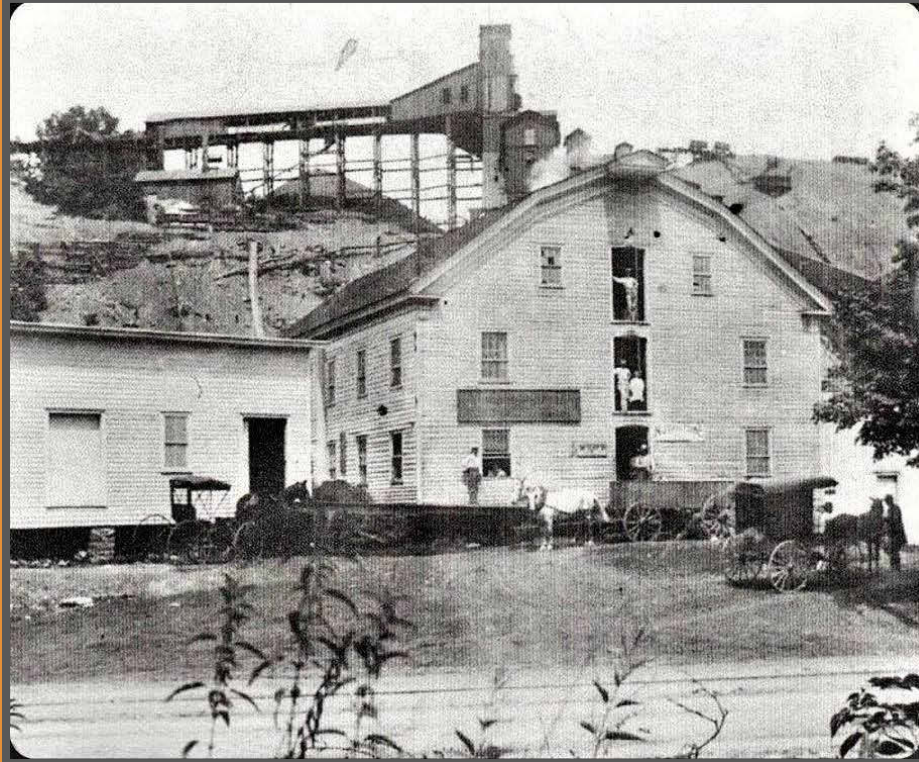
[Library of Congress: Hillman Fan House](#)

Waddel's Mill Hollow Colliery

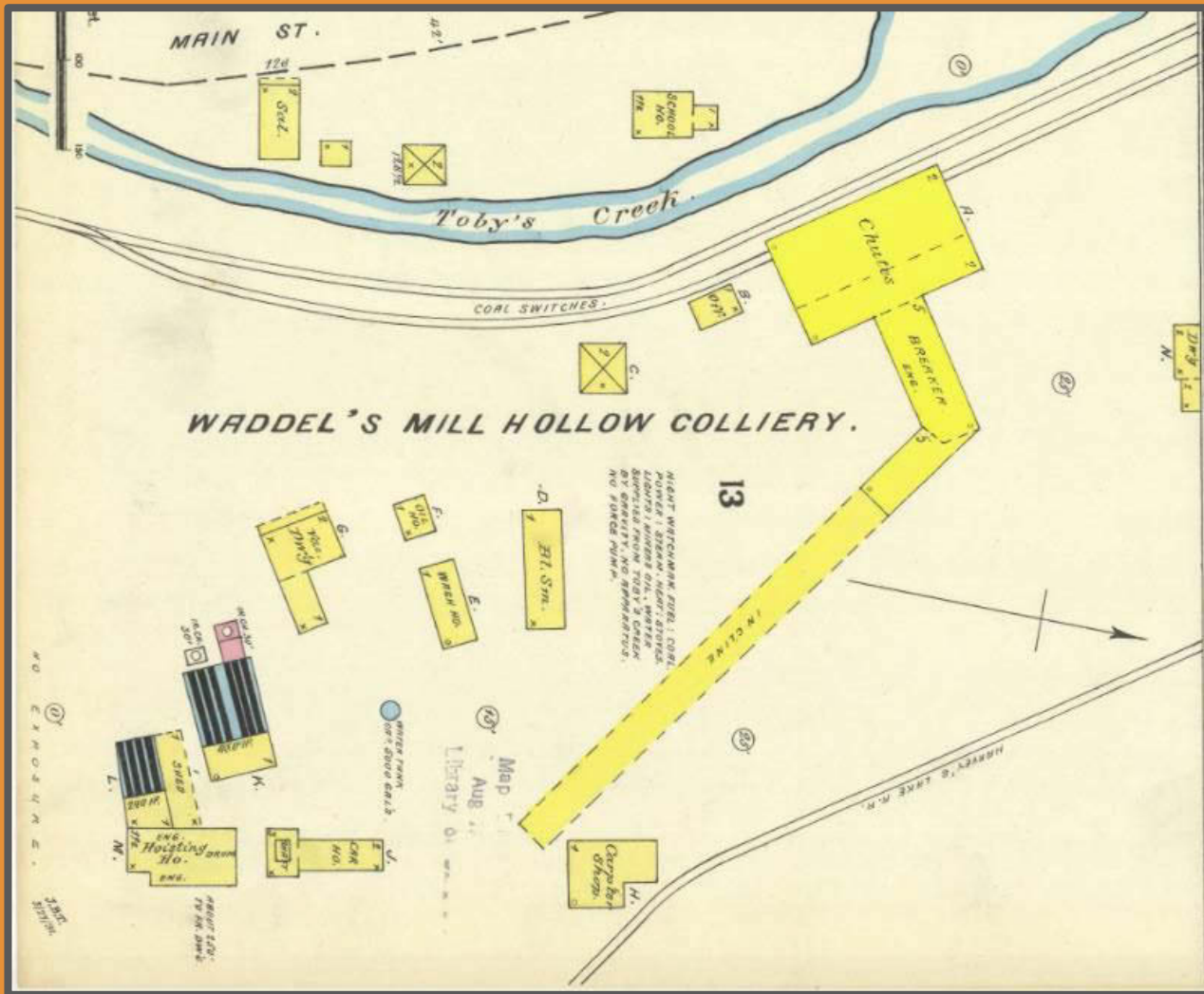
- Located in Luzerne Borough
- Owned by Thomas Waddel & Co.
- Bought by Raub Coal Co. in
 - 22,895 Tons produced in 1899
 - 18,938 railroad shipments



