6. PROPOSED ACTION IN THE LOWER ESOPUS CREEK STUDY AREA

6.1 LOWER ESOPUS CREEK STUDY AREA

The lower Esopus Creek study area is generally defined as the 0.25-mile area on either side of lower Esopus Creek along its 33-mile length from Ashokan Reservoir to its confluence with the Hudson River, as shown in **Figure 6.1-1**. Specific lower Esopus Creek study area boundaries are described further in the respective technical area assessments.

The lower Esopus Creek watershed is located mostly in Ulster County with a small part in the southern end of Greene County. The lower Esopus Creek watershed is approximately 169 square miles and consists of forests, agricultural lands, and rural and residential areas. There are many homes and businesses along lower Esopus Creek, and residents and visitors participate in recreational activities along lower Esopus Creek. The most upstream portion of lower Esopus Creek stretches from Ashokan Reservoir to the confluence with the East Basin Spillway Channel (spillway channel) at the spillway confluence where it combines with water that spills over Ashokan Reservoir's East Basin Spillway. Streamflow to this most upstream portion (reach) of lower Esopus Creek originates from groundwater baseflow, surface water runoff, and Reservoir releases. This reach is comprised of the Ashokan Release Channel, Little Beaverkill, and the upper portion of lower Esopus Creek, which receives flow from Tongore Creek.

The spillway channel is approximately 1.6 miles long, is lined with bedrock, and has no major tributaries. Spill events are the primary source of water in the spillway channel, with an additional, small amount of runoff that originates from the surrounding watershed area. Therefore, flow through the spillway channel is intermittent. Since the intermittent nature of flows in the spillway channel supports few aquatic species, and the species present would already be accustomed to these intermittent patterns of flow, effects of potential differences between the future without and with the Proposed Action on aquatic species would be negligible. Recreational use of the spillway channel is not permitted.

Lower Esopus Creek includes three distinct segments, transitioning from a steeply sloped, confined, and fast flowing channel reach to a wider, flatter, and slower stream at Lomontville, and finally to a long narrow valley confined by bedrock ridges without a wide floodplain at Leggs Mill Road. Lower Esopus Creek streamflow is largely unimpeded, except at Cantine Dam, a former mill dam which is located approximately one mile upstream of lower Esopus Creek's terminus. To better describe and evaluate these segments within the EIS, lower Esopus Creek was divided into a series of reaches across three distinct valley segments based on geology and topography (Milone and MacBroom 2009)[1] (see **Table 6.1-1**). Valley segments were further divided into six reaches of lower Esopus Creek (valley reaches), defined by NYSDEC, to capture the changing nature of habitat along the full 33-mile length of lower Esopus Creek. The boundaries of each valley reach are presented in **Figure 6.1-1**. The technical area assessments for lower Esopus Creek were conducted by valley reach and are presented either by individual reaches or grouped (i.e., upstream or downstream of the spillway confluence) depending on the technical area assessment as described in Section 7.0, "Potential Impacts and Benefits of the Proposed Action on Lower Esopus Creek."

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[1] Milone & MacBroom. 2009. River Reconnaissance Report for Sustainable River Management: Lower Esopus Creek, Ulster County, NY.

Table 6.1-1. Valley Segments and Reaches of Lower Esopus Creek

Valley Segment	Reach	Valley Reach	Start (Upstream) Location	End (Downstream) Location	Reach Length (Miles)	Valley Segment Length (Miles)	Reach Slope (%)
1	A	1A	Ashokan Dam	Spillway Confluence	3[1]	8.5	0.7
	B	1B	Spillway Confluence	Hurley Mountain Road	5.5		0.5
2	C	2C	Hurley Mountain Road	Leggs Mill Road	16	16	0.1
3	D	3D	Leggs Mill Road	Glenerie Falls	2	8	0.05
	E	3E	Glenerie Falls	Cantine Dam	5		0.2
	F	3F	Cantine Dam	Hudson River	1		NA

Notes:

[1] Reach A includes the reach between the Ashokan Release Channel and the spillway confluence. Reach A does not include the spillway channel (from the east basin to the spillway confluence) or the portion of lower Esopus Creek above the spillway confluence between Olivebridge Dam and the confluence with the upper portion of lower Esopus Creek, which comprises approximately one additional mile.

NA – Not applicable

6.1.1 GEOLOGY AND SOILS

The lower Esopus Creek valley is the result of millions of years of fluvial (stream) processes of erosion and deposition with intermittent glacial periods disrupting the valley formation process. Glacial till was deposited during glacial periods. When glaciers retreated, meltwater formed streams, complex outwash plains, and sand and gravel deposits. Additionally, glacial lakes formed, leaving layered deposits of silt and clay, which are a natural source of turbidity. More recently, fluvial processes resulted in alluvial deposits (material deposited by flowing water). Some bedrock outcrops exist where they are exposed by erosion or where surficial deposits never formed.

