FUSS & O'NEILL

MEMORANDUM

TO: MVP Core Team, Uxbridge, MA

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1550 Main Street, Suite 400
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DATE: May 11, 2020

RE: Dams Assessment
Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
MVP Action Grant – Town of Uxbridge

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1 Introduction

The Town of Uxbridge was awarded a FY19 EEA Municipal Vulnerability Preparedness (MVP) Program Action Grant to conduct a comprehensive, regional climate change vulnerability assessment and develop an associated management plan that addresses the major types of water infrastructure in the community, including transportation systems (culverts and bridges), dams, water supply infrastructure, and stormwater infrastructure. The project consists of a series of technical assessments focused on each type of water infrastructure and associated climate change vulnerabilities; these assessments inform an integrated plan to improve climate resiliency of local infrastructure. A key goal of this project is to promote resiliency measures that consider both infrastructure and natural system solutions. The integrated plan is intended to help local decision-makers think more strategically about ways to utilize natural systems to provide more effective strategies to reduce flooding, while also benefitting water quality and ecological health.

Based on information available from MassGIS, there are 13 state-registered dams in Uxbridge. An additional 17 unregistered dams have been identified within the town. Of these 30 dams, many are relatively small dams built to power industrial mills of the 17th and 18th centuries, are no longer used for their original purpose, and are in poor condition. Some of these dams could pose upstream flooding hazards by backing up water during floods. Dams also present a hazard to downstream areas in the event of a breach or failure, which can result from aging infrastructure, insufficient maintenance and changes in upstream flow regimes. Dam failure can release large quantities of flow, sediment (sometimes contaminated), and debris and is therefore a threat to property, ecosystems, and public safety. Dams have also fragmented the riverine systems in the watershed, thereby preventing the movement of fish and other aquatic life to feed, spawn, or migrate past the dams.

The objective of the technical assessment described in this memorandum is to assess the structural condition, risk factors, and ecological connectivity potential of 20 dams and evaluate potential management alternatives and to provide recommendations for each dam to increase flood resilience and provide ecological benefits.

2 Dam Assessments

2.1 Selection of Dams for Assessment

The number of dams to be assessed was determined in consultation with members of the Project Steering Committee at the time that the grant proposal was written, and was intended to allow for assessment of registered dams, as well as a subset of the unregistered dams known to exist in the Town. An initial list of thirty-one (31) dams within or on the border of the Town were identified as potential structures for assessment. This included 14 state-registered dams (13 in Uxbridge and 1 in Northbridge) identified based on review of database files provided by the Massachusetts Department of Conservation and Recreation Office of Dam Safety (ODS), 15 unregistered dams identified either by the Town or through visual review of aerial imagery by Fuss & O'Neill staff, and two (2) dams discovered in the field by Fuss & O'Neill staff.

A subset of dams was then selected for vulnerability assessment in the following manner:

- The 14 state-registered dams were selected for assessment, as these dams could reasonably be expected to be the largest dams in the Town, and would likely have the greatest associated risk.
    - The Linwood Pond Dam was included in the assessment because although the dam is located in the Town of Northbridge, the downstream area (hazard area) for this High Hazard dam is located almost entirely within the Town of Uxbridge.
- The unregistered Home Brew Dam was selected for assessment due to the Town's concern over the risk posed by the dam. In addition, as the dam owner, the Town is well-positioned to address any concerns about the dam identified in the vulnerability assessment.
- The West Hill Dam was not selected for assessment because it is owned by the Army Corps of Engineers and is actively operated as a flood control dam.
- Dams identified by Fuss & O'Neill via aerial imagery were considered for assessment based on availability of access (see Section 2.3 regarding access permissions).

As described in Section 2.3, a total of 20 dams were included in the final assessment. Table 1 provides summary information for each of the 20 dams, including hazard classifications for state-registered dams. Figure 1 shows the locations of these dams. The definition of each hazard classification is provided in Table 2.

Of the 20 assessed dams, three (3) are owned by the Town of Uxbridge (including registered and unregistered dams) and four (4) are owned by the Massachusetts Department of Conservation and Recreation (MADCR). The remaining dams are either privately owned or of unknown ownership.

2.2 Office of Dam Safety File Review

Files maintained by the ODS were reviewed to gather available information on each dam selected for assessment. For each state-registered dam, the files requested consisted of the most recent one to two inspection reports, as available, and any follow-up inspection reports.

Hazard classification, flood hazard mapping, upstream and downstream development and infrastructure, and the condition identified in previous dam inspection reports were each considered in the analysis, as described in Section 3.

Table 1. Dams Selected for Assessment

Site No.	Dam ID Number	Dam Name	Impoundment Name	Stream Name	Ownership	Hazard Class
1	MA00895	Whitin Pond Dam	N/A	Tributary of Mumford River	Mumford River Condominium Trust and John F Baer Jr, Trustee	Significant
2	MA02916	Rivulet Village Pond Dam	Taft Pond	(Cold) Spring Brook	Rivulet, LLC	High
3	MA00898	Rivulet Pond Dam	Rivulet Pond	(Cold) Spring Brook	Fairwoods Christian Recreation Society	Low
4	MA01165	West River Pond Dam	--	West River	Uxbridge Associates, LLC	Significant
5	MA03216	Hecla Canal Diversion Structure	--	Hecla Canal	Town of Uxbridge	--
6	MA02815	Old Ice Pond Dam	Inman Pond	Wigwam Brook	Margaret & Heywood Leziak	--
7	MA00891	Lee Pond Dam	--	Emerson Brook	Charles & Linda Vacanti	Significant
8	MA00890	Lee Reservoir Dam	--	Scadden Brook	Uxbridge Rod and Gun Club	Low
9	MA02919	Ironstone Reservoir Dam	--	Bacon Brook	Flagg Realty, LLC	Significant
10	MA03396	Blackstone Canal East Embankment and Gate	--	Blackstone River	MADCR	Low
11	MA00937	Blackstone Canal West Embankment & Stanley Gate	--	Blackstone River Canal at Rice City	MADCR	Low
12	MA00897	Caprons Pond Dam, Canal and Gates	--	Mumford River	MADCR	Significant
13	MA00935	Rice City Pond Dam	--	Blackstone River	MADCR	High
14	MA00896	Linwood Pond Dam	Linwood Pond	Mumford River	Linwood Mill, LLC	High
15	--	371 Aldrich Street	--	--	371 Aldrich Street	Significant*
16	--	Dam on Albee Road	--	--	Town of Uxbridge (if considered part of ROW); Frank & Jill Kenrick if considered part of private property; impoundment owned by Kenricks	Significant*
17	--	Bacon Street Dam	--	--	98 Elmdale Road	Significant*
18	--	Home Brew Dam	--	--	Town of Uxbridge	Significant*
19	--	Dam on Marywood Street	--	--	Town of Uxbridge	Low*
20	--	Albee Road Weir	--	--	Unknown	Low*

*Hazard potential class estimated by Fuss & O'Neill staff

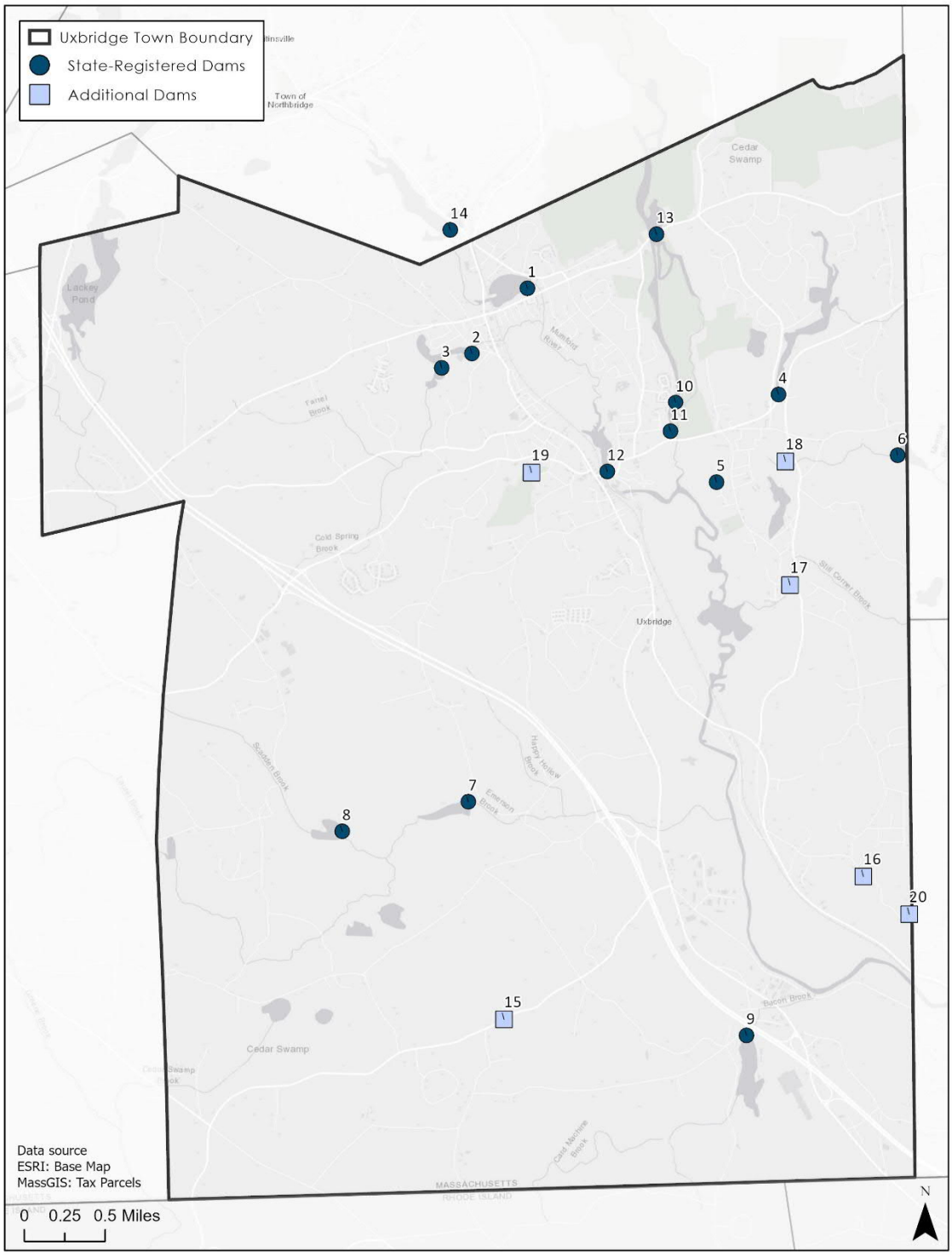


Figure 1. Dams Selected for Assessment in the Town of Uxbridge.
(Refer to Site Numbers in Table 1)

Table 2. Dam Hazard Class Definitions

Dam Hazard Class	Definition
Low	The dam is located where failure may cause minimal property damage and loss of life is not expected.
Significant	The dam is located where failure may cause loss of life and damage to property.
High	The dam is located where failure will likely cause loss of life and serious damage to property.

2.3 Field Data Collection

Access to the dams was facilitated by Town staff, who contacted dam owners to secure permission for access. Permission to access could not be secured for three (3) of the state-registered dams and five (5) of the unregistered dams, due to owner refusal, lack of reply from the owner, or lack of information to contact the owner. Permission to access six (6) unregistered dams was granted after field assessments were completed; visits to these dams ultimately could not be scheduled because of weather constraints.. Of the 20 dams assessed, 15 dams were visually assessed in the field and five (5) dams were assessed based on ODS Inspection Reports and information provided by Town staff.

Limited visual condition assessments of the 15 visually assessed dams were conducted on August 19, August 21, and October 18, 2019 by a two-person field crew led by a water resources engineer experienced in performing state dam inspections in Massachusetts. During the visual dam assessments, the field crew was accompanied by the Uxbridge Conservation Agent Holly Jones for two field days and Uxbridge Board of Health Member David Tapscott for the third field day. The limited condition visual assessments were completed using field data collection forms adapted from ODS's standard dam inspection forms. A blank copy of the field data collection form is provided in Attachment A. Digital photographs were taken at each site. Following the visual assessments, field data were checked against previous dam inspection reports when available. Completed visual assessment forms are provided in Attachment B.

2.4 Visual Assessment Findings Summary

Table 3 summarizes key field data and findings of the limited visual condition assessments. Dam condition ratings are defined in Table 4.

The following issues were observed at the dams:

- Beaver Activity: Beaver activity was observed at the spillway of Rivulet Village Pond Dam, which is located within a factory complex. This beaver activity requires daily effort on behalf of factory staff to remove debris from the spillway in order to keep it clear and to prevent flooding.
- Trees and Vegetation on the Embankment: Many of the assessed dams have vegetation encroaching or growing directly on the dam embankment. Vegetation, especially large trees, can promote the formation of voids in the dam embankment, leading to seepage and piping through the dam, thereby accelerating the degradation of the dam. Trees and vegetation should be cleared back to a distance of 20 feet from any dam and a cover of healthy grass should be maintained on dam embankments. Note that prior to removal of existing trees and woody

growth from dams, part A of a Chapter 253 Dam Safety Permit Application must be submitted to the Office of Dam Safety, and tree removal should be completed under the supervision of a qualified professional engineer.

- Lack of Operation and Maintenance (O&M) Plans: Previous inspection reports stated that O&M Plans were not in place for the majority of the dams as of their last inspection. Maintenance is critical at dams to prevent small problems from accumulating and leading to failure of the dam. Dam owners should be encouraged to develop and follow O&M plans to maintain the stability and safety of the dam(s) under their care.

