

**FEASIBILITY REPORT
KUSHAQUA DAM IMPROVEMENTS
TOWN OF FRANKLIN, FRANKLIN COUNTY
NEW YORK**

January 4, 2018

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Section 1.0 Introduction:

This Report describes the proposed improvements to the Kushaqua Dam located in the Town of Franklin, Franklin County, New York (see Figures No. 1 and 1A). The dam is owned and operated by Rainbow Lake Water Protection District, an agency established by Franklin County. The District is a Special Taxing entity and operates within the Franklin County Government.

The dam is regulated by NYSDEC and is classified as a low hazard (Class A) dam. The dam is identified by NYSDEC as No. 182-1308.

The dam consists of a reinforced concrete gravity dam with three spillways separated by concrete piers (see Plan Sheet No. D-1). Two of the spillways are ogee spillways and the center spillway is a modified ogee spillway fitted with stop logs.

The dam is located on the Kushauqa-Mud Pond Road approximately 2.5 miles northeast of the hamlet of Onchiota in a remote area and serves to form flat water impoundments covering in excess of 2.5 square miles.

During a flood event (warm rain with snow melt on frozen ground) in the spring of 2011, the level behind the dam rose to slightly below the top of the earthen embankment adjacent to the spillways. The NYSDEC Engineer who observed the dam at the time recommended action be taken to address the issue since overtopping of the embankment would lead to dam failure. Review of the spillway hydraulics and site hydrology indicates the stop logs must be removed from the center spillway to allow the design flood (100 year) to safely pass. Removal of the stop logs under high flow conditions is not practical and removal of the stop logs under normal flow conditions would lower the reservoir by five to six feet. The lower reservoir level is not acceptable to landowners within the District and would have negative effects on the environment (fish and wildlife).

The preferred alternative has been determined to be raising the dam (wing walls, deck and adjacent embankments) by approximately 2-1/2 to 3-1/2 feet.

This Report describes the selected alternative. A more complete description of the analysis and design of the improvements is contained in the Engineering Report dated November 21, 2017 prepared by Blue Mountain Engineering, PLLC (BME).

Section 2.0 Facility Description:

The Kushaqua Dam forms Lake Kushaqua and Rainbow Lake on the north branch of the Saranac River. These lakes, along with Buck Pond, Clear Pond, Rainbow Lake Narrows, smaller interconnected bodies of water and the streams feeding into the lakes form the headwaters of the north branch of the Saranac River.

The dam was reconstructed in 1948 by the predecessor to New York State Gas and Electric (NYSEG), and replaced a timber dam dating back to the 1800's. The dam is owned and operated by the Rainbow Lake Water Protection District which was created by New York County Law (Section 264A) in 1993. The District was established to provide for the maintenance and operation of the dam. The dam site is surrounded by forest lands owned by New York State and NYSEG with an abandoned railroad right-of-way and three (3) private parcels on the east side.

The dam itself consists of cast-in-place concrete abutments on the eastern and western shores, a (submerged) concrete approach slab between the abutments and a spillway section consisting of three (3) segments. The eastern and western segments of the spillway consist of ogee spillways and the center spillway, which is separated from the other spillways by concrete piers, takes the form of a modified ogee spillway. Earthen embankments on each side of the dam are integral portions of the dam. See Plan Sheets No. S-1 and D-1 for the current layout and dimensions of the dam.

The two ogee spillways are fitted with retractable flashboards which are used in the summer months to maintain water levels in the lakes and ponds formed by the dam.

The structure has been routinely inspected by BME beginning in July 2014 through October 2017. The concrete was found to be in good to excellent condition, particularly considering its age. The concrete appears to be solid and durable with minimal cracking or deterioration. The earthen embankments have experienced minor erosion adjacent to the abutment walls.

Section 3.0 Evaluation:

The stability of the dam as well as the hydraulics and hydrology of the site were studied in 1995 by Christie Engineering and concluded the dam is in general compliance with NYS regulations and guidance criteria. The Report recommended the stop logs should always be removed during major flood events. Removal of the stop logs would require use of a crane or suitable lifting equipment. Due to the remote nature of the site, availability of a crane is a concern during emergency high flow events.

A subsequent analysis completed in 2015 by BME confirms Christie's analysis. However, to safely operate the dam in its present condition, the stop logs must be removed during flood events. Removal of the stop logs requires human intervention. Because of the remote nature of the site and the specialized equipment required to remove the stop logs (i.e. a crane), this is not considered a safe method of addressing high flow events.

Section 4.0 Hazard Assessment:

NYSDEC has previously classified this dam as a low hazard (Class "A") dam based on the downstream characteristics and potential impacts associated with dam failure. Since the dam is a low hazard dam, the facility is not required to have a formal dam break analysis or develop a formal Emergency Action Plan (EAP).

Christie (1995, see Attachment No. 6) also concluded this hazard assessment was appropriate for this dam. A reassessment by BME in 2016 further confirmed these prior assessment(s).

