



West Amwell Township
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Regarding: PennEast Pipeline Docket #PF15-1

The residents as well as the governing body of West Amwell Township are opposed to any pipeline construction within the Township because of the severe impacts a pipeline would have on the very sensitive and unique environment of our community.

The Township has taken considerable efforts to protect our forests, unique geologic formations, water resources, wetlands, thin soils, and wildlife. To that end, the Township has preserved over 5500 acres of farmland and forests. Additionally, the Township has adopted ordinances to protect our streams, soils, rock formations, woodlands, critical areas, and rural character.

The proposed pipelines will cause irreparable negative impacts to the following environmental features in West Amwell:

The Sourland Mountain

The Sourland Mountain is the last and only contiguous forested area in central New Jersey. (Figure 1)

The Sourland region encompasses a complex ecosystem of forest, wetlands and grasslands. Its mosaic of habitats is home to an incredibly rich diversity of animal and plant species, many rare or endangered. The forest is especially important as a breeding area for migratory songbirds from Mexico, Central and South America, particularly those who nest only in large wooded areas. Fragmentation of this forest will result in loss of habitat and loss of diversity.

The proposed routes of the pipeline through the Sourland Mountain will invade the habitats of threatened and endangered species protected by the Federal Endangered Species Act, such as the bald eagle, the wood turtle, the long tailed salamander, the Indiana bat, the American Kestrel, and various plants and other animals protected by federal and state law. Bald eagles and nesting bald eagles have been sighted in and around the Lambertville (United Water Company) reservoir, which is located in West Amwell. Over 90 percent of the Sourland Region is habitat for threatened and endangered species.

The Sourland Mountain region may be the last refuge of some complex plant communities that once flourished in central New Jersey. Sixteen plant species that are either endangered or of special concern in New Jersey have been documented in the region to date.

Removal of the forest, even in small patches, can have impacts extending up to 1,000 feet in all directions and creates an “edge effect,” where the deep woods habitat of the interior forest is fragmented and breeding bird habitat is threatened by increased nest predation. Many Sourland region species rely on both the quantity and the quality of the forest and understory, and will disappear as the forest becomes fragmented and degraded.

Because of its extreme environmental importance, the Sourland Mountain should not be disturbed in any way.

Hydrogeology

Geology and Groundwater

Diabase

The Sourland Mountain/Ridge is the most prominent topographic feature within the Township and is underlain by diabase rock. The largest diabase sills are encountered beneath Sourland Mountain. Two large linear sills are directly connected to Sourland Mountain. One of these sills parallels and is directly north of Rocktown-Lambertville Road and the second one trends to the southwest from Wilson Road to Mount Airy. Two smaller sills have also been mapped in the Township. The first one is located north of South Hunterdon Regional Elementary School in West Amwell and the second intersects the border with Lambertville. (Figure 2)

The diabase formation is the poorest source of groundwater. The rock has virtually no permeability. Because this formation is relatively young compared to other formations, it has not been subjected to folding and faulting that allow groundwater to move toward the surface. In addition, surface water generated by rainfall and snow runs off rapidly with virtually no opportunity for infiltration. Conditions created by the diabase formation have also metamorphosed portions of the adjacent geologic formations, resulting in similar conditions in these areas.

Diabase was formed by magmas (molten rock) and is dense and hard. These dense, hard, and poorly fractured crystalline rocks have a thickness ranging from 1,200 to 1,300 feet. Dense hard rock will create a major problem with blasting.

That diabase rock has no intergranular openings, it therefore has no primary porosity for transmitting water. Groundwater storage and transmittal depend on the secondary porosity or the openings between blocks of impermeable rock. These openings are typically associated

with fractures from faults or found near joints or along bedding planes. “Depending on the proximity to regional or local fault systems and the brittleness of the rocks, the spacing between these vertical to near vertical joints will range from fractions of an inch to several tens or hundreds of feet. In some areas, the joints serve to interconnect fractured beds and in others, the beds interconnect the joints”. (Evaluation of Groundwater Resources of West Amwell Township, Matthew Mulhall, PG, M2 Associates, 2003).

Blasting through the hard, dense diabase rock formations of West Amwell during pipeline construction will seriously cause these fractures to shift and/or be blocked. Our wells and our water supply will be seriously impacted. An explosion of the pipeline would destroy the wells and water supply of the residents of the Township both nearby and at a distance, as these fractures containing groundwater can travel for a great distance. We are dependent on water from these fractures.