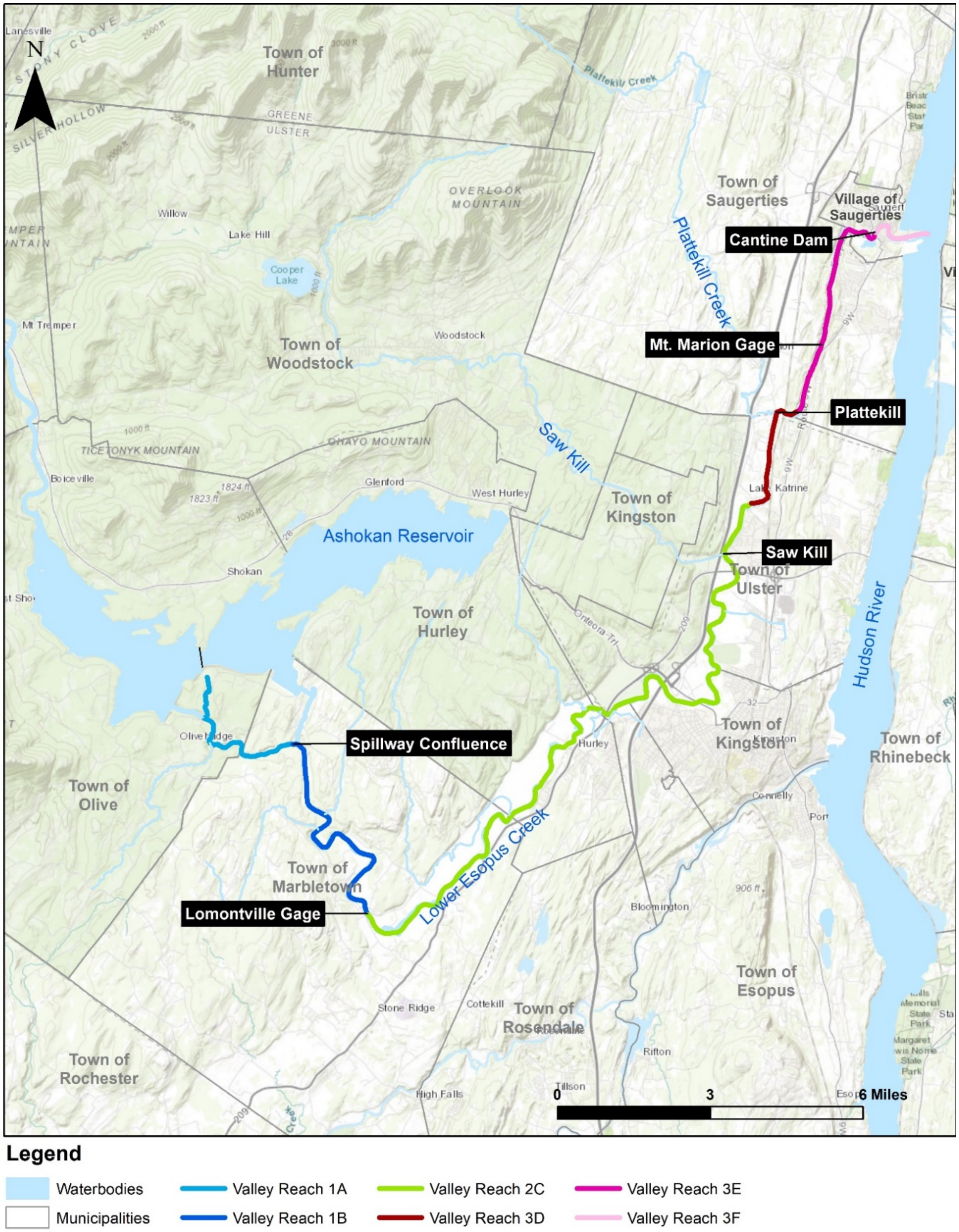
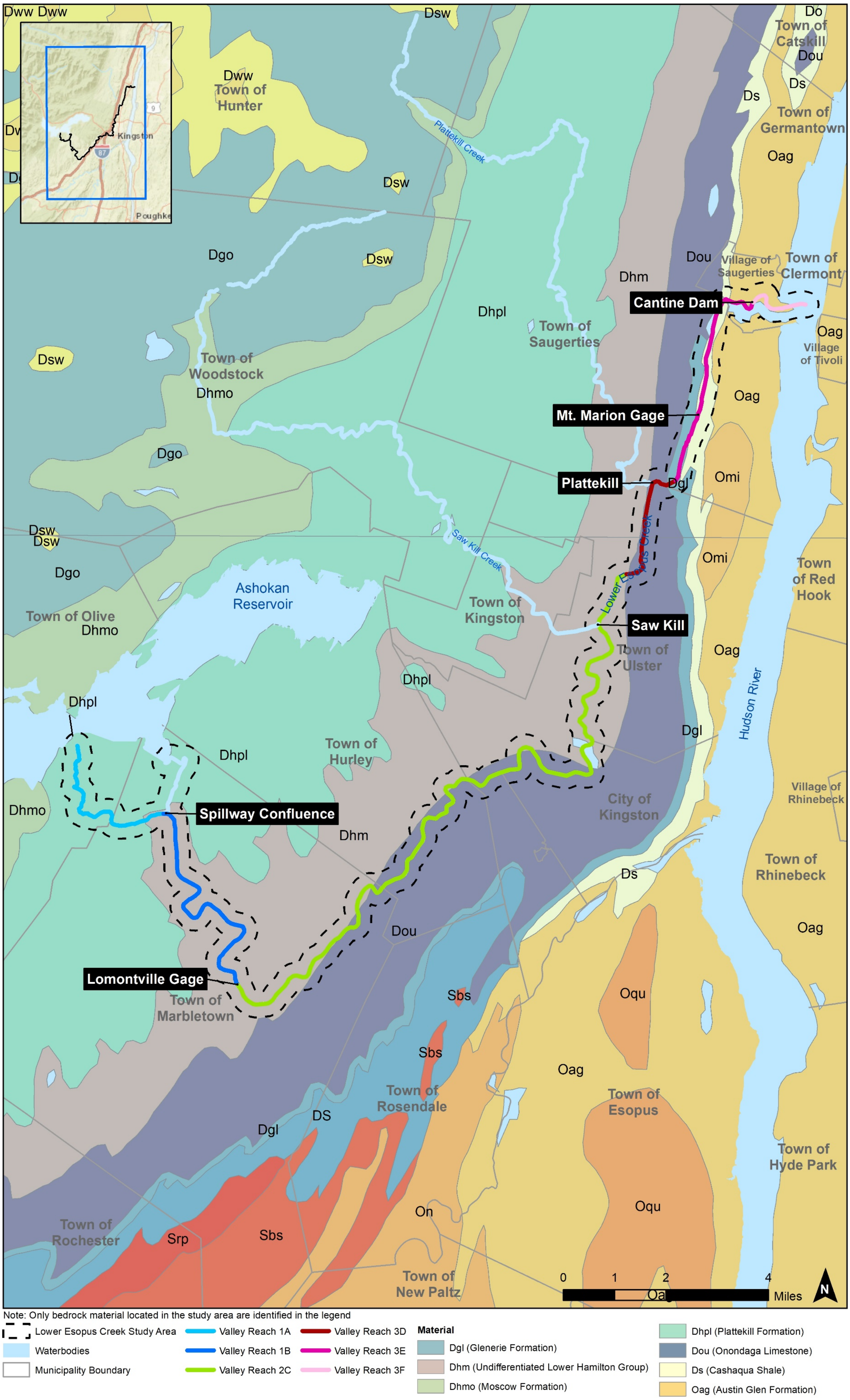


