

ISSUE PAPER SERIES

# Designation of the Northern Tug Hill Aquifer as a Sole Source Aquifer

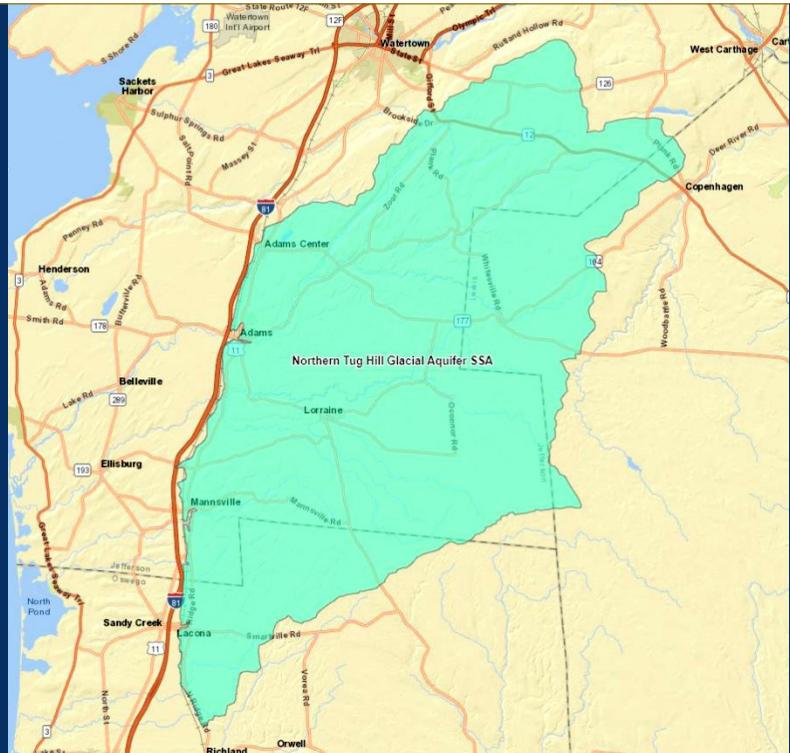
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NEW YORK STATE TUG HILL COMMISSION

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The Tug Hill Commission Technical and Issue Paper Series are designed to help local officials and citizens in the Tug Hill region and other rural parts of New York State. The Technical Paper Series provides guidance on procedures based on questions frequently received by the Commission. The Issue Paper Series provides background on key issues facing the region without taking advocacy positions. Other papers in each series are available from the Tug Hill Commission. Please call us or visit our website for more information.



# Designation of the Northern Tug Hill Aquifer as a Sole Source Aquifer

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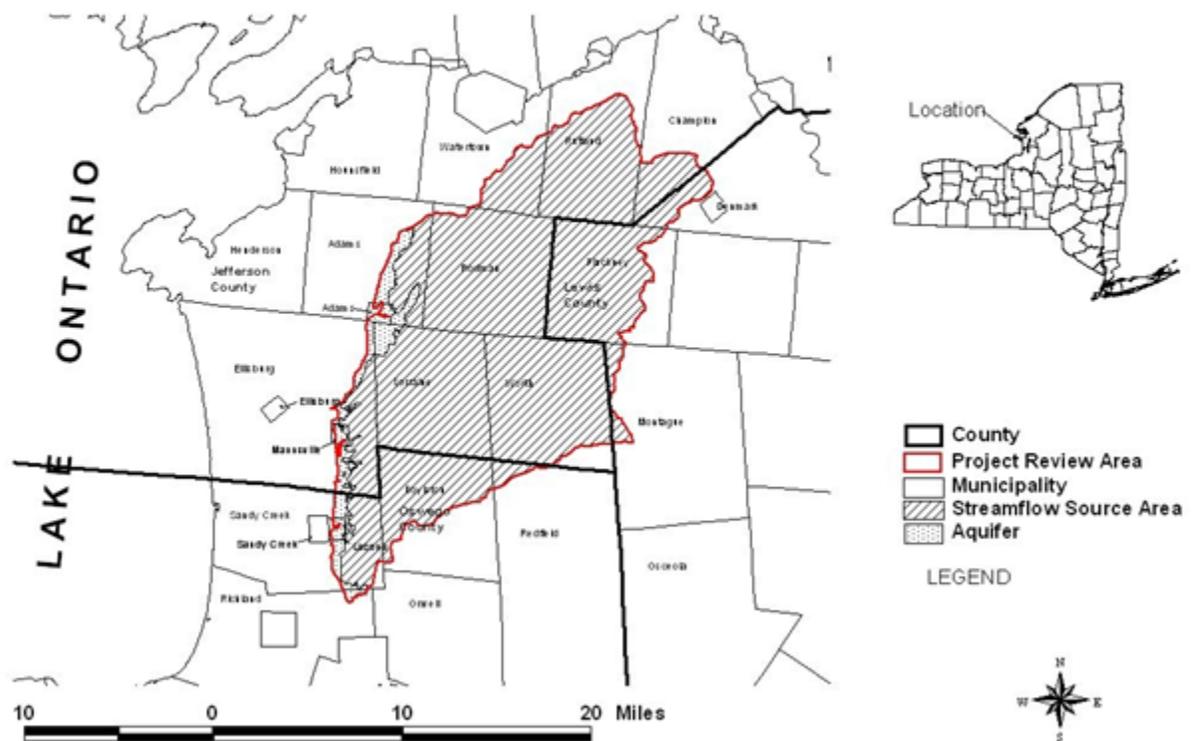
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## The purpose of this paper