Since the primary source of drinking water for Township residents is groundwater, the Township of West Amwell has protected its valuable groundwater resources for current and future residents and businesses. Township officials understand that the protection of water quality and quantity is critical to supporting public health and quality of life. They also understand that protection of these resources is not only critical for their own citizens but also for other citizens of New Jersey and Pennsylvania located downstream of the West Amwell community.

The diabase intrusions in the Township are an important part of our geology and the groundwater supply of the residents of West Amwell. Pipeline intrusion would very much compromise the groundwater supply for our residents.

“Future development must reflect land use considerations that preserve the quality and availability of West Amwell’s limited groundwater resources”. – (2012 Natural Resource Inventory for West Amwell.)

Lockatong, Passaic, and Stockton formations

See Figure 2 for the Lockatong, Passaic, and Stockton formations in West Amwell.

To quote Professor Tullis Onstott
Dept. of Geosciences, Princeton University
1-18-2015 Comments to FERC

“The proposed routes through Hunterdon County cut right through the Triassic shales of the Passaic and Lockatong Formations. It has been long established that these formations, particularly the Lockatong argillite belt that runs through Hunterdon, are the sources of arsenic in the groundwater in this region. Several New Jersey Geological Survey reports document the

high arsenic levels in the wells in Hunterdon and Mercer counties. This belt of rocks form an arsenic hot spot. The groundwater supply is known to be vulnerable in these counties, but Hunterdon County is uniquely vulnerable because the farms and rural homes all rely upon well water. They have no access to the public water utilities of their much more populated neighbors. The privately-owned wells are the source of drinking water for families and for their livestock. These wells tap a surficial, unconfined, fractured rock aquifer in the Lockatong, Passiac and Stockton formations. The proposed PennEast pipeline cuts right through the arsenic hot spot where it can do the most damage to the drinking water supplies of the inhabitants”.

Wells in West Amwell have been documented to contain arsenic. Our drinking water supplies do not need to be further contaminated with arsenic.

Clean water, our rights.

Flemington-Furlong Fault

The Flemington-Furlong fault lines are in the northern and western portions of West Amwell. (Figure 3).

Although the Eastern part of the United States has fewer and generally smaller earthquakes than the West, at least two factors increase the earthquake risk in New Jersey. Due to geologic differences, eastern earthquakes effect areas ten times larger than western ones of the same magnitude. Also, the eastern United States is more densely populated, and New Jersey is the most densely populated state in the nation. (NJDEP).

Pipeline construction would contribute to ground disturbances, and could trigger earthquakes. After pipeline construction, earthquakes, however minor, could cause significant leaks in the high pressure gas pipeline, as well as damaging the aquifers we depend on for drinking water.

Surface Water

Delaware River

Most of the streams in West Amwell are tributaries of the Delaware River. The Delaware River is designated as a National Wild and Scenic River.

From the Delaware River Basin Commission website:

In an October 18, 2000 letter to U.S. Rep. Rush Holt, President Bill Clinton wrote:

"As you know, the future of the Delaware River, the longest free-flowing river in the eastern United States, is vital to the economy of the regions surrounding this important waterway. Wild

and Scenic River designation will encourage natural and historic resource preservation and protect precious open space. By allowing local municipalities to sustain and protect the Delaware River as one of our nation's national treasures, this law will help to ensure the vitality of these communities and the quality of life of their citizens."

The Delaware River, as a National Treasure, should not be crossed by a very potentially contaminating pipeline, capable of leaks and explosions. Our clean water is at stake. Clean water for millions of the residents of New Jersey and Pennsylvania and clean water for the nationally designated Wild and Scenic Delaware River.

West Amwell, Alexauken Creek

The Alexauken Creek is the principal surface water body in West Amwell, draining 15.12 square miles including 28.64 stream miles and 52.31 lake acres. It has been classified by the State of New Jersey as a Category 1 waterbody based on its connection to the federally protected Delaware River, its value as habitat for threatened and endangered species and the relatively undeveloped nature of its watershed.

Category 1 waters are those waters designated in the tables in N.J.A.C. 7:9B- 1.15(c) through (h), for purposes of implementing the anti-degradation policies set forth at N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality characteristics.