Figure 6.1-1
Lower Esopus Creek
General Study Area

The bedrock geology of the lower Esopus Creek study area is located within the Catskill Mountains Appalachian Plateau physiographic region. A map of major bedrock formations present in the lower Esopus Creek study area is depicted in **Figure 6.1-2**. Shale formations, including Plattekill formation, undifferentiated Lower Hamilton group, Cashaqua shale, and Austin Glen formation, are dominant in Valley Reaches 1A, 1B, 3D, 3E, and 3F, while Onondaga limestone is the primary bedrock formation in Valley Reach 2C. The Valley Reach 2C limestone is more easily erodible, the likely reason that lower Esopus Creek flows northeast, contrary to the south/southeast direction of regional topography.

Surficial geology in the lower Esopus Creek study area includes: recent alluvium, lacustrine silt and clay, lacustrine deltas, till, alluvial outwash, and exposed bedrock. A map of surficial geology features is presented in **Figure 6.1-3**. Exposed bedrock and outwash deposits are concentrated in Valley Reaches 1A and 1B, while alluvial deposits and glacial lacustrine silt and clay primarily comprise Valley Reach 2C. The lacustrine silt and clay layers are a natural source of very fine particles that cause turbidity, similar to the natural turbidity sources upstream of the Reservoir itself. Valley Reaches 3D, 3E, and 3F are comprised of till, lacustrine silt and clay, and bedrock. Bedrock constrains the vertical and lateral movement of lower Esopus Creek in Valley Reaches 3D, 3E, and 3F.

The most prevalent soil in the lower Esopus Creek study area is Unadilla silt loam, which is a well-drained soil located on lacustrine plains and terraces. Other common soil types include Suncook, Tioga, Riverhead, and Bath soil series. The valley soils in the lower Esopus Creek study area are typically comprised of well-drained soils that promote sub-surface groundwater flow during and after rainfall events, contributing to the maintenance of background streamflow.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)
GIS Data Sources: Geology: New York State Museum

Figure 6.1-2
Lower Esopus Creek Study Area
Bedrock Formations

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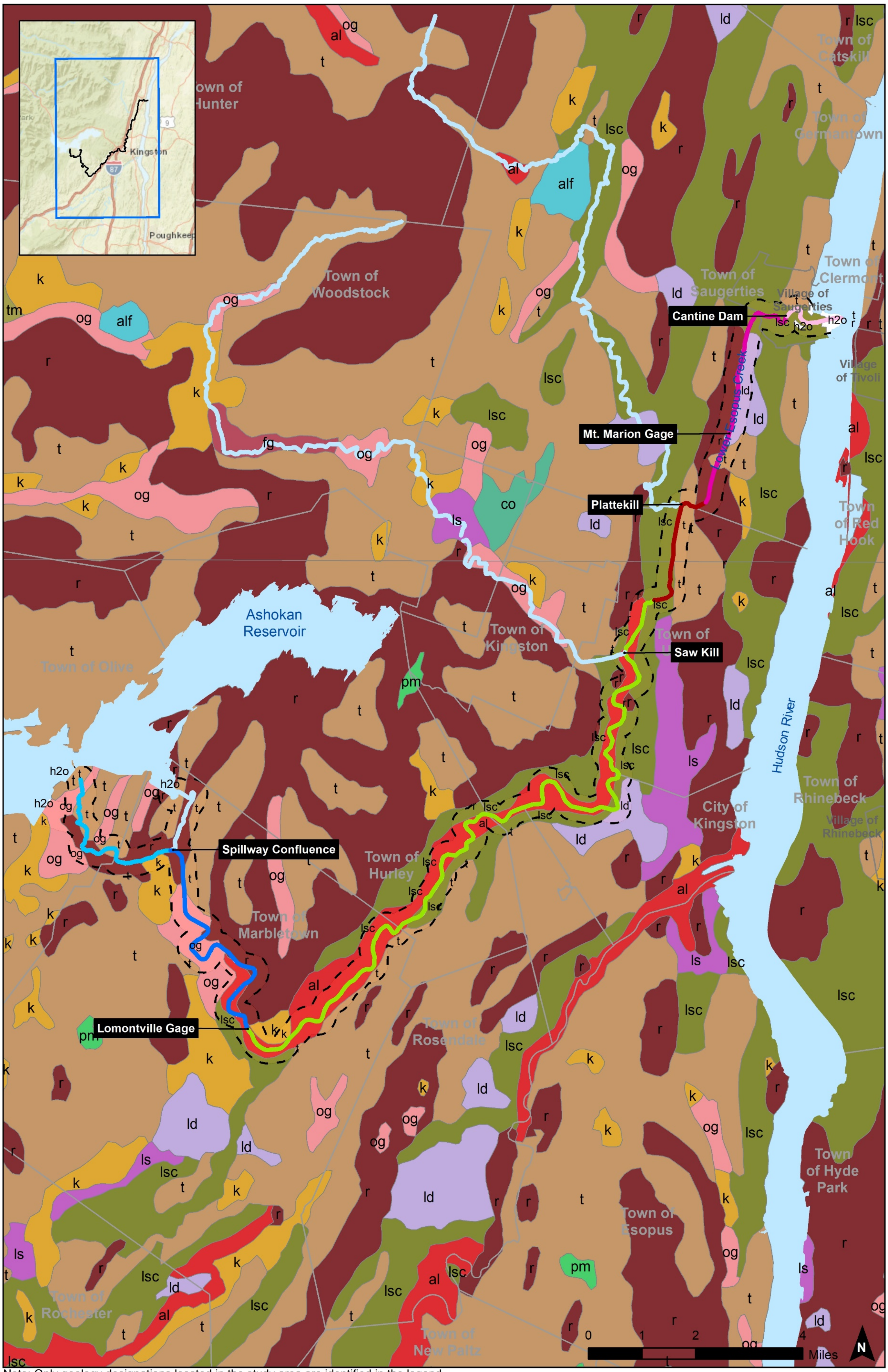

Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)
GIS Data Sources: Geology: New York State Museum

Note: Only geology designations located in the study area are identified in the legend.

Lower Esopus Creek Study Area
Waterbodies
Municipality Boundary
Valley Reach 1A
Valley Reach 1B
Valley Reach 2C
Valley Reach 3D
Valley Reach 3E
Valley Reach 3F

Material
al (Recent Alluvium)
k (Kame Deposits)
ld (Lacustrine Delta)
lsc (Lacustrine Silt and Clay)
og (Outwash Sand and/or Gravel)
r (Bedrock)
t (Till)

Figure 6.1-3
Lower Esopus Creek
Surficial Geology

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6.1.2 SURFACE WATER INPUTS TO LOWER ESOPUS CREEK

Streamflow in lower Esopus Creek originates in several sub-watersheds. The percent (by area) contribution of each sub-watershed (by valley reach) as compared to the total lower Esopus Creek watershed are listed in **Table 6.1-2** and shown on **Figure 6.1-4**. The Saw Kill flows into lower Esopus Creek at the downstream end of Valley Reach 2C. The Plattekill tributary flows into lower Esopus Creek in Valley Reach 3D. Together, the Valley Reach 2C watershed (which includes the Saw Kill sub-watershed) and Valley Reach 3D watershed (Plattekill sub-watershed) constitute 80 percent of the lower Esopus Creek watershed.

Table 6.1-2. Lower Esopus Creek Watershed by Valley Reach Sub-watershed

Valley Reach[1]	Individual Percent Contribution to Lower Esopus Creek Watershed Area	Cumulative Percent Contribution to Lower Esopus Creek Watershed Area
1A	8%	8%
1B	7%	15%
2C	52%	67%
3D	28%	95%
3E	4%	99%
3F	1%	100%

Note:
[1] Valley Reach 2C includes flow from the Saw Kill watershed. Valley Reach 3D includes flow from the Plattekill watershed.

NYSDEC classifies waterbodies according to their best use (fishing, source of drinking water, etc.). Along the 33-mile stretch between Ashokan Reservoir and Cantine Dam, lower Esopus Creek is given a classification of B, indicating a best usage for swimming and other contact recreation, but not for drinking water. A portion of this stretch of lower Esopus Creek, from just above the spillway confluence to a point near the City of Kingston, has an additional standard of (T), indicating that it may support a trout population. The approximately 1.2-mile stretch between Cantine Dam and the lower Esopus Creek mouth at the Hudson River (Valley Reach 3F) is given a classification of C, indicating it supports fisheries and may be suitable for non-contact recreation (e.g., fishing).

Figure 6.1-5 shows observed annualized streamflow at Mount Marion for the period prior to issuance of the Consent Order (1970–2012). These data predominately capture spills, but not releases, from Ashokan Reservoir.[2] Averages for wet, normal, and dry years are shown on the figure. In all years, streamflow within lower Esopus Creek is typically highest in the spring and lowest in the summer. For all but the late winter and early spring, 95 percent of the average monthly streamflow within lower Esopus Creek is at or below 1,000 MGD (1,547 cfs). In the late winter and early spring, monthly average streamflow can reach 2,000 MGD (3,094 cfs).

Figure 6.1-6 shows observed monthly streamflow at Mount Marion since issuance of the IRP (2013 through 2018). These years fall within the range of dry/normal years observed since 1970.

