

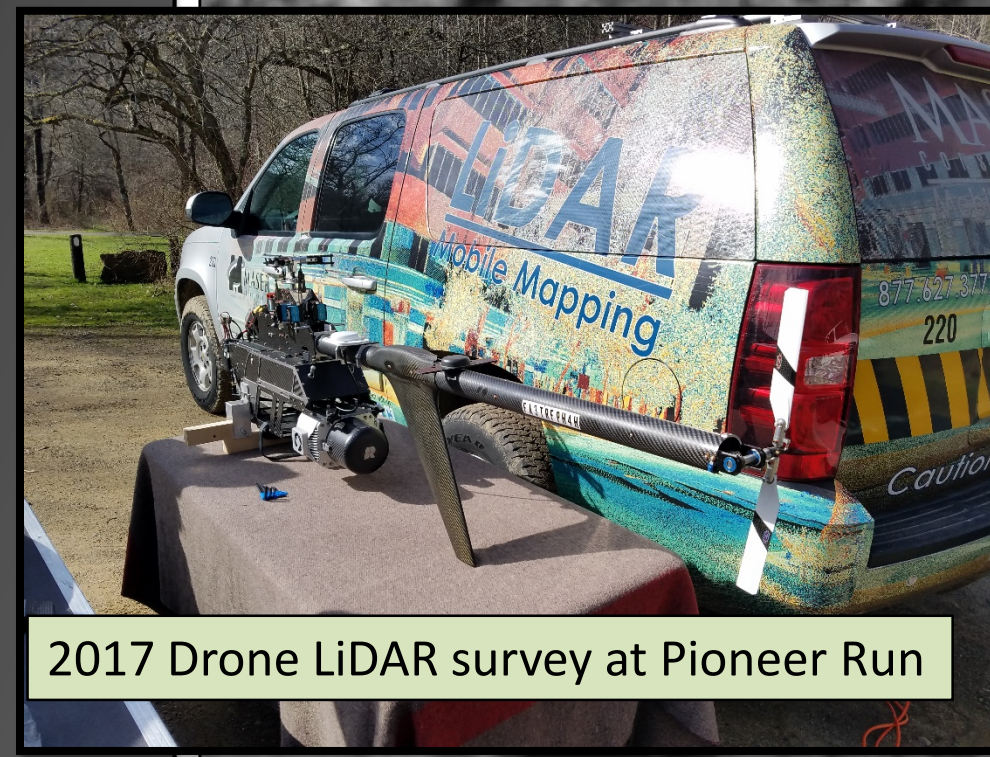
# LiDAR mapping of 1860s' oil fields along Pioneer Run, Oil Creek State Park, Titusville, Pennsylvania

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Oil Creek State Park is the site of America's oldest oil field, which developed from the oil strike by Colonel Edwin Drake in August 1859 at a site just south of Titusville, PA. By the mid-1860s, dozens of oil wells dotted the hillsides near Pioneer Run and a community of 2,000 people settled there where hotels, boarding houses, saloons, stores, and a railroad station made up the town of Pioneer. A local photographer, John Mather, became the historiographer that documented the birth and development of the oil industry. For more than 50 years, his photographs presented a detailed story showing life in the oil fields. At Pioneer, the oil boom did not last long, and by the mid-1870s, Pioneer was a ghost town. Today, the lush wooded hillsides of Oil Creek State Park at Pioneer Run in Western Pennsylvania bear little resemblance to the 1865 landscape when dozens of oil derricks, crude wooden support structures, and rutted access trails prevailed. The wooden derricks are gone and trees now cover the former well sites, which now may present environmental, safety, and economic concerns in the form of possible methane leaks and physical dangers. Locating these wells is the first step in properly sealing the well bore and insuring the site is environmentally safe.

To find these historic wells, NETL flew a drone survey over the site in May 2017 equipped with a LiDAR sensor. Features such as drill pads, service roads, and the well site can become viewable in images created from the LiDAR point cloud data. These features appear as a topographic anomaly in the natural landscape. One objective of this study was to evaluate the effectiveness of an airborne LiDAR survey to locate historic wells. The John Mather photographs have provided valuable insights into understanding the structures that once occupied the land surface. For more information contact Jim Sams (email [jsams@netl.doe.gov](mailto:jsams@netl.doe.gov)).