The proposed routes of the PennEast pipeline will disrupt/contaminate the Alexauken Creek and its buffers and its watershed numerous times. Buffers for the Alexauken Creek are 300 feet on either side of the midline. This Category 1 waterway is protected under NJDEP's Surface Water Quality Standards in conformance with the Federal Clean Water Act.

Pipeline construction activities result in impacts affecting water resources, including: erosion and sedimentation, loss of riparian vegetation, forest and habitat loss and fragmentation, and cumulative impacts. In addition, these negative impacts are irreparable. The Alexauken Creek and its tributaries are protected from degradation. It appears that PennEast will ignore these protections for the water supply for millions of residents.

West Amwell and the Federal Clean Water Act

West Amwell is currently the recipient of a \$570,000 Federal Clean Water Act 319(h) grant provided to implement our approved management plan for the Alexauken Creek. In 2005, West Amwell had received a 319h (\$239,000) grant to prepare a management plan for the Alexauken Creek. The NJDEP is responsible for administering the Federal 319(h) grants for watershed restoration and protection which is a priority not only for New Jersey but nationally as well, as can be attested by the over \$800,000 grant expenses.

The current grant for the Alexauken Creek is to address the thermal impairments that affect the stream's capability to support a trout fishery as well as to reduce nutrient, sediment and pathogen loading in order to preserve the stream's Category One nature.

West Amwell has worked very hard to protect the Alexauken Creek and its tributaries and to protect the quality of our water. The Federal government has provided over \$800,000 to restore and protect the Alexauken Creek. The proposed pipeline's contamination and irreparable destruction is in direct opposition to the intent of the Federal Clean Water Act.

West Amwell, Swan Creek and Lambertville's water supply

Swan Creek and its tributaries feed the United Water Company Reservoir, the Delaware and Raritan Canal, and the Delaware River, drinking water sources for the city of Lambertville (population close to 4,000 residents) and New Jersey and Pennsylvania communities downstream (number of residents in the millions).

A PennEast proposed pipeline route, which potentially co-locates with the electric transmission lines, comes dangerously close (within 200 feet) of the United Water Company reservoir, with serious potential to contaminate the water supplies for Lambertville and downstream, during construction and after. It also crosses Swan Creek, with considerable negative impact on the stream. It also appears to cross near or through the United Water Company water treatment plant. (Figure 4).

Wetlands

NJDEP wetland mapping indicates that 1,146 acres of wetlands exist in West Amwell Township. The predominant wetland type is deciduous/mixed forest, composing 90.02 percent of the total acreage of wetlands at 1,042.13 acres. They are located primarily on the Sourland Mountain, along stream corridors, and in isolated pockets throughout the Township.

Wetlands play a particularly important role on the Sourland Mountain Ridge and are a valuable part of the ecosystem. In addition to acting as headwaters, wetland systems capture and retain precipitation, slowly releasing it into the ground and recharging aquifers. This is critical as recharge on the Mountain is extremely low.

See Figure 5 for the wetlands in West Amwell. Note that a large percentage of wetlands are in the Sourland Mountain. This is another reason why the mountain should not be crossed by the PennEast pipeline.

Soils - Erosion

Erosion can be a concern and the erodability of a soil type is determined by the soil infiltration capacity and the ease with which particles dislodge in precipitation or under flow conditions.

Soils with low erodability show significant signs of erosion when occurring on steep slopes. Figure 6 depicts highly erodable soils in the Township. West Amwell has very few areas which are not highly erodable or potentially highly erodable.

“The large amount of soil disturbance involved in laying pipelines also poses erosion and sedimentation risks, particularly in steeper areas, near water bodies, and during heavy rain events. Heavy rains during two tropical storms in August and September 2011 caused extensive failures to erosion and sediment controls on pipelines under construction in north central Pennsylvania (Tanfani & McCoy, 2011). Stream and wetland crossings may create erosion and sedimentation problems, as well, especially with an “open cut” process, and there is a risk of stream bed collapse with “bore crossing” techniques if poorly designed or executed. The “open cut” process uses a trench dug across the stream channel with water temporarily diverted around the trench, while the “bore crossing” technique uses a drill or hydraulic ram to create a bore for the pipeline under the stream.” (Report 2 of the Pennsylvania Energy Impacts Assessment December 16, 2011).