Table 3. Summary of Dam Visual Assessment Findings

Site No.	Dam ID Number	Dam Name	Visually Assessed?	Condition	Comments
1	MA00895	Whitin Pond Dam	Yes	Poor	Voids in areas of stone in primary/auxiliary spillway, vegetation overgrowth on training walls, trees growing through training walls and from primary spillway. Assessment of primary spillway was limited due to lack of access.
2	MA02916	Rivulet Village Pond Dam	Yes	Fair	Primary and auxiliary spillway in good condition. Some potential leakage through stones in primary spillway. Vegetative growth and loss of pointing in auxiliary spillway. Flowing and non-flowing seepage through downstream walls.
3	MA00898	Rivulet Pond Dam	Yes	Fair	Holes and gullying along embankment. Mud/debris in discharge area.
4	MA01165	West River Pond Dam	No	Poor	2019 Phase I Inspection report notes woody vegetation on embankment and irregularities in crest width and vertical alignment. Seepage reported at the downstream end of the spillway at the left abutment and at the downstream toe adjacent to the right spillway training wall. Vertical and horizontal cracks in spillway weir near both training walls. Auxiliary outlet in poor condition with no operable controls. No known control device for the low-level outlet. Downstream banks overgrown with trees and vegetation.
5	MA03216	Hecla Canal Diversion Structure	No	Breached	Dam noted as breached in 2006 Verification in field form. Dam location could not be verified by Fuss & O'Neill team and Town staff during field assessments.
6	MA02815	Old Ice Pond Dam	Yes	Unsafe	Limited visibility due to vegetation. Heavy woody vegetation on the downstream embankment, including large trees. Erosion noted at the upstream embankment.
7	MA00891	Lee Pond Dam	Yes	Fair	Downstream embankment heavily vegetated. Tree stumps and root systems observed in upstream and downstream embankments. Inoperable sluiceway facility and potentially inadequate slope protection on upstream embankment face.
8	MA00890	Lee Reservoir Dam	No	Fair	Inspection report listed condition as "good." Condition downgraded to fair in this assessment due to the presence of trees on the downstream embankment in available site photos.
9	MA02919	Ironstone Reservoir Dam	Yes	Poor	Large cracks in training walls with seepage in left training wall and in downstream face of spillway. Scour along right training wall. Sediment accumulation and vegetative growth in spillway approach area. Heavy vegetation on dam embankment. A 3-4 foot deep sinkhole (8" diameter) was observed along the downstream edge of the crest in the area of the auxiliary spillway during the 2019 follow-up inspection.
10	MA03396	Blackstone Canal East Embankment and Gate	Yes	Poor	Downstream embankment heavily vegetated and very steep. Upstream embankment slope heavily vegetated. Minor delamination of concrete at spillway and efflorescent cracks in both training walls. Erosion from foot traffic along embankment slopes. Numerous animal burrows and sparse vegetation on embankment.
11	MA00937	Blackstone Canal West Embankment & Stanley Gate	Yes	Poor	Heavy tree growth on north portion of embankment. Exposed gravel on left side of discharge channel. Lack of stop log structure restricts maintenance. Some erosion of upstream embankment, asphalt path, and embankment crest. Minor voids in training walls. Woody debris (sticks and logs) accumulating in approach area.
12	MA00897	Caprons Pond Dam, Canal and Gates	Yes	Fair	Heavy vegetation on downstream embankment. Two 1-inch cracks in upstream walls. Large crack observed at downstream end of right abutment. Some sediment deposition observed in the approach area of the primary spillway. Cracks and voids observed in both training walls.

Table 3. Summary of Dam Visual Assessment Findings

Site No.	Dam ID Number	Dam Name	Visually Assessed?	Condition	Comments
13	MA00935	Rice City Pond Dam	Yes	Fair	Voids from missing mortar and dislodged stones in primary and auxiliary spillway training walls. Auxiliary spillway concrete cracked and spalled; vegetation growing through joints at crest and training walls of auxiliary spillway; erosion at toe of auxiliary spillway. Misalignment of stone masonry at left end of auxiliary spillway. Debris accumulating at trash rack at outlet works. Trees and woody vegetation growing on embankments.
14	MA00896	Linwood Pond Dam	No	Satisfactory	Minor weed growth in riprap of upstream slope. Several bare areas of exposed turf reinforcement mat on embankment crest and downstream slopes. Some rot on timber spillway apron and sill with some leakage underneath. Missing and displaced chinking stones in spillway training walls. Tree debris on rip rap spillway apron with minor weed growth on training walls.
15	--	371 Aldrich Street	Yes	Fair	Voids and heavy vegetation growth in stone training walls. Spillway blocked by debris. Medium-sized trees growing on embankment crest.
16	--	Dam on Albee Road	Yes	Poor	Outlet blocked. Trees and woody vegetation growing on upstream and downstream embankments.
17	--	Bacon Street Dam	Yes	Fair	Trees and brush growing on crest and downstream embankment. Sloughing at upstream embankment. Unable to observe outlet works due to wooden platform structure built directly above outlet.
18	--	Home Brew Dam	Yes	Unsafe	Left training wall of auxiliary spillway collapsed due to formation of sinkhole. Concrete block forming right training wall of auxiliary spillway displaced and leaning away from right abutment, allowing erosion of abutment. Auxiliary spillway approach blocked by two metal pipes; debris accumulated against pipes. Large trees growing on embankment and abutments. Voids and cracks in left training wall of primary spillway and 1-foot crack in primary spillway weir. Flowing seepage along right training wall of primary spillway eroding base of wall. Large tree roots and some vertical misalignment observed in embankment crest. Large cracks in central wall with 1-foot void (missing stone at base).
19	--	Dam on Marywood Street	Yes	Poor	Slight erosion on embankment downstream slope. Portion of upstream embankment masonry collapsed into reservoir with some erosion. Small animal burrows on dam crest. Some debris in approach area.
20	--	Albee Road Weir	Yes	Poor	Simple boulder weir clogged with debris. Significant gaps.

Table 4. Dams Condition Rating Definitions

Dam Condition	Definition
Good	No operational or maintenance deficiencies recognized. Safe performance is expected under all loading conditions.
Satisfactory	Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.
Fair	Significant operational and maintenance deficiencies are present, but no structural deficiencies. Potential deficiencies exist under unusual loading conditions. This rating may be used when uncertainties exist as to critical parameters.
Poor	Significant structural, operational, and maintenance deficiencies are clearly recognized under normal operating conditions.
Unsafe	Major structural, operational, and maintenance deficiencies exist under normal operating conditions.

3 Evaluation and Prioritization of Management Alternatives

3.1 Dam Management Alternatives Evaluation Criteria

Using data from the limited visual condition assessments and available ODS file data, various criteria were evaluated for each dam to identify and prioritize management actions that would enhance flood resiliency and provide ecological benefits. The criteria were assessed qualitatively according to the flowchart in Figure 2 and included current uses and recreational/cultural value of the dam and impoundment, the owner's ability to maintain the dam, failure risk (based on hazard classification and structural condition), flood mitigation potential, and stream continuity and aquatic habitat quality. These criteria are discussed in more detail below.

3.1.1 Current Uses/Values of the Impoundment

Uses of impoundments may include flood control, water supply, recreation, conservation, or aesthetic/cultural/historical preservation value. Critical uses are those uses that require the dam and impoundment to remain in place without removal, breaching, or lowering of the dam in order for the value to be realized. Dams may have multiple uses, including multiple critical uses, such as both recreation and flood control.

Thirteen (13) dams retain recreational impoundments and/or have historic preservation or aesthetic value. Two (2) dams are used for both recreation and flood control and one (1) dam is used by the owner to control the level of the impoundment for unstated purposes. Four (4) of the dams have no known use.

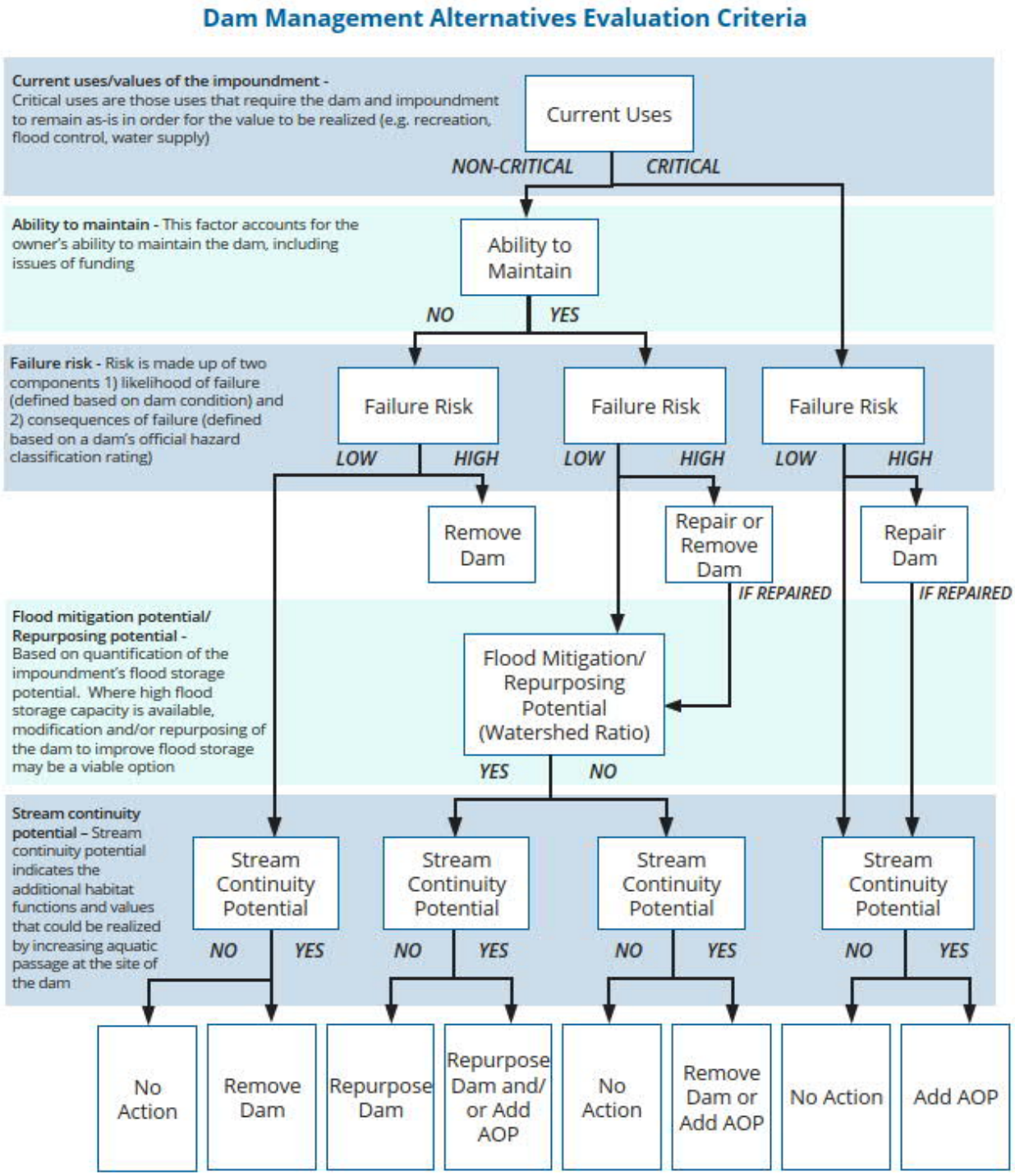


Figure 2. Management Alternatives Evaluation Criteria Flowchart

3.1.2 Ability to Maintain

The ability to maintain a dam was evaluated based on visual evidence of maintenance (or lack thereof) observed during the visual assessments, supplemented with information from previous dam inspection reports. For dams where vegetation consisted of mowed grass and deficiencies were relatively few and minor, and where the dam owner was known, the Ability to Maintain was entered as "Yes." For dams covered in tall grasses, shrubs, and/or trees and/or dams without a known owner, the Ability to Maintain was entered as "No." Where the Ability to Maintain was unclear, the most appropriate answer was entered with supplemental notes.

Visual evidence of maintenance was observed at fewer than half of the dams that were assessed (8 out of 20 dams). These eight (8) dams are either privately owned or owned by MADCR.

3.1.3 Failure Risk

Failure risk was estimated for each dam based on the hazard class of the dam (i.e., a rating system based on the magnitude of potential impacts in the event of dam failure) and the structural condition of the dam (i.e., likelihood of dam failure) based on the limited visual condition assessments and/or dam inspection information from the ODS file review (Figure 3). A dam may present a severe risk if the probability of failure is high, if the consequences of failure are high, or both.

		Dam Condition				
		Good	Satisfactory	Fair	Poor	Unsafe
Dam Hazard Class	Low	Low	Low	Low	Moderate	Moderate
	Significant	Low	Low	Moderate	Moderate	Severe
	High	Low	Moderate	Moderate	Severe	Severe

Figure 3. Dam Failure Risk Assignment Matrix

One (1) of the 20 dams assessed falls into the Severe Failure Risk category. This dam should be considered among the highest priorities for action, as they are the most likely to fail and/or have significant impacts upon failure.

Thirteen (13) of the 20 dams are considered a Moderate Failure Risk and six (6) are considered a Low Failure Risk.

3.1.4 Flood Mitigation Potential

Dams may provide flood mitigation services if their impoundments have sufficient available volume to attenuate flood flows from upstream and slow their release to downstream areas. The flood mitigation benefits of a dam and associated impoundment can be enhanced by increasing the available storage volume of the impoundment. This can typically be accomplished by: 1) raising the height of the dam, 2) dredging the impoundment, or 3) modifying the dam's low-level outlet structure to reduce the normal impoundment size and normal pool elevation, in order to provide more room for storage in the existing impoundment under flood conditions.

Flood mitigation potential was assessed based on the ratio of the dam's impoundment area to the dam's drainage area. A higher ratio reflects an impoundment that is large in relation to the size of the watershed, and is therefore more likely to provide significant flood protection benefits to downstream properties and infrastructure (assuming adequate freeboard is available above the normal pool elevation). For each dam, the watershed area was obtained from the dam inspection report or the USGS StreamStats web tool, and the impoundment area was obtained from file review information or estimated from aerial imagery in Google Earth. Dams with a watershed ratio greater than 0.1 (i.e., where the impoundment area is 10% or greater of the watershed area) were designated as having flood mitigation potential.

None of the assessed dams were determined to have significant flood mitigation potential, as all have a ratio of watershed area to impoundment area of 0.01 or lower.

3.1.5 Stream Continuity Potential

Stream continuity refers to the connectedness of different reaches of the stream and the ecological benefits associated with that connectedness. Stream Continuity Potential was estimated for each dam using the Restoration Potential Model (RPM) Tool, developed by the Division of Ecological Restoration, MA Department of Fish and Game (MADER). This statewide analysis tool is used to evaluate the ecological benefits of dam removal. The RPM Tool evaluates environmental and stream health data upstream and downstream of a dam in order to assess how its removal may improve habitat in the stream and its local watershed. The result is a percentile ranking (0-100) of ecological benefit potential for the dam if it were removed. The Stream Continuity Potential tool was only applicable for 14 of the 20 dams, as information for the other dams was not available in the RPM Tool.

The RPM Tool relies on three main environmental indicators:

1. Watershed Position. The Tool adds a scoring weight for dams located in reaches with unique ecological characteristics that particularly benefit from dam removal (head-of-tide habitats, coastal stream habitats, and headwaters ecosystems).

2. Ecological Integrity. The effect of dam removal is measured by four indicators:
    a. The presence of rare species and aquatic habitat upstream or downstream of a dam. Places of high ecological value and integrity have been designated by BioMap2 (https://www.mass.gov/service-details/biomap2-conserving-the-biodiversity-of-massachusetts-in-a-changing-world), a project of the MassWildlife's Natural Heritage & Endangered Species Program.

b. The percent cover of impervious surfaces upstream from the dam.
c. The presence of mapped coldwater habitat upstream or downstream of a dam, indicating suitable year-round habitat for aquatic life such as trout.
d. The alteration of August stream flow due to water withdrawals, with higher alterations indicating higher stress on the aquatic ecosystem.

