

# CRMC DECISION WORKSHEET

2021-08-102

Bristol County Water Authority

Hearing Date:	
Approved as Recommended	
Approved w/additional Stipulations	
Approved but Modified	
Denied	Vote

APPLICATION INFORMATION						
File Number	Town	Project Location		Category	Special Exception	Variance
2021-08-102	Warren	Lower Kickemuit Reservoir Dam		FWW	<input type="checkbox"/>	<input type="checkbox"/>
		Plat	13B  21			
Date Accepted		09/01/2021		Work at or Below MHW		<input checked="" type="checkbox"/>
Date Completed		08/26/2022		Lease Required		<input type="checkbox"/>
Owner Name and Address				Bristol County Water Authority 450 Child Street Warren, RI 02885		

## PROJECT DESCRIPTION

Remove the Lower Kickemuit Reservoir Dam and restore the upper Kickemuit estuary

## KEY PROGRAMMATIC ISSUES

**Coastal Feature:** Coastal wetlands, coastal bluff, freshwater wetlands, concrete seawall, riprap revetment  
**Water Type:** Type 2, Kickimuit River  
**Red Book:** 1.1.4(D), 1.1.6(F), (G), 1.1.10, 1.2.1(C), 1.2.2(C), (D), 1.3.1(A)  
**SAMP:** N/A  
**Freshwater Wetlands in the Vicinity of the Coast**

Variations and/or Special Exception Details:  
 The project is reviewed as both a Category "B" and an Application to Alter, under the "Red Book" and Freshwater Wetlands in the Vicinity of the Coast, respectively

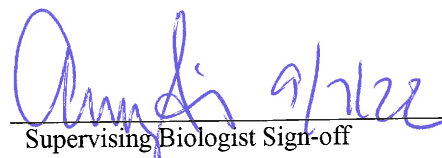
Additional Comments and/or Council Requirements:

Specific Staff Stipulations (beyond Standard stipulations):  
 Additional Stipulations included within report

## STAFF RECOMMENDATION(S)

Engineer RAS Recommendation: No Objections  
 Biologist ALS Recommendation: No Objections  
 Other Staff \_\_\_\_\_ Recommendation: \_\_\_\_\_

 9/7/22  
 Engineering Supervisor Sign-Off date

 9/7/22  
 Supervising Biologist Sign-off date

 9/7/22  
 Executive Director Sign-Off date

Staff Sign off on Hearing Packet (Eng/Bio) date

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STATE OF RHODE ISLAND  
**COASTAL RESOURCES MANAGEMENT COUNCIL**  
STAFF REPORT TO THE COUNCIL

DATE: August 26, 2022  
TO: Jeffrey M. Willis, Executive Director  
FROM: Amy Silva/ Ross Singer

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Applicant's Name:	Bristol County Water Authority
CRMC File Number:	2021-08-102
Project:	Remove the Lower Kickemuit Reservoir Dam and restore the upper Kickemuit estuary
Location:	Lower Kickemuit Reservoir Dam; Warren: Plat(s): 13B 21; Lot(s): 28 182
Water Type/Name:	Type 2/ Kickemuit River
Coastal Feature:	Coastal wetlands, coastal bluff, freshwater wetlands, concrete seawall, riprap revetment
Plans Reviewed:	"Lower Kickemuit Reservoir Dam Removal (Warren Reservoir Lower Dam)..." 9 sheets, revised March 10, 2022

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**INTRODUCTION:**

The removal of the Lower Kickemuit Reservoir Dam is part of a larger project including the removal of the Upper Kickemuit Dam for the purpose of restoring the upper Kickemuit estuary and the connectivity of the Kickemuit River system. CRMC review of this project is limited to the removal of the Lower Dam. The remainder of the project is under the jurisdiction of Rhode Island Department of Environmental Management (RIDEM). The project is under review by the RIDEM Office of Water Resources Freshwater Wetlands Permitting and the Water Quality Certification Program (DEM/WQ is reviewing the project as a whole and is currently under review for issues concerning the upper dam), as well as the Army Corps of Engineers.