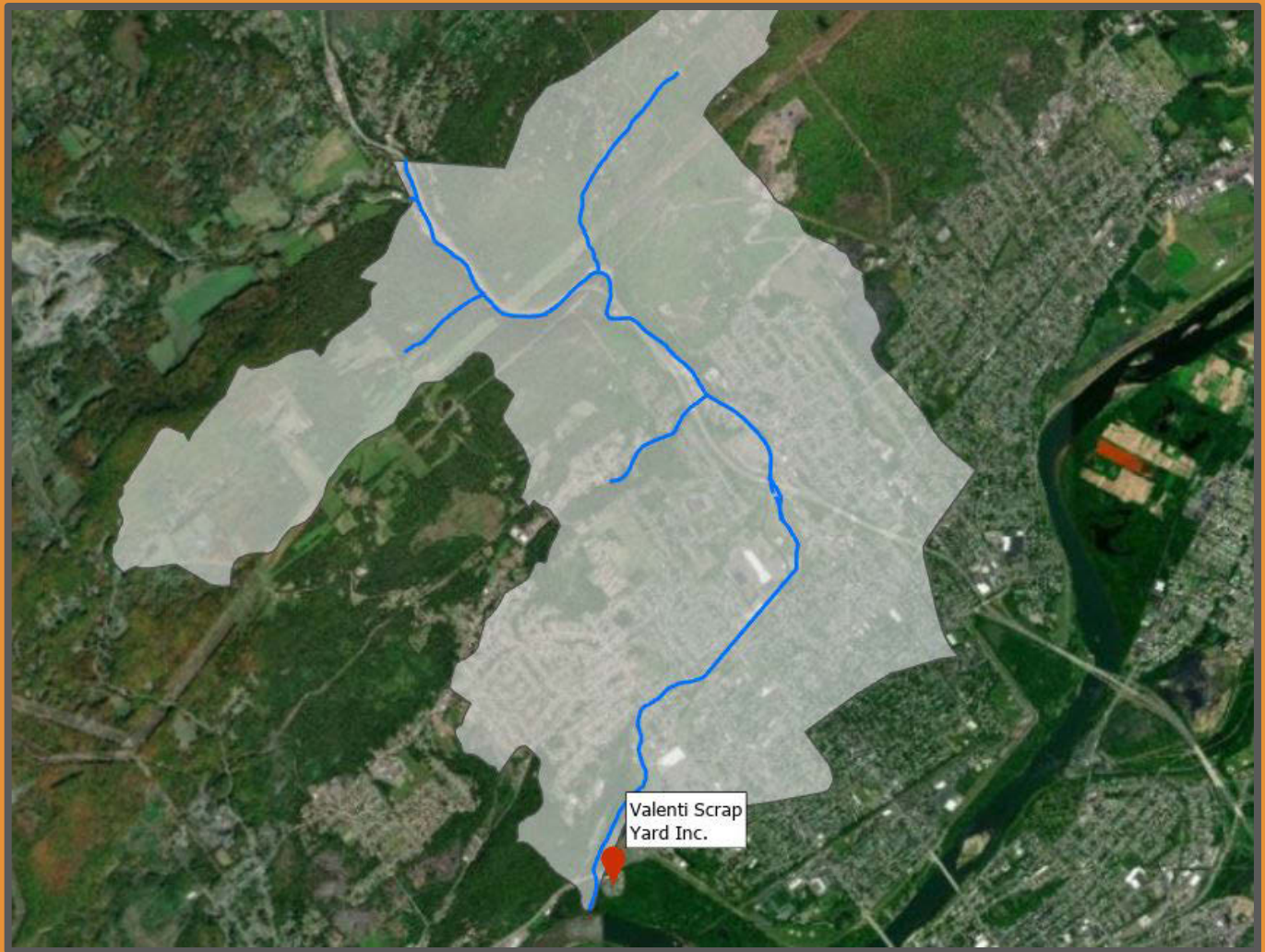
Waddel's Mill Hollow Colliery (left photo from the past) and Luzerne Lumber (foreground)



Waddel's Mill Hollow Colliery



Valenti Scrap Yard Inc.



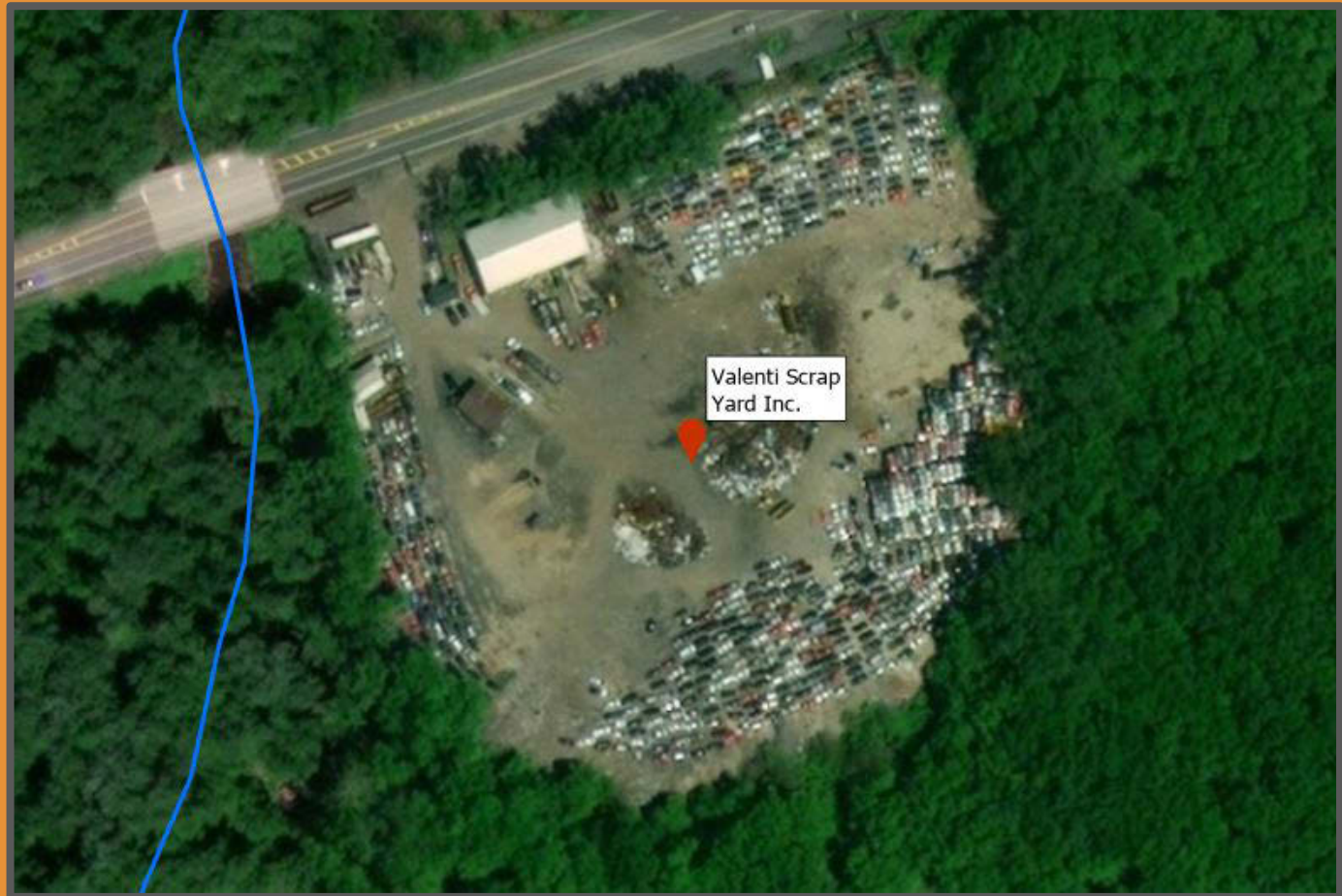
[ArcGIS Pro](#)

[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

Valenti Scrap Yard Inc.

Located within
the Toby Creek
Watershed in
Edwardsville
Borough along
the floodplain of
the Susquehanna
River