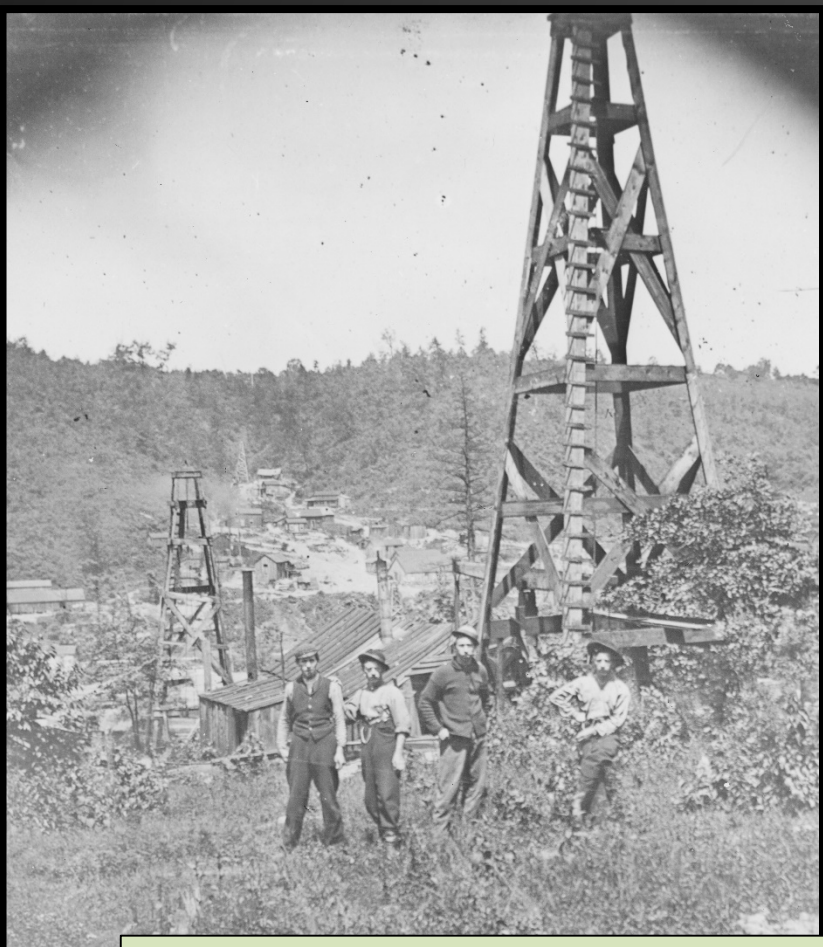


2017 Drone LiDAR survey at Pioneer Run

This 1865 John Mather photograph is of the hillside shown at right. The footprint of the 17 oil wells, pump houses, storage tanks, and wooden buildings remain in the landscape today.