3. Connectivity. The improvement in stream connectivity (upstream and downstream) that would be gained if the dam were removed.

The data supplied in the tool was last updated on April 28, 2017. For more information about DER's Restoration Potential Model Tool or how these indicators are scored, or to access the interactive map viewer of statewide dam assessments, go to www.mass.gov/service-details/ders-restoration-potential-model-tool-description.

Only three (3) dams are considered to have a high stream continuity potential if removed: the West River Pond Dam, Lee Pond Dam, and the Ironstone Reservoir Dam. One (1) dam (Rivulet Pond Dam) is considered to have moderate/high stream continuity potential and one (1) dam (Lee Reservoir Dam) is considered to have a moderate stream continuity potential. Nine (9) dams are considered to have low stream continuity potential, and six (6) dams were not assessed using the DER Restoration Potential Model.

Of the three major factors considered in the Restoration Potential Model, ecological integrity carries the most weight, followed by connectivity. The high number of dams with a low or moderate Stream Continuity Potential is explained primarily by low ecological integrity scores and low connectivity scores. Low connectivity scores were common due to the large number of dams and culverts within the stream networks in both towns, which limit the length of stream that can be opened through removal of a single structure. Few dams in the Town received points for watershed position, as none are coastal or tidal dams and only a small number are headwaters dams.

Improvements in water quality and habitat connectivity of streams and lakes through other concurrent work by each town (such as green infrastructure, impervious area reduction, and road-stream crossing replacement projects) would generally increase the ecological benefit of dam removal as well as improving aquatic ecosystem health and aquatic organism passage overall.

3.2 Prioritization Method

As human health and safety is the first and foremost concern when it comes to dams, management recommendations for each dam were assigned a relative priority (low, moderate, or high) based on whether the dam is considered a low, moderate, or severe failure risk, respectively (see Section 3.1.3 for information on how failure risk was defined and calculated).

4 Management Recommendations

4.1 Dam Management Recommendations Assessed

A common set of evaluation criteria were considered in determining the most appropriate recommendation(s) for each dam using the flowchart in Figure 2. Feedback from the Town was also considered in developing final management recommendations.

The following dam management alternatives were evaluated based on the factors described in Section 3.1.

- Removal / Breach: Full removal or partial breach of a dam, thereby eliminating or lowering the impoundment, reducing the risk of failure or breach, and restoring free-flowing conditions. Dam removal eliminates flood risk due to failure or breach, potentially reduces flood risk in upstream areas, meets aquatic organism passage objectives, and eliminates significant liability and costly maintenance for dam owners.

- Repair: Repair of structural components of a dam to address existing deficiencies that threaten the structural integrity of the dam, thereby reducing the potential for failure or breach during large storms. The dam repair alternative alone does not eliminate the risk of failure nor does it improve aquatic organism passage. In some cases the repair option, potentially combined with provision of aquatic organism passage, may be the only viable alternative if removal is not feasible. Dam repair involves the up-front cost of the repairs and a long-term financial commitment to inspect and maintain the dam following the initial repairs. It also assumes that the owner has the willingness, ability, and financial resources to adequately maintain the dam.

- Modification / Repurposing: Modification of an existing dam to provide increased storage during floods. For example, repurposing could include increasing the elevation of the dam, dredging of the impoundment, or modification of the outlet structure to significantly reduce the impoundment size and normal pool elevation, allowing the river to flow freely under normal conditions (i.e., a dry impoundment), but allowing the impoundment to fill up and store floodwaters during larger storms. Repurposing of dams for hydropower was not considered because hydropower is generally not economically viable at the scale of the dams located within the Town.

- Aquatic Organism Passage Structure: Construction of an engineered structure at a dam to provide for passage of fish and other aquatic organisms, including fishways such as fish ladders, rock ramps, or bypass channels. This option provides enhanced stream continuity if dam removal is not feasible.

- No Action / Maintain: Maintain the dam in its current condition.

4.2 Recommended Actions

The following is a summary of management recommendations for the 20 dams evaluated.

- Removal is recommended for eight (8) of the twenty (20) dams assessed, due to their moderate or severe failure risk and/or lack of ability to maintain these structures, as well as the potential gains in aquatic connectivity upon removal.

  Two dams (the dam at 371 Aldrich Street and the dam on Albee Road) should be removed in conjunction with the replacement of the culvert under each road, respectively.

- Repair and maintenance is recommended for nine (9) dams. These dams are structures with intrinsic cultural and historic value, or that retain recreational impoundments, but that also require some repair work and maintenance to correct structural deficiencies.

  Repair and maintenance is recommended for Lee Pond Dam, although the dam was not assessed in the field by Fuss & O'Neill staff (permission to access was not granted). It could also be a potential candidate for removal. Follow-up coordination with the property owners is recommended to conduct a visual assessment.

- Addition of aquatic organism passage (AOP) (e.g., fishways–a fish ladder, eel ladder, rock ramp, and/or nature-like fishway) is recommended for two (2) dams (Lee Pond Dam and Rivulet Pond Dam).

- The No Action alternative is recommended for three (3) dams (the Hecla Canal Diversion Structure, the Albee Road Weir, and the dam on Bacon Street).

- Dam Registration with ODS should be encouraged for all unregistered dams. Dam owners are responsible for registration of their dam(s) but may be unaware of this requirement.

Five dams were determined to be high priority dams: Whitin Pond Dam, Rivulet Village Pond Dam, Ironstone Reservoir Dam, the dam on 371 Aldrich Street, and Home Brew Dam. Removal is recommended for all of these dams. Only one of these dams is owned by the Town (Home Brew Dam). Although the remaining four are privately owned, municipalities can play a role in contacting the dam owners and helping connect them with funding and technical resources for removal. More detailed site-specific recommendations were developed for these five dams in order to provide a blueprint for future work. These detailed recommendations are provided in Section 4.4.

4.3 Assessment and Prioritization Results

Table 5 summarizes the Ability to Maintain, Failure Risk, Flood Mitigation Potential, and Stream Continuity Potential criteria, as well as the management recommendations and relative priority, for each dam. The dam assessment and prioritization worksheet is provided in Attachment C. High priority dams are shaded in gray.

Table 5. Dam Assessment and Prioritization Results Summary

Dam ID Number	Dam Name	Current Use(s)	Failure Risk	Priority	Ability to Maintain	Flood Mitigation Potential*	Stream Continuity Potential	Management Recommendations
MA00895	Whitin Pond Dam	Flood control and recreation	Moderate	High	No	No	Low	Removal
MA02916	Rivulet Village Pond Dam	Recreation	Severe	High	Yes	No	Low	Consider removal
MA00898	Rivulet Pond Dam	Recreation	Low	Low	Yes	No	Moderate/ High	Repair and maintain; consider adding AOP. Could be a candidate for removal but owner did not allow access.
MA01165	West River Pond Dam	Recreation	Moderate	Medium	No	No	High	Consider removal
MA03216	Hecla Canal Diversion Structure	--	Low	Low	No	No	Low	No action
MA02815	Old Ice Pond Dam	Recreational and environmental resource	Low	Low	No	No	Low	Consider removal
MA00891	Lee Pond Dam	Recreation	Moderate	Medium	Yes	No	High	Repair and maintain; consider adding AOP. Could be a candidate for removal but owner did not allow access.
MA00890	Lee Reservoir Dam	Recreation and aesthetic	Low	Low	Yes	No	Moderate	Repair and maintain
MA02919	Ironstone Reservoir Dam	Recreation	Moderate	High	No	No	High	Removal
MA03396	Blackstone Canal East Embankment and Gate	Recreation and historic preservation	Moderate	Medium	No	No	Low	Repair and maintain
MA00937	Blackstone Canal West Embankment & Stanley Gate	Recreation and historic preservation	Moderate	Medium	Potentially	No	Low	Repair and maintain
MA00897	Caprons Pond Dam, Canal and Gates	Recreation	Moderate	Medium	Yes	No	Low	Repair and maintain
MA00935	Rice City Pond Dam	Recreation and flood control	Moderate	Medium	Yes	No	Low	Repair and maintain
MA00896	Linwood Pond Dam	Recreation	Moderate	Medium	Yes	No	Low	Repair and maintain
--	371 Aldrich Street	Property owner says he uses it to control level of impoundment	Moderate	High	No	No	Not Assessed	Remove in conjunction with culvert replacement.

Table 5. Dam Assessment and Prioritization Results Summary

Dam ID Number	Dam Name	Current Use(s)	Failure Risk	Priority	Ability to Maintain	Flood Mitigation Potential*	Stream Continuity Potential	Management Recommendations
--	Dam on Albee Road	Unknown	Moderate	Medium	No	No	Not Assessed	Remove in conjunction with culvert replacement.
--	Bacon Street Dam	Aesthetic	Moderate	Medium	Yes	No	Not Assessed	No action. Encourage owner to register with ODS.
--	Home Brew Dam	None	Low	High	No	No	Not Assessed	Removal
--	Dam on Marywood Street	Recreation and aesthetic	Moderate	Medium	No	No	Not Assessed	Repair and maintain.
--	Albee Road Weir	None	Low	Low	No	No	Not Assessed	No action

*High Priority dams shaded in gray.

4.4 High Priority Dam Descriptions

Detailed descriptions of existing conditions and recommended actions are provided in Sections 4.4.1-4.4.5 for dams identified as high priority structures in this analysis.

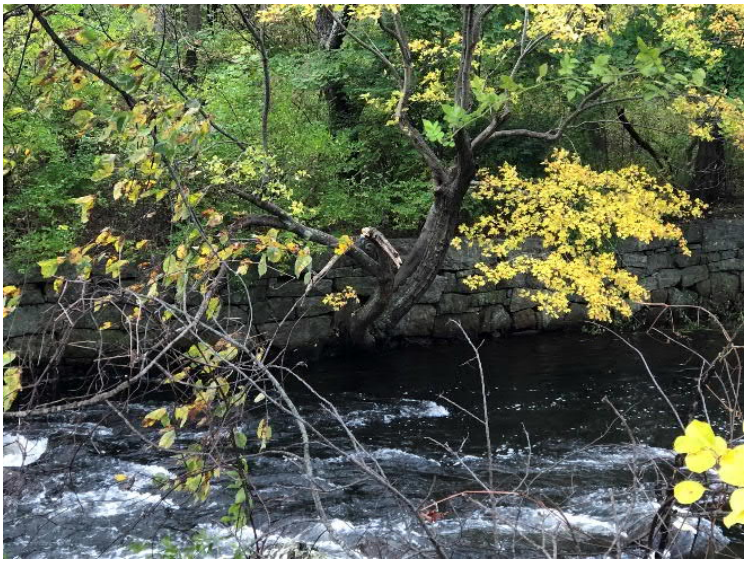
4.4.1 Whitin Pond Dam (MA#00895)

Existing Conditions

- The structure is currently considered to be in poor condition due to voids in the stone of the primary and auxiliary spillways and vegetation overgrowth on the training walls (with a tree growing through one wall).
- Trees, brush, stumps, and other vegetation are present on the embankment.
- The dam is currently used for flood control and recreation.
- The dam has a low stream continuity potential as measured by DER's Restoration Potential Model tool.
- The dam is classified as Significant hazard potential dam.
- The dam is privately owned by the Mumford River Condominium Trust.

Primary spillway at Whitin Pond Dam. Note the growth of trees and woody vegetation in the spillway.

Auxiliary spillway at Whitin Pond Dam.



Tree growth through a training wall at Whitin Pond Dam.

Recommendations

- Consider removal of Whitin Pond Dam to improve flood resiliency and eliminate the need for maintenance.
    - Contact and coordinate with the dam owner to complete engineering design and permitting and removal of the dam.
    - Leverage grant funding and partnerships with state and federal agencies and non-profit organizations to streamline dam removal.
- Alternatively, repair and maintain the dam if dam owner is not in support of removal.

4.4.2 Rivulet Village Pond Dam (MA#02916)

Existing Conditions

- The structure was determined to be in fair condition due to potential leakage through stones in the primary spillway, stones in need of repointing on the auxiliary spillway, and seepage (flowing and non-flowing) through the downstream walls.
- Small trees, brush, and other vegetation are present on the embankment.
- Beavers regularly build dams on the primary spillway, requiring factory staff to clean out the debris on a near daily basis.
- The impoundment is currently used for recreation. The dam was originally built for water supply for the mill complex.
- The impoundment has a low flood mitigation potential.
- The dam has a low stream continuity potential as measured by DER's Restoration Potential Model tool.
- The dam is classified as High hazard potential dam.

Rivulet Village Pond Dam spillway. Note the vegetation growing through the walls and downstream face of the spillway.

Pile of beaver debris removed from the spillway at Rivulet Village Pond Dam. This was one of multiple piles of debris observed during the assessment.

View facing downstream at the Rivulet Village Pond Dam spillway from the impoundment. The mill building has flooded multiple times during high flow events.

Recommendations

- Consider removal of Rivulet Village Pond Dam to improve flood resiliency and eliminate the need for maintenance.
    - Contact and coordinate with the dam owner to complete engineering design and permitting and removal of the dam.
    - Leverage grant funding and partnerships with state and federal agencies and non-profit organizations to streamline dam removal.
- Alternatively, repair and maintain the dam. Develop a comprehensive beaver management plan to address the issue of beaver activity leading to flooding.

4.4.3 Ironstone Reservoir Dam (MA#02919)

Existing Conditions

- The Ironstone Reservoir dam is considered to be in poor condition due to large cracks in both training walls, seepage through the left training wall downstream face of the spillway, and scouring along the right training wall. The approach area is heavily sedimented, and large woody debris has become trapped downstream of the spillway.
- The impoundment was originally used as an ice pond and is currently used for recreation.
- The impoundment has low flood mitigation potential.
- The dam has a high stream continuity potential as measured by DER's Restoration Potential Model tool.
- The dam is classified as a Significant hazard potential dam.

Left training wall at Ironstone Reservoir Dam. Note the seepage along the training wall just above the spillway.

Spillway at Ironstone Reservoir Dam.

Recommendations

- Coordinate with the dam owner, Flagg Realty LLC., on dam removal.
    - The owner is currently exploring removal options with Pare Corporation. A feasibility study has been submitted to ODS, and conceptual design for removal was completed in June 2019.
    - The owner expressed interest in partnering with the Blackstone River Watershed Association for a Dam and Seawall Grant.
    - The owner has also expressed interest in the potential of applying for an MVP Action Grant for dam removal.
    - Potential barriers to removal include BJ's fire suppression pond, located adjacent to the impoundment, which may or may not rely on the impoundment for water. There is also a known objection from one abutter.