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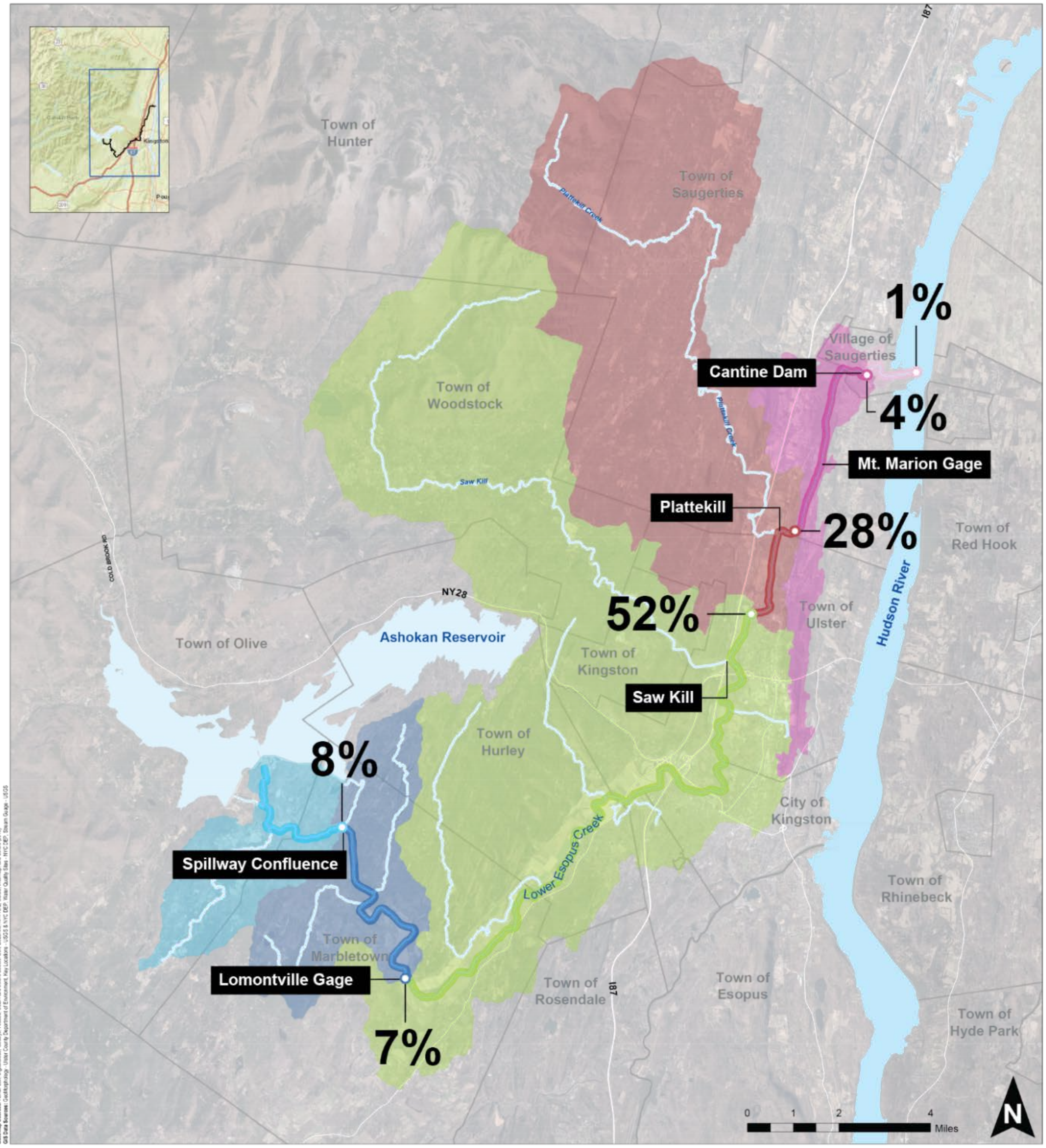
[2] As described in Section 1.2.4, "Alum Application and Ashokan Release Channel Use," some releases were made from the Reservoir between 2005 and 2012 in advance of issuance of the Consent Order and Interim Ashokan Release Protocol.



Percentages shown are the individual contribution of the sub-watershed areas to the lower Esopus Creek watershed area. Sub-watershed boundaries are shaded for each Valley Reach.

Valley Reach 1A — Valley Reach 1B — Valley Reach 2C
Valley Reach 3D — Valley Reach 3E — Valley Reach 3F

Figure 6.1-4
Sub-watersheds by Valley Reach of Lower Esopus Creek

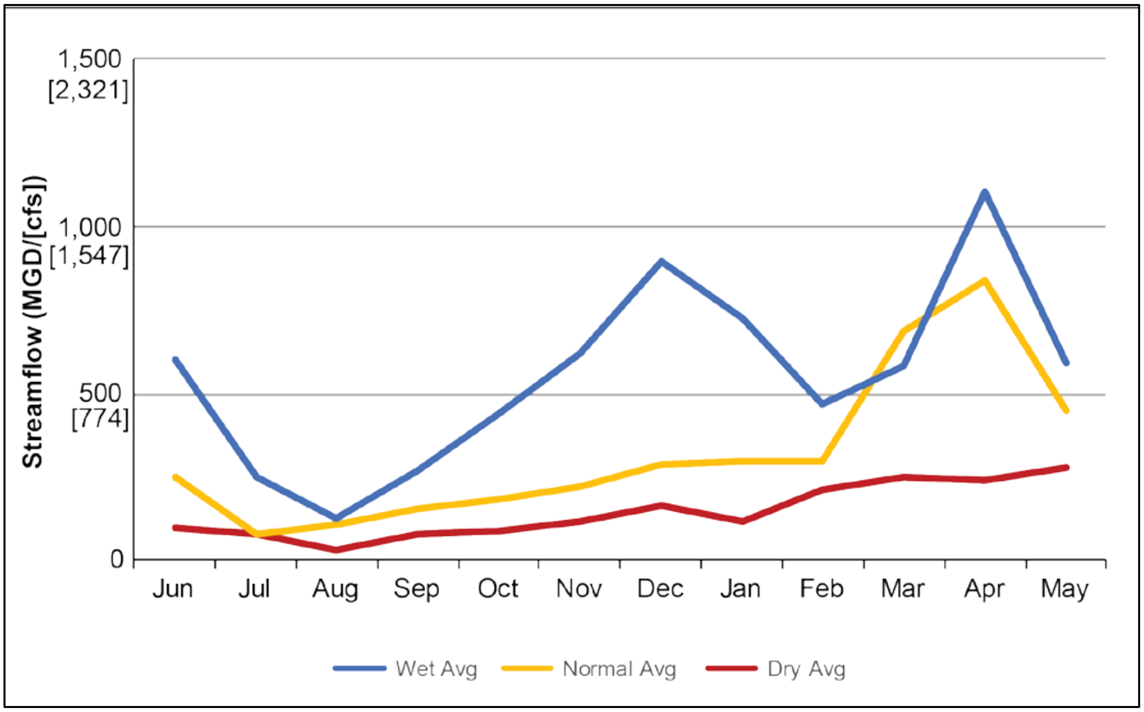


Figure 6.1-5. Observed Annualized Streamflow for Lower Esopus Creek at Mount Marion, Water Years 1971–2012 (Pre-IRP)