Very steep slopes are documented on the Sourland Mountain, another reason to not cross and violate this esteemed forested ridge. Pipeline construction will irreparably damage this unique ecosystem. The pipeline should not destroy this major and last unique forested area in central New Jersey.

Soils – Diabase and contaminated soils

“West Amwell has a long history of protecting the natural environment, preserving farmland and respecting the carrying capacity and constraints of the land. With these planning objectives in mind West Amwell wishes to protect soil as a necessary and valuable resource in the Township. Soil is an essential component of farming and therefore key to farmland productivity. It is a vital part of woodland habitat, where it provides the ecological underpinnings for a healthy and diverse population of flora and fauna. Soil removal can also impact neighbors in such areas as drainage and runoff”. (West Amwell Township ordinance: Chapter 138, Soil Removal)

The diabase rock formations in the Township are overlain with very thin soils. Removal of massive amounts of diabase rock will necessitate importation of soil to cover the pipeline. West

Amwell does not wish to import contaminated soils. PennEast cannot guarantee the pristine nature of soils to be imported. Farms will be impacted with possibly contaminated soils. Runoff of contaminants to groundwater and water supplies to the Delaware River recipients cannot be ignored.

All pipelines develop leaks over time with the potential to leach further industrial chemicals into surrounding soils and to contaminate groundwater. The use of chemical herbicides to maintain pipeline rights of way adds another source of possible contamination.

From West Amwell Township ordinance: Chapter 138, Soil Removal: Large rocks and boulders (greater than three-foot minimum diameter at any point) indicative of the rocky landscape of the Sourland Mountains shall not be removed from the Sourland Regional Planning District (SRPD). PennEast will totally disregard our ordinances and the reasons for such protections.

Public Safety – Proximity of the proposed pipelines to South Hunterdon Schools

The original pipeline route is approximately 650 feet from South Hunterdon Regional High School.

The preferred alternate route was on the northern border of South Hunterdon Regional Elementary School, approximately 400 feet from the school and located even closer to the playing fields. See below, “Explosions.” It now appears to have moved further north, but we have no official confirmation of this nor any assurance that the line will not revert to its original route.

Public Safety - Explosions

Penn East is proposing a 36-inch natural gas transmission line through West Amwell. This pipeline will have natural gas flowing at the rate of 1 billion cubic feet per day. The effects of an explosion with this rate of energy flow would be disastrous. A 36 inch diameter natural gas transmission line under high pressure, if exploded, could cause radiant heat to ignite secondary fires within a 1,000 foot radius.

PennEast downplays issues of pipeline safety and claims that they will incorporate the best safety practices from construction through operation.

However, in 2012 alone, natural gas transmission lines accounted for more than 80 explosions and fires according to the Pipeline Hazardous Materials Safety Administration (PHMSA), a

branch of the US Department of Transportation that inspects and regulates the nation's pipelines. Of the 80 incidents, 38 were classified as significant, PHMSA data show. The 2012 accidents and fires reportedly caused seven injuries, and more than \$44 million of damage.

Since 2001, however, natural gas pipeline explosions and other accidents have resulted in the loss of at least 45 lives and many more serious injuries, usually from burns. (FracDallas.org)

In September 2010, a natural gas pipeline explosion rocked neighborhoods of San Bruno, California, killing eight people. The National Transportation Safety Board investigated the cause, and in the words of Chairman Deborah Hersman, found “troubling revelations ... about a company that exploited weaknesses in a lax system of oversight and government agencies that placed a blind trust in operators to the detriment of public safety.” And, according to a *Philadelphia Inquirer* investigative report, such revelations ring true in Pennsylvania, where “hundreds of miles of high-pressure pipelines already have been installed in the shale fields with no government safety checks — no construction standards, no inspections, and no monitoring.” (Food&Water Watch, Natural gas pipeline problems from beginning to end, January 2013)

Public Safety – Co-location with transmission lines

There is also concern with the co-location of a large, high pressure gas line to overhead electrical transmission lines.