In November of 2006, the United States Environmental Protection Agency (EPA) designated the northern section of the existing Tug Hill Aquifer, and its tributary surface watershed, as a Federal Sole Source Aquifer. The intent of this issue paper is to explain what Sole Source Aquifer designation means, how the Northern Tug Hill Glacial Aquifer came to be designated, and the future implications of the designation. It is important to note that Sole Source Aquifer designation includes not only the land surface directly above this section of the aquifer, where water exists underground, but also the land surface over the entire tributary surface watershed in this section of the aquifer.

For more general background about the Tug Hill Aquifer, please also see the commission's issue paper "Tug Hill Aquifer 101 for Local Communities."

### Project Review Area Northern Tug Hill Glacial Aquifer



Area encompassed in the Sole Source Aquifer Designation. Map Source: Environmental Protection Agency.

## What is the Tug Hill Aquifer?

The Tug Hill Aquifer is a 47-mile-long underground rock and soil formation that is shaped like a crescent bending around the western and southwestern side of the Tug Hill region, from Jefferson County through Oswego County and into northern Oneida County. The EPA Sole Source designation covers the northern portion of the aquifer.

The Tug Hill Aquifer is made of sand and gravel that was deposited by retreating glaciers approximately 12,000 years ago. Unconsolidated soil and rock fragments sorted into layers (like the Tug Hill Aquifer) will typically yield high amounts of water from coarse-grained sand and gravel, but low amounts from fine-grained sand, silt or clay. The Tug Hill Aquifer has sections which are unconfined (water table conditions) and confined (capped and pressurized by a layer of impermeable material such as clay or glacial till). In some areas, both conditions can be present at different depths.

## Who uses water from the Tug Hill Aquifer?

The entire Tug Hill Aquifer is the source of drinking water for a number of municipalities, as well as private drinking water wells for private residences, manufactured home parks, campgrounds, and other facilities. Additionally, water from the aquifer is used in manufacturing, industry, agriculture, and the NYSDEC Fish Hatchery in Altmar, NY. According to the Central New York office of the New York State Department of Health and the Region 6 office of the New York State Department of Environmental Conservation, communities who use water from the aquifer as a drinking water supply throughout the region are (from north to south) portions of the Town of Adams, the Village of Adams, Rodman, portions of the Town of Ellisburg, the Village of Mannsville, the Villages of Sandy Creek and Lacona, the Village of Pulaski, Orwell, portions of the Town of Camden, and the Village of Camden.

## How does a groundwater supply become designated as a Sole Source Aquifer (SSA)?

The Environmental Protection Agency (EPA) is authorized through the federal Safe Drinking Water Act to designate an aquifer as a SSA if it is shown that the aquifer supplies at least 50% of the drinking water consumed in the area overlying the aquifer. In most cases these areas have no alternative drinking water sources that could physically, legally, and economically supply all those who depend on the aquifer for drinking water.