4.4.4 Dam at 371 Aldrich Street

Existing Conditions

- The dam at 371 Aldrich Street was assessed as being in fair condition due to voids in the training walls and heavy vegetation growing in the training walls. The spillway was blocked by debris and broken weir-boards. Medium-sized trees were observed growing on the embankment.
- The owner of the property stated that he uses the dam to control the level of the impoundment. However, the weir boards at the site were broken and would not be usable for water level control. Town staff were not aware of any recreational use of the impoundment.
- The impoundment has low flood mitigation potential.
- The dam does not have a score as measured by DER's Restoration Potential Model tool.
- The dam does not have an official hazard classification, but is estimated to be a Significant hazard potential dam. Although there is little development downstream of the dam, Aldrich Street (Route 98) has flooded in the past, likely due to a combination of the dam and the undersized culvert under Aldrich Street. Jersey barriers have been placed along the upstream side of the crossing in an attempt to prevent flooding of the roadway, according to Town staff. As a result of the potential impact of roadway flooding on Route 98, the dam was determined to be high priority despite its moderate failure risk.

Spillway of dam at 371 Aldrich Street. Note broken weir boards and voids in the spillway and training walls.

Trees growing on the embankment of the dam at 371 Aldrich Street.

Jersey barriers at the crossing upstream of the dam at 371 Aldrich Street.

Recommendations

- Remove the dam in conjunction with replacement of the in-line culvert under Aldrich Street/Route 98 to increase resiliency and reduce the risk of flooding of Aldrich Street/Route 98.
    - Contact and coordinate with the dam owner to complete engineering design and permitting and removal of the dam and replacement of the culvert.
    - Leverage grant funding and partnerships with state and federal agencies and non-profit organizations to streamline dam removal and culvert replacement.
- Alternatively, if the dam cannot be removed, register the dam with ODS and repair and maintain the structure.

4.4.5 Home Brew Dam

Existing Conditions

- The dam was determined to be in unsafe condition due to numerous structural deficiencies, including minor soil loss at the right abutment, vertical misalignment/roots/undulation of the embankment, and large cracks in the central wall with a one-foot void due to a missing stone at the base of the wall. The upstream wall also appears to be undermined. There is a one-inch crack in the primary spillway and sediment deposition at the top of the weir, with water flowing under the right training wall onto the spillway, which is eroding the base of the wall. The left

training wall of the auxiliary spillway has collapsed due to a sinkhole approximately 18-inches in diameter behind the wall. The auxiliary spillway approach area is clogged with debris and sediment. The right abutment is eroding due to the tilting of the concrete block forming the right training wall of the auxiliary spillway and its separation from the dam's right abutment.

- The dam currently has no known purpose, and the original purpose of the dam is unknown. Town staff estimated that the dam was constructed in the 1950s.
- The impoundment has a low flood mitigation potential.
- The dam does not have a score for stream continuity potential as measured by DER's Restoration Potential Model tool.
- The dam has been estimated a Low hazard potential dam due to the lack of development downstream. However, it was noted that should the dam overtop, one or more wells owned and operated by the Uxbridge Water Division may be impacted by flooding.
- Due to the potential impacts to the Uxbridge water supply in the event of flooding, and concerns expressed by Town Staff over the potential impacts to drinking water safety the dam was determined to be high priority.

View of the Home Brew Dam from the right abutment. Note the debris accumulated behind the pipes immediately upstream of the auxiliary spillway and the collapsed left training wall of the auxiliary spillway.

Sinkhole behind the left training wall of the auxiliary spillway at the Home Brew Dam.

Collapsed left training wall of the auxiliary spillway at the Home Brew Dam.

Separation of the right training wall of the auxiliary spillway from the right abutment of the Home Brew Dam.

Location of Home Brew Dam relative to three wells owned and operated by the Uxbridge Water Division.
Image credit: Google Earth

Recommendations

- Consider removal of Home Brew Dam to improve resiliency, eliminate the need for maintenance, alleviate public safety concerns, and to protect the nearby wells.
    - Complete engineering design and permitting and removal of the dam.
    - Leverage grant funding and partnerships with state and federal agencies and non-profit organizations to streamline dam removal.

Attachments: Attachment A: Dam Visual Assessment Field Form (Blank)
Attachment B: Dam Visual Assessment Field Forms (Completed)
Attachment C: Dam Assessment Scoring and Prioritization Results

FUSS & O'NEILL

Attachment A

Dam Visual Assessment Field Form (Blank)

DAM SAFETY INSPECTION

NAME OF DAM: _____ STATE ID #: _____

AKA NAME: _____ WATERCOURSE NAME: _____

DAM LOCATION INFORMATION

CITY/TOWN: _____ LAT. / LONG.: _____

STATE: _____ HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: _____

PURPOSE OF DAM: _____

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: _____ NAME OF INSPECTOR: _____

TIME OF INSPECTION: _____ OTHER ATTENDEES: _____

WEATHER CONDITIONS: _____

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: _____ AUXILIARY SPILLWAY TYPE: _____

NUMBER OF OUTLETS: _____ TYPE OF OUTLETS: _____

HAS THE DAM BEEN BREACHED OR OVERTOPPED? _____

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) _____

DOES THE CREST SUPPORT A PUBLIC ROAD? _____

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? _____

ACCESS CONDITIONS TO THE SITE: _____

SECURITY DEVICES? _____

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
EMBANKMENT (D/S SLOPE)		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
EMBANKMENT (U/S SLOPE)		
AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
EMBANKMENT (CREST)		
AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
INSTRUMENTATION		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
DOWNSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
UPSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	
	FOUNDATION SEEPAGE	
	SLIDE, SLOUGH, SCARP	
	WEIRS	
	DRAINAGE SYSTEM	
	INSTRUMENTATION	
	VEGETATION	
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
PRIMARY SPILLWAY		
AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
AUXILIARY SPILLWAY		
AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
OUTLET WORKS		
AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS: _____

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

SKETCH

FUSS & O'NEILL

Attachment B

Dam Visual Assessment Field Forms (Completed)

DAM SAFETY INSPECTION

NAME OF DAM: Albee Road Weir STATE ID #:

AKA NAME: WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: LAT. / LONG.:

STATE: HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: boulder/earth/beaver

PURPOSE OF DAM: None

YEAR BUILT:

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: ~~2000~~ 14:00 OTHER ATTENDEES: SH, HJ

WEATHER CONDITIONS: Sunny, ~~Warm~~, 87°, humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: / AUXILIARY SPILLWAY TYPE: /

NUMBER OF OUTLETS: / TYPE OF OUTLETS: /

HAS THE DAM BEEN BREACHED OR OVERTOPPED? yes

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) NO

DOES THE CREST SUPPORT A PUBLIC ROAD? NO

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? Albee Road - culvert

ACCESS CONDITIONS TO THE SITE: Walk from road

SECURITY DEVICES? NO

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	boulders w/ gaps
	WET AREAS (NO FLOW)	/
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	~~seep~~ under + through boulders
	SLIDE, SLOUGH, SCARP	N/A
	EMBANKMENT-ABUTMENT CONTACT	poor - erosion
	SINKHOLE/ANIMAL BURROWS	N/A
	EROSION	erosion around ends
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	jewelweed growing on brush/beaver debris
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (U/S SLOPE) N/A - see D/S embank

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	N/A
	SLOPE PROTECTION TYPE AND COND.	N/A
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (CREST) See D/S embank

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Albee Road		INSPECTION DATE 8/19/19
INSTRUMENTATION N/A		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

DOWNSTREAM WALLS N/A

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Albee Road 3/12/19

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Albee Road		INSPECTION DATE 8/19/19		
UPSTREAM WALLS N/A				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	~~Stable~~
	FOUNDATION SEEPAGE	N/A
	SLIDE, SLOUGH, SCARP	N/A
	WEIRS	N/A
	DRAINAGE SYSTEM	N/A
	INSTRUMENTATION	N/A
	VEGETATION	~~Stable~~
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Shallow channel w/ eroded banks leads to culvert under Albee Road (~20 ft D/S)

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	N/A
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

N/A

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal? Best option
Remove w/ culvert replacement

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Site appears to be a common flooding/washout area (cones, patching, collapsing head wall area)
dam may have been built to create pond for boating, hunting, water supply; NOT a mill dam
width of dam > culvert → could be contributing to culvert problems

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. *Overview of dam from upstream*
2. *Overview of dam from downstream*
3. *Overview of upstream face from right abutment*
4. *Overview of upstream face from left abutment*
5. *Overview of dam crest from right abutment*
6. *Overview of dam crest from left abutment*
7. *Overview of downstream face from right abutment*
8. *Overview of downstream face from left abutment*
9. *Overview of spillway from upstream*
10. *Overview of spillway from downstream (tailrace or channel area)*
11. *Overview of right training wall*
12. *Overview of left training wall*
13. *Overview of weir*
14. *Overview of stilling basin*
15. *Overview of downstream channel*
16. *Overview of gatehouse exterior*
17. *Overview of gatehouse interior*
18. *Overview of operators*
19. *Outlet inlets and discharge points*
20. *Overview of reservoir*
21. *Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)*

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

SKETCH

DAM SAFETY INSPECTION

NAME OF DAM: Albee Road Weir STATE ID #:

AKA NAME: WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: LAT. / LONG.:

STATE: HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: boulder/earth/beaver

PURPOSE OF DAM: None

YEAR BUILT:

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: ~~2000~~ 14:00 OTHER ATTENDEES: SH, HJ

WEATHER CONDITIONS: Sunny, ~~Warm~~, 87°, humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: / AUXILIARY SPILLWAY TYPE: /

NUMBER OF OUTLETS: / TYPE OF OUTLETS: /

HAS THE DAM BEEN BREACHED OR OVERTOPPED? yes

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) NO

DOES THE CREST SUPPORT A PUBLIC ROAD? NO

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? Albee Road - culvert

ACCESS CONDITIONS TO THE SITE: Walk from road

SECURITY DEVICES? NO

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	boulders w/ gaps
	WET AREAS (NO FLOW)	/
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	~~seep~~ under + through boulders
	SLIDE, SLOUGH, SCARP	N/A
	EMBANKMENT-ABUTMENT CONTACT	poor - erosion
	SINKHOLE/ANIMAL BURROWS	N/A
	EROSION	erosion around ends
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	jewelweed growing on brush/beaver debris
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (U/S SLOPE) N/A - see D/S embank

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	N/A
	SLOPE PROTECTION TYPE AND COND.	N/A
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

EMBANKMENT (CREST) See D/S embank

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Albee Road		INSPECTION DATE 8/19/19
INSTRUMENTATION N/A		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

DOWNSTREAM WALLS N/A

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Albee Road 3/12/19

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Albee Road		INSPECTION DATE 8/19/19		
UPSTREAM WALLS N/A				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	~~Stable~~
	FOUNDATION SEEPAGE	N/A
	SLIDE, SLOUGH, SCARP	N/A
	WEIRS	N/A
	DRAINAGE SYSTEM	N/A
	INSTRUMENTATION	N/A
	VEGETATION	~~Stable~~
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Shallow channel w/ eroded banks leads to culvert under Albee Road (~20 ft D/S)

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	N/A
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Albee Road	INSPECTION DATE	8/19/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

N/A

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal? Best option
Remove w/ culvert replacement

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Site appears to be a common flooding/washout area (cones, patching, collapsing head wall area)
dam may have been built to create pond for boating, hunting, water supply; NOT a mill dam
width of dam > culvert → could be contributing to culvert problems

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

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1. *Overview of dam from upstream*
2. *Overview of dam from downstream*
3. *Overview of upstream face from right abutment*
4. *Overview of upstream face from left abutment*
5. *Overview of dam crest from right abutment*
6. *Overview of dam crest from left abutment*
7. *Overview of downstream face from right abutment*
8. *Overview of downstream face from left abutment*
9. *Overview of spillway from upstream*
10. *Overview of spillway from downstream (tailrace or channel area)*
11. *Overview of right training wall*
12. *Overview of left training wall*
13. *Overview of weir*
14. *Overview of stilling basin*
15. *Overview of downstream channel*
16. *Overview of gatehouse exterior*
17. *Overview of gatehouse interior*
18. *Overview of operators*
19. *Outlet inlets and discharge points*
20. *Overview of reservoir*
21. *Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)*

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SKETCH

DAM SAFETY INSPECTION

NAME OF DAM: Aldrich Street #1 STATE ID #:

AKA NAME: WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.:

STATE: MA HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: Earth Embankment

PURPOSE OF DAM: Unknown

YEAR BUILT:

INSPECTION SUMMARY

DATE OF INSPECTION: 10-18-19 NAME OF INSPECTOR: SAH

TIME OF INSPECTION: 10:30 AM OTHER ATTENDEES: SH, David Topscott

WEATHER CONDITIONS:

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: Broad Crested Weir AUXILIARY SPILLWAY TYPE: N/A

NUMBER OF OUTLETS: 1 TYPE OF OUTLETS:

HAS THE DAM BEEN BREACHED OR OVERTOPPED? Yes

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? Yes

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No

ACCESS CONDITIONS TO THE SITE: Walk down slope from Aldrich street

SECURITY DEVICES? None

DAM NAME: Aldrich Street #1 INSPECTION DATE: 10-18-19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	Earth
	WET AREAS (NO FLOW)	No
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	None observed
	SLIDE, SLOUGH, SCARP	None observed
	EMBANKMENT-ABUTMENT CONTACT	Good contact
	SINKHOLE/ANIMAL BURROWS	None observed
	EROSION	None observed
	UNUSUAL MOVEMENT	N/A
	VEGETATION (PRESENCE/CONDITION)	Short grass, two medium sized trees
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Aldrich Street #1	INSPECTION DATE	10-18-19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	Earth Embankment
	SLIDE, SLOUGH, SCARP	None observed
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	None observed
	EMBANKMENT-ABUTMENT CONTACT	Good contact
	EROSION	Some erosion around barriers on dam crest down u/s slope
	UNUSUAL MOVEMENT	None observed
	VEGETATION (PRESENCE/CONDITION)	Small trees and vegetation
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Aldrich Street #1	INSPECTION DATE	10-18-19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	Bituminous roadway
	SURFACE CRACKING	Minor cracking
	SINKHOLES, ANIMAL BURROWS	None observed
	VERTICAL ALIGNMENT (DEPRESSIONS)	None observed
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	None observed
	VEGETATION (PRESENCE/CONDITION)	No
	ABUTMENT CONTACT	Good
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
INSTRUMENTATION		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	N/A
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
DOWNSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT	N/A		
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
UPSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	None observed
	FOUNDATION SEEPAGE	None observed
	SLIDE, SLOUGH, SCARP	N/A
	WEIRS	
	DRAINAGE SYSTEM	Wooded creek
	INSTRUMENTATION	
	VEGETATION	Short grass
	ACCESSIBILITY	Walk down slope from Aldrich STreet
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Aldrich Street #1	INSPECTION DATE	10-18-19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	Stone masonry weir
	WEIR TYPE	Broad Crested Weir
	SPILLWAY CONDITION	Good
	TRAINING WALLS	Stone Masonry
	SPILLWAY CONTROLS AND CONDITION	Cracked weir board in spillway, poor condition
	UNUSUAL MOVEMENT	None observed
	APPROACH AREA	
	DISCHARGE AREA	Wooded Creek
	DEBRIS	Medium sized debris in spillway channel and d/s area
	WATER LEVEL AT TIME OF INSPECTION	2" above spillway cresh

ADDITIONAL COMMENTS:

It was mentioned that the owner said he has ability to install weir boards to control water level. No area to install weir boards was observed.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
AUXILIARY SPILLWAY		
AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	N/A
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

DAM NAME		INSPECTION DATE
OUTLET WORKS		
AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	N/A
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS: _____

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

If the ability to control water level is important at this dam then a more stable area to install weir boards is desirable.