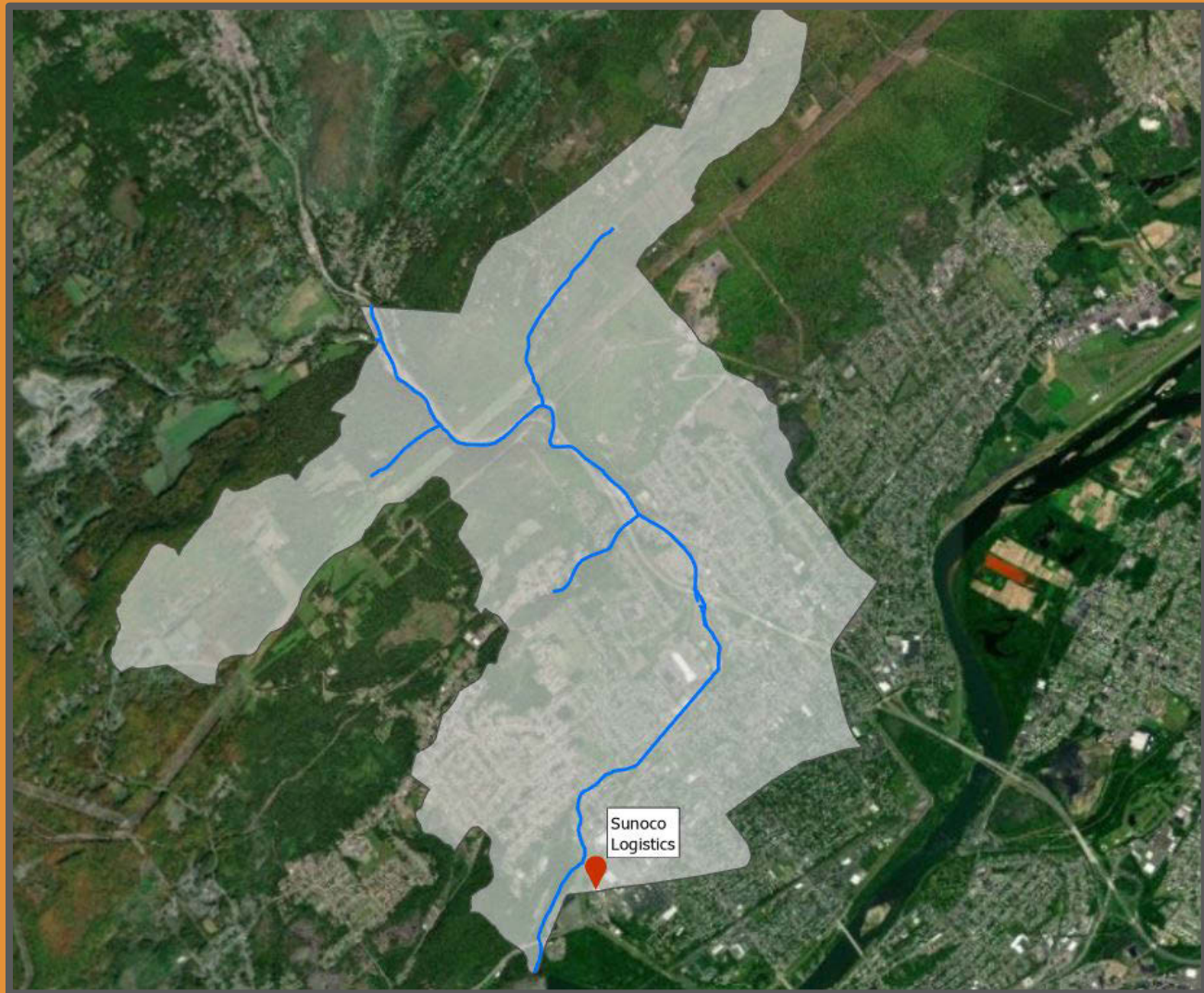
13.18 Acre property estimated via GIS analysis

Sunoco Logistics

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access
- The Pennsylvania Geospatial
Data Clearinghouse](#)

[Google Maps Satellite View](#)



Shopping Centers Near Toby Creek confluence with the Susquehanna River



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[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

[Google Maps Satellite View](#)

Wyoming Valley Flood Control System

- 1.76 miles of Toby Creek runs underground

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

[WYOMING VALLEY FLOOD CONTROL SYSTEM, WOODWARD PUMPING STATION](#)



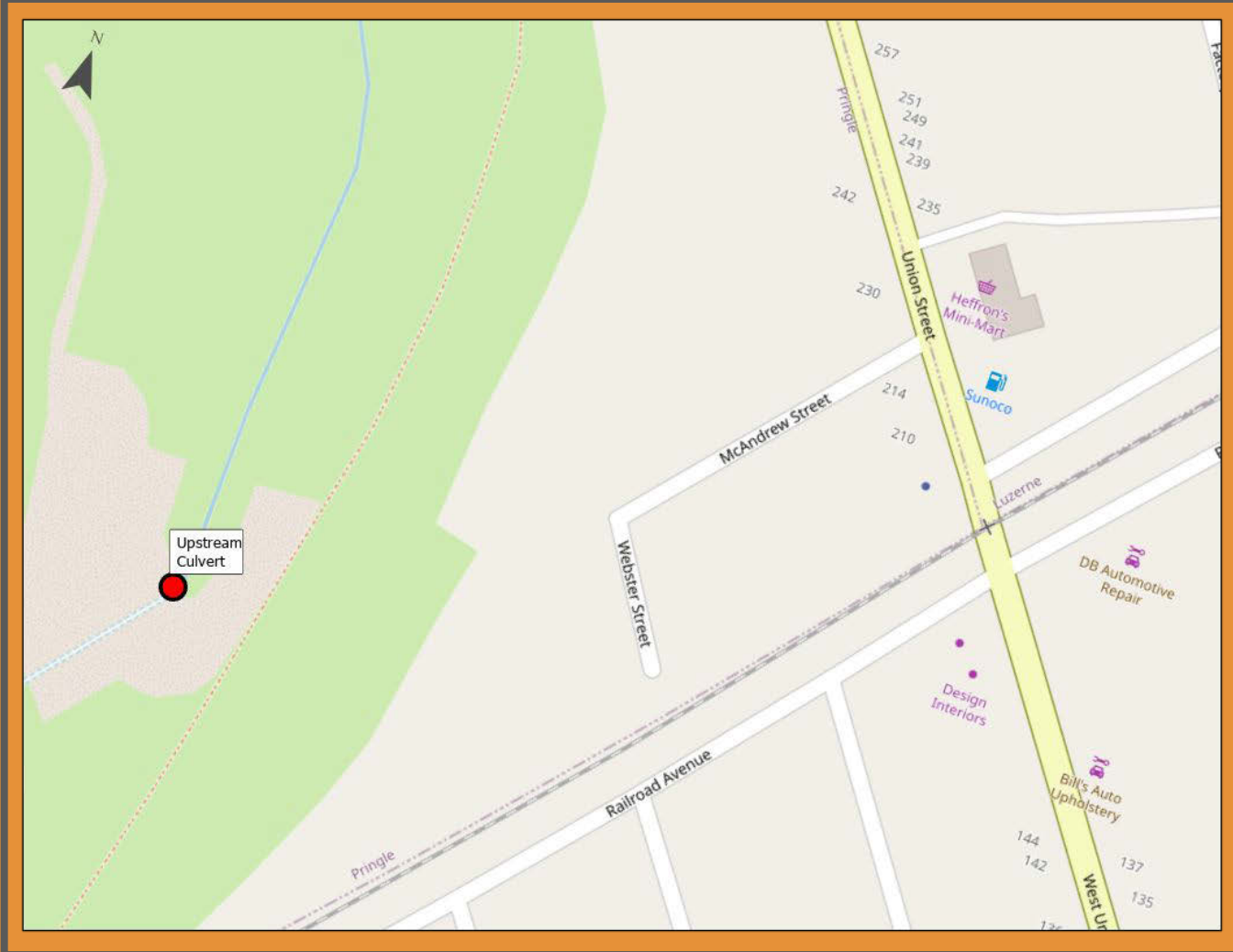
Upstream Culvert in Pringle Borough on Toby Creek

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[Pennsylvania Spatial Data
Access - The Pennsylvania
Geospatial Data
Clearinghouse](#)

[Google Maps Satellite View](#)

[WYOMING VALLEY FLOOD
CONTROL SYSTEM,
WOODWARD PUMPING
STATION](#)