Any person may apply for SSA designation. A "person" is any individual, corporation, company, association, partnership, state, municipality or federal agency. A Sole Source Aquifer

Designation Petitioner Guidance document is available from EPA to assist those interested in preparing and submitting SSA designation petitions to EPA regional offices.

Following EPA's technical review of a petition, the agency summarizes the information in a technical support document that is made available for public review. A Federal Register notice is published at the end of the review process to announce EPA's decision to designate the area as a sole source aquifer and explain the basis for the decision. The public has an opportunity to participate in the SSA designation process by providing written comments to EPA or by participating in an EPA-sponsored public hearing before a designation decision is made.

## **Why would a municipality choose to petition for Sole Source Aquifer designation?**

Groundwater's value as a drinking water source and its vulnerability to contamination can vary considerably between and within designated aquifers. The type of soil on the ground surface, and below the ground, controls how readily water, and contaminants, can move through the soil to recharge an underlying aquifer. Sand and gravel allow water to move into an aquifer more quickly and easily than other soils.

Sand and gravel aquifers, like in the Tug Hill region, receive large amounts of recharge in the form of rain and snowmelt. The aquifer also receives major recharge from streams which originate outside of the aquifer area, and that enter and cross over the aquifer area, and from hillside runoff along the aquifer boundaries. Because the Tug Hill Aquifer and overlying soils are largely composed of porous sand and gravel, contaminants can more easily move through the soil and into the aquifer before they can be captured (cleaned up), bind to the soil, be biologically degraded or otherwise made less potent. Once contaminants enter the aquifer, they travel quickly through the sand and gravel, and may threaten wells and nearby streams, lakes and wetlands that receive water from the aquifer.

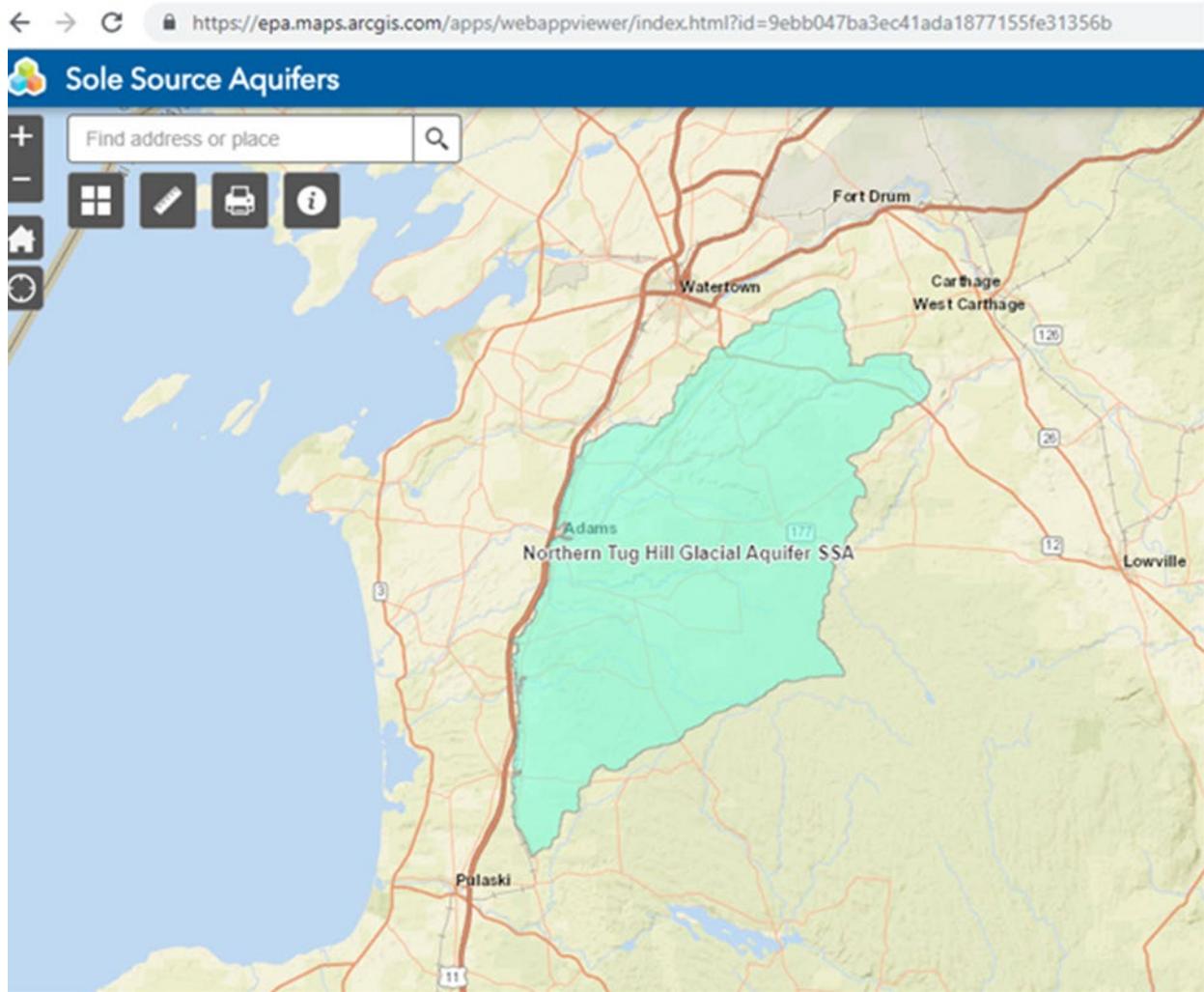
SSA designations help to increase public awareness of the nature and value of local ground water resources by demonstrating the link between an aquifer and a community's drinking water supply. The realization that an area's drinking water originates from a vulnerable underground supply can lead to increased interest in protection measures.