Repurposing?

Fish/eel passage?

Notes:

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

SKETCH

DAM SAFETY INSPECTION

NAME OF DAM: Bacon Street Dam STATE ID #: /

AKA NAME: — WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.:

STATE: MA HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: earth

PURPOSE OF DAM: Rec/aesthetic

YEAR BUILT: unknown - >60 yrs

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: /

TIME OF INSPECTION: 11:45 AM OTHER ATTENDEES:

WEATHER CONDITIONS: Hot, sunny, humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: unknown; concrete weir AUXILIARY SPILLWAY TYPE: N/A

NUMBER OF OUTLETS: No? TYPE OF OUTLETS:

HAS THE DAM BEEN BREACHED OR OVERTOPPED? water on grass if lots of rain

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) NO

DOES THE CREST SUPPORT A PUBLIC ROAD? No

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? Bacon St - local road

ACCESS CONDITIONS TO THE SITE: walk from 78 Elmdale St or Bacon St @ bridge

SECURITY DEVICES? Wooden cover over spillway entrance; former sign now gone

was earthen; husband covered w/ concrete
recent beaver problems; had them trapped

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Bacon Street Dam	INSPECTION DATE	8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	WET AREAS (NO FLOW)	could not observe - veg
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	"
	SLIDE, SLOUGH, SCARP	"
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	"
	EROSION	"
	UNUSUAL MOVEMENT	"
	VEGETATION (PRESENCE/CONDITION)	large trees, brush, vines
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St Dam — INSPECTION DATE: 8/19/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	SLIDE, SLOUGH, SCARP	earth sloughing @ edge of water to 2 ft into land
	SLOPE PROTECTION TYPE AND COND.	N/O
	SINKHOLE/ANIMAL BURROWS	N/O - may be observed by veg in places
	EMBANKMENT-ABUTMENT CONTACT	~~ab~~ left abut. slightly lower than crest
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	mainly mowed grass; left of spillway - brush, grass + trees
	CONDITION OF JOINTS (CONCRETE)	~~N/O~~

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St. 1 Dam — INSPECTION DATE: 8/19/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth w/ uniform grass
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	small depressions, crest slopes down toward right side
	HORIZONTAL ALIGNMENT	slightly curved
	RUTS AND/OR PUDDLES	N/O
	VEGETATION (PRESENCE/CONDITION)	maintained grass right of Spillway, trees + brush left of spillway; shrubs + tree stumps on U/S side right of SW
	ABUTMENT CONTACT	lower on both ends than in middle
	CONDITION OF JOINTS (CONCRETE)	—

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Bacon St. Dam		INSPECTION DATE 8/19/19.
INSTRUMENTATION N/O		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	N/O
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St. Dam — INSPECTION DATE: 8/19/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S WALLS	1. WALL TYPE	right ww - concrete; left ww masonry
	2. WALL ALIGNMENT	good
	3. WALL CONDITION	good - ? obscured by vegetation
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: max:
	5. SEEPAGE OR LEAKAGE	obscured by veg
	6. ABUTMENT CONTACT N/A	erosion around corner where wingwalls + endwall meet;
	7. EROSION/SINKHOLES BEHIND WALL	
	8. ANIMAL BURROWS	N/O - obscured
	9. UNUSUAL MOVEMENT	N/O - obscured
	10. WET AREAS AT TOE OF WALL	unable to access
	11. VEGETATION	Moss on u/s side of concrete endwall
	12. SCOUR/EROSION AT BASE OF WALL	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St. Dam				INSPECTION DATE: 8/19/19
UPSTREAM WALLS N/O				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St Dam		INSPECTION DATE: 8/19/19
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	
	FOUNDATION SEEPAGE	
	SLIDE, SLOUGH, SCARP	
	WEIRS	
	DRAINAGE SYSTEM	
	INSTRUMENTATION	
	VEGETATION	
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Bacon St Dam	INSPECTION DATE: 8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	can't observe due to wooden platform above
	WEIR TYPE	"
	SPILLWAY CONDITION	"
	TRAINING WALLS	"
	SPILLWAY CONTROLS AND CONDITION	"
	UNUSUAL MOVEMENT	"
	APPROACH AREA	clear of debris
	DISCHARGE AREA	outfall to channel along bacon St; Bacon St retained by stone mas. wall
	DEBRIS	—
	WATER LEVEL AT TIME OF INSPECTION	4-6" below dam crest

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Bacon St Dam		INSPECTION DATE 8/19/19
AUXILIARY SPILLWAY N/A		
AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Bacon St Dam		INSPECTION DATE 8/19/19
OUTLET WORKS N/A/N/D		
AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

Repurposing?

too low for flood control

Fish/eel passage?

culvert immed. D/S

Notes:

Dam appears to be well generally maintained; family attachment due to long ~~presence~~ ownership.

Dam likely to be jurisdictional if registered (height > 6')

Bacon St Dam

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. *Overview of dam from upstream*
2. *Overview of dam from downstream*
3. *Overview of upstream face from right abutment*
4. *Overview of upstream face from left abutment*
5. *Overview of dam crest from right abutment*
6. *Overview of dam crest from left abutment*
7. *Overview of downstream face from right abutment*
8. *Overview of downstream face from left abutment*
9. *Overview of spillway from upstream*
10. *Overview of spillway from downstream (tailrace or channel area)*
11. *Overview of right training wall*
12. *Overview of left training wall*
13. *Overview of weir*
14. *Overview of stilling basin*
15. *Overview of downstream channel*
16. *Overview of gatehouse exterior*
17. *Overview of gatehouse interior*
18. *Overview of operators*
19. *Outlet inlets and discharge points*
20. *Overview of reservoir*
21. *Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)*

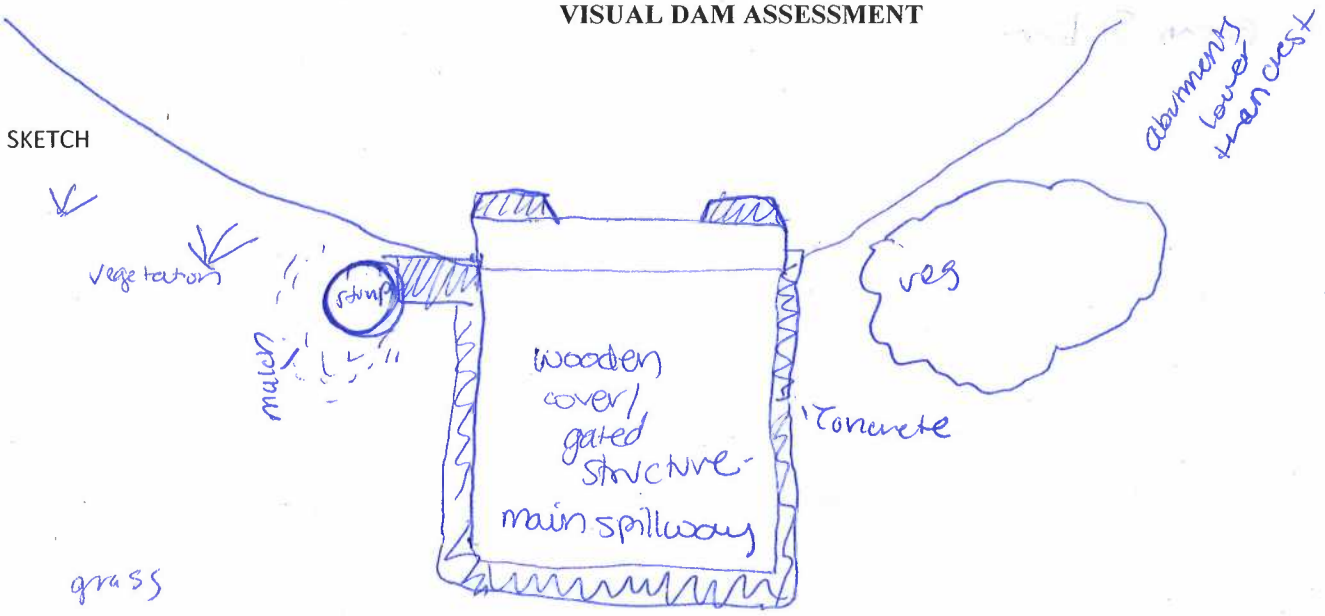
Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

Bacon Street Dam

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan

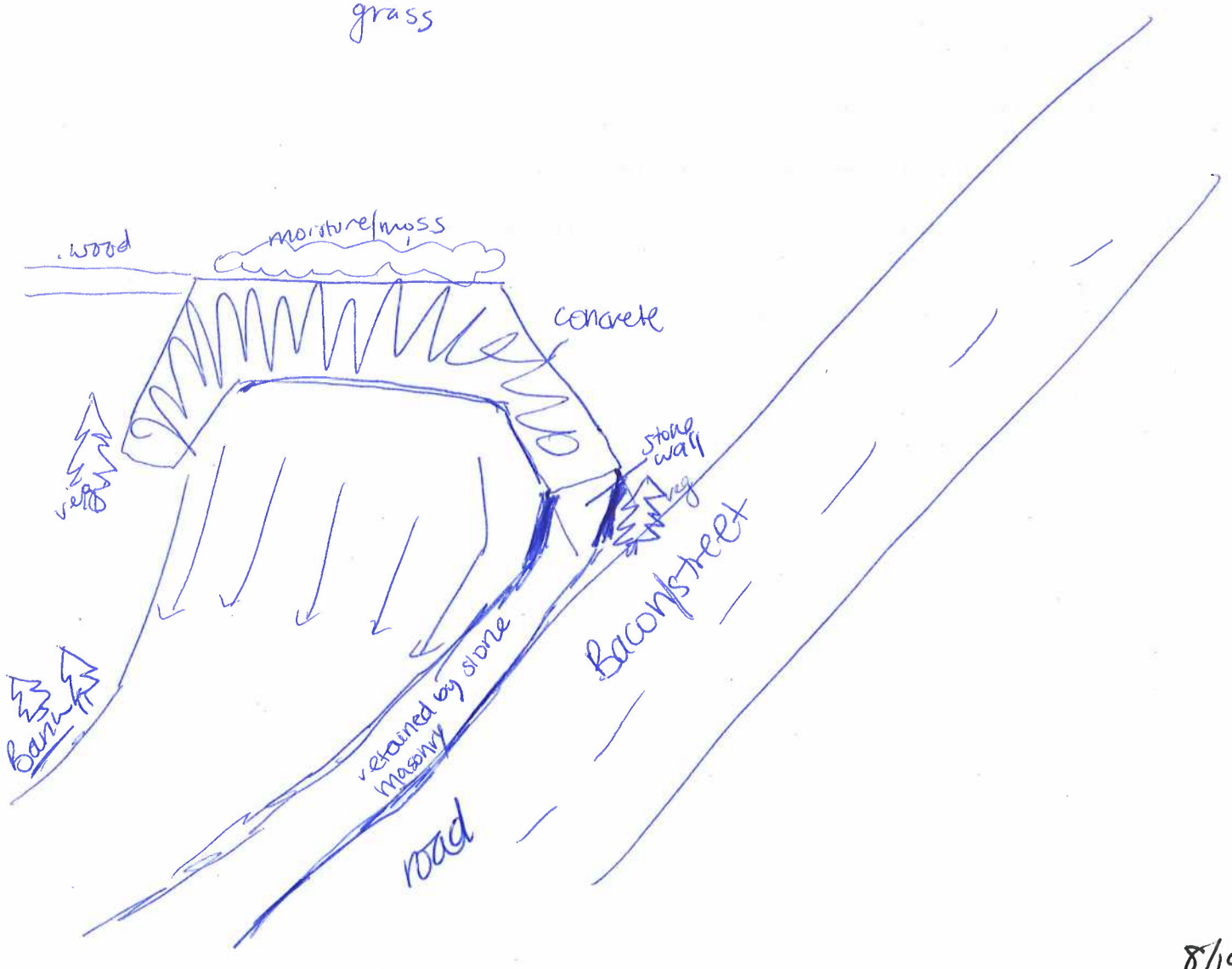
VISUAL DAM ASSESSMENT

SKETCH



grass

grass



8/19/19

DAM SAFETY INSPECTION

NAME OF DAM: Marywood Street #1 STATE ID #:

AKA NAME: WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: UxBridge LAT. / LONG.:

STATE: MA HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: Earth Embankment

PURPOSE OF DAM: Unknown/Recreation

YEAR BUILT:

INSPECTION SUMMARY

DATE OF INSPECTION: 10-18-19 NAME OF INSPECTOR: SAH

TIME OF INSPECTION: 11:00 AM OTHER ATTENDEES: SH

WEATHER CONDITIONS:

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: 24" RCP AUXILIARY SPILLWAY TYPE: 12" RCP

NUMBER OF OUTLETS: 2 TYPE OF OUTLETS:

HAS THE DAM BEEN BREACHED OR OVERTOPPED?

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) NO

DOES THE CREST SUPPORT A PUBLIC ROAD? NO

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? NO

ACCESS CONDITIONS TO THE SITE: Paved path from Marywood Street

SECURITY DEVICES? NO

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Marywood Street #1	INSPECTION DATE	10-18-19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	Earth
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	Good Contact
	SINKHOLE/ANIMAL BURROWS	
	EROSION	Slight erosion on D/s Slope
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	Vegetative brush and medium sized trees
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
EMBANKMENT (U/S SLOPE)		
AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	Stone Masonry
	SLIDE, SLOUGH, SCARP	Portion of upstream masonry has collapsed into reservoir
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	Good Contact
	EROSION	Some erosion observed
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	None
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: Missing stones in portions of u/s masonry face. Portions of wall are outwardly leaning over reservoir.