Woodward Pumping Station

WOODWARD PUMPING STATION

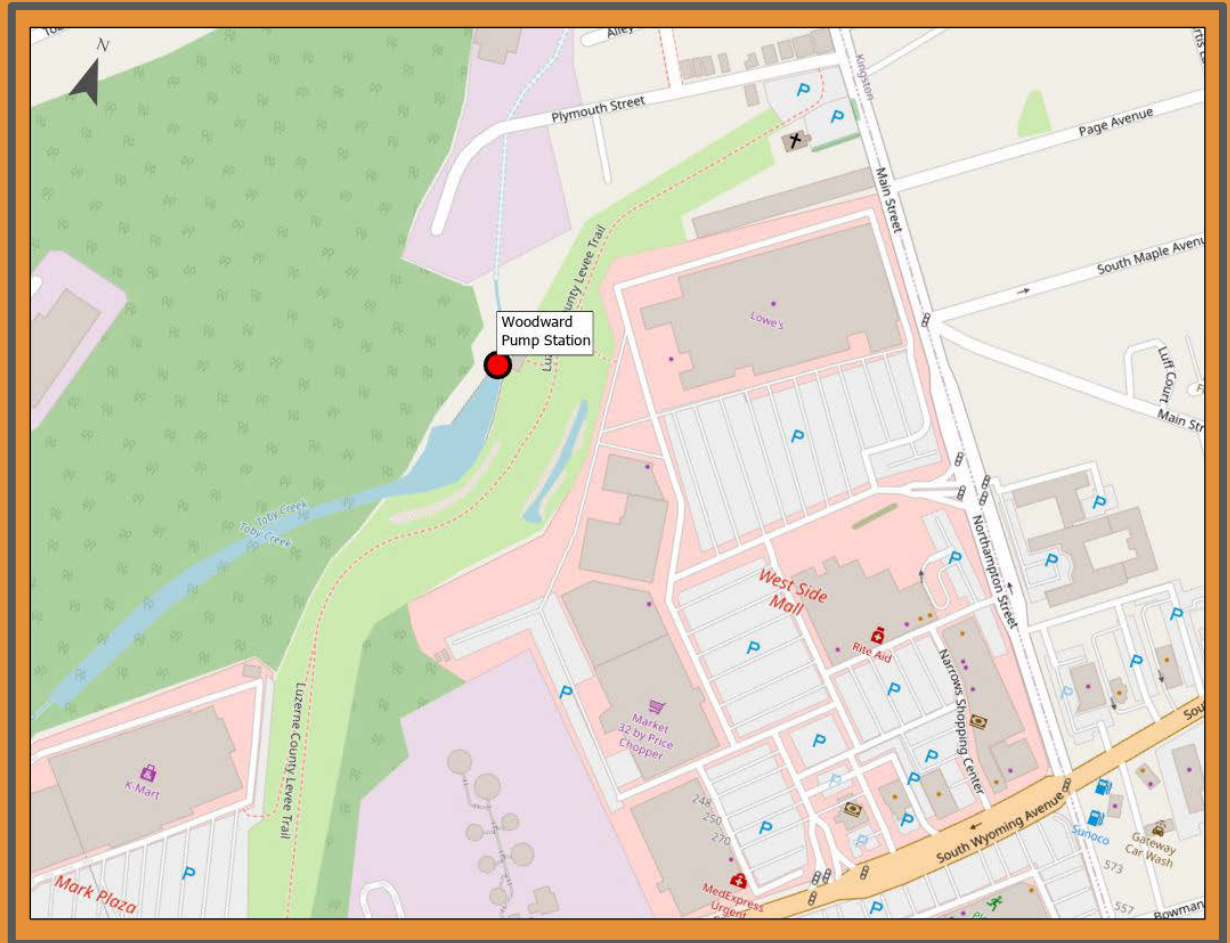
- East of Toby Creek Railroad Crossing of Luzerne and Susquehanna Railway
- It is still active

[ArcGIS Pro](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)

[Google Maps Satellite View](#)

[WYOMING VALLEY FLOOD CONTROL SYSTEM, WOODWARD PUMPING STATION](#)



Woodward Pump Station

- Spurred by the Flood Control Act of 1936
- Constructed as part of Wyoming Valley Flood Control System
- Completed in 1943
- Built by the Army Corps of Engineers
- Built to handle over 250,000 Gallons per Minute
- \$222,650 for structure alone
- \$29,520 for additional equipment

WOODWARD PUMPING STATION

https://books.google.com/books?id=5bZlAAAAMAAJ&pg=PA316&lpg=PA316&dq=toby+creek+impounding+basin&source=bl&ots=wkhxwt883&sig=ACfU3U2a43a8wVaOWiMPVqikUYTyctlXBg&hl=en&sa=X&ved=2ahUKewi7zbCQv_XpAhXFTDABHd4eBNYQ6AEwDnoECAsQAQ#v=onepage&q=toby%20creek%20impounding%20basin&f=false

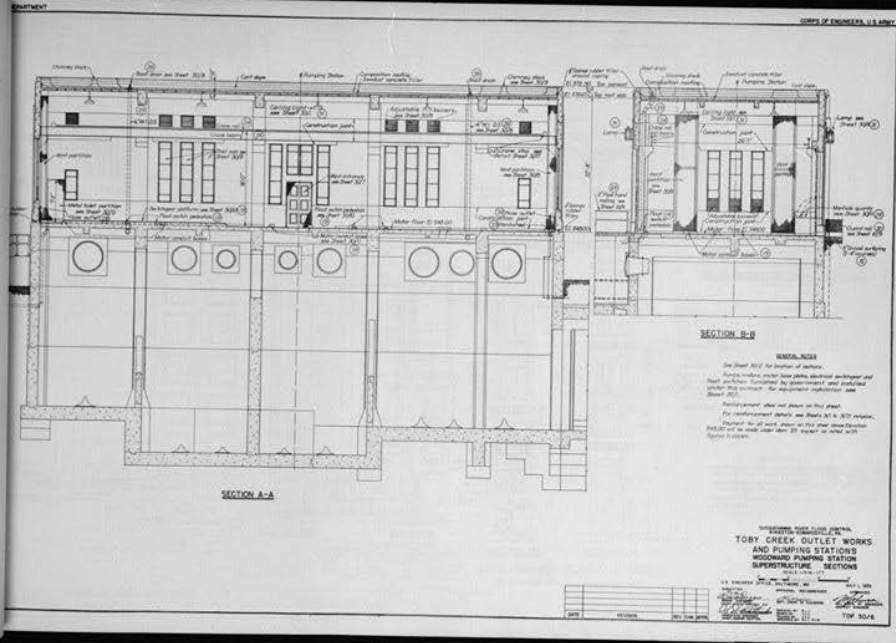
<https://cdm16021.contentdm.oclc.org/digital/collection/p16021coll7/id/13979/rec/1>

Woodward Pump Station

- Station is divided into two separate units with 8 total pumps
 - Sewer and Water Inflow from Kingston Borough are diverted into southern half of station
 - 3 pumps
 - Susquehanna and Toby Creek floodwaters are diverted into the northern half
 - 5 pumps
 - Both halves eventually divert to the Susquehanna River
- Infrastructure of Station
 - 6,400 foot long conduit
 - 3,000 foot long interceptor sewer
 - Relief culvert

Woodward Pumping Station

HAER No. PA-339-A-23



[Wyoming Valley Flood Control System, Woodward Pumping Station, East of Toby Creek crossing by Erie-Lackawanna Railroad, Edwardsville, Luzerne County, PA](#)

Woodward Pumping Station



[Wyoming Valley Flood Control System, Woodward Pumping Station, East of Toby Creek crossing by Erie Lackawanna Railroad, Edwardsville, Luzerne County, PA](#)

Toby Creek Impounding Basin - History

- The detention basin for Toby Creek is located in Pringle, next to Route 309
 - Approximately 10.7 acres
- The basin was constructed as a part of the Wyoming Valley Flood Control System plan as means to prevent excess water from entering the Susquehanna during flood periods
 - The basin contains the inlet culvert for the intercepting Toby Creek sewer, leading to the pump stations
- Along with the Woodward pump station and the 6,600 feet of concrete pipeline, the basin was completed by the Army Corps of Engineers in 1943
- A 1989 report from the Corps of Engineers reported that the basin had prevented \$650,000,000 in flood damage up until that point

History - War Department. (1943). *Report of the Chief of Engineers, U.S. Army, 1942*. Washington D.C.: Government Printing Office. Retrieved from:

https://books.google.com/books?id=5bZIAAAAMAAJ&pg=PA316&lpg=PA316&dq=toby+creek+impounding+basin&source=bl&ots=wkhnxwt883&sig=ACfU3U2a43a8wVaOWiMPVqikUYTyctXBg&hl=en&sa=X&ved=2ahUKewi7zbCQv_XpAhXFTDABHd4eBNYO6A.

