New York City Department of Environmental Protection

Bureau of Water Supply

Stream Management Program

Request for Approval for the Final Ashokan Basin Stream Project: Woodland Creek at Woodland Valley Park Association

March 2017

Prepared in accordance with Section 4.6 of the NYSDOH Revised 2007 Filtration Avoidance Determination

Prepared by: DEP, Bureau of Water Supply

Introduction

Stream restoration projects are a core component of the Stream Management Program (SMP) and can have a primary purpose of improving water quality, especially by reducing erosion into fine sediments that contribute to turbidity, which is a concern in the Ashokan Basin. The Revised 2007 FAD requires DEP to:

- Complete construction of seven stream management projects within the Ashokan basin with a goal of protecting water quality, in particular by reducing turbidity, by November 30, 2018.
- Submit to NYSDOH/EPA and NYSDEC brief descriptions of proposed projects and anticipated timelines for their completion as projects are identified by Annual Action Plans and annually by March 31.

To date, six projects have been approved. This report is provided to secure NYSDOH approval for the seventh project in the Ashokan basin, the Woodland Creek at Woodland Valley Park Association. This report also provides an update on the fifth and sixth projects which are in process and targeted for 2017 construction, as well as a summary status of all projects to date.

Woodland Creek at Woodland Valley Park Association

Woodland Creek primarily flows parallel to Woodland Valley Road in the Town of Shandaken. Reports produced by the United States Geological Survey (USGS) indicate that Woodland Creek contributes a substantial amount of suspended sediment to the upper Esopus Creek, and is part of a second tier of sediment contributors ranking behind only Stony Clove Creek in total suspended sediment load contribution. Stream feature inventories (SFI) conducted in 2007-2008, and repeated in 2013, characterized instability throughout the watershed visible through eroding banks and steep head cuts. These eroding banks have contributed both fine and coarse sized sediment to the system which has accumulated in areas where it could not be effectively transported, further contributing to the lateral instability of the stream channel. Following the SFIs, the unstable reaches were ranked and this section of Woodland Creek was prioritized by DEP and the Ulster County Soil and Water Conservation District (UCSWCD) for full channel stream restoration. The stream reach begins at a private bridge at Wilmot Way, and continues approximately 1,750 feet upstream through property managed by a nonprofit organization named Woodland Valley Park Association. The project reach includes a high bank failure, as well as several other eroding banks which are contributing to excessive sediment deposition and both lateral and vertical channel migration.

This section of stream is a cause for water quality concern primarily due to the presence of glacial lacustrine clay which had been exposed through erosion. These clay particles are mobilized during moderate to high flows, contributing to turbid discharge which eventually flows into Esopus Creek. Aggradation of coarse sediment is also evident at this project site with the presence of large sediment bars forming in the center of the channel as well as the outside of

meander bends. The accumulation of these coarse sediment deposits is further contributing to erosion by forcing flow laterally into the banks. The largest bank failure within this project reach is located at the upstream end, measuring approximately 160 feet in length and 30 feet in height, and consisting of both clay and coarse sediment.

The stream restoration design for this project is currently at the 60% stage, and uses hydraulic modeling to identify the cause of instability in the channel bed and banks. Existing bank erosion, including the high bank failure in the upstream section of the project reach, are currently proposed to be stabilized through the creation of bankfull benches wherever feasible in order to allow the channel to dissipate energy during moderate flood flows by accessing a floodplain. These benches will likely be protected with a combination of rock and bioengineering structures to maximize stability. Realignment of the stream channel through this reach to a geometry appropriate for the valley setting, and more in line with historical channel alignment, will be used to assist in taking the pressure off of eroding banks. The grade and slope of the channel will be controlled through the construction of hardened riffles so that the stream cannot form headcuts and further threaten bank and channel stability.

It is believed that restoration measures will contribute to water quality improvement by reducing erosion of the bed and banks and the associated mobilization of clay and other fine sediment particles. It is also important to note that since this site is located relatively far up in the Woodland Creek watershed, the reduction of coarse sediment entrainment through this restoration will likely have a significant system wide benefit by reducing the volume of coarse sediment available to accumulate further downstream. If this site is not treated, there is a high likelihood that due to the degree of bank failure and existing headcuts in the channel, the instability will continue to extend both upstream and downstream. The final design for this project is is expected to be completed in spring 2017. Restoration of this site is expected to be completed in 2018 to fulfill the requirements of the Revised 2007 FAD.

Beaver Kill at Van Hoagland Road, Project 1 and Project 2 – Design Update

The UCSWCD contracted with Milone & MacBroom in spring 2016 for the design of restoration solutions on these two sites on the Beaver Kill in the Town of Woodstock, representing the fifth and sixth FAD deliverable projects. Design and hydraulic modeling work on these projects has surpassed the 60% milestone and is expected to be completed in spring 2017. The first hillslope failure begins 400 feet upstream of the Van Hoagland Bridge and at its base measures approximately 200 feet in length and 75 feet in height; the second occurs 1,200 feet upstream of the bridge and is approximately 100 feet in length at its base and 25 feet in height. In their current state, both project sites are contributors of fine sediment to the stream system, and they are also sources of excessive amounts of large woody debris as trees slide into the channel with eroded sections of the bank.