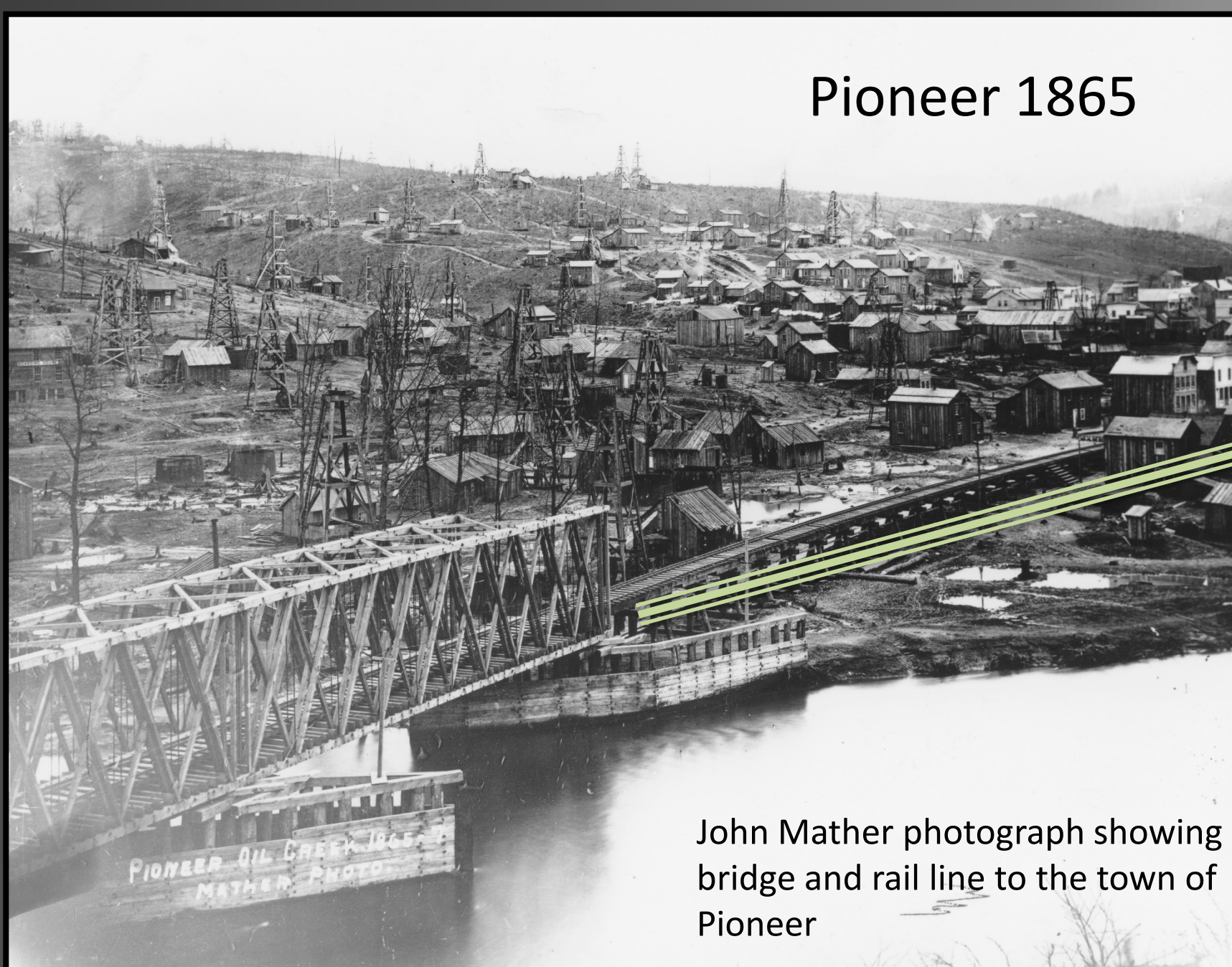
Oil Storage Tank



The open well bore at right was found by analysis of a LiDAR surface image which revealed an unnatural depression in the landscape.