United States. Army. Corps of Engineers. North Atlantic Division (1989). *1989 Water Resources Development in PA*. The Division. Retrieved from: <https://cdm16021.contentdm.oclc.org/digital/collection/p16021coll7/id/13979/rec/1>.

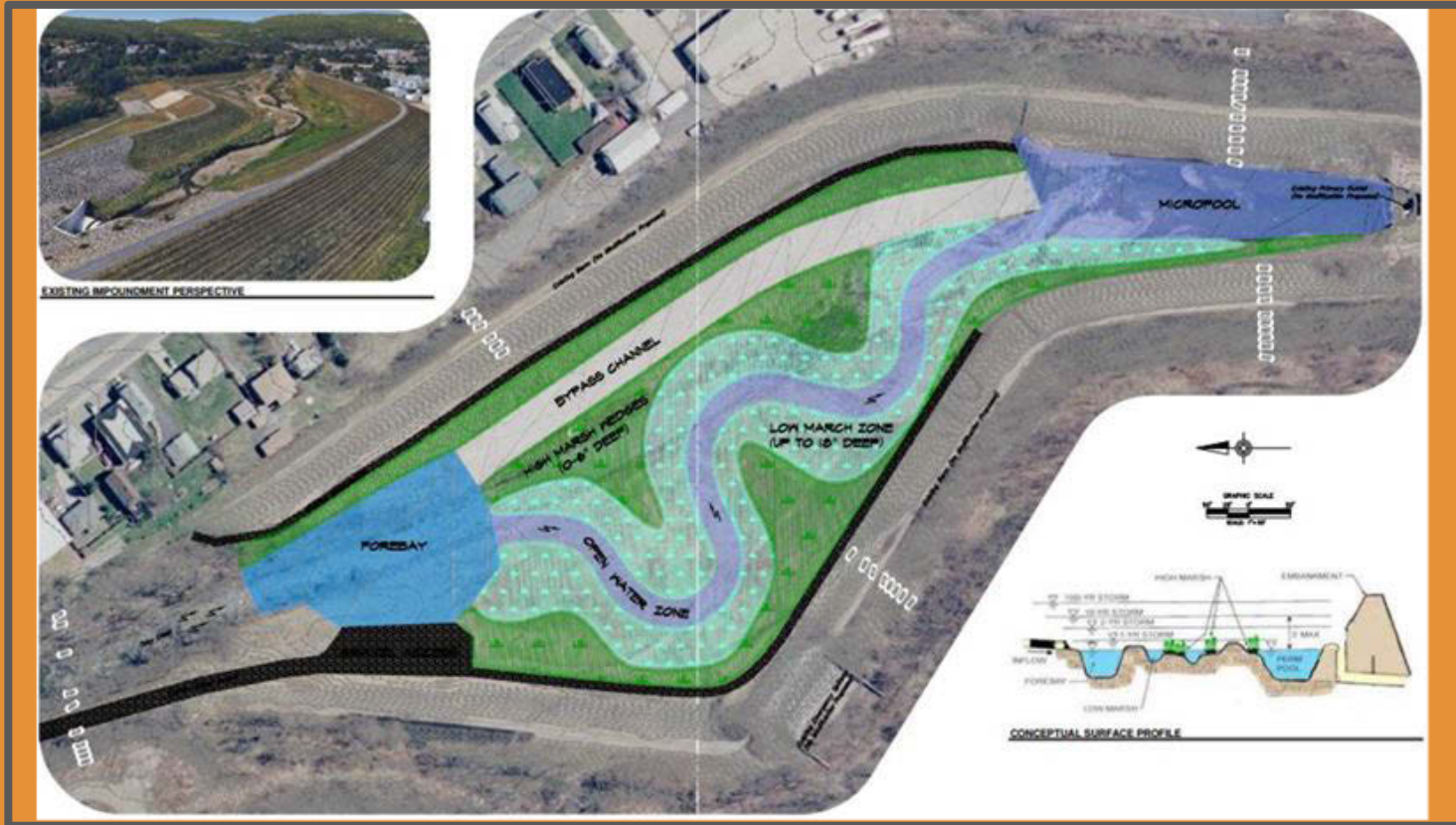
Toby Creek Impounding Basin - Refurbishment

- In 2009, a project to revitalize and elevate the basin was completed
 - The project was overseen by the Corps of Engineers and accomplished by KC Construction
 - The basin was elevated with more 100,000 cubic yards of earth and 6,500 cubic yards of rip rap
- In 2010, phase 2 of the revitalizing was complete, including installing a new concrete spillway on the west side of the basin
- A 2018 Times Leader article discussed the possibility of expanding the basin to better meet potential flood capacity and reduce sediment
 - Official plans and authorization have yet to be presented on this expansion

2009 refurb - Construction, K. (2009, June). *Toby Creek Impounding Basin*. Retrieved from KC Construction: http://www.kcconstruct.com/government_toby.html

Times Leader - Learn-Andes, J. (2018, December 16). Luzerne County flood authority says use of basin for new stormwater project not set in stone. *Times Leader*. Retrieved from: <https://www.timesleader.com/news/727761/luzerne-county-flood-authority-says-use-of-basin-for-new-stormwater-project-not-set-in-stone>.

Toby Creek Impounding Basin - Revitalization Sketch



HRG. (2018, May 29). DEP Providing Counties with the Tools to Craft Local Water Quality Solutions. *Herbert, Rowland & Grubic, Inc.*
Retrieved from: <https://www.hrg-inc.com/category/insights-environmental/>.

Toby Creek Impounding Basin - Revitalization



Construction, K. (2009, June). *Toby Creek Impounding Basin*. Retrieved from KC Construction:
http://www.kcconstruct.com/government_toby.html

Toby Creek Impounding Basin - Revitalization



Construction, K. (2009, June). *Toby Creek Impounding Basin*. Retrieved from KC Construction:

http://www.kcconstruct.com/government_toby.html

Toby Creek Impounding Basin - Revitalization



Construction, K. (2009, June). *Toby Creek Impounding Basin*. Retrieved from KC Construction: http://www.kcconstruct.com/government_toby.html

Toby Creek Impounding Basin - Inlet Culvert



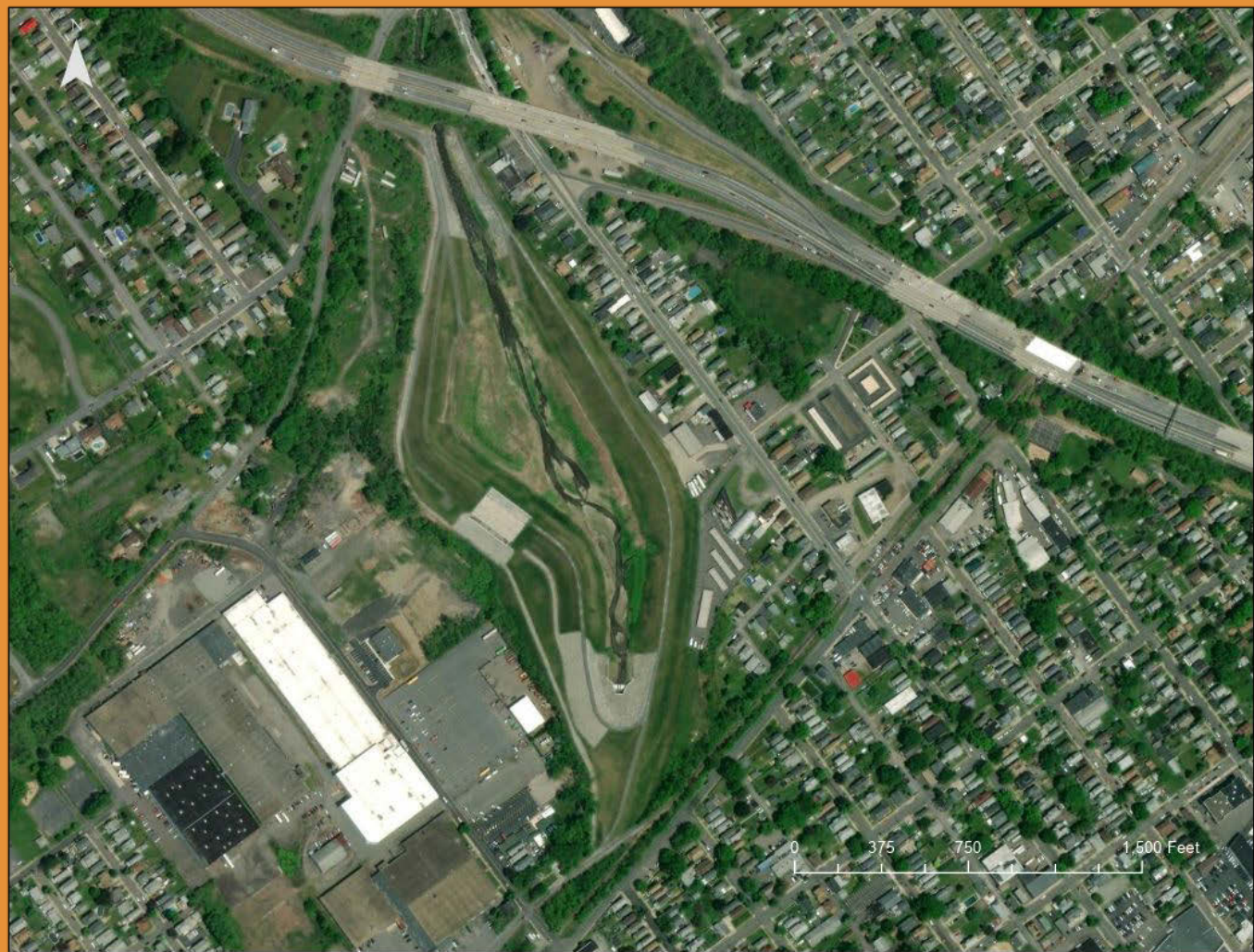
Construction, K. (2009, June). *Toby Creek Impounding Basin*. Retrieved from KC Construction: http://www.kcconstruct.com/government_toby.html