In the case of the Tug Hill Aquifer, the Oswego County village of Lacona petitioned EPA to designate the Northern Tug Hill Glacial Aquifer as a sole source aquifer on September 16, 2003. The village pursued the designation based on concerns it had over land uses taking place near

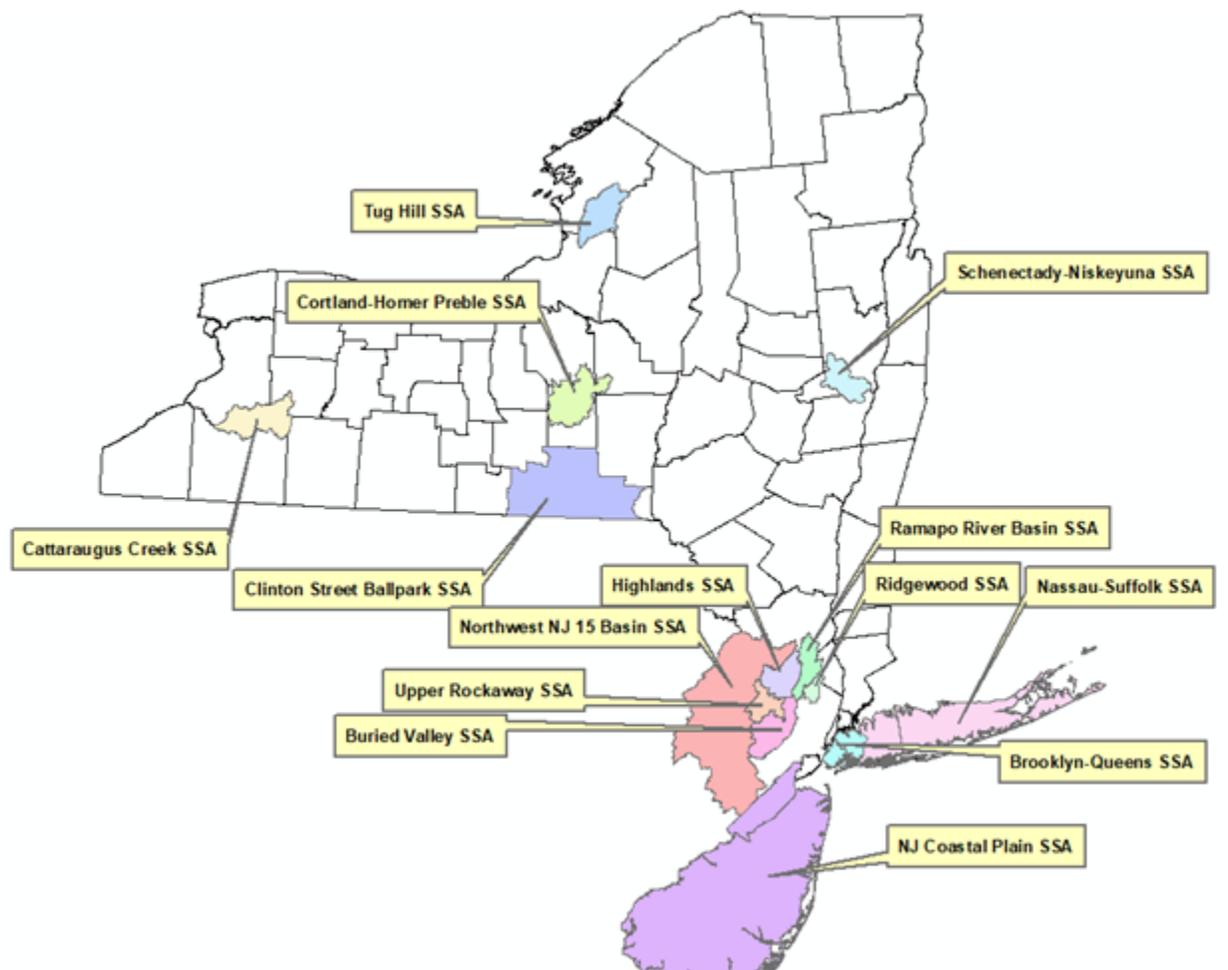
its groundwater wells. The EPA designated the Northern Tug Hill Glacial Aquifer a SSA in November of 2006, in Federal Register 71 64524, available at <https://www.federalregister.gov/documents/2006/11/02/E6-18487/northern-tug-hill-glacial-aquifer-in-jefferson-lewis-and-oswego-counties-ny-sole-source-aquifer>

## **What area is included in the SSA designation?**

The Northern Tug Hill Glacial Aquifer extends approximately 21 miles from the town of Adams in Jefferson County south into the town of Richland in Oswego County (see graphic below). It includes portions of eight towns in Jefferson County (Adams, Champion, Ellisburg, Lorraine, Rodman, Rutland, Watertown, and Worth), portions of three towns in Lewis County (Denmark, Montague, and Pinckney), and portions of four towns in Oswego County (Boylston, Redfield, Richland, and Sandy Creek).



Screen shot of the interactive mapping tool of Sole Source Aquifers on EPA's website, <https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b>.



*Map of other Sole Source Aquifers in EPA Region 2.*