Based on the dam height (14 feet), the river bed slope and the flood plain width, it is unlikely that any of downstream bridges would be impacted by a dam failure. Some seasonal camps along Goldsmith Road could, potentially, be flooded to a depth of around 2 or 3 feet, but it is unlikely this would result in loss of life.

Based on this review, it appears the classification of this dam as a Class "A" low hazard dam is appropriate.

Section 5.0 Proposed Improvements:

The proposed improvements to the dam consist of raising the concrete abutment walls and deck 2'-8" and constructing a stone armored berm about 325 feet long along the shoreline adjacent to the concrete portion of the dam (see Plan Sheets No. S-3, S-8, D-2 and D-3).

Raising the embankment (see Sheet No. S-8) will consist of clearing and grubbing the area, placement of compacted structural (granular) fill, overlaying the embankment with a heavy (12 oz/sy) non-woven geotextile and placing a twelve inch thick layer of 8" diameter angular stone armoring. The surface of the stone armoring will be chinked to provide an erosion resistant surface.

The abutment wall extensions will be constructed using reinforced concrete with reinforcing bars grouted into the existing abutment walls. The walls will be raised from elevation 100.83 to 103.50 (1673 to 1675.67 on USGS datum). This will provide 1.6 feet of freeboard during the 100 year storm and 0.8 feet of freeboard during a 500 year storm under worst case (flashboards down) conditions.

A new steel framed deck will be installed on the raised abutments to allow operation of the dam including clearing of obstructions, raising and lowering of the flashboards and routine maintenance and inspection.

To allow additional flow during high flow events and still allow control of the reservoir level during the summer, the top of the existing stop logs will be lowered (cut) to the level of the adjacent spillways and a third retractable flashboard will be installed in the center spillway. The third flashboard will be constructed in the same configuration as the existing flashboards.

The new deck and flashboard operations will be surrounded with a 7'-0" high chain link fence to prevent unauthorized entry and/or vandalism.

It is expected the work will be completed in 45 to 60 days during the summer of 2018. The construction of the improvements will require Permits from the NYSDEC and the US Army Corps. The initial permit applications are contained in Attachment No. 1.

Section 6.0 Potential Environmental Impacts (SEQR): (Up-dated 3-2-18)

The potential for the improvements to the dam to negatively impact the environment were minimized during design by limiting the extent of disturbed area necessary for the raised embankment and avoiding disturbance to the existing water bodies.

In consultation with the NYSDEC, the US Army Corps and NYS-OPRHP, the existing site was examined for unique or special natural and cultural resources (see Figures No. 4 and No. 5). The Natural Heritage Program (NYSDEC) was consulted because the NYSDEC Environmental Resource Mapper (ERM – Figure No. 4) indicated there were rare species at or near the project site. The Regional NYSDEC Office and the Natural Heritage Program in Albany confirmed the ERM listing refers to the presence of Common Loons in the adjacent waterway. Since the project will not involve disturbance to the waterways, the potential for impact on the Loons appears to be small to insignificant.

By limiting the width of the embankment and use of relatively steep, armored slopes, the amount of disturbed area was minimized to the maximum extent possible. This minimizes the number of trees which need to be cut to six (6) (see Plan Sheet No. S-4 for the location, size and species of the trees). Cutting of these trees is not expected to impact the Northern Long-Eared Bat as the site does not contain "Critical Habitat" per IPaC.

A Sediment and Erosion Control Plan (see Sheet No. S-7) has been developed to further reduce the potential for environmental impacts. The Long Form SEQR Environmental Assessment Impact Form (EAF) and SEQR correspondence received to date are contained in Attachment No. 2.

Due to the small extent of the project, the project was classified as an "Unlisted Action" per SEQR. The Franklin County Legislature and the NYSDEC have conducted uncoordinated reviews tentatively concluding "No Significant Environmental Impact". This conclusion will be examined at a public hearing.

Section 7.0 Property Ownership:

The RLWPD contains all or portions of 204 Real Property Tax Parcels composed of 201 actual land parcels and three (3) administrative (Tax Roll) entries for taxing purposes related to the NYS Forest Preserve lands. The District extends into two Towns; the Town of Brighton and the Town of Franklin. There are 155 (actual) parcels located in the Town of Brighton and 46 parcels in the Town of Franklin. The lands within the District are taxed using an "A-Valorem" value determined by a formula which includes the amount of water frontage contained within each parcel and improvements (buildings, etc.) on each parcel within 200 feet of the shoreline. The value of lands and improvements more than 200 feet from the shoreline are not included in the Ad-Valorem assessment.

Tables No. 1 and No. 2 in Attachment No. 3 summarize the assessments of the parcels and the Ad-Valorem values assigned to each parcel. Table No. 1 contains all of the parcels within the District and Table No. 2 contains only those parcels classified as residential use. The assessments are based on the 2017 calendar year tax rolls. In 2017 the equalization rate in the Town of Brighton was 86% and in the Town of Franklin the rate was 100%. The differences in these two rates means the values are only comparable with the full value assessments. The total full value Ad-Valorem value is \$47,759,772 (in 2018). The parcels in the Town of Brighton account for 65% of the Ad-Valorem value.