Toby Creek Impounding Basin

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Clearinghouse](#)

[Google Maps Satellite View](#)



1936 Flood - Preventative Measures

- In 1935, the president and Congress developed several emergency assessment and flood prevention plans to provide local jobs and strengthen flood infrastructure
 - One such plan was the construction of the levees along the Susquehanna River, running through Luzerne County
 - This project was overseen by the US Army Corps of Engineers, allotted \$3.65 million for the construction
 - They had been tasked with flood prevention measures in the past, mostly under the justification of improving navigation
- The levee was designed to protect from a river level increase of 33 feet
- Ground was broken in December of 1935 with the prospect of completing the project in November, 1936

Skrapits, E. (2016, March 19). Memorable 1936 flood showed need for levee system along the Susquehanna. *The Citizens Voice*, pp. Retrieved from:

https://www.citizensvoice.com/news/memorable-1936-flood-showed-need-for-levee-system-along-the-susquehanna/article_2f401c43-2e1a-5cfb-bcde-a55f069fc936.html.

Arnold, J. L. (1988). *The Evolution of the 1936 Flood Control Act*. Fort Belvoir: Office of History, United States Army Corps of Engineers.

1936 Flood - Spring Storms

- The flood prevention levees were only 2 months into construction when the waters of the Susquehanna began to rise
 - With a large thaw occurring in Upstate New York and PA, melted snow was pouring into the river, raising water levels 2' and causing mild concern for what was to come
- In the 2nd week of March, a 2 week long storm surge swept across the NE
- Pennsylvania was hit particularly hard out of the surrounding states
 - The river was recorded at a record high crest of 33 feet
 - Out of the total 107 people killed in the flood, 84 died in PA
 - 82,000 buildings were damaged or destroyed
 - Mining facilities regionally shut down due to flooded mine shafts and immense water damage
 - The 1936 flood cost PA approximately \$212 million in damages

Skrapits, E. (2016, March 19). Memorable 1936 flood showed need for levee system along the Susquehanna. *The Citizens Voice*, pp. Retrieved from: https://www.citizensvoice.com/news/memorable-1936-flood-showed-need-for-levee-system-along-the-susquehanna/article_2f401c43-2e1a-5cfb-bcde-a55f069fc936.html.

NOAA. (2020, January 21). *Historical Floods: Susquehanna River at Wilkes-Barre, PA*. Retrieved from National Weather Service: <https://www.weather.gov/media/marfc/FloodClimo/MSU/WilkesBarre.pdf>

Arnold, J. L. (1988). *The Evolution of the 1936 Flood Control Act*. Fort Belvoir: Office of History, United States Army Corps of Engineers.

1936 Flood - Kingston and Swoyersville



006

Overall view of Forty Fort and Swoyersville at bottom, looking east. Old Swoyersville High School is at the bottom center.

LCFPA. (2017). *LCFPA History*. Retrieved from Luzerne County Flood Protection Authority: <http://www.lcfpa.org/history.html>

Buck Mountain Quarry in Kingston Township, PA

- Located at the very edge of the watershed divide between Toby Creek and Abraham Creek

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[Google Maps Satellite View](#)



Buck Mountain Quarry in Kingston Township, PA

[ArcGIS Pro](#)

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[Google Maps Satellite View](#)



