

**New York City Department of Environmental Protection
Bureau of Water Supply**

**Stream Management Program
Request for Approval for Three
Water Quality-Driven Stream Projects:
Bush Kill at Watson Hollow (Ashokan Basin) and
Batavia Kill at Red Falls, Phases I and II (Schoharie Basin)**

November 2017

*Prepared in accordance with Section 4.6 of the NYSDOH Draft 2017 Filtration
Avoidance Determination*



Prepared by: DEP, Bureau of Water Supply

Introduction

Stream restoration projects are a core component of the New York City Department of Environmental Protection (DEP) Stream Management Program (SMP); they have a primary purpose of improving water quality, especially by reducing erosion into fine sediments that contribute to turbidity, which is a concern in both the Ashokan and Schoharie watersheds.

The Draft 2017 Filtration Avoidance Determination (FAD) requires the SMP to design and complete construction of at least 24 Stream Projects that have a principal benefit of water quality protection or improvement by December 31, 2027; at least 8 of these 24 projects shall be in the Ashokan watershed, and beginning in 2017, projects completed beyond those required for the Revised 2007 FAD shall be counted towards this new requirement. DEP shall propose projects for FAD approval annually, by November 30.

To date, one project has been approved towards fulfillment of the 24 required Stream Projects having a principal benefit of water quality protection or improvement: the Kastanis Project on the Batavia Kill in the Schoharie watershed (completed in 2017). Through this report, DEP formally requests FAD approval for three additional projects to be counted towards the new 2017 FAD requirement: the Bush Kill at Watson Hollow in the Ashokan watershed, and the Batavia Kill at Red Falls Projects (Phases I and II) in the Schoharie watershed.

Bush Kill at Watson Hollow Project

The Bush Kill begins in the Town of Denning in the Sundown Wild Forest and flows through the towns of Olive and Shandaken before reaching the Ashokan Reservoir. After passing through State-owned land, the stream runs parallel to County Route 42, known locally as Watson Hollow Road. A stream feature inventory (SFI) conducted by the Ashokan Watershed Stream Management Program (AWSMP) in 2015 reported that 16% of the total stream banks along the Bush Kill were experiencing active erosion, with 13% of the recorded erosion occurring in fine sediments. As described in the Bush Kill Stream Management Plan, much of the erosion on the Bush Kill can be attributed to the unbalanced and excessive supply of coarse sediment that is being contributed by bank erosion in the upper reaches; this sediment often cannot be effectively transported by the stream, causing channel instability and directing flow laterally into steep stream banks. These dynamics are of particular water quality concern in areas where instability is occurring in the vicinity of clay and other fine sediment exposures on the Bush Kill.

This project focuses on a slope failure that is located approximately 0.1 miles north of the Kanape Brook Trailhead in the Town of Olive. The hillslope is approximately 30 feet high by 60 feet long, and is directly adjacent to the east shoulder of Watson Hollow Road. Shortly after Tropical Storm Irene, this reach of stream received emergency repair work which included large wood removal and reshaping of a point bar within the channel. A large quantity of wood was buried within the point bar, which has led to confinement of the stream flow against the failing road embankment. At the time the SFI was conducted, the slope retreat was reported to have been within 4-6 feet of Watson Hollow Road. The slope failure has since worsened and led to a collapse of Watson Hollow Road, which is now reduced to one functional lane. Channel incision

is active at this site and if left unaddressed has the ability to migrate upstream, undermining bank stability and resulting in the creation of additional erosion sources. This site is a high priority for channel restoration and bank stabilization due to mobilization of fine and coarse sediment from the slope, as well as the hazards presented by failure of the road.