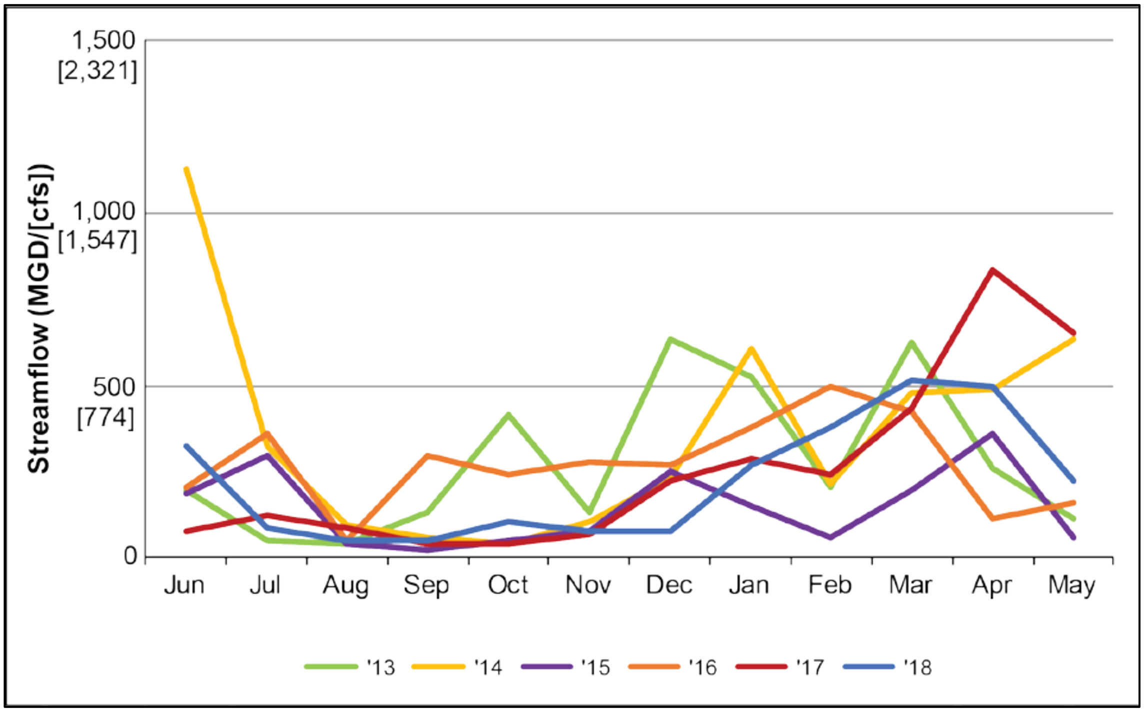


Figure 6.1-6. Observed Annualized Streamflow for Lower Esopus Creek at Mount Marion, Water Years 2013–2018 (IRP)

6.1.3 GROUNDWATER INPUTS TO LOWER ESOPUS CREEK

Groundwater flow to or from lower Esopus Creek is a function of the surficial geology of the lower Esopus Creek valley and nearby groundwater elevations. In Valley Reaches 1A and 1B, where less permeable bedrock and outwash deposits predominate, groundwater flows are expected to be lower and make up smaller percentages of lower Esopus Creek streamflow than in other reaches. In Valley Reach 2C, where unconsolidated alluvial deposits underlie a relatively wide valley floor, groundwater recharge is likely to occur from precipitation on the land surface and infiltration from smaller streams at the edges of the valley. Groundwater generally flows from the edges of the valley towards, and ultimately discharges into, lower Esopus Creek although there may be localized reaches where lower Esopus Creek recharges the groundwater. The Town of Ulster draws water from three wells located in Valley Reach 2C. Additional detail on the assessment of the Proposed Action on these wells is provided in Section 7.11, "Infrastructure and Energy." In Valley Reaches 3D, 3E, and 3F, the surficial geology primarily consists of bedrock and relatively impermeable lacustrine silt and clay, which indicates limited connectivity between groundwater and lower Esopus Creek streamflow. A few small aquifers exist in Valley Reaches 3D, 3E, and 3F; it is likely the same pattern of groundwater recharge and flow occurs in these valley reaches as is present in Valley Reach 2C. Here, groundwater is recharged at the valley edges and discharges to lower Esopus Creek.

Groundwater recharge in the lower Esopus Creek valley is primarily driven by precipitation over land surfaces, and tributary streams along the edges of the valley, as opposed to infiltration from lower Esopus Creek streamflow. Any potential recharge that might result from streamflow would be similar between the future without and with the Proposed Action. As discussed in Section 6.2, "Operation of Ashokan Reservoir in Accordance with the IRP," the contribution of the Proposed Action as a percentage of total lower Esopus Creek streamflow diminishes downstream; and therefore, the relative contribution of any potential additional recharge that might result from the Proposed Action would also diminish downstream. Therefore, any potential differences to streamflow between the future without and with the Proposed Action are not anticipated to have an impact on these groundwater flows.

6.1.4 SUMMARY OF VALLEY REACH CHARACTERISTICS

As discussed above, lower Esopus Creek was divided into six valley reaches to better describe and evaluate conditions along lower Esopus Creek under baseline and future without and with the Proposed Action conditions. These valley reaches are described in greater detail below to provide context for the technical area assessments that follow.

There are sources of suspended sediment to lower Esopus Creek originating within the sub-basins and tributaries that drain to each valley reach.

VALLEY REACHES 1A AND 1B

Valley Reach 1A extends from Olivebridge Dam to the spillway confluence. Valley Reach 1B extends from the spillway confluence to Hurley Mountain Road bridge (see **Figure 6.1-1)**. The overall channel slope in these valley reaches is the steepest portion of lower Esopus Creek. The lower Esopus Creek valley is confined in these valley reaches, meaning there is little or no floodplain. Bedrock, boulders, and cobble are the most prevalent bed material in these valley reaches. Bedrock outcrops control the lateral migration of the stream channel in some areas. Bedrock also acts as a control on the bed elevation. Lower Esopus Creek in these valley reaches exhibits meanders and typical riffle-pool sequences.