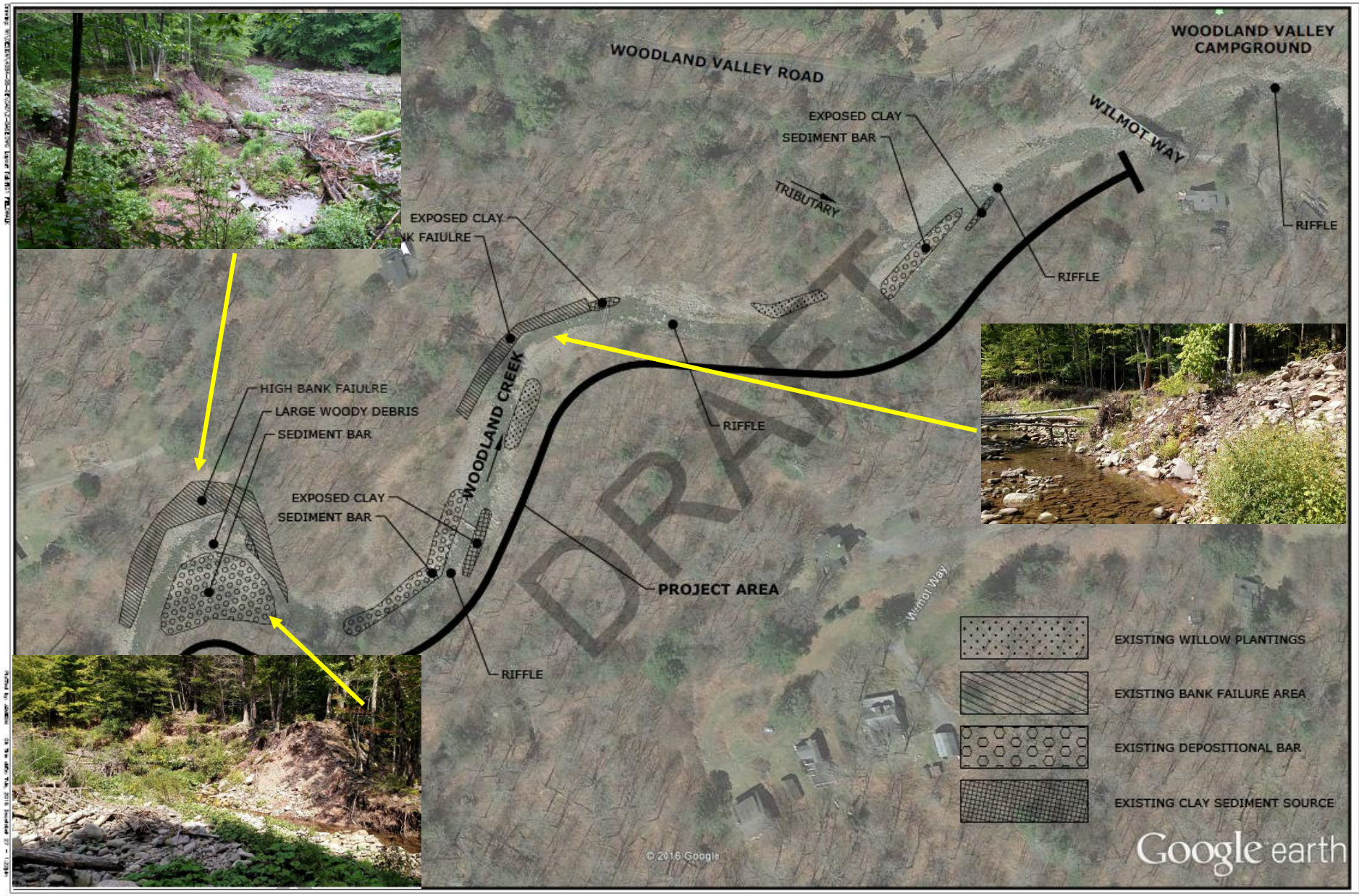
For both slope failures, the restoration design includes realignment of the stream channel away from the point of erosion, construction of armored floodplain benches, and the installation of stone lined drainage swales to intercept the source of saturation and direct it safely to the main

stream channel. Floodplain width and connectivity will be increased wherever feasible throughout both project reaches. Numerous headcuts throughout the Beaverkill are contributing to the bank failures and will be addressed through in channel grade control structures. Multiple bioengineering practices are included as part of these designs, and will be used in combination with tree and shrub plantings in order to provide long term soil stability at the project sites.

To date, DEP has completed four of the six previously approved projects. The table below summarizes all seven water quality projects in the Ashokan basin that are intended to fulfill the requirements of the Revised 2007 FAD.

Table 1. Summary of SMP water quality projects in the Ashokan Basin.

Project	Town	Length (ft.)	Cost	Status
Stony Clove at Chichester – Sites 2/3/4	Shandaken	1,650	$1,547,182	Complete
Warner Creek – Site 5	Shandaken	800	$495,465	Complete
Stony Clove at Wright Road	Hunter	2,675	$1,802,985	Complete
Stony Clove Creek Hillslope Stabilization	Hunter	650	$1,221,771	Complete
Beaverkill at Van Hoagland Road Project 1	Woodstock	600	TBD	60% Design
Beaverkill at Van Hoagland Road Project 2	Woodstock	700	TBD	60% Design
Woodland Creek at Woodland Valley Park Association	Shandaken	1,750	TBD	60% Design
	Total	8,825	$5,067,403	



REVISIONS

PROJECT SITE
WOODLAND CREEK
STREAM RESTORATION PROJECT
WOODLAND VALLEY ROAD
TOWN OF PHOENICIA, ULSTER COUNTY, NEW YORK

JCM	JCM	JGM

N.T.S.

DEC. 27, 2017

4084-08

FIG 2-1