The District contains portions of parcels covering about 4,950 acres, but this includes the portions of the parcels that are located outside the 200 foot zone which is considered the District boundary. An actual area contained within the District boundary has not been determined as a part of this report.

Because the District is located within the Adirondack Park, lands owned by New York State are considered Forest Preserve Lands and are not, in general, exempt from local taxes or special District fees (or tax). In 2017, the State of New York owned sixteen (16) parcels, one of which is "exempt". In addition, three (3) Tax Roll entries for NYS are included; only one of these has any Ad-Valorem value. The total Ad-Valorem value of these NYS parcels and the three administrative (Tax Roll) entries is \$2,792,417 or 5.8% of the total within the District. The total District tax to be paid in 2018 by NYS is \$1,169 (or 5.8% of the District budget). This is equivalent to about 14 privately owned properties within the District.

To determine the potential cost impact of the improvement project on the typical District landowner, the average and median Ad-Valorem values were determined after excluding non-typical properties. The non-typical parcels excluded are the NYS owned lands (and Tax Roll entries) and six parcels with low values. These parcels are, in general, small parcels adjacent to larger parcels under common ownership with the larger parcel or otherwise distinctly different from the majority of the parcels (i.e. NYSEG).

The average full value Ad-Valorem assessment of the typical property within the District is (in 2017) \$250,391 and the median value is \$191,930. The typical properties vary widely in values with a maximum of \$1,670,900 and a minimum of \$14,500. The median value is well below the average due to the presence of sixteen parcels in the District with values exceeding twice the average value. Six parcels (or 3.4% of the parcels) have values exceeding four times (400%) of the average value.

To determine the potential cost impact of the improvement project on the typical one or two family residential property, only those parcels classified (assessed) as residential in nature were considered (see Table No. 2). Of the 201 parcels in the District, about two-thirds (137) are classified as residential. These are either classified as single family residences (PUC-210), seasonal residences (PUC-260) or estates (PUC-250). The average full value Ad-Valorem assessment of these parcels is \$306,597 with a median of \$250,900. Again the six parcels with values exceeding the average by 300+% affect the average value significantly.

Section 8.0 Project Cost Impact:

Construction of the improvements is expected to cost in the range of \$250,000 to \$260,000 (see Attachment No. 4). Soft costs (engineering, permitting, financing, legal, etc) will increase the project cost to approximately \$300,000.

The “normal” operating expenses for the District include expenditures for inspections, repairs and maintenance, insurance, legal and accounting fees and have ranged from \$5,000 to \$7,000 since 2011. The 2016 budget was increased to \$10,000 to accommodate engineering and planning costs. The budget for 2018 was increased to \$24,000 (+/-) in anticipation of the costs associated with the improvement project. The approximate District Tax amounts for each parcel and a District budget of \$7,000 are summarized in Table No. 1 and range from \$2.13 to \$245.

Currently (in 2018), the typical property with the median value (Ad-Valorem) of \$191,930 will pay a District Tax of about \$96 based on the 2018 budget of \$24,000 for the District. The parcel by parcel assessment of the budget is summarized in Table No. 1. Each \$10,000 increase in the District budget will increase the tax on the typical property by about \$40 per year.

The typical RESIDENTIAL property with the median Ad-Valorem value of \$250,900 will pay a District Tax of about \$126 in 2018. Each \$10,000 increase of the District budget will increase this by about \$53 per year.

We understand the project will be financed by Bonds issued by Franklin County and tax revenue generated by the District. The total project cost (\$300,000) will be paid by using approximately \$30,000 in current District funds and proceeds of the Bond sale. This will reduce the borrowing to \$270,000.

Assuming the Bonds are issued at an interest rate of 4% over a 15 year term, the average annual debt service (principal and interest) of the first five years will be \$25,520 (see Attachment No. 5). This will increase the District budget to approximately \$32,500. The resulting tax on properties in the District is estimated in the far right column of Table No. 1. This estimate assumes the Ad-Valorem assessments remain relatively stable. A property with the median assessment of \$191,930 will be taxed at \$131 per year. A property with the maximum assessment will pay approximately \$1,140 and the property with the lowest assessment will pay approximately \$10.

The tax on the typical (median) residential property with a median assessed value of \$250,900 will be approximately \$171 per year, an increase of about \$134 over the 2015 tax levy and an increase of \$45 per year over the current (2018) levy.

Section 10.0 Closing:

The proposed improvements will not require removal of the stop logs or other human interaction to safely pass the design flood. In addition, the dam improvements were designed in such a manner as to minimize the amount of maintenance required.

The projected tax on the typical property with a median assessment of \$191,930 in the District will be about \$131 per year or \$103 above the 2015 tax and \$34 above the current (2018) levy for the course of the Bond issuance (15 years).

The projected tax on the typical residential (single family or seasonal residence) with a median assessment of \$250,900 will be about \$171 per year or \$134 above the 2015 tax and \$45 above the current levy over the course of the Bond issuance (15 years).

The increase in taxes due from New York State will be approximately \$1,491 per year over the 2015 tax (\$1,900 total/year) for the proposed 15 year term of the Bonding.

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