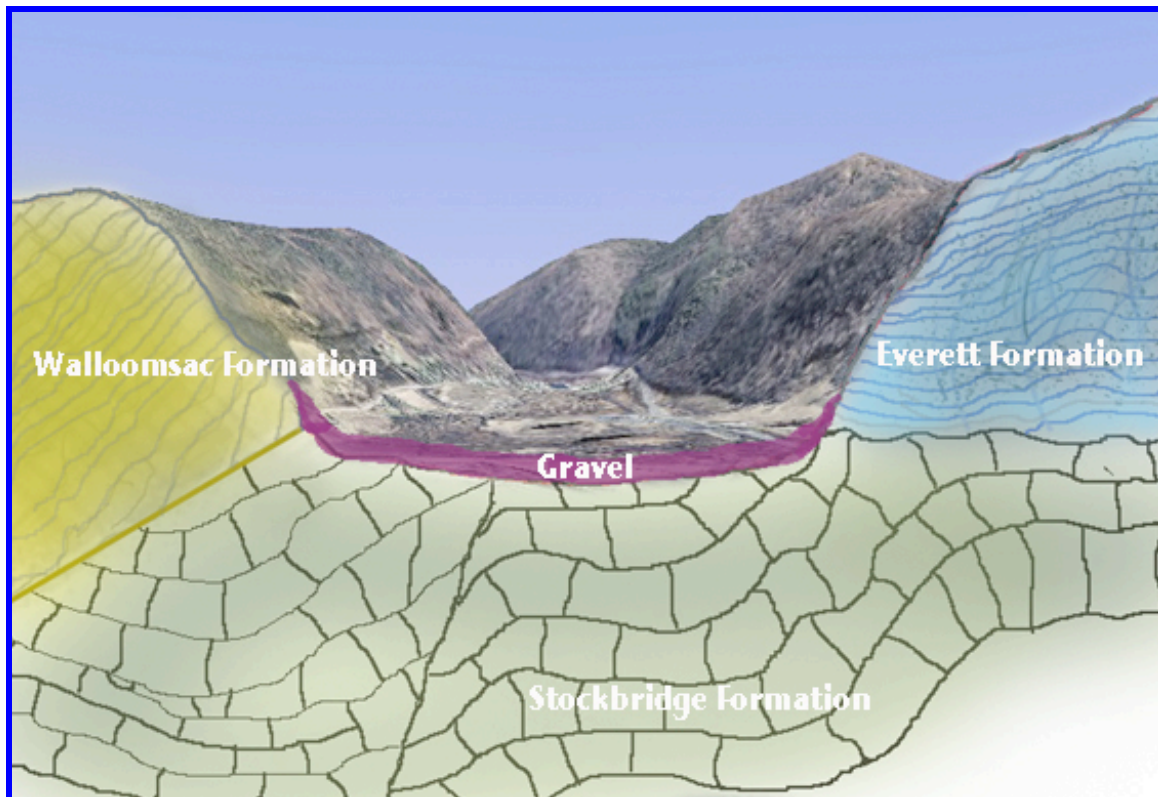


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# Mineral Resources In Amenia



Generalized geologic cross-section looking south between Amenia and Wassaic. Vertical exaggeration is three times.