The Lower Kickemuit Dam is approximately 250ft long, consisting of a 50ft wide spillway with adjacent embankments. The Dam separates the lower Kickemuit reservoir from the tidally influenced Kickemuit River. The existing dam structure is in significant disrepair and no longer serves to protect any resources. The lower dam has been periodically breached by the tidal portion of the Kickemuit and the reservoir is contaminated with salt water. The Bristol County Water Authority (BCWA) has discontinued using reservoir as a drinking water source, and at this point the dams are functionally obsolete. By removing the dam, the estuary can be restored to its natural condition as a tidal estuarine habitat.

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The scope of this project consists of the removal of the dam structure, dredging of sediment, limited shoreline stabilization, and wetland restoration. Special Exceptions are required for dredging in Type 2 waters §1.3.1(I)(3)(b), filling in Type 2 waters §1.3.1(J)(3)(a) and alterations to coastal wetlands §1.3.1(L)(3)(b)

**COMMENTS ON APPLICATION/APPLICABLE POLICIES, STANDARDS & ETC:**

The proposed project involves demolition of the dam structure, sediment removal, limited shoreline restoration and wetland restoration. The work associated with the lower dam removal falls within 200' of Coastal Waters (Type 2), but not within waters specifically identified as Type 2. The application is being reviewed primarily under the Freshwater Wetlands in the Vicinity of the Coast Regulations. However, as the project primarily concerns dredging and in-water work, both regulations have essentially the same requirements.

Cofferdams and temporary diversion pipes are proposed to be utilized in several different stages to allow for controlled containment. The dam spillway, tidal gates, fishway, training walls, surrounding riprap will be demolished. The left dam wall and northern shoreline embankment will be protected to remain in place as a proposed area of shoreline access.

Dredging is proposed in stages through the process to establish a 60ft wide channel. Sediment will be removed from the lower reservoir to prevent downstream migration of copper contaminated sediment once the dam is breached. Following demolition, fine impounded sediment will be removed through controlled phased mobilization and mechanically removed from settling basins. Sediment will be dewatered and disposed offsite at a licensed facility. A total of approximately 7,800 cubic yards of sediment removal is proposed. A Sediment Characterization and Management Plan is included in the application.

Channel banks will be graded and stabilized to prevent erosion. Two discrete areas of structural and non-structural fill in tidal waters are proposed. The critical area along the excavated channel slope involves removal and subsequent replanting of salt marsh vegetation with the intent to provide permanent stabilization. Proposed non-structural shoreline protection will stabilize approximately 151 feet of shoreline and require approximately 58 cubic yards of fill. Second, the culvert below Child Street requires approximately 41 cubic yards of trap stone to be placed along the river bottom fill to slow velocities and at culvert approaches to protect the culvert walls.

Extensive hydraulic and hydrologic studies were analyzed to evaluate the impact of flooding associated with the removal of the Kickemuit dams. The analysis shows that flood events associated with rainfall would be overall reduced upstream of the lower dam, however a slight increase in flooding is predicted in the area between the lower dam and child street. This area would see a flooding elevation increase of 0.01 feet for a 1 year storm event, and a maximum 1.30 feet for a 100 year storm event. This increase does not increase the lateral inundation to any structures or infrastructure. In addition, coastal flooding events were also analyzed. Based on the submitted analysis, the removal of the dam does not have a significant effect on the extent of coastal flooding due to the low elevation of the lower dam. The worst case scenario involving a 10 year storm surge and precipitation event at high tide would have an increase of 9 inches. This would potentially inundate a section of Serpentine Road to a depth of only 2 inches. Coastal flooding from storm surge greater than the 10 year event would currently overtop the lower dam. A 100 year storm event scenario indicates water levels would result in decrease by 0.5 to 1.15 feet with the dams removed.