“Transmission lines are considered one of the major sources of magnetic fields. In recent years electromagnetic field (EMF) interference with buried pipelines has been of great interest in the literature. The EMF interference on pipelines located in utility corridors is a real and serious problem which can place both operator safety and pipeline integrity at risk. Installing pipelines in energy utility corridors containing high-voltage AC transmission lines subjects the pipelines to induced AC voltages. This can be caused by an imbalance in the transmission system, and by high voltages near transmission tower grounding systems resulting from lightning strikes and phase faults. When a long-term induced AC voltage exists on a pipeline, it can be dangerous and potentially life-threatening for operations personnel to touch the pipeline or appurtenances. In addition, pipe corrosion also can result from AC discharge”. (Transmission Line EMF Interference with Buried Pipeline: Essential & Cautions M. H. Shwehdi and U. M. Johar)

“The issue of electromagnetic field interference on buried pipelines has been known for over 30 years. When a pipeline runs parallel to a transmission or electric distribution line, the pipeline becomes part of the electrical circuit by electromagnetic and electrostatic coupling (Nelson, 1986). The impact of co-locating metallic pipelines usually buried in the earth directly underneath high-voltage transmission lines can cause electromagnetic interference”. (Issues

Affecting Co-Location of Energy Infrastructure, Governor's Office of Energy and Security, May 2011)

An explosion in a pipeline located near transmission lines, would again, be disastrous.

We have provided studies of the environmental impacts of the PennEast proposed pipeline routes which would compromise our residents and their environs.

Township residents and members of the governing body of West Amwell are opposed to any of the proposed pipeline routes, as they would endanger our residents' health and safety, would create a very potentially compromised situation for our environment, and would contaminate our present clean water supply and the water supply for millions of residents in New Jersey and Pennsylvania.

For all of the above categorized reasons, we oppose all of the proposed PennEast pipeline routes in West Amwell.