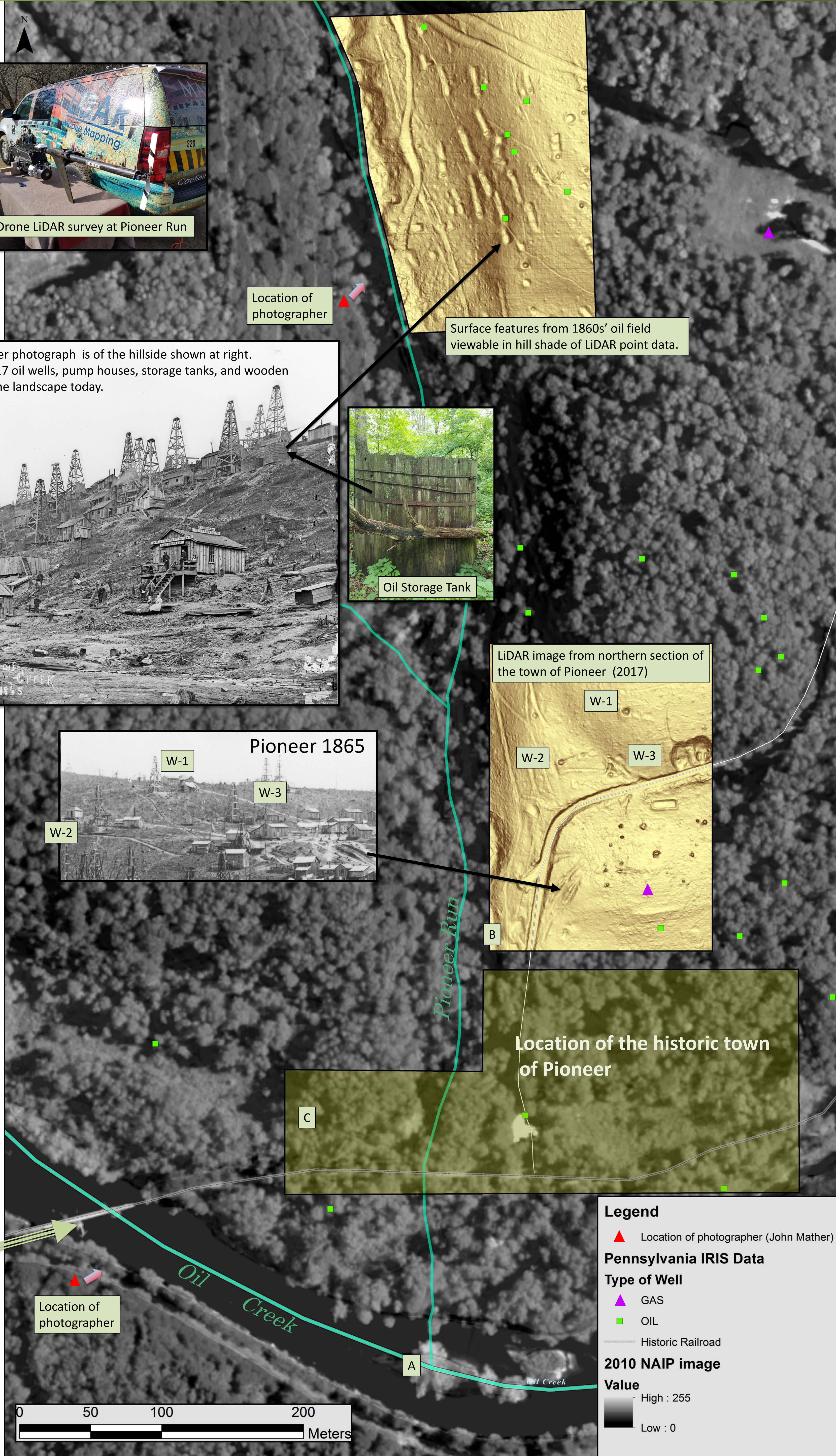


The photograph below shows an image of the 1860s' oil field along the hillside above the north bank of Oil Creek at the confluence with Pioneer Run (A on map at right). In the foreground is the floodplain of Oil Creek. The derrick and pump houses were constructed of wood on foundations leveled into the hillslope. The footprints of the foundations and roads remain in the landscape and are viewable in the shaded relief image created from high resolution LiDAR elevation data (B). Today the surface is now covered by a mature hardwood forest (C).



Pioneer 1865

John Mather photograph showing bridge and rail line to the town of Pioneer



Location of photographer

Surface features from 1860s' oil field viewable in hill shade of LiDAR point data.

LiDAR image from northern section of the town of Pioneer (2017)

W-1 W-2 W-3

Location of the historic town of Pioneer

Pioneer 1865 W-1 W-2 W-3

Location of photographer

**Legend**

- ▲ Location of photographer (John Mather)

**Pennsylvania IRIS Data**

**Type of Well**

- ▲ GAS
- OIL

— Historic Railroad

**2010 NAIP image**

**Value**

- High : 255
- Low : 0