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The submitted narrative states that that water chemistry in the lower reservoir is characteristic of a brackish waterbody with intermediate salinity. Although the reservoir is not subject to the tidal cycle, saltwater intrusion is occurring through the lower dam flap gates and fishway

An Essential Fish Habitat (EFH) List and Assessment Worksheet were completed and are included in the application package. Members of DEM Fish & Wildlife were part of pre-application meetings. The dam removal is anticipated to have significant long-term benefit to marine fisheries within the Kickemuit River estuary by removing passage barriers and increasing tidal estuarine habitat.

The removal of the dam and restoration of flow to the reservoir will increase the amount of brackish/freshwater wetland interface, an uncommon wetland habitat in RI, and one known for its habitat value – particularly for the rare diamondback terrapin. The restoration of the natural estuary is likely to increase habitat for wildlife.

The removal of the lower dam will return the lower reservoir to its natural state – an estuarine habitat. In the immediate area of the lower dam, areas of hardened shoreline associated with the dam will be restored to salt marsh habitat. The applicants have submitted a post-construction monitoring plan to ensure that post removal conditions and restoration goals are met.

Wetland impacts have been identified by the applicant's consultants as the following (taken from the application submittal):

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Wetland Type	Square Feet of Impact	Cubic Yards of Fill/ Removal	Permanent/ Temporary	Material/ Activity Description
Tidal Waters	1,368±	138±	Temporary	Temporary fill for control of water and turbidity controls.
Tidal Waters	690±	160±	Permanent	Mechanical removal of the dam structure. Excavation required to establish channel.
Tidal Waters	13,045±	7,800±	Permanent	Mechanical removal of sediment mobilized from the Lower Kickemuit Reservoir.
Tidal Waters	912±	58±	Permanent	Fill for non-structural shoreline stabilization along southern shoreline.
Tidal Waters	1,657±	41±	Permanent	Trap stone fill for stabilization of Child Street culvert.
Coastal Wetlands (Salt Marsh)	228±	N/A	Permanent	Removal of <i>Spartina alterniflora</i> along the southern shoreline.
Coastal Wetlands (Salt Marsh)	222±	11.5±	Temporary	Super sack coffer dams for control of water.
Total (permanent)	16,532±	Removal: 7,960± Fill: 99±	Permanent	Total permanent impacts to tidal waters and coastal wetlands.
Total (temporary)	1,590±	Fill: 150±	Temporary	Total temporary impacts to tidal waters and coastal wetlands.

Wetland Type	Square Feet of Impact	Cubic Yards of Fill/Removal	Permanent/ Temporary	Material/ Activity Description
Lower Kickemuit Reservoir	2,309±	152±	Temporary	Supersack coffer dams and temporary diversion pipes for control of water. Temporary construction access.
Lower Kickemuit Reservoir	39,285±**	1,000±	Permanent	Removal of sediment impacted with Copper Sulfate.
Lower Kickemuit Reservoir	2,088±	172±	Permanent	Excavation and grading immediately upstream of dam to establish channel and remove dam.
Total (Temporary)	2,309±	152±	Temporary	Total temporary impacts to freshwater wetlands in the vicinity of the coast.
Total (Permanent)	41,373±	1,172±	Permanent	Total Permanent impacts to freshwater wetlands in the vicinity of the coast.

\*\* Approximately 2,398 square feet of impacted Copper Sulfate removal overlaps with temporary and permanent impact activities.

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As can be seen in the charts, the majority of the expected impact is in-water sediment removal. The applicant has identified the original channel within the reservoir and has designed the project to return to utilization of that channel. As such, there is an expectation that much of the current open water area within the lower reservoir will become an intertidal zone of marshland and marsh flats. (see attached figures provided by the applicant).

The removal of the lower dam is expected to have an overall beneficial impact on both wetlands and wildlife habitat, as well as provide area for salt marsh establishment and migration.

#### **COMMENTS ON RED BOOK:**

The work associated with the lower dam removal falls within 200' of Coastal Waters (Type 2), but not within waters specifically identified as Type 2. The application is being reviewed under both the Freshwater Wetlands in the Vicinity of the Coast and the "Red Book" Regulations.