In Valley Reaches 1A and 1B, land use adjacent to lower Esopus Creek is primarily forested. There are small tributaries along these reaches including Tongore Creek in Valley Reach 1A. Releases from Ashokan Reservoir also enter lower Esopus Creek in Valley Reach 1A and continue to flow past the spillway confluence and through the remaining valley reaches to the Hudson River. Spills from Ashokan

Reservoir enter Valley Reach 1B via the spillway channel where water flows past the spillway confluence into the upstream end of this valley reach.

The stream banks in Valley Reaches 1A and 1B vary widely. Some banks are uniform cobble and gravel, while others are composite banks. Composite banks contain varying sediment in stratified layers, such as gravel at the toe of the bank overlaid by silts and clays. The layering associated with composite banks makes them more prone to erosion than uniform banks. There are limited, localized areas of observable bank erosion in Valley Reaches 1A and 1B.

VALLEY REACH 2C

The low gradient valley and floodplain and composite banks in Valley Reach 2C make this reach the most susceptible to erosion.

Valley Reach 2C extends from the Hurley Mountain Road bridge to the Leggs Mill Road bridge. The overall channel slope in this valley reach is less steep than both Valley Reaches 1A and 1B and Valley Reaches 3D, 3E, and 3F. The lower Esopus Creek valley is unconfined in this reach, meaning a well-developed floodplain exists.

Bedrock exposures at the downstream end of Valley Reach 2C at Leggs Mill Road bridge act as a hydraulic control for the streambed within this valley reach, contributing to the relatively narrow valley and flatter stream slopes. Surficial geologic deposits in this section of lower Esopus Creek are primarily alluvium and lacustrine silt and clay. Dominant sediment sizes in the upstream portion (from Hurley Mountain Road bridge to the Route 209 bridge crossing; see **Figure 6.1-3**) are cobble and gravel, transitioning to more erodible gravel, sand, and silt in the downstream reaches between the Route 209 bridge crossing and Leggs Mill Road bridge.

Lower Esopus Creek is more sinuous in this section than in other valley reaches. As a result of valley slope and sinuosity, water velocities are generally lower in this section of lower Esopus Creek than Valley Reaches 1A and 1B. The majority of Valley Reach 2C has a wide floodplain that provides space for sediment deposition, as well as floodwater storage for streamflow large enough to reach the floodplain. Several sections in this valley segment have been widened, likely from human activities. Meanders are common in Valley Reach 2C, particularly in the section between the Route 209 bridge crossing and Leggs Mill Road bridge. The alluvial material in Valley Reach 2C, typically small cobble or finer material, is easily mobilized, even at low streamflow. Valley Reach 2C is also characterized by oxbow lakes and old abandoned side channels, evidence of historical channel migration prior to construction of Ashokan Reservoir.

Land use adjacent to lower Esopus Creek in Valley Reach 2C is primarily agricultural and residential. In the downstream portion of this valley reach, lower Esopus Creek flows through the City of Kingston. Spills and releases from Ashokan Reservoir flow from Valley Reach 1B to Valley Reach 2C. Downstream of the Route 209 bridge in Valley Reach 2C, the Saw Kill tributary flows into lower Esopus Creek. This tributary is one of two major tributaries that provide flow and sediment to lower Esopus Creek. There is also stormwater runoff from development within Valley Reach 2C.

The stream banks in this valley reach transition from coarse cobble, gravel, and sand upstream to finer gravels, sand, and silt downstream. Composite banks are also pervasive in this valley reach. In addition to natural processes, anthropogenic activities have affected erosion and deposition processes in Valley Reach 2C. Historical sand and gravel extraction have occurred in this reach, creating a series of deeper pools within lower Esopus Creek. These pools widened the channel and reduced stream velocities, typically catching and storing sediment. Agricultural lands characterize lower Esopus Creek's floodplain within portions of this reach, altering the natural landscape that would otherwise occur. However, most reaches in this portion of lower Esopus Creek retain narrow, vegetated riparian corridors along the stream banks; this vegetation provides bank stability in some locations.

VALLEY REACHES 3D, 3E, AND 3F

Valley Reaches 3D, 3E, and 3F extend from the Leggs Mill Road bridge to the Hudson River. The valley is narrow and confined by bedrock ridges. Large bedrock exposures exist at the Leggs Mill Road bridge and at Glenerie Falls (see **Figure 6.1-3**). Glenerie Falls is located at the old railroad bridge crossing immediately downstream of the confluence with the Plattekill tributary. These bedrock exposures limit bank and bed erosion, regardless of flow magnitude. In between bedrock exposures, the streambed and banks consist of a combination of sand, silt, and clay, with intermittent rock outcrops.

Generally, the stream channel is wider and water velocities are lower in Valley Reaches 3D and 3E than in Valley Reaches 1A, 1B, and 2C. Valley Reach 3F is where lower Esopus Creek meets the Hudson River and this portion of lower Esopus Creek is tidal. Valley Reaches 3D, 3E, and 3F are straighter than Valley Reach 2C due to the valley confinement from bedrock and the channel does not have a wide floodplain. Valley Reaches 3D and 3E are primarily comprised of backwater pools due to the hydraulic controls present. Typical riffle-pool sequences are not present.

Lower Esopus Creek flows through the towns of Ulster and Saugerties, and Village of Saugerties in Valley Reach 3E. The Plattekill flows into lower Esopus Creek at the downstream end of Valley Reach 3D. This tributary is the second of two major tributaries that provide flow and sediment (including turbidity) to lower Esopus Creek. The land adjacent to the stream is more developed in Valley Reaches 3D, 3E, and 3F than in upstream areas; impervious surfaces in these developed areas contribute stormwater runoff to lower Esopus Creek. Buildings (both private residential homes and municipal or industrial buildings) are located in close proximity to the stream channel.