DAM NAME	Marywood Street #1	INSPECTION DATE	10-18-19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	Earthen Crest with areas of bituminous pavement
	SURFACE CRACKING	Bituminous pavement has deteriorated
	SINKHOLES, ANIMAL BURROWS	Small animal burrows on dam crest
	VERTICAL ALIGNMENT (DEPRESSIONS)	Good
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	None
	VEGETATION (PRESENCE/CONDITION)	Short grass on crest
	ABUTMENT CONTACT	Good contact
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
INSTRUMENTATION		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	N/A
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
DOWNSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT	N/A		
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
UPSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT	N/A		
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	None observed
	FOUNDATION SEEPAGE	None observed
	SLIDE, SLOUGH, SCARP	None observed
	WEIRS	No
	DRAINAGE SYSTEM	Small Creek
	INSTRUMENTATION	
	VEGETATION	Heavy vegetation and medium sized trees
	ACCESSIBILITY	Cleared path
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Marywood Street #1	INSPECTION DATE	10-18-19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	Concrete Weir
	WEIR TYPE	24" RCP
	SPILLWAY CONDITION	Good
	TRAINING WALLS	Stone masonry, good condition
	SPILLWAY CONTROLS AND CONDITION	N/A
	UNUSUAL MOVEMENT	None observed
	APPROACH AREA	Some debris in approach area
	DISCHARGE AREA	Not observe due to heavy vegetation
	DEBRIS	Some debris in approach area
	WATER LEVEL AT TIME OF INSPECTION	3" above primary spillway invert

ADDITIONAL COMMENTS:

DAM NAME: Marywood Street #1 INSPECTION DATE: 10-18-19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	Concrete Weir
	WEIR TYPE	12" RCP
	SPILLWAY CONDITION	Upstream alt spillway is in good condition
	TRAINING WALLS	None
	SPILLWAY CONTROLS AND CONDITION	No controls
	UNUSUAL MOVEMENT	None observed
	APPROACH AREA	N/A
	DISCHARGE AREA	Wooded Stream
	DEBRIS	Free of debris
	WATER LEVEL AT TIME OF INSPECTION	6" below spillway invert

ADDITIONAL COMMENTS: The downstream outlet of the alt spillway is a concrete RCP and is significantly cracking.

DAM NAME		INSPECTION DATE
OUTLET WORKS		
AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	N/A
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Playground in close proximity to dam. Upstream masonry wall should be repaired to prevent continued erosion and potential dam failure/over-topping.

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

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7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
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19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

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SKETCH

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM SAFETY INSPECTION

NAME OF DAM: Home Brew Dam STATE ID #: —

AKA NAME: _____ WATERCOURSE NAME: unknown; pond - no name

DAM LOCATION INFORMATION

CITY/TOWN: _____ LAT. / LONG.: _____

STATE: _____ HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: earth

PURPOSE OF DAM: none

YEAR BUILT: unknown?

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: 10:45 AM OTHER ATTENDEES: WJ, SH

WEATHER CONDITIONS: sunny, hot humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: concrete AUXILIARY SPILLWAY TYPE: not official; water main pipes

NUMBER OF OUTLETS: 0 TYPE OF OUTLETS: _____

HAS THE DAM BEEN BREACHED OR OVERTOPPED? None known

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? No

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No

ACCESS CONDITIONS TO THE SITE: Access from water dept (walk or drive)

SECURITY DEVICES? none

Year built unknown
Dries up completely during droughts

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Home Brew Dam

INSPECTION DATE: 8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth w/ masonry retaining
	WET AREAS (NO FLOW)	N/O
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	N/O
	SLIDE, SLOUGH, SCARP	N/O - obscured by veg
	EMBANKMENT-ABUTMENT CONTACT	^
	SINKHOLE/ANIMAL BURROWS	N/O - obscured by veg
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	large trees, brush
	CONDITION OF JOINTS (CONCRETE)	/

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Home Brew Dam	INSPECTION DATE	8/19/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth except for central pier (masonry)
	SLIDE, SLOUGH, SCARP	banks nearly vertical
	SLOPE PROTECTION TYPE AND COND.	None present
	SINKHOLE/ANIMAL BURROWS	N/O - veg.
	EMBANKMENT-ABUTMENT CONTACT	minor soil loss @ right abutment
	EROSION	banks nearly vertical
	UNUSUAL MOVEMENT	N/O - veg
	VEGETATION (PRESENCE/CONDITION)	shrubs + brush cover bank-thick + uniform
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Home Brew Dam	INSPECTION DATE	8/19/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth, concrete
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	some vertical misalignment, roots, undulation
	HORIZONTAL ALIGNMENT	good
	RUTS AND/OR PUDDLES	N/O
	VEGETATION (PRESENCE/CONDITION)	grass, moss, large trees, gravel
	ABUTMENT CONTACT	right - a little soil loss
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Home Brew Dam	INSPECTION DATE	8/19/19

INSTRUMENTATION N/O - see notes on wells @ end

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	N/O
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Home Brew Dam

INSPECTION DATE: 8/19/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S WALLS	1. WALL TYPE	Stone masory w/ mortar
	2. WALL ALIGNMENT	good
	3. WALL CONDITION	~~good~~ (1") large crack in central wall, 1 sq ft void (missing stone @ base)
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: ; max: 4.5 ft ~~4.5~~
	5. SEEPAGE OR LEAKAGE	N/O
	6. ABUTMENT CONTACT	N/A
	7. EROSION/SINKHOLES BEHIND WALL	N/O
	8. ANIMAL BURROWS	N/O
	9. UNUSUAL MOVEMENT	N/O
	10. WET AREAS AT TOE OF WALL	water flowing along bottom of wall
	11. VEGETATION	3" tree growing from wall; also small ~~herb~~ - plants + moss
	12. SCOUR/EROSION AT BASE OF WALL	yes; stones @ bottom gone or loose, missing masonry

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Home Brew Dam | INSPECTION DATE: 8/19/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S WALLS	1. WALL TYPE	Mixed masonry
	2. WALL ALIGNMENT	good
	3. WALL CONDITION	looks undermined; hear water that sounds like it is running (there wall cr pipe)
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: max: 2 ft avg:
	5. ABUTMENT CONTACT	N/A
	6. EROSION/SINKHOLES BEHIND WALL	obscured by veg
	7. ANIMAL BURROWS	N/O - veg
	8. UNUSUAL MOVEMENT	
	9. VEGETATION	thick - obscures wall
	10. SCOUR/EROSION AT BASE OF WALL	severe - mortar + stones may be missing

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Home Brew Dam

INSPECTION DATE: 8/19/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	N/O - veg
	FOUNDATION SEEPAGE	"
	SLIDE, SLOUGH, SCARP	"
	WEIRS	N/O
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	trees, wetland plants
	ACCESSIBILITY	difficult
	DOWNSTREAM HAZARD DESCRIPTION	N/O

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Home Brew Dam	INSPECTION DATE	8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	Concrete weir constructed of two slabs
	WEIR TYPE	straight, level
	SPILLWAY CONDITION	
	TRAINING WALLS	misc. masonry (concrete, brick, stone) - cracked, misaligned
	SPILLWAY CONTROLS AND CONDITION	N/O
	UNUSUAL MOVEMENT	1" crack between slabs
	APPROACH AREA	sediment deposit level w/ top of weir
	DISCHARGE AREA	undeveloped wetland
	DEBRIS	N/O
	WATER LEVEL AT TIME OF INSPECTION	2" below top of spillway weir

ADDITIONAL COMMENTS: water flowing out from under RT training wall into spillway joint + disappears under spillway; some flow continues along spillway TW, eroding base of wall + edge of spillway slab

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Home Brew Dam — INSPECTION DATE: 8/19/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	1. - 2 water main pipes; spillway partially paved w/asp
	WEIR TYPE	?
	SPILLWAY CONDITION	unsafe
	TRAINING WALLS	left training wall - unsafe, complete collapse; rt tr wall see below
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	L+R TWs
	APPROACH AREA	clogged w/ debris + sediment
	DISCHARGE AREA	creek + wetland
	DEBRIS	built up on pipes @ spillway entrance
	WATER LEVEL AT TIME OF INSPECTION	≈3" below pipe top (D/S);

ADDITIONAL COMMENTS: sinkhole diam approx 18"; wall in front completely collapsed right TW - concrete block tilted, pulling away from masonry TW behind; masonry TW obscured but block was placed there due to poor masonry condition

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Home Brew Dam	INSPECTION DATE	8/19/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal? Water dept wants removed; concerned about human safety + impacts on drinking water wells if pond were to flood
Wetland D/S - potential ecological benefit

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

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2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

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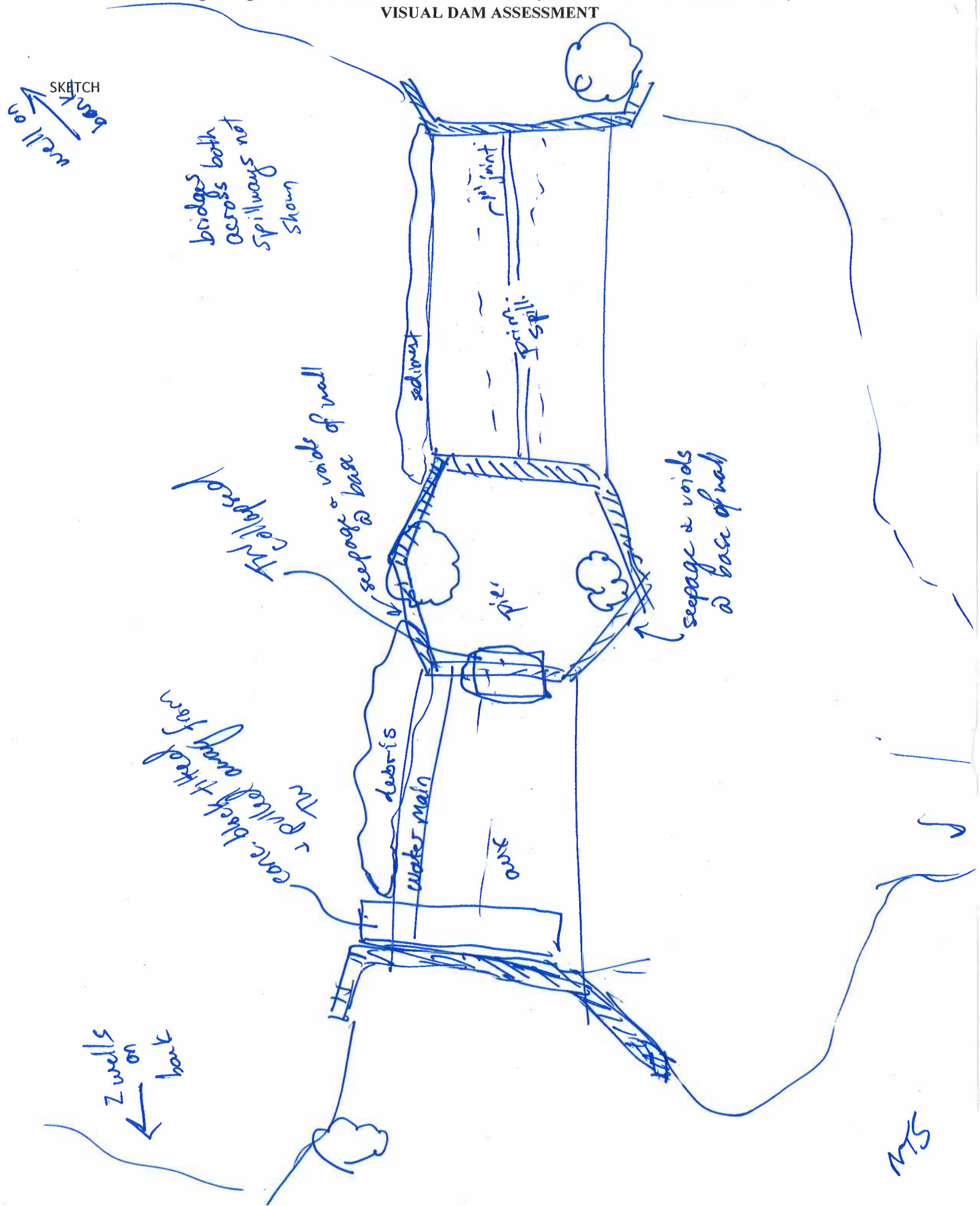
Home Brew Dam 8/19/19

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan

VISUAL DAM ASSESSMENT

SKETCH



DAM SAFETY INSPECTION

NAME OF DAM:	Whitin Pond Dam	STATE ID #:	MA00895
AKA NAME:		WATERCOURSE NAME:	

DAM LOCATION INFORMATION

CITY/TOWN:	Uxbridge	LAT. / LONG.:	
STATE:	MA	HAZARD CLASS:	Significant

GENERAL DAM INFORMATION

TYPE OF DAM:	Earth and stone masonry
PURPOSE OF DAM:	Flood control and recreational
YEAR BUILT:	

INSPECTION SUMMARY

DATE OF INSPECTION:	10-18-19	NAME OF INSPECTOR:	SAH
TIME OF INSPECTION:	8:30	OTHER ATTENDEES:	SH, David Topscott
WEATHER CONDITIONS:			

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE:	Wooden Weir	AUXILIARY SPILLWAY TYPE:	2 sharp crested weirs
NUMBER OF OUTLETS:	3	TYPE OF OUTLETS:	

HAS THE DAM BEEN BREACHED OR OVERTOPPED?	unknown
IS THERE A FISH LADDER? (LIST TYPE IF PRESENT)	No
DOES THE CREST SUPPORT A PUBLIC ROAD?	No
ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM?	Yes
ACCESS CONDITIONS TO THE SITE:	From behind Progressive Club
SECURITY DEVICES?	None observed

DAM NAME Whitin Pond Dam

INSPECTION DATE 10-18-19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	N/A
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: Only the left half (facing d/s) of the dam was observed due to lacking property permission

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Whitin Pond Dam

INSPECTION DATE 10-18-19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	N/A
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: Only the left half (facing d/s) of the dam was observed due to lacking property permission

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Whitin Pond Dam	INSPECTION DATE	10-18-19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	Earth
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	Some animal burows
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	Short grass, medium sized brush, small and medium trees
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: Only the left half (facing d/s) of the dam was observed due to lacking property permission

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
INSTRUMENTATION		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	N/A
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Whitin Pond Dam	INSPECTION DATE	10-18-19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE	Stone Masonry		
	2. WALL ALIGNMENT			
	3. WALL CONDITION	Poor in areas, voids and collapsed portions		
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE	None observed		
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS	Some animal burrows observed		
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL	None observed		
	11. VEGETATION	Heavy brush		
	12. SCOUR/EROSION AT BASE OF WALL	None obsereved		

ADDITIONAL COMMENTS: Only left d/s masonry wall could be inspected closely. Right d/s was viewed from across the d/s channel.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Whitin Pond Dam	INSPECTION DATE	10-18-19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT	N/A		
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS: Not observable due to lacking property permission

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Whitin Pond Dam	INSPECTION DATE	10-18-19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	None observed
	FOUNDATION SEEPAGE	None observed
	SLIDE, SLOUGH, SCARP	None observed
	WEIRS	None observed
	DRAINAGE SYSTEM	None observed
	INSTRUMENTATION	None observed
	VEGETATION	Heavy vegetation brush and trees
	ACCESSIBILITY	Left side of the dam is accessible from behind Progressive Club
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Whitin Pond Dam	INSPECTION DATE	10-18-19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	Stone masonry with wodden crest
	WEIR TYPE	Broad Crested Weir
	SPILLWAY CONDITION	Not observed
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	No spillway controls
	UNUSUAL MOVEMENT	Void areas in stones
	APPROACH AREA	Vegetative debris in approach area
	DISCHARGE AREA	Stones, brush and downed trees in discharge area
	DEBRIS	In downstream area
	WATER LEVEL AT TIME OF INSPECTION	1" over spillway crest

ADDITIONAL COMMENTS: Primary spillway was only observed from left abutment.