## What are the implications of the SSA designation?

All federally financially assisted projects constructed in the Northern Tug Hill Glacial Aquifer Area and its stream flow source area will be subject to EPA review to ensure that these projects are designed and constructed so they do not create a significant hazard to public health. Additionally, water supply improvement projects in a SSA receive additional priority for funding (25 scoring points) through the Drinking Water State Revolving Fund.

The EPA has in place a Memorandum of Understanding (MOU) with its sister agencies in the federal government, such as the U.S. Department of Agriculture (USDA), U.S. Department of Housing and Urban Development (HUD), and U.S. Department of Transportation, to name a few. The MOU requires those agencies to submit projects that they are funding within the SSA

area to EPA. EPA then has 15 days to issue a finding as to whether or not the project is in compliance with the Safe Drinking Water Act and requires no changes.

For example, in 2007, a bridge replacement project on Route 69 over Sandy Creek being financed in large part with federal funds, has been submitted to EPA from one of its sister agencies, the U.S. Department of Transportation. The U.S. Department of Transportation submitted their plans to EPA, including a Draft Environmental Impact Statement and groundwater impact study (which would normally be done in the planning phase of such a project). The EPA issued a finding that the project was in compliance with the requirements of the SSA and that no changes would be needed. More recently, in 2017, the USDA Farm Service Agency submitted a dairy farm well installation project for review, for which EPA issued a finding that the project was in compliance with the requirements of the SSA and that no changes would be needed.