George Fisher, Mayor, West Amwell Township

Cathy Urbanski, Chair, Environmental Commission, West Amwell Township

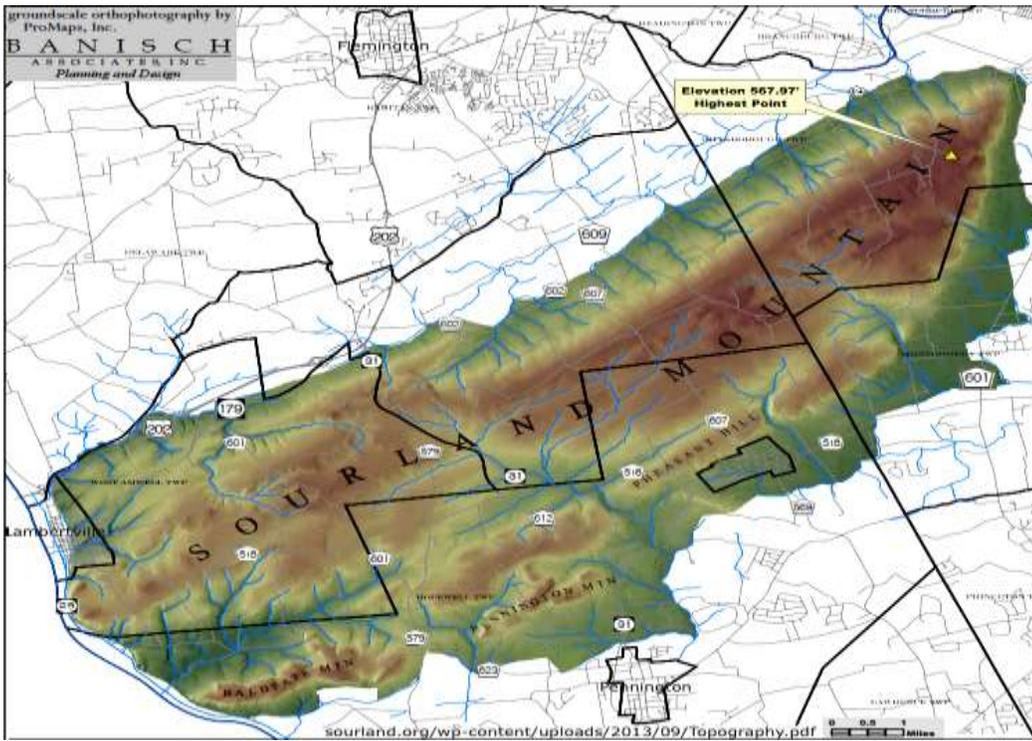
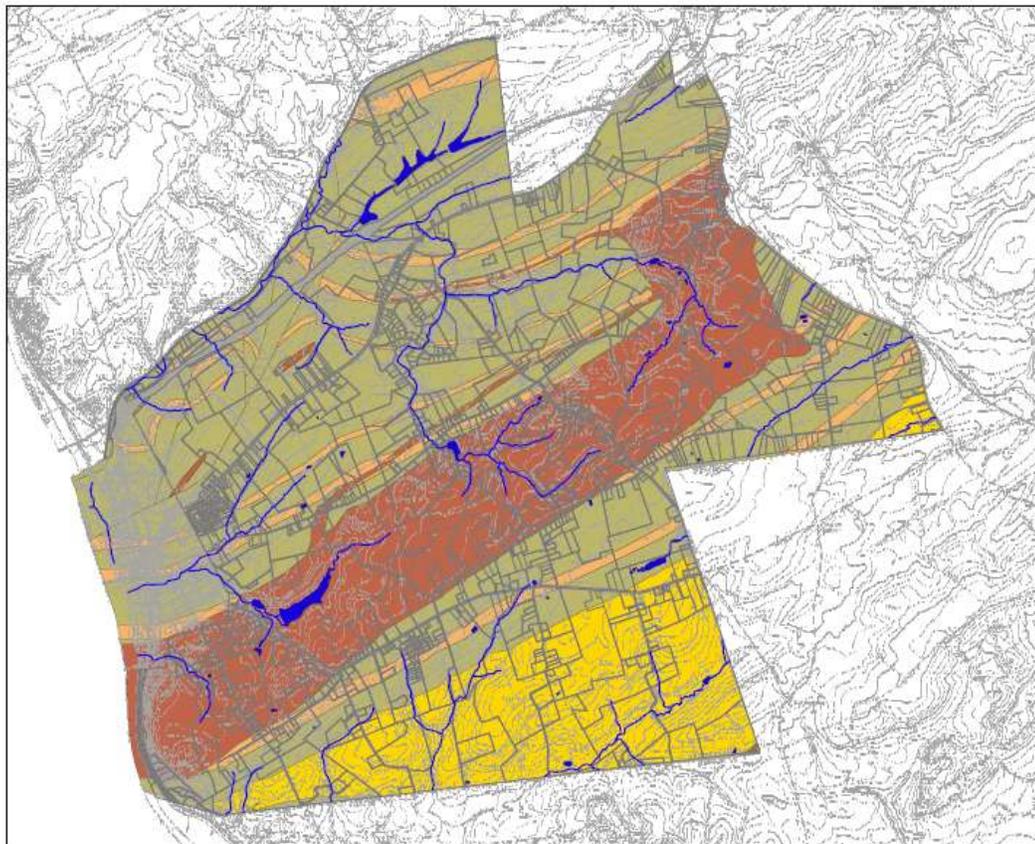


Figure 1



Modified from NJGIS CD Series CD-00-1 and GIS information from Hunterdon County GIS Group. This map was developed using GIS digital data developed under the auspices of the NJDEP and Hunterdon County, but this secondary product has not been verified by the NJDEP or Hunterdon County and is not State or County authorized.

Figure 2



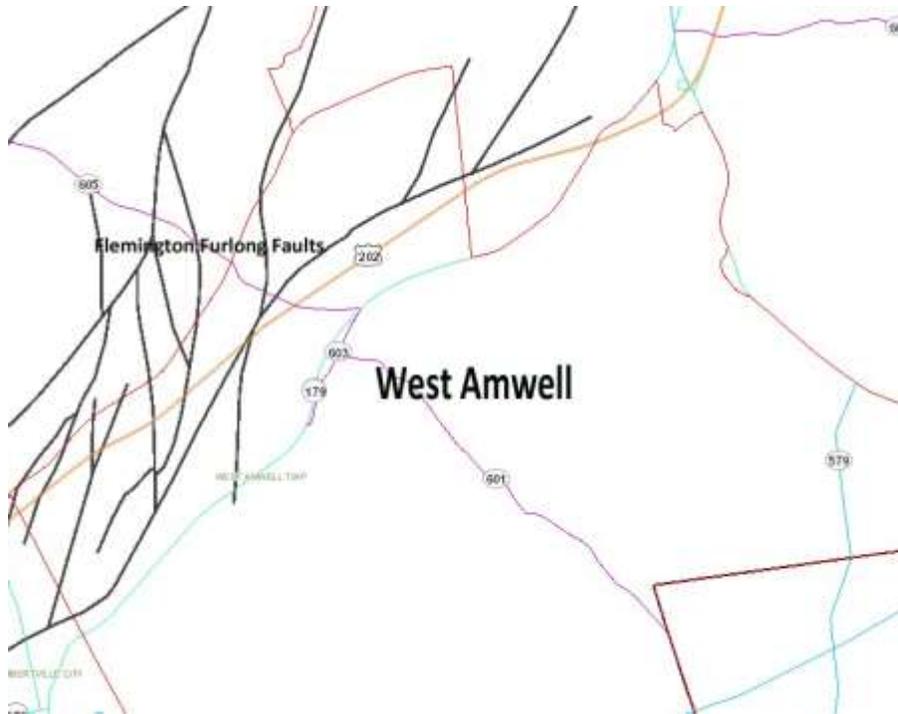


Figure 3



Figure 4

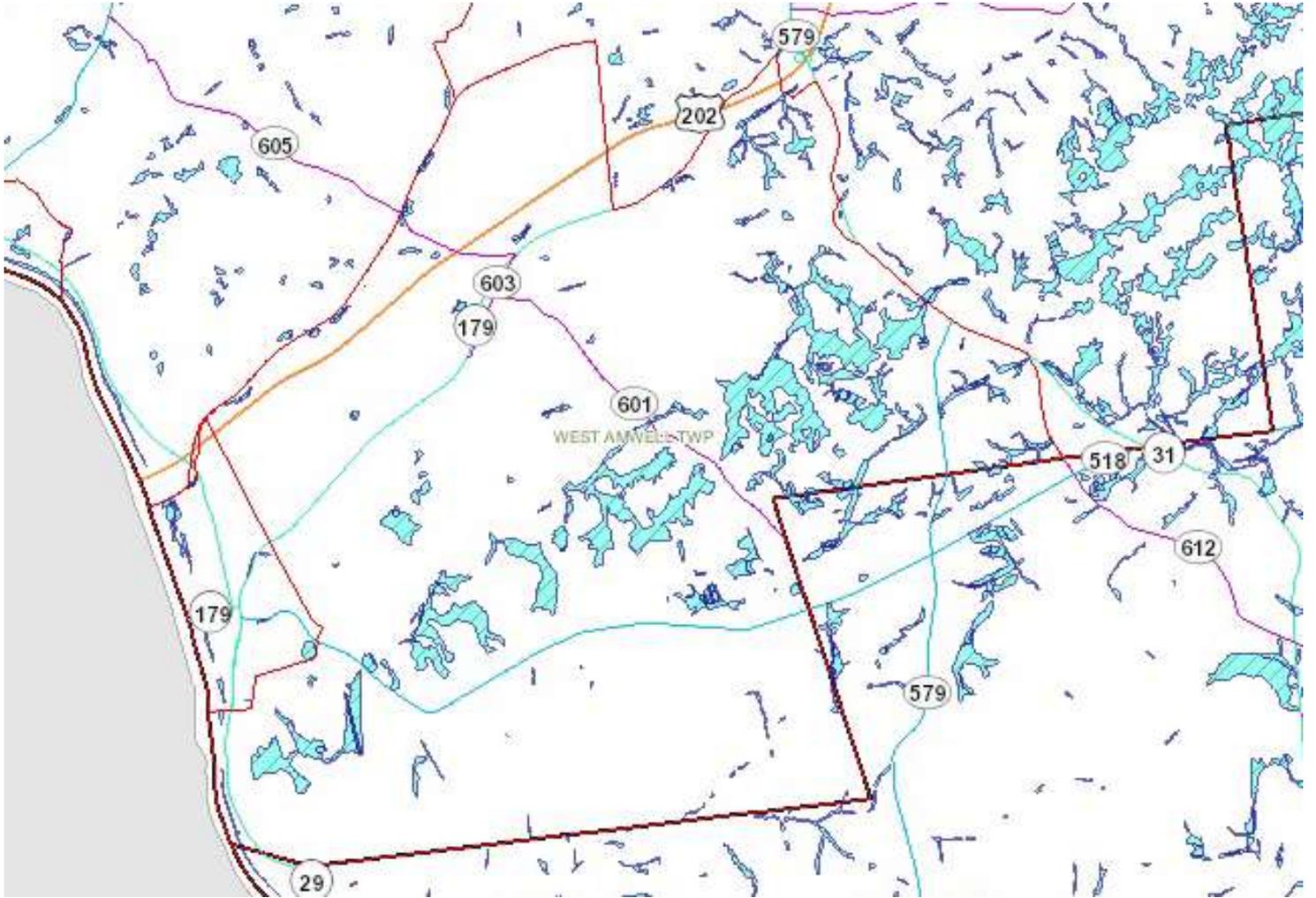


Figure 5

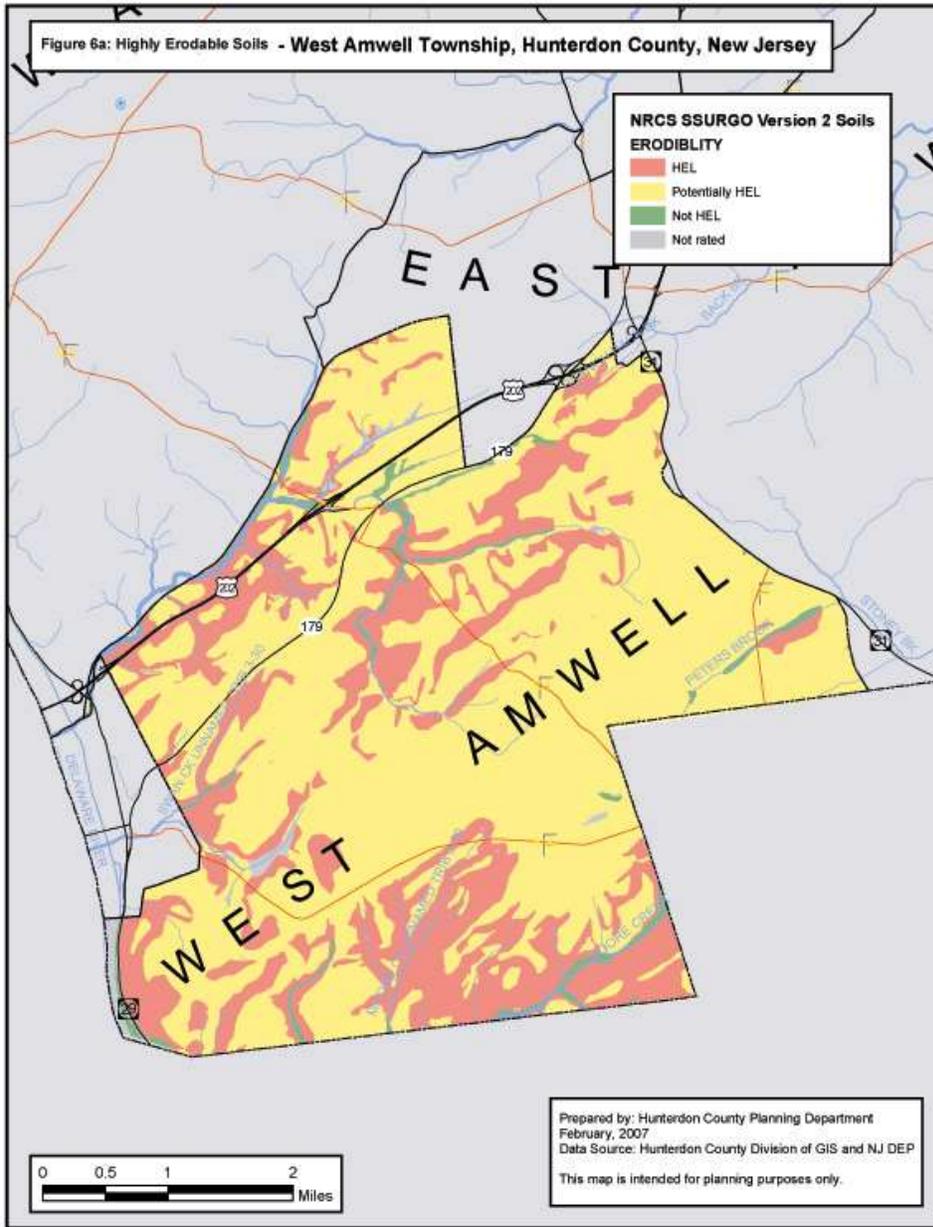


Figure 6