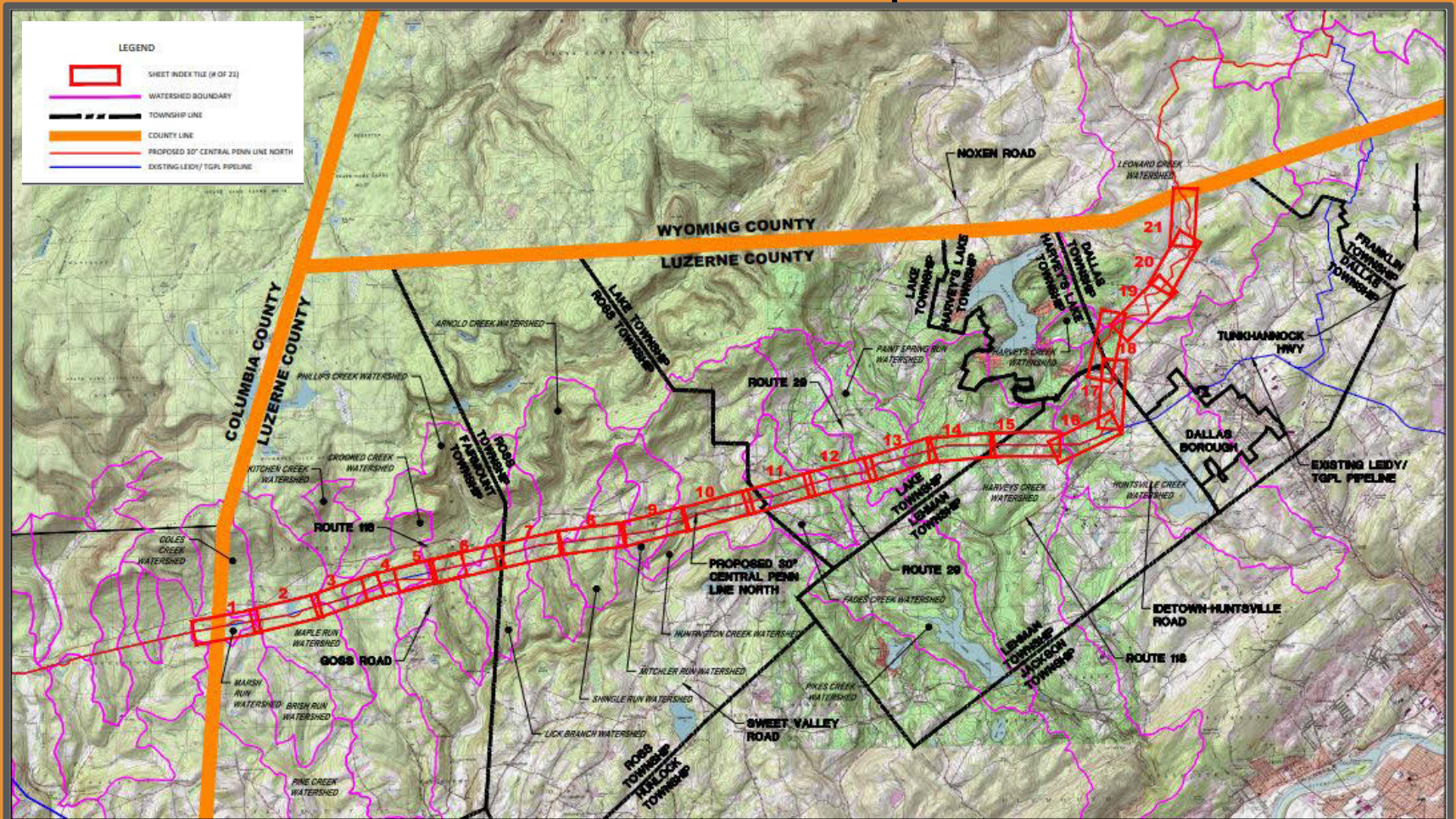
Buck Mountain Quarry

- **Owned by Brdaric Excavating Inc.**
- **Permit No. 40980301**
 - **86.5 Acre Permit**
 - **106,000 tons of Production**
 - **Sand and Gravel Quarry**
 - **2018**

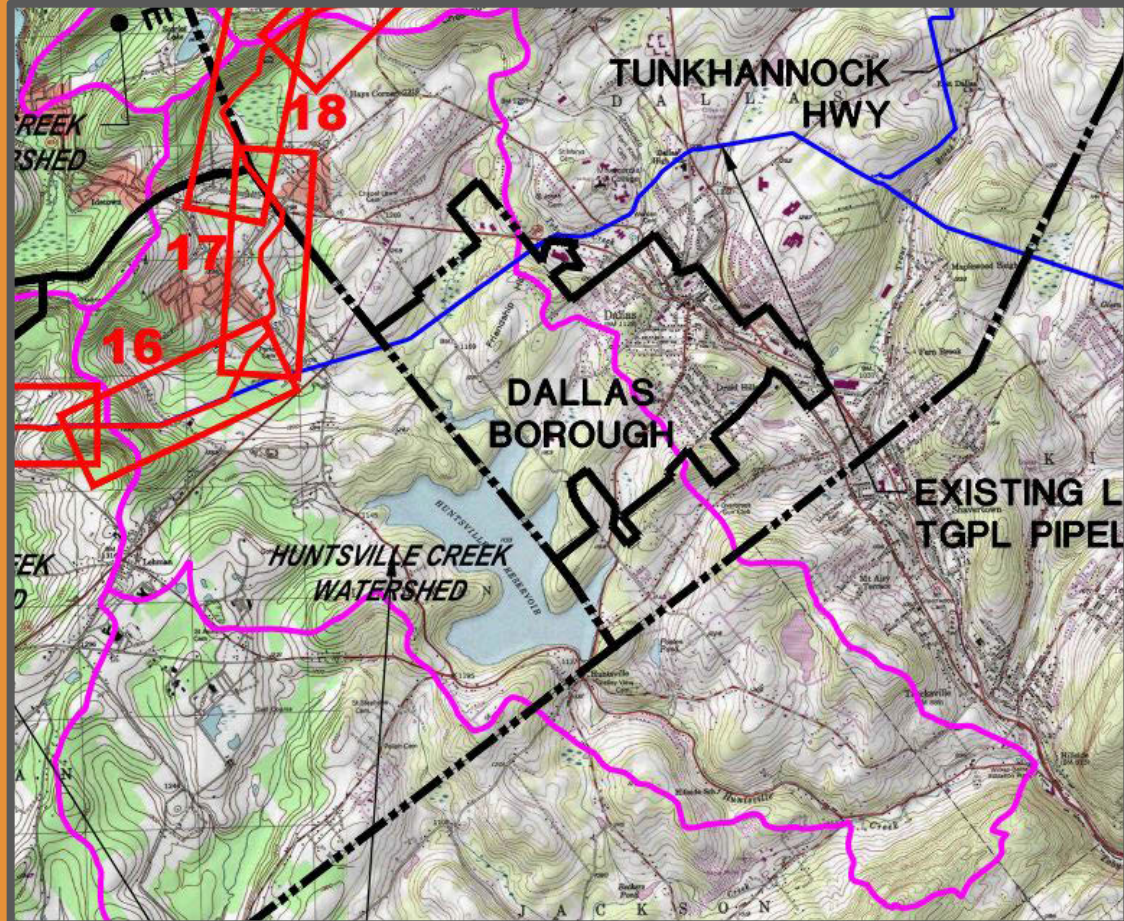


[Google Images, Buck Mountain Quarry, Swoyersville](#)

Atlantic Sunrise Pipeline



Atlantic Sunrise Pipeline

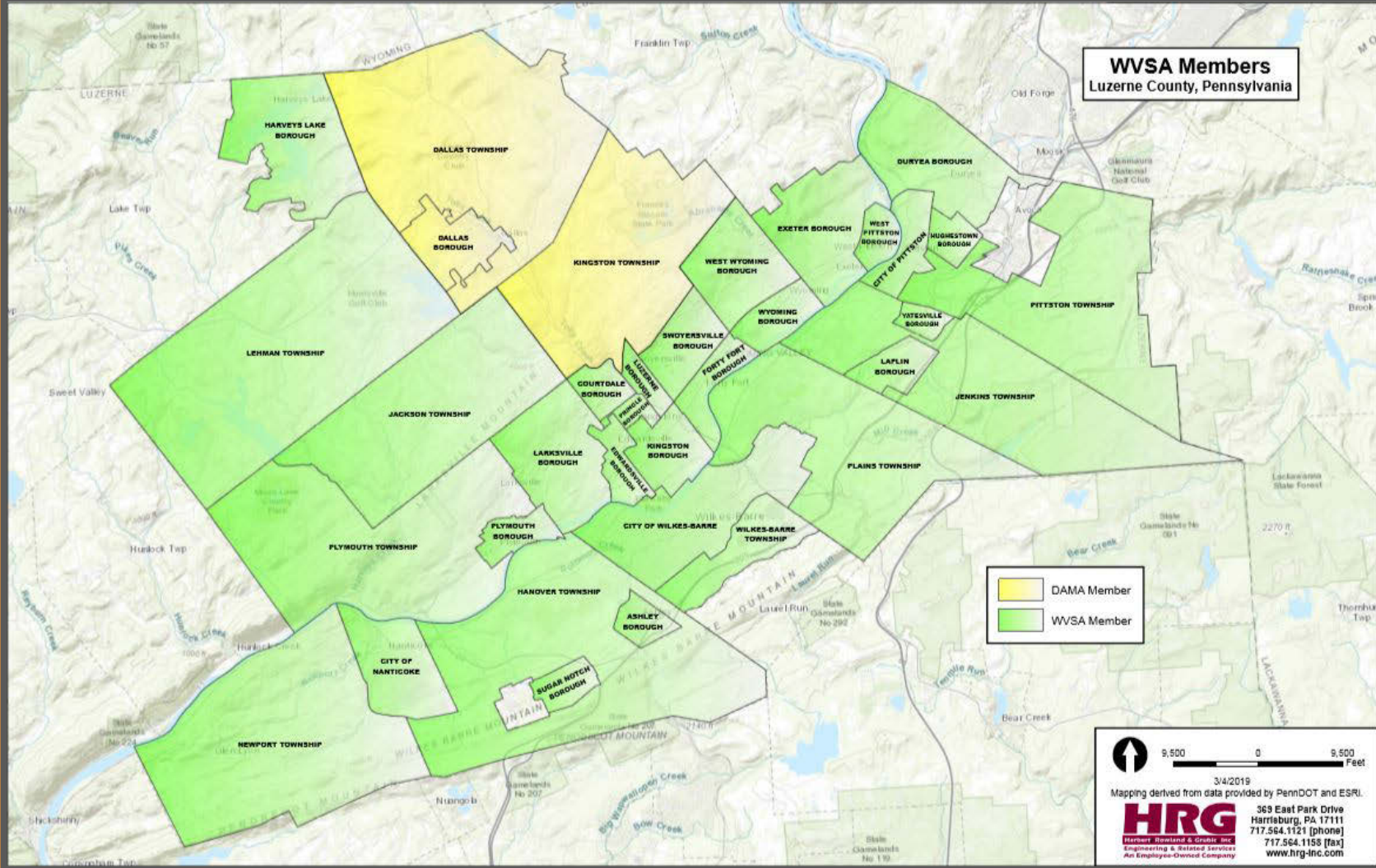


Wyoming Valley Sanitary Authority (WVSA)

- **Best Management Practices (BMPs)**
 - Activities, facilities, designs, measures or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of the Stormwater Management Program. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "non structural" or "structural" as further defined in WVSA's Credit Policy.