The applicants have, out of an abundance of caution, supplied Special Exception criteria in accordance with the RICRMP, as a Special Exception is required for dredging in Type 2 waters §1.3.1(I)(3)(b), filling in Type 2 waters §1.3.1(J)(3)(a) and alterations to coastal wetlands §1.3.1(L)(3)(b). The Special Exception may be granted for these prohibited activities only if the following criteria are met:

*The proposed activity serves a compelling public purpose which provides benefits to the public as a whole as opposed to individual or private interests. The activity must be one or more of the following:*

- a. An activity associated with public infrastructure such as utility, energy, communications, transportation facilities, however, this exception shall not apply to activities proposed on all classes of barriers, barrier islands or spits except as provided in § 1.2.2(C)(4)(i) of this Part;*
- b. A water-dependent activity or use that generates substantial economic gain to the state; and/or*
- c. An activity that provides access to the shore for broad segments of the public.*

The removal of the dam provides a compelling public purpose by providing public boating access to the Upper Kickemuit River which is now obstructed. In addition, the removal of the dam is expected to improve water quality and the general health of the environment.

*All reasonable steps shall be taken to minimize environmental impacts and/or use conflict.*

The overall goal of this project is to improve the environment. It is Staff's opinion that the proposed project is designed to minimize environmental impact during construction through the use of cofferdams and phased dredging of impacted sediments. Temporary impacts to wetlands are minimized and native coastal vegetation will be restored.

*There is no reasonable alternative means of, or location for, serving the compelling public purpose cited.*

There is not an alternative means of restoring the estuary other than by removing the dam. The existing dam structures are severely deteriorated and the reservoir no longer serves as a potable water source. Repair of the structure would not address the impaired environmental conditions and would continue to prevent access to the Upper Kickemuit River.

#### **COMMENTS ON OBJECTION:**

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The applicant has met with members of the public multiple times during the concept and design phases of this project. The applicants state that three public presentations were held and that as a result of concerns raised, additional modelling was done and revisions made to the design. A fourth public meeting was planned upon submission of applications to DEM/CRMC. Staff is unaware of the status of that meeting.

The project has received letters of support from Save the Bay, and the Kickemuit River Council. A number of objections originating from a single form letter were received during the public comment period. The Objectors concerns and responses are as follows:

*Private property will be devalued due to being inundated with salt water. Agricultural land will become tidal marsh.*

The flood studies prepared have found minimal change to the flood surface elevations under all scenarios modelled under a variety of tidal conditions. As an added measure, ten culverts along Serpentine Road will be improved with tidal gates to prevent back flow of tidal waters to properties along the western side of Serpentine Road.

*Private wells along Serpentine Rd will be impacted from saltwater intrusion*

The water Lower Kickemuit Reservoir is no longer consider a public water supply, and the BCWA has not used the reservoir as a portable water source since 2011. The abutters to the reservoir have always obtained their water supplies from private wells located at varying distances from the reservoir and at varying depths. The BCWA has agreed to monitor the wells before removing the dams and will work with the abutters to address changes if they occur.

*Removal of the reservoir will hinder fire department access to water for fire suppression*

The BCWA has agreed to work with the Town of Warren to address fire suppression concerns relative to changes in the lower impoundment's salinity from brackish to saltwater. The lower impoundment has already converted to a brackish system due to tidal inundation.

*Flood waters will inundate the historical Kickemuit Cemetery and tidal erosion may impact an ancient Native American burial ground*

The cemetery is located above the storm surge elevation near the northern end of Serpentine Road and was established prior to the construction of the dams based upon a natural and free flowing estuary. The Historical Preservation and Heritage Commission has reviewed this project and determined that there will be no effect of any significant cultural resources.