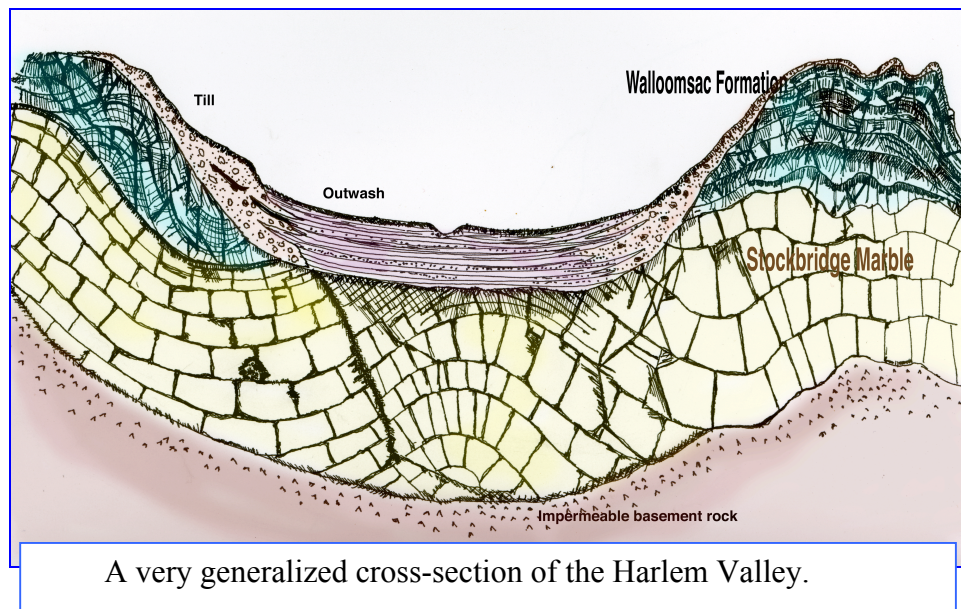
# Mineral Resources in Amenia

## The Rocks

Mineral resources in Amenia are, of course, intimately related to the long geologic history of the region.

The oldest rock, over a billion years old, is found in the area of Bog Hollow, and East Mountain. It is composed of hard granitic gneiss, which is resistant to erosion and tends to form steep ridges.

Most of the rest of Amenia is dominated by a series of metasedimentary rocks that began their formation about 450 million years ago in a wide shallow sea that covered most of what is now eastern North America. Imagine the Bahamas and you will have a good picture of Amenia at that time. Conditions were ideal for the deposition of thick layers of limestone, which now constitute the locally important Stockbridge formation. The Stockbridge is fairly soft and soluble and is found mainly in the Harlem Valley, the Oblong Valley, and the Smithfield Valley. Mostly it is covered with thick sand and gravel deposits although outcrops occur in South Amenia, along the Tenmile River, and the Harlem Valley Rail Trail. Because it contains many fractures it is a very important source of groundwater for Amenia forming the “Valley Bottom Aquifer”.



As time passed, colliding continents pushed up a mountain range along the eastern edge of this shallow sea and sediment eroding from this ancient range covered the limestone with sediment and formed the Walloomsac formation. The Walloomsac is composed of metamorphosed sedimentary rocks known as slate, schist, and gneiss, is resistant to erosion and forms the ridges to the east of Amenia including Rattlesnake Mountain. Ridges on the western side of Amenia are composed of the Everett formation, another series of metamorphic rocks very similar to the Walloomsac. These rocks form



the scenic “backbone” of Amenia and produce smaller amounts of groundwater than the Stockbridge rocks do. They are still important, forming what is known as the “Upland Aquifer”.

Eventually, as continents split and collided over the immensity of geologic time, the aforementioned rock formations were buried deeply, their components were altered by great heat and pressure, they were folded, fractured, and faulted, and eventually exposed at the surface after hundreds of millions of years of erosion.

## **The Ice Age**

About two million years ago a period of time known to geologists as the Pleistocene Ice Age began. The climate cooled and four great ice sheets advanced and retreated across northern North America. Glacial ice, over a mile thick, covered the entire landscape and altered the bedrock by carving away the relatively soft Stockbridge marbles and creating ridges from the harder rocks. The Harlem Valley was formed during these ice advances. When the ice melted, it left enormous deposits of ground up rock known as till and stream sorted material known as outwash. The last glacial advance, known as the Wisconsin, ended locally about 15,000 years ago with a great melting that carved out steep ravines and left the area covered with thick deposits of sand and gravel. These deposits, which are mainly in the valley bottoms, are very important sources of groundwater as well as commercially important sources sand and gravel.

The soils in Amenia, some of which are very fertile, have formed from these glacial deposits. Soils of this type are known as transported soils because they are largely unrelated to the deeply buried bedrock on which soils in unglaciated areas generally form.

## **Mineral Resources**

As in most towns in this part of New York and adjacent New England, mining has historically been important. Iron mining and smelting was a dominant industry locally from the late 1700’s into the late 1800’s before more economical sources of iron ore and the fuel to process it with the latest technologies were developed in other parts of the United States. The ruins of several iron works and flooded open-pit mines still dot the countryside if a person knows where to look. Important sites were located in Wassaic, Sharon Station, Amenia Union, and Amenia.