- **Stormwater Management Program**
 - The comprehensive program developed and implemented by the WVSA to address stormwater issues, including, but not limited to, reductions in storm runoff rate and volume, improvements to water quality, compliance with state/federal regulatory permit requirements and overall management of the Stormwater Systems.

WVSA Members
Luzerne County, Pennsylvania



DAMA Member
 WWSA Member



3/4/2019
Mapping derived from data provided by PennDOT and ESRI.

HRG
 Harbert, Rowland & Grubb, Inc.
 Engineering & Related Services
 An Employee-Owned Company

363 East Park Drive
 Harrisburg, PA 17111
 717.564.1121 [phone]
 717.564.1155 [fax]
www.hrg-inc.com

[WVSA:](#)
[Regional](#)
[Stormwater](#)
[Management](#)
[Program](#)

WVSA Stormwater Credit Program

- Credit
 - “A SMP Fee reduction usually in the form of an account credit or rebate that a property owner receives for implementing and complying with the established practices and policies.”
- “Stormwater Credits are provided as a means for customers to reduce the amount of their quarterly fee by implementing a creditable Best Management Practice activity to reduce the contribution of stormwater and pollutants to WVSA’s stormwater management system and/or to aid WVSA in meeting its MS4 Permit obligations”
- “The maximum amount of credit received shall not exceed 30% per property for Tier 3 and 15% per property for Tier 2, unless otherwise provided for in these policies.”

WVSA Available Credits under SMP

- Page A2 - 6

WVSA Credit Code	Credit	Eligible Property Type		Max Credit
		Tier 2	Tier 3	
1	Impervious Area located outside of the Urbanized Area	X	X	15%
2	Low Impact Parcel		X	30%
3	BMP Easement	X	X	TBD
4	Existing BMP with WQ Benefit		X	15%
5	Retrofit of an Existing or New BMPs to add a WQ Benefit		X	30%
6	Riparian Buffer		X	20%
7	Stream Restoration	X	X	TBD
8	Turf and Landscape Management Program		X	15%
9	Pervious Pavement	X	X	15%
10	Separate MS4 Permit	X	X	40%
11	Education Credit	X	X	15%
12	Stormwater Partnership Credit	X	X	TBD
13	Public Participation Credit Donation		X	10%
14	Rain Barrels & Downspout Disconnection	X	X	15%
15	Green Roofs		X	15%
16	Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species		X	20%

WVSA Credit Eligibility

“To be eligible for a Credit, the property must have been assigned a minimum of 500 SF of IA and there must not be any outstanding and unpaid SMP Fees or sanitary sewer fees against the property. Owners must submit the appropriate Credit Application along with any documentation required by WVSA.”

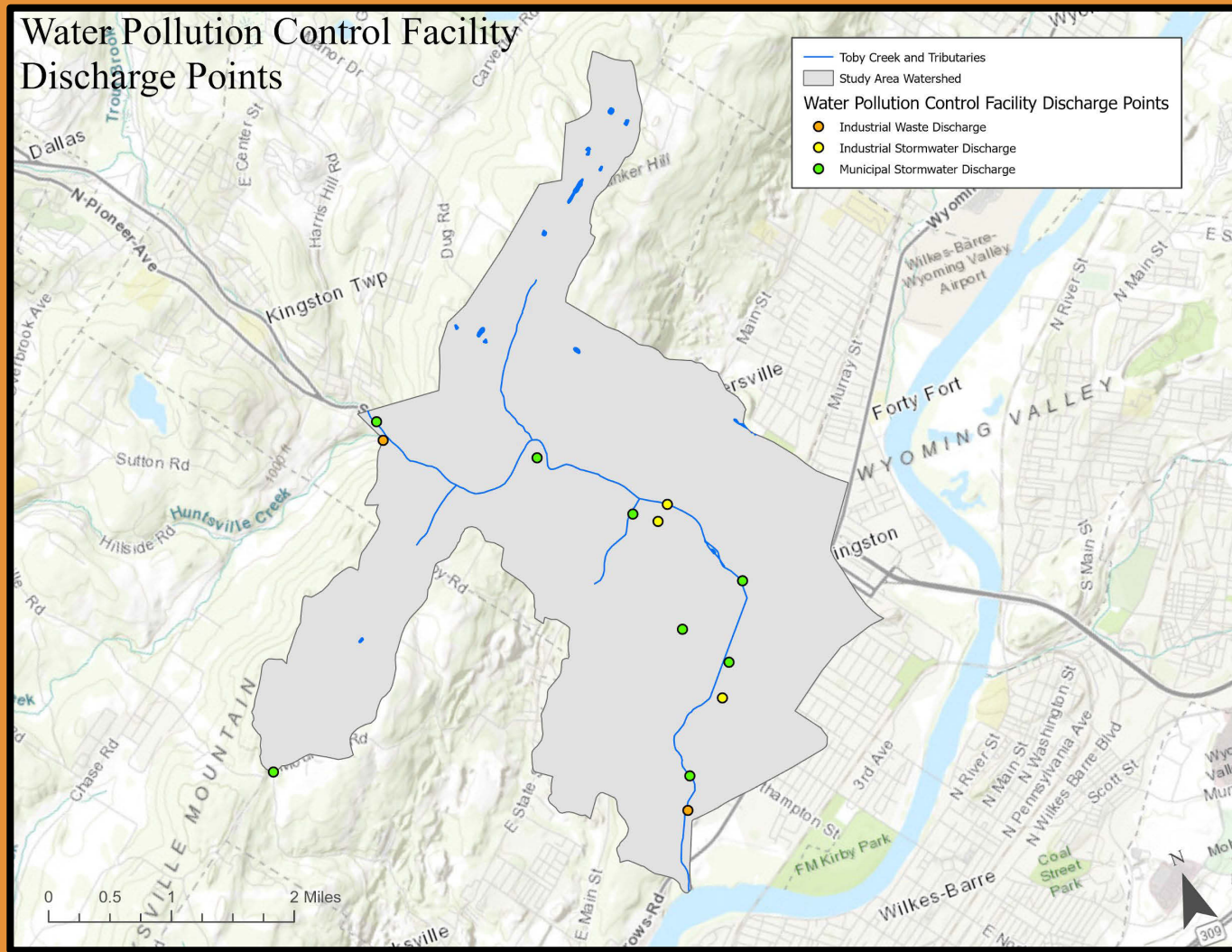
DAMA Stormwater Participating Municipalities

- Participants
 - Dallas Borough
 - Kingston Township
 - Dallas Township

Water Pollution Control Facilities (DEP)

- DEP Primary Facility related to Water Pollution Control Program (WPCP)
- Includes
 - Treatment Plants and Storage Units
 - Land and Stream Discharges
 - Conveyance Systems and Conduits
 - Cooling Water Intake Structures
 - Biosolids Treatment and Processing
 - Agricultural Activities, Pesticide Treatment Areas, Manure Management, CAFOs
 - Internal and Groundwater Monitoring Points

Water Pollution Control Facility Discharge Points



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[Google Maps Satellite View](#)

[Pennsylvania Spatial Data Access - The Pennsylvania Geospatial Data Clearinghouse](#)