In 2015 the Ulster County Department of Public Works applied to the AWSMP for funding to design and construct a restoration project at the Bush Kill slope failure along Watson Hollow Road to protect the road from becoming impassable. It is also recognized that this project will contribute to water quality protection by preventing a significant amount of sediment from entering the Bush Kill system. The stream restoration design is currently at the 90% design phase, and includes realignment of the stream channel away from the slope failure, as well as the creation of a floodplain bench in front of the slope in order to allow the stream some floodplain access. Grade control structures will be installed within the channel to prevent further down cutting of the stream bed and prevent channel incision from migrating upstream. The slope will be graded and vegetated, and drainage installed under Watson Hollow Road will help to transfer storm water to the stream without excessive saturation of the slope.

The Bush Kill at Watson Hollow project will help to relieve a major source of sediment that is directly correlated to system wide instability in the Bush Kill. It is important to note that areas of glacial lacustrine clay deposits were identified in the lower reaches of the Bush Kill, one of which is situated approximately 1,000 feet downstream of the project site. By removing a major sediment source through this restoration effort, the threat of exposure of this clay deposit through erosion will be reduced. The final design for this project is expected to be completed in winter 2017-2018, with restoration of the site expected to be completed in summer 2018.

Batavia Kill at Red Falls Projects: Phase I and Phase II

The Batavia Kill watershed is a sub-basin of the Schoharie Creek and accounts for approximately 30% of the Schoharie Reservoir watershed. The Batavia Kill originates in the Town of Windham and flows west through the towns of Ashland and Prattsville for approximately 21 miles to its confluence with the Schoharie Creek.

The Red Falls project reach begins 1,000 feet upstream of a private bridge on the Kane property in Ashland, extending downstream nearly 7,100 feet to a large waterfall known as Red Falls in the Town of Prattsville. The contributing watershed to the projects is 68.6 square miles. In this section of the Batavia Kill, the valley morphology is dominated by the presence of a large terminal glacial moraine in the middle of the reach and steep hillslopes.

This segment of the Batavia Kill was prioritized for restoration based on significant water quality impacts related to excessive incision and lateral erosion into glacial lacustrine clay and till deposits. The project was determined to be the highest priority water quality project in the basin and recommended for restoration in the Batavia Kill Stream Management Plan. The reach has been the focus of extensive geomorphic and water quality monitoring studies by the Greene County Soil and Water Conservation District (GCSWCD) and DEP since the late 1990s and has been characterized as the largest contributor of turbidity and suspended sediment in the Batavia Kill watershed. In 2000, an assessment identified this reach as one of the most unstable sections

of stream in the watershed, with 38% of the reach experiencing erosion with over 97,000 square feet of exposed streambank inventoried, equating to 17 square feet of exposed streambank for every linear foot of channel. Erosion and mass wasting processes along steep hillslopes exceeding 50 feet in height still continue.

A restoration project was planned by GCSWCD in 2005 in the Phase II area, but the project was later suspended due to landowner issues and the occurrence of an archeologically sensitive area in the floodplain, which prevented site disturbance and excluded equipment access. Since then, DEP has acquired a large parcel in the Phase II project reach making the site more accessible. Flooding associated with Tropical Storm Irene in 2011 resulted in considerable site damage, including a partial re-routing of the Batavia Kill through the glacial moraine and floodplain which damaged the archeologically sensitive area. Channel incision and streambank erosion also advanced upstream several thousand feet through the Kane property, now referred to as the Phase I area.

GCSWCD has recently resumed the project and is proceeding with designs for both sites simultaneously. Topographic surveys, archeology, wetland inventories and hydraulic modeling are complete. Multiple conceptual designs are in progress with design and permitting to be completed during winter 2017-2018. DEP anticipates that Phase I will be constructed during 2018 and Phase II will start in 2019.

New York City DEP - Stream Management Program 2017 - SMP Proposed Water Quality Driven Stream Projects



NOTE: GIS data are approximate according to their scale and resolution. They may be subject to error and are not a substitute for on-site inspection or survey.

DATA SOURCES: NY CDEP, 2017
Produced by SMP GIS (DD), 11/2017