DAM NAME: Whitin Pond Dam

INSPECTION DATE: 10-18-19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	Wooden weir boards in left sluiceway
	WEIR TYPE	Sharp Crested
	SPILLWAY CONDITION	Fair
	TRAINING WALLS	Stone masonry
	SPILLWAY CONTROLS AND CONDITION	6 foot tall wooden weir boards, water leaking around edge
	UNUSUAL MOVEMENT	Collapsed portion of walls, voids in stone masonry
	APPROACH AREA	
	DISCHARGE AREA	Canal that passes under former mill
	DEBRIS	Vegetative debris in channel
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS: Only left sluice way was observable during assessment.

DAM NAME Whitin Pond Dam INSPECTION DATE 10-18-19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	N/A
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

SKETCH

DAM SAFETY INSPECTION

NAME OF DAM: Capron's Pond Dam STATE ID #: MA00897

AKA NAME: _____ WATERCOURSE NAME: Mumford River

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: MA HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: Earth embankment w/ stone masonry walls

PURPOSE OF DAM: Aesthetic, Cultural/Historic, Recreation (Park)

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: 12:45 OTHER ATTENDEES: SH, HJ

WEATHER CONDITIONS: Overcast, humid, ~

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: Stone masonry AUXILIARY SPILLWAY TYPE: wood structure w/ 2 metal sluice gates

NUMBER OF OUTLETS: 2 TYPE OF OUTLETS: ~~wood structure w/~~ metal sluice gates in stone channels

HAS THE DAM BEEN BREACHED OR OVERTOPPED? unknown

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? No

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? Yes - MA 16 immed. D/S; businesses + house attached/nearby

ACCESS CONDITIONS TO THE SITE: Access available thru pocket park

SECURITY DEVICES? metal fence + gate - open to public

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Caprons Pond Dam INSPECTION DATE 8/21/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth ~~dam~~ embankment w/ stone masonry walls
	WET AREAS (NO FLOW)	N/O
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	N/O
	SLIDE, SLOUGH, SCARP	N/O
	EMBANKMENT-ABUTMENT CONTACT	good
	SINKHOLE/ANIMAL BURROWS	N/O
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	small trees, shrubs, herb.
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: heavily veg - difficult to observe

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Caprons Pond Dam	INSPECTION DATE	8/21/19

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	N/A
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Capron's Pond Dam	INSPECTION DATE	8/21/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Capron's Pond Dam INSPECTION DATE 8/21/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S WALLS	1. WALL TYPE	stone masonry w/ motar
	2. WALL ALIGNMENT	good
	3. WALL CONDITION	good = two 1" cracks, one mortared from top only
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: max: avg:
	5. ABUTMENT CONTACT	N/A
	6. EROSION/SINKHOLES BEHIND WALL	N.
	7. ANIMAL BURROWS	N/O
	8. UNUSUAL MOVEMENT	N/O
	9. VEGETATION	small trees, brush growing along wall
	10. SCOUR/EROSION AT BASE OF WALL	unable to observe

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Capron's Pond Dam INSPECTION DATE 8/21/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	right abutment - large crack where mortar has been lost
	FOUNDATION SEEPAGE	N/O
	SLIDE, SLOUGH, SCARP	N/O
	WEIRS	N/O
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	difficult - access from D/S of MA16 bridge + walk U/S through stream
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	MA16 Bridge, homes + businesses (dam located in Downtown Uxb)

ADDITIONAL COMMENTS:

Tree growing from right abutment

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Capron's Pond Dam — INSPECTION DATE: 8/21/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	Stepped Stone masonry
	WEIR TYPE	broad-crested
	SPILLWAY CONDITION	appears good - somewhat obscured by flow
	TRAINING WALLS	Stone masonry - mortar + surface material loss has opened cracks + voids
	SPILLWAY CONTROLS AND CONDITION	weir board slots present but no weir boards
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	some sediment deposition, emergent veg.
	DISCHARGE AREA	Concrete apron to rocky stream bottom
	DEBRIS	None observed
	WATER LEVEL AT TIME OF INSPECTION	~1-3" above Spillway crest

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Capron's Pond Dam	INSPECTION DATE	8/21/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	wooden weir structure w/ 2 metal sluice gates
	WEIR TYPE	BC? concrete
	SPILLWAY CONDITION	good
	TRAINING WALLS	Stone masonry - right wall bulging slightly U/S & D/S of weir
	SPILLWAY CONTROLS AND CONDITION	Wood? 2 sluice gates set into wooden weir; manually op?
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	mill race w/ Stone masonry training walls
	DISCHARGE AREA	concrete apron → Cobble apron → cobble-bottom millrace
	DEBRIS	~~N/O~~ N/O
	WATER LEVEL AT TIME OF INSPECTION	~~N/O~~ <1" over Concrete BCW

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Caprons Pond Dam — INSPECTION DATE: 8/21/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	2 rectangular outlets
	INTAKE STRUCTURE	unknown
	TRASHRACK	N/O
	PRIMARY CLOSURE	(unknown) flow appears to be from top - stop logs?
	SECONDARY CLOSURE	- leaking?
	CONDUIT	rect. channel through stone masonry
	OUTLET STRUCTURE/HEADWALL	stone masonry wall
	EROSION ALONG TOE OF DAM	N/O - possible ~~beneath~~ flow below right-most outlet @ right end of concrete apron
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	N/O
	UNUSUAL MOVEMENT	N/O
	DOWNSTREAM AREA	left outlet discharges onto apron; right discharges to right of apron - possible low flow channel?
	MISCELLANEOUS	wheel slot?

ADDITIONAL COMMENTS: Access limited to view from Rte 16 bridge

Potential Recommendation Notes

Removal?

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Dam seems culturally/aesthetically important to town

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

SKETCH

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Capron's Pond Dam	INSPECTION DATE	8/21/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth emb. w/ stone masonry wall - see U/S walls
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Capron's Pond Dam	INSPECTION DATE	8/21/19

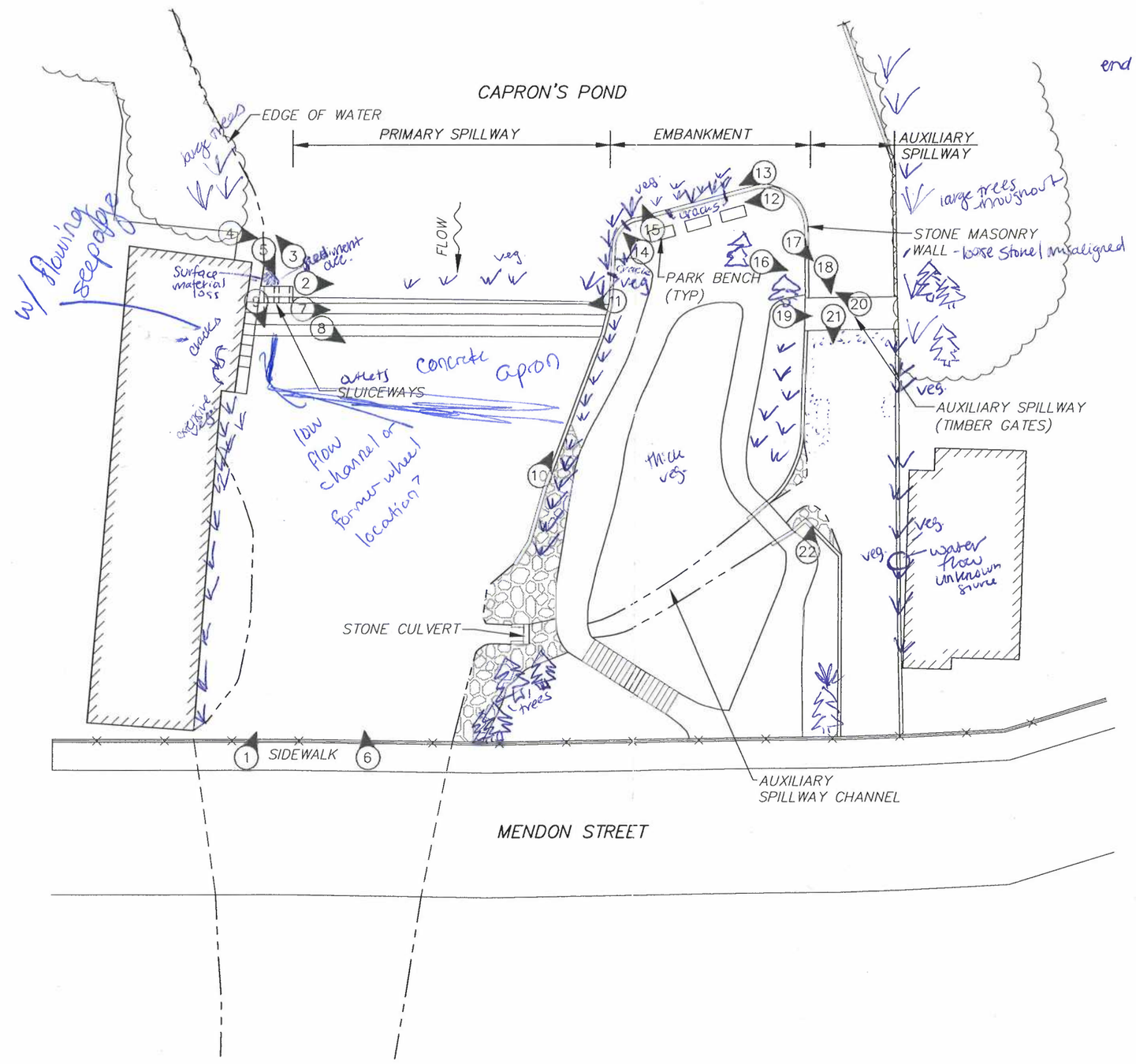
EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth - landscaped as park
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	good
	HORIZONTAL ALIGNMENT	good
	RUTS AND/OR PUDDLES	N/O
	VEGETATION (PRESENCE/CONDITION)	mowed grass
	ABUTMENT CONTACT	does not connect - see sketch
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

8-21-19
Dam visual assessment
Uxbridge MVP

end 1:30



LEGEND

④ PHOTO LOCATION AND DIRECTION

PHOTO LOCATION PLAN

CAPRONS POND DAM, CANAL, AND GATES
UXBRIDGE, MASSACHUSETTS
MA DCR

Tighe&Bond
www.tighebond.com

SCALE: NO SCALE

DATE: JULY 2015

J:\M\M0736 MA DCR Engineering Services MSA\37 - ODS FY15 Assignment 4\REPORT\MA00897 Coprons Pond Dam\Photo Location Plan\CaronPondDam.dwg Jul 10, 2015 - 2:50pm Plotted By: ZDB

DAM SAFETY INSPECTION

NAME OF DAM: Rivulet pond Dam STATE ID #: MA 00898

AKA NAME: _____ WATERCOURSE NAME: _____

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: _____ HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: earth-gravity

PURPOSE OF DAM: Recreational

YEAR BUILT: ?

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: 13:00 OTHER ATTENDEES: SH, NJ

WEATHER CONDITIONS: 87°, sunny, mostly clear, humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: Conc. weir AUXILIARY SPILLWAY TYPE: N/A

NUMBER OF OUTLETS: slot thru spillway TYPE OF OUTLETS: _____

HAS THE DAM BEEN BREACHED OR OVERTOPPED? unknown

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? No; bridge across spillway

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No

ACCESS CONDITIONS TO THE SITE: walk/drive past public beach

SECURITY DEVICES? bridge + fencing to prevent access to spillway

From Freightliner Parts

Freightliner Service Manual 3 group

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Rivulet Pond Dam

INSPECTION DATE: 8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	WET AREAS (NO FLOW)	N/O - veg
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	N/O - veg
	SLIDE, SLOUGH, SCARP	N/O - veg
	EMBANKMENT-ABUTMENT CONTACT	N/O - veg
	SINKHOLE/ANIMAL BURROWS	N/O - veg
	EROSION	former erosion area along left TW paved w/ concrete; herd path/minor erosion around right abut (concrete block joins to earth)
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	Heavy veg. - trees, brush, shrubs
	CONDITION OF JOINTS (CONCRETE)	N/O

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Rivulet Pond Dam — INSPECTION DATE: 8/19/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	SLIDE, SLOUGH, SCARP	some sloughing along 3' wide unmowed strip
	SLOPE PROTECTION TYPE AND COND.	N/O
	SINKHOLE/ANIMAL BURROWS	~~N/O~~ - holes/beginnings of gullying
	EMBANKMENT-ABUTMENT CONTACT	low @ rt abut, low spot @ left abut. leading to gulling
	EROSION	gully @ left abut - grows larger + armored w/ boulders as you move D/S
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	small trees, grass clumps, pickerel weed; 3' strip unmowed
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	not uniform; highest btwn bridge + left abutment
	HORIZONTAL ALIGNMENT	good
	RUTS AND/OR PUDDLES	N/A
	VEGETATION (PRESENCE/CONDITION)	mowed grass
	ABUTMENT CONTACT	good - rt.
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Rivulet Pond Dam		INSPECTION DATE 8/19/19
INSTRUMENTATION N/A		
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Rivulet Pond Dam INSPECTION DATE 8/19/19