*Concern that the dam removal will trigger FEMA flood zone change and require residents to obtain flood insurance*

The FEMA 100 year flood plain inundation in the area of the Kickemuit Reservoirs is not expected to change per the consultants analysis. Therefore it is unlikely that there would be any changes to the FEMA flood

insurance maps. The Kickemuit River is currently mapped as a Zone AE with an elevation of 12 feet at Schoolhouse Road, which extends across Serpentine Road to the residences along the west side. The lower dam is not mapped as a dam on the FEMA flood map and does not provide a flood barrier. The upper dam is identified on the FEMA flood map, north of Schoolhouse Road, but the map does not indicate that the dam provides flood protection as there is no change in the flood elevation from upstream to downstream of the dam. Below Child Street, the mapped Zone AE has an elevation of 14 feet, indicating that Child Street is the hydraulic barrier which acts to lower flood elevation. The current FEMA mapping *does not* indicate that the area is an “Area with Reduced Risk Due to Levee”, signifying that the presence of the dams does not reduce the level of flooding within this portion of the Kickemuit River.

*Pollution stemming from septic systems will be released by removing the dam. Contaminants will impact commercial and recreational fishing*

The water quality monitoring data analyzed by URI’s Watershed Watch program in the summer and fall of 2020 documented that the dams do not provide a barrier to control pollution under existing conditions. According to the URI Watershed Watch’s water quality report, total nutrients, phosphorus and nitrogen were high in the upper and lower impoundments as well as in the downstream Kickemuit estuary site at Child Street. Dissolved oxygen was at levels considered to be stressful and potentially lethal for aquatic life. All three sites recorded fecal coliform values above the criterion for the designated uses. The expectation of this project is that by reverting the estuary to natural conditions water quality will improve.

*Concerns that there will be negative impacts to freshwater habitat and wildlife.*

The water quality of the upper and lower impoundment is degraded and considered either eutrophic or hypereutrophic according to URI’s Watershed Watch water quality monitoring report. The poor water clarity and low oxygen levels result in a stressful or potentially lethal condition for aquatic life. Removing the dams is expected to improve the water quality by eliminating the stagnant conditions and re-establishing a free flowing estuary capable of supporting salt water habitat.

#### **CONCLUSION/RECOMMENDATION:**

The goal of the removal of the Lower Kickemuit Dam is to restore the tidal estuary to its natural conditions. It is expected that water quality will be improved by removing the deteriorated structure and restoring the natural channel. Native coastal wetland vegetation will be restored and the health of the habitat improve. Additionally, public access to the Upper Kickemuit River will be improved through water based recreational activities. It is staff’s opinion that the proposed project meets the burdens of proof required for Special Exception relief and recommends approval of the project with the following stipulations held pending Council’s Decision that the Special Exception burden of proof has been met for this project.

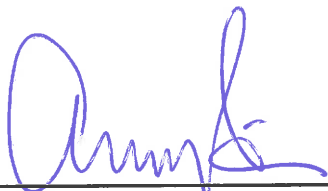
Should the Council approve this application, staff has the following recommended stipulations in addition to standard Assent stipulations:

- E1 Sediment removal shall be managed in accordance with the Sediment Characterization and Management Plan last revised March 2022.
- B1 Monitoring shall be done in accordance with the submitted “Pre and Post-Dam Removal Monitoring Plan”



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B2 An environmental consultant, experienced in site assessments and measures necessary to protect sensitive aquatic environments or sensitive ecosystems, must be employed prior to the commencement of site alterations to monitor the project and to ensure compliance with the terms and conditions of this permit, and ensure success of the project. The CRMC must be notified in writing of the consultant chosen to comply with this condition. Written progress reports shall be submitted to the CRMC during all phases of the project. Once the projects are complete, annual written monitoring reports shall be provided for a period of 3 years to insure long-term success. Monitoring reports shall be due by November 30 of each year. Where corrective actions are determined to be necessary by the consultant performing the monitoring work or by CRMC Staff, the (applicant) shall work with the CRMC to assure appropriate corrective measures are undertaken in a timely manner and in cooperation with CRMC Staff.

Signed  \_\_\_\_\_ Reviewing Biologist

Signed  \_\_\_\_\_ Reviewing Engineer