6.2 OPERATION OF ASHOKAN RESERVOIR IN ACCORDANCE WITH THE IRP

The Proposed Action reduces the number, magnitude, and duration of spill events by proactively managing the Reservoir water level with releases to meet the CSSO.

Operation of Ashokan Reservoir in accordance with the IRP has the potential to affect lower Esopus Creek. In accordance with the IRP, there would be the potential for changes to the magnitude, duration, frequency, seasonality, and quality of streamflow in lower Esopus Creek. No construction is proposed as part of the Proposed Action in the lower Esopus Creek study area. There are three types of releases in the IRP: (1) the community release to provide recreational, environmental, and economic benefits to lower Esopus Creek; (2) spill mitigation releases to enhance the flood attenuation provided by Ashokan Reservoir; and (3) operational releases to prevent or mitigate the spilling of more turbid west basin waters into the east basin of Ashokan Reservoir in order to protect water quality. All three types of releases enhance the flood attenuation benefit that the Reservoir already provides to lower Esopus Creek communities. The IRP prescribes flow and duration criteria for community, spill mitigation, and operational releases based on seasonality and turbidity levels. It is based, in part, on maintaining a Conditional Seasonal Storage Objective (CSSO) in Ashokan Reservoir. The CSSO enhances the Reservoir's flood attenuation capacity by creating a void in Ashokan Reservoir to store runoff during storm events. Each of the elements of the IRP is shown on **Figure 3-1** and described in Section 7.1.3, "Summary of Effects of the Proposed Action on Flow Regime and Water Quality in Lower Esopus Creek."

In accordance with the IRP, releases from Ashokan Reservoir to lower Esopus Creek are made through the Ashokan Release Channel, a concrete channel that joins Ashokan Reservoir to Little Beaverkill, which then connects to lower Esopus Creek at Olivebridge in Ulster County in the upstream end of Valley Reach 1A. Releases allow DEP to convey water in a controlled manner from the Reservoir through lower Esopus Creek. Spills continue to flow over the Reservoir's spillway into the East Basin Spillway Channel.

In accordance with the IRP, releases from Ashokan Reservoir to lower Esopus Creek range from 10 to 15 MGD (23 cfs) (seasonally-based community release) to 600 MGD (928 cfs) (maximum spill mitigation and operational release magnitude). The community release provides sustained flow to lower Esopus Creek year-round (except when these releases are curtailed during drought or elevated turbidity conditions). Spill mitigation releases help DEP maintain the CSSO in Ashokan Reservoir and reduce peak flows during spill events. Based on the OST 69-year simulation period, the community release would occur 71 percent of the time in accordance with the IRP, and flows from Ashokan Reservoir between the community release and maximum release magnitude of 600 MGD (928 cfs) would occur 22 percent of the time. Four percent of the time the combined flow of spills and releases is between 600 (928 cfs) and 1,000 MGD (1,547 cfs). For the remaining time the Reservoir spill would be more than 1,000 MGD (1,547 cfs) (two percent of the time) or the system would be in a drought (one percent of the time). During periods of spill greater than 1,000 MGD or drought, there would be no releases from Ashokan Reservoir.

The influence of flows from Ashokan Reservoir diminishes moving downstream.

Release flows from Ashokan Reservoir combine with background streamflow in lower Esopus Creek. The percent contribution of flow from Ashokan Reservoir is greatest in the upper portions of lower Esopus Creek where the sub-watersheds of the upstream valley reaches represent a smaller portion of the lower Esopus Creek watershed. **Table 6.2-1** presents the median (50^{th} percentile) contribution of various release flows from Ashokan Reservoir at the end of each valley reach. The percent contribution is not calculated for Valley Reach 3F since this portion of lower Esopus Creek is tidally influenced by the Hudson River. As shown in the table, release flows make up more than half of the streamflow within lower Esopus Creek through Valley Reach 1B for all release magnitudes. Downstream of Valley Reach 1B, releases from the Reservoir become a smaller proportion of the total streamflow within lower Esopus Creek. This is due to the increased area of the sub-watersheds; lower Esopus Creek receives flow from its two major tributaries, the Saw Kill (downstream end of Valley Reach 2C) and Plattekill (downstream end of Valley Reach 3D).

Table 6.2-1. Median Contribution of Flows from Ashokan Reservoir to Lower Esopus Creek Background Streamflow in the Future with the Proposed Action

Percent Occurrence of Release and Spill Magnitude[1]	71%	22%	4%[3]
Valley Reach	**Community Release Flow Less than or Equal to 15 MGD (23 cfs) (Percent Contribution)[2]**	**Flow from Ashokan Greater than 15 (23 cfs) and Less than or Equal to 600 MGD (928 cfs) (Percent Contribution)**	**Flow from Ashokan Greater than 600 (928 cfs) and Less than or Equal to 1,000 MGD (1,547 cfs) (Percent Contribution)**
1A	65%	90%	96%
1B	53%	84%	94%
2C	26%	61%	78%
3D	21%	55%	73%
3E	20%	54%	72%
3F	NA	NA	NA

Notes:

[1] The percent occurrence of flow magnitude is the percent of time each flow rate from Ashokan Reservoir would occur in the future with the Proposed Action.

[2] To calculate the percent contribution of Ashokan Reservoir releases to lower Esopus Creek streamflow, modeled daily flows from OST were added to the observed background streamflow at Mount Marion over the same time period scaled by valley reach).

[3] For the remaining time, the Reservoir is spilling (2 percent) or the system is in a drought (1 percent). During periods of spill greater than 1,000 MGD or drought, there would be no releases from Ashokan Reservoir.

NA – Not applicable