DOWNSTREAM WALLS N/A

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	N/A	OBSERVATIONS		
U/S WALLS	1. WALL TYPE	~~N/A~~			
	2. WALL ALIGNMENT				
	3. WALL CONDITION				
	4. HEIGHT: TOP OF WALL TO MUDLINE		min:	max:	avg:
	5. ABUTMENT CONTACT				
	6. EROSION/SINKHOLES BEHIND WALL				
	7. ANIMAL BURROWS				
	8. UNUSUAL MOVEMENT				
	9. VEGETATION				
	10. SCOUR/EROSION AT BASE OF WALL				

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	N/O - veg
	FOUNDATION SEEPAGE	N/O - veg
	SLIDE, SLOUGH, SCARP	"
	WEIRS	N/O
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	trees + brush growing close either side
	ACCESSIBILITY	eroded gully d/s near channel outlet, or walk around fence @ right abutment
	DOWNSTREAM HAZARD DESCRIPTION	Taft Pond Dam (

ADDITIONAL COMMENTS:

D/S area is short (~100 ft) rock channel lined w/ boulders either bank that flows directly into Taft Pond

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	concrete weir
	WEIR TYPE	broad crested
	SPILLWAY CONDITION	~~fair~~ good - concrete in good shape
	TRAINING WALLS	good - concrete
	SPILLWAY CONTROLS AND CONDITION	N/O
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	debris + mud buildup
	DISCHARGE AREA	channel narrower than dam
	DEBRIS	debris on weir crest, caught @ under bridge
	WATER LEVEL AT TIME OF INSPECTION	≈3" above spillway crest (difficult to measure, increased by debris buildup

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

AUXILIARY SPILLWAY N/A

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rivulet Pond Dam	INSPECTION DATE	8/19/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	narrow slot thru + under spillway
	INTAKE STRUCTURE	~~N/O~~ could not be observed
	TRASHRACK	N/O -
	PRIMARY CLOSURE	~~N/~~ could not observe - appears to be removed +/or inoperable
	SECONDARY CLOSURE	N/O
	CONDUIT	~~N/O~~ rectangular concrete slot thru spillway
	OUTLET STRUCTURE/HEADWALL	vert concrete face of spillway
	EROSION ALONG TOE OF DAM	N/O
	SEEPAGE/LEAKAGE	N/O
	DEBRIS/BLOCKAGE	Clogged w/ mud + debris @ upstream side of spillway
	UNUSUAL MOVEMENT	N/O
	DOWNSTREAM AREA	same as primary spillway
	MISCELLANEOUS	

ADDITIONAL COMMENTS: See front page for brand/manual reference

Potential Recommendation Notes

Removal? Not a good candidate

Breach/Spillway Adjustments?

Repurposing?
Banks too low?

Fish/eel passage?
May be room for fish ladder, naturelike fishway
Pond appears healthy

Notes:
Rec dam in fairly good upkeep
Beach + picnic area well maintained, dam crest mowed, some rough repairs made

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

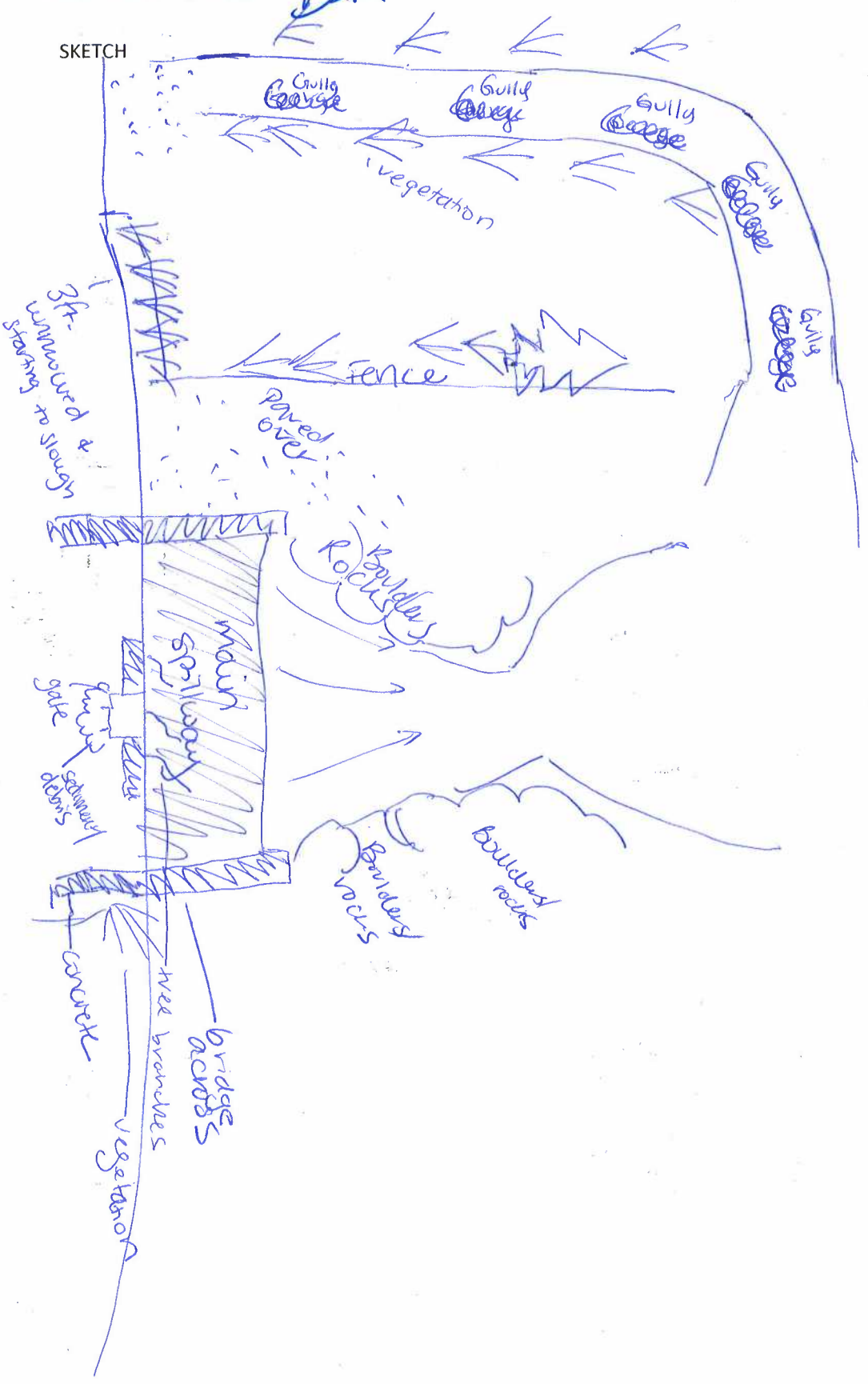
1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

Rivulet Pond Dam

SKETCH



8/19/19

DAM SAFETY INSPECTION

NAME OF DAM: Rice City Pond Dam STATE ID #: _____

AKA NAME: _____ WATERCOURSE NAME: _____

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge ~~MA~~ LAT. / LONG.: _____

STATE: MA HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: earth embankment w/ stone masonry walls

PURPOSE OF DAM: recreation, direct water to mill race

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19 NAME OF INSPECTOR: _____

TIME OF INSPECTION: 13:45 OTHER ATTENDEES: _____

WEATHER CONDITIONS: overcast, humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: concrete - ? AUXILIARY SPILLWAY TYPE: concrete ogee

NUMBER OF OUTLETS: 2 TYPE OF OUTLETS: wooden sluice gates to box culvert

HAS THE DAM BEEN BREACHED OR OVERTOPPED? unknown

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? ~~No~~ yes public highway over primary spillway

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No - walking trail

ACCESS CONDITIONS TO THE SITE: walk from Tri Comm. Health, River Bend Park

SECURITY DEVICES? wooden split rail fences above outlet structure

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth w/ stone masonry walls
	WET AREAS (NO FLOW)	0
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: unable to access safely

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	Unable to access safely — earth w/ stone masonry walls
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Highway - unable to access safely

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	N/A
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Rice City Pond Dam — INSPECTION DATE: 8/21/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE	stone masonry		
	2. WALL ALIGNMENT	unk		
	3. WALL CONDITION	unk		
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE	unk		
	6. ABUTMENT CONTACT	unknown		
	7. EROSION/SINKHOLES BEHIND WALL	unknown		
	8. ANIMAL BURROWS	unk		
	9. UNUSUAL MOVEMENT	unk		
	10. WET AREAS AT TOE OF WALL	unk		
	11. VEGETATION	herb, vine, tree		
	12. SCOUR/EROSION AT BASE OF WALL	unk		

ADDITIONAL COMMENTS: observed from a distance (across aux Spillway

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

unable to observe

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

DOWNSTREAM AREA - canal + river

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	unk
	FOUNDATION SEEPAGE	unk
	SLIDE, SLOUGH, SCARP	unk
	WEIRS	unk
	DRAINAGE SYSTEM	~~unk~~ unable to observe
	INSTRUMENTATION	N/O
	VEGETATION	~~unk~~ emergent in water along banks
	ACCESSIBILITY	not safe
		Statepark - public walking trail
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Rice City Pond Dam	INSPECTION DATE: 8/21/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

unable to observe

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Rice City Pond Dam

INSPECTION DATE: 8/21/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	Concrete
	WEIR TYPE	ogee
	SPILLWAY CONDITION	good
	TRAINING WALLS	stone masonry - some misalignment @ left end of dam
	SPILLWAY CONTROLS AND CONDITION	2 ~~sluice gates - recently replaced but outfall into canal may be filled in~~ ~~estimate (water opaque)~~
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	clear; unable to observe below water surface
	DISCHARGE AREA	concrete or stone apron
	DEBRIS	N/O
	WATER LEVEL AT TIME OF INSPECTION	~1 ft below crest (not directly measured)

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Rice City Pond Dam	INSPECTION DATE	8/21/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	sluice ~~gates - wood~~
	INTAKE STRUCTURE	2 square conduits
	TRASHRACK	yes - debris caught, including large branch
	PRIMARY CLOSURE	sluice gates - wood - 2 - recently replaced
	SECONDARY CLOSURE	N/O
	CONDUIT	rectangular stone conduits
	OUTLET STRUCTURE/HEADWALL	stone masonry
	EROSION ALONG TOE OF DAM	unk
	SEEPAGE/LEAKAGE	N/O
	DEBRIS/BLOCKAGE	N/O
	UNUSUAL MOVEMENT	N/O
	DOWNSTREAM AREA	canal
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal? would likely be opposed

water rights? ownership issue?

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Rice City Pond Dam ~~8/19/19~~ 8/21/19

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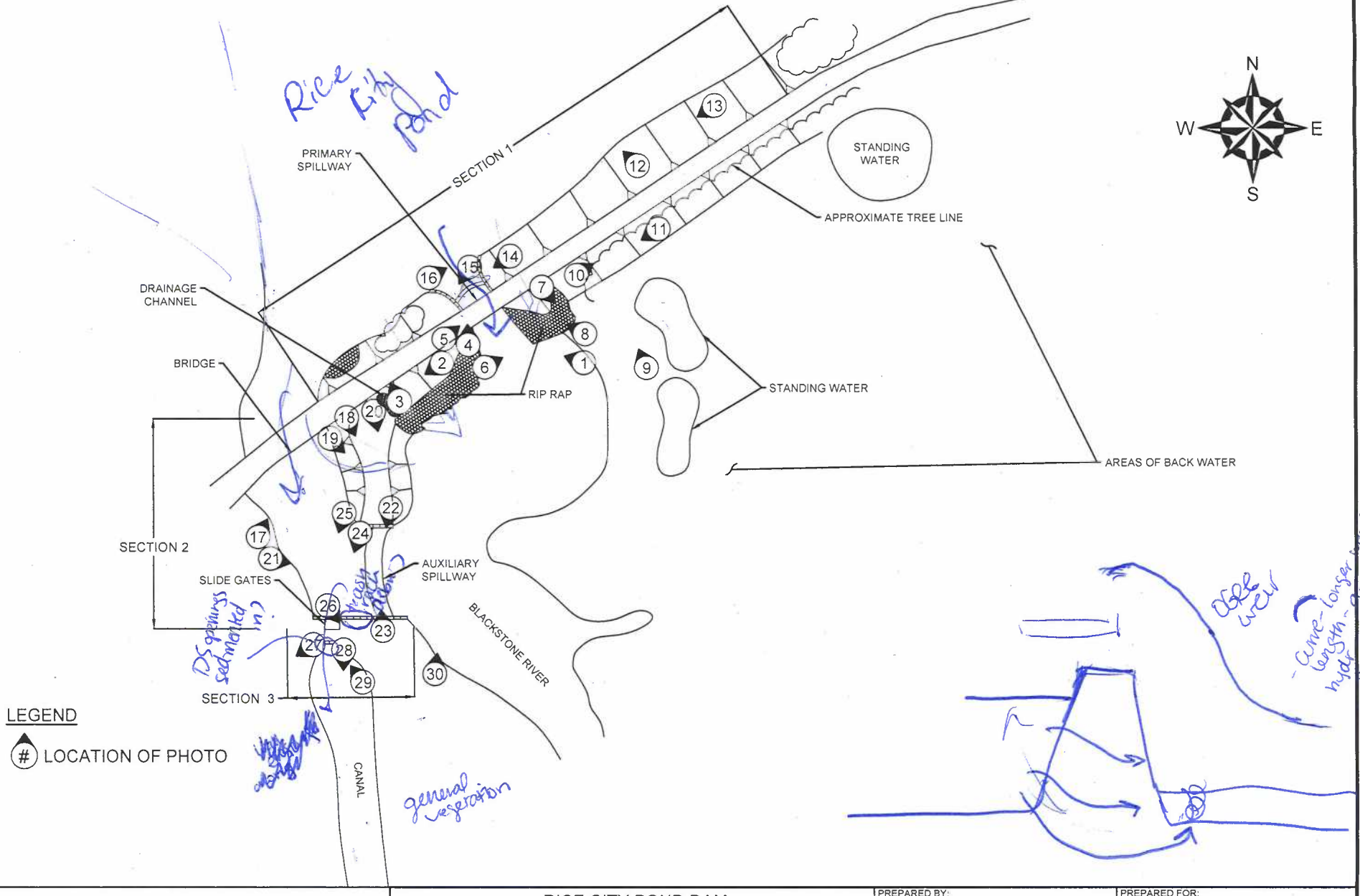

RICE CITY POND DAM UXBRIDGE, MASSACHUSETTS NID ID# MA00935	PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: Massachusetts DCR 251 Causeway St, Suite 900 Boston, MA 02114	
PHOTO LOCATION SKETCH	PROJ MGR: DJS	REVIEWED BY: DJS	CHECKED BY: CWC	FIGURE 6
	DESIGNED BY: DJS	DRAWN BY: CK	SCALE: N.T.S	
	DATE: 3/29/2019	PROJECT NO. 19798.29	REVISION NO.	

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