Examples of federally funded projects that EPA has reviewed under the SSA protection program in other areas of the country are:

- Highway improvements and new road construction
- Public water supply wells and transmission lines
- Wastewater treatment facilities
- Construction projects that involve management of storm water
- Agricultural projects that involve management of animal waste
- Projects funded through Community Development Block Grants

EPA review of a proposed federally financed project in designated sole source aquifers focuses on any potential effects on the groundwater resource and could lead to specific recommendations or additional pollution prevention requirements as a condition of funding. The types of projects that EPA in particular pays attention to are those that involve cutting into the ground's surface, which could open a potential entryway for contaminants. Most projects referred to EPA for review, however, are approved without any additional conditions because they meet all federal, state and local groundwater protection standards. If for some reason the EPA finds an issue with a proposed project it can halt the release of federal funds for the project until EPA's conditions are met.

If projects are funded entirely by state, local, or private sources they are not subject to EPA review.

## Does Sole Source Aquifer designation fully protect a community's drinking water?

The designation of an SSA provides limited federal protection of ground water resources and by no means constitutes a complete protection strategy. Local wellhead protection programs designed to protect the recharge areas of public water supply wells should work in concert with contaminant source control and pollution prevention efforts at all levels of government. This coordination ensures that source water activities meet the same protection goal without duplication of time, effort and resources.

## Does Sole Source Aquifer designation change the way New York State reviews projects funded with federal monies?

The SSA designation has limited impact on the way New York State reviews federally funded projects. The State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) screens for projects in SSA areas, and the designation then becomes a factor in weighing the environmental impact of proposed projects. Similar to, but separate from, the EPA, New York State has an aquifer designation strategy for identifying and protecting highly productive and vulnerable aquifers. This strategy is outlined in the New York State Department of Environmental Conservation - Division of Water's Technical and Operational Guidance Series (TOGS) 2.1.3 available on the department's web site at [https://www.dec.ny.gov/docs/water\\_pdf/togs213.pdf](https://www.dec.ny.gov/docs/water_pdf/togs213.pdf).

## For more information?

For more information about the EPA designation, contact Stephen Gould, US EPA Region 2, Water Programs, 290 Broadway, 24<sup>th</sup> Floor, New York, NY 10007-1866, 212-637-3822, [gould.stephen@epa.gov](mailto:gould.stephen@epa.gov).

## Additional References

A detailed technical information about the Tug Hill Aquifer, the full report by the United States Geological Survey (USGS) entitled "Hydrogeology and Water Quality of the Tug Hill Glacial Aquifer in Northern New York," (1989), Water-Resources Investigations Report 88-4014, is available for review at the Tug Hill Commission's office in Watertown.

Four educational bulletins published by the Tug Hill Commission in conjunction with the USGS report: 1) Raymond, L.S.; "What is Groundwater," July 1988; 2) Raymond, L.S.; "Groundwater Contamination," November 1988; 3) Raymond, L.S.; "Aquifers," June 1990; and 4) Porter, M.J.

and Feeney, T; “Tug Hill Aquifer: A Guide for Decision-Makers,” March 1990 are also available for review at the Tug Hill Commission’s office in Watertown.

Heath, R.C.; Basic Ground-Water Hydrology (WSP #2220), USGS

NY USGS Groundwater web page

<http://waterdata.usgs.gov/ny/nwis/gw>.

EPA’s Sole Source Aquifer web page

<https://www.epa.gov/dwssa>

EPA’s Source Water Protection web site

<https://www.epa.gov/sourcewaterprotection>

New York Rural Water Association Source Water Protection

<http://www.nyruralwater.org/technical-assistance/source-water-protection>

New York State Department of Health Drinking Water Protection Program

<https://www.health.ny.gov/environmental/water/drinking/>

New York State Department of Environmental Conservation Bureau of Water Resource Management

<https://www.dec.ny.gov/about/1149.html>