As romantic as it may appear today, the iron industry, while creating large numbers of jobs and providing important products, had major detrimental environmental effects. Entire forests were cut to produce charcoal for furnaces resulting in enormous unchecked erosion on the steep denuded hillsides. Air pollution was a serious problem and quarrying was unregulated. No reclamation was ever undertaken; mines were simply abandoned and allowed to fill with groundwater.

Recent mineral extraction has been in the form of surface mining of sand and gravel. Currently (May, 2007), there are four operating mines in Amenia. Three are concentrated in South Amenia with another in Wassaic. The South Amenia mines are in the process of mining beneath the water table, a controversial method of extending the life of a mine without expanding its aerial extent.

Large amounts of unmined gravel remain in Amenia. These deposits are in areas where zoning, social, and economic pressures may limit their utilization. The new Comprehensive Plan and its zoning will somewhat limit mining to a Soil Mining Overlay District.

Mining and its effects have never been very popular with the neighbors. Among the detrimental environmental effects of mining include dust, noise, truck traffic, groundwater impact, soil destruction, loss of agricultural land, loss of wildlife habitat, and enormous visual impact.



Gravel mining in South Amenia, May 2007.

Besides surficial sand and gravel deposits, there is obviously a lot of rock in Amenia that could be mined. There have been two serious quarrying proposals in Amenia over the past twenty years. One, a proposal to mine 20 million tons of rock in South Amenia, was the focus of a bitter, protracted, and expensive struggle between the proposed mine operator and neighboring residents. At this writing, that particular quarry proposal may have been made moot by the sale of the land it was proposed for.

Another type of rock removal, taking surface rocks for landscape use, has become a recent development in Amenia. As of May 2007, only two such mines are operating and the new zoning rules will regulate this activity.

Amenia has a long and continuing history of using its mineral resources. Some areas of Town have been burdened with this more than others, particularly South Amenia. Reclamation, while part of the mining process is still largely incomplete and many problems remain.

The most important mineral resource in Town, although strictly speaking it is not a mineral, is groundwater, which is covered in another section of this report.



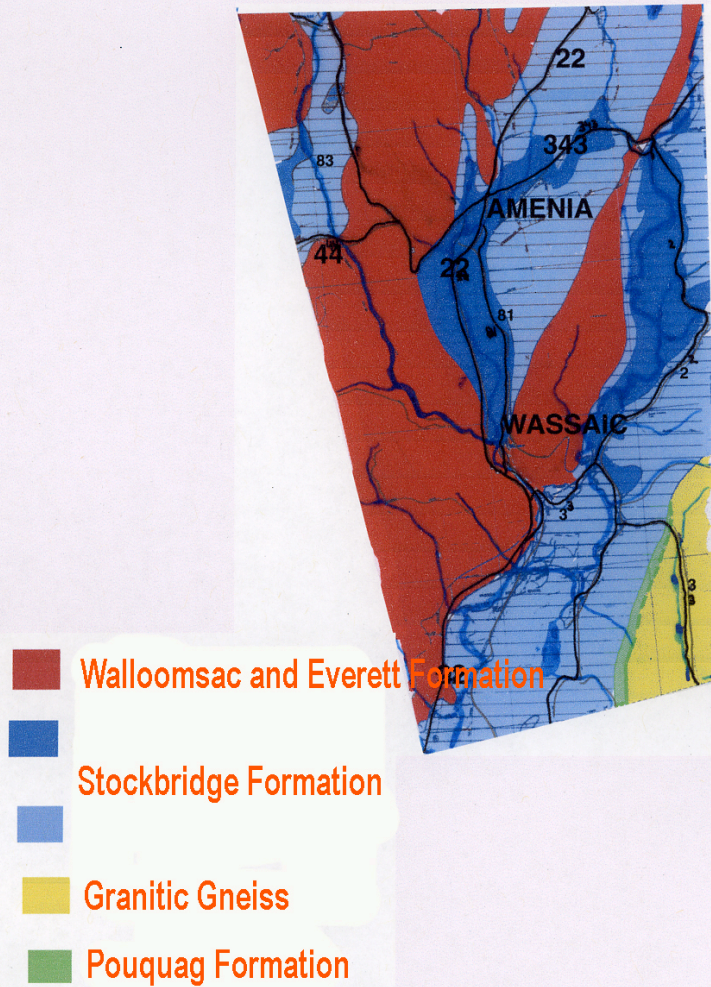
Walloomsac Formation, Wassaic



Stockbridge Formation, South Amenia



## GENERALIZED GEOLOGIC MAP OF AMENIA, NEW YORK



After Fisher 1961

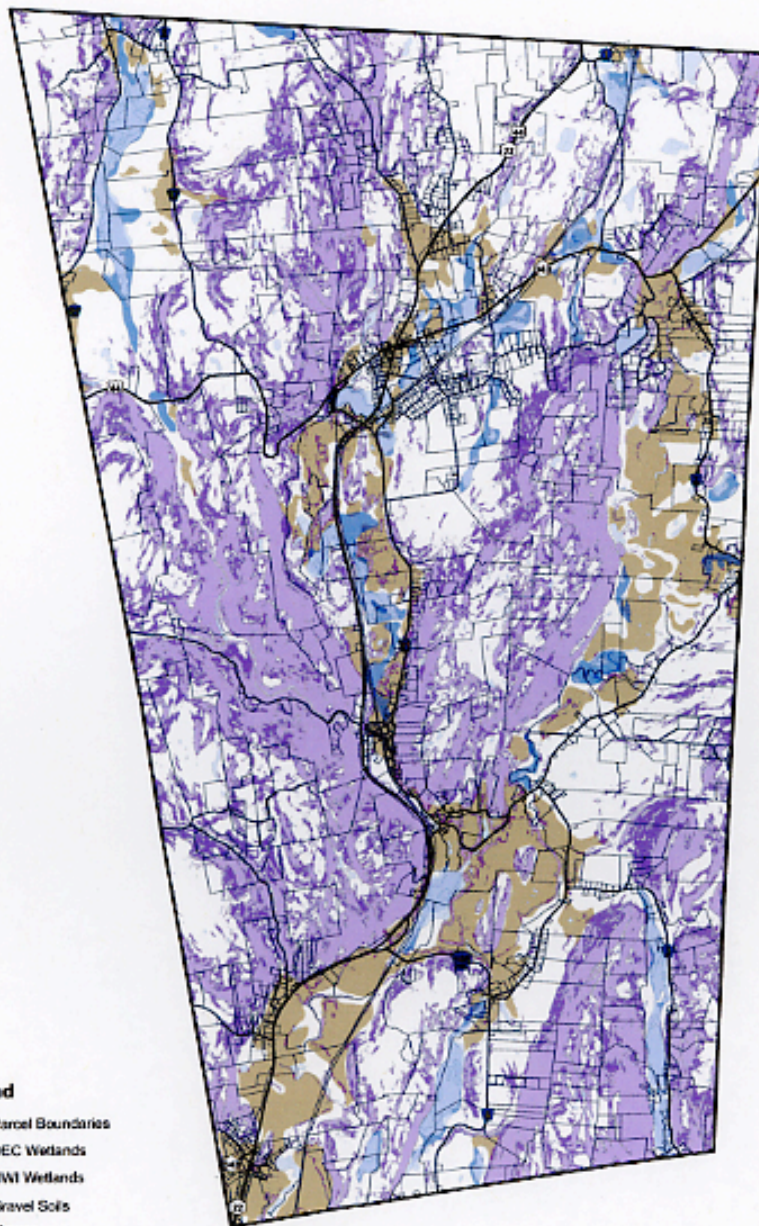


# Town of Amenia

## Natural Resources Inventory Map

### Gravel Soils and Wetlands

Prepared by Dutchess County Department of Planning & Development  
January 2007



#### Legend

- Parcel Boundaries
- DEC Wetlands
- NWI Wetlands
- Gravel Soils
- Steep Slopes**
- 15% Grade
- 25% Grade

DEC Wetlands: NYS Dept of Environmental Conservation, 1999  
NWI Wetlands: US Fish & Wildlife Service, 1999  
Soil Survey: US Dept of Agriculture 1996  
Steep Slopes: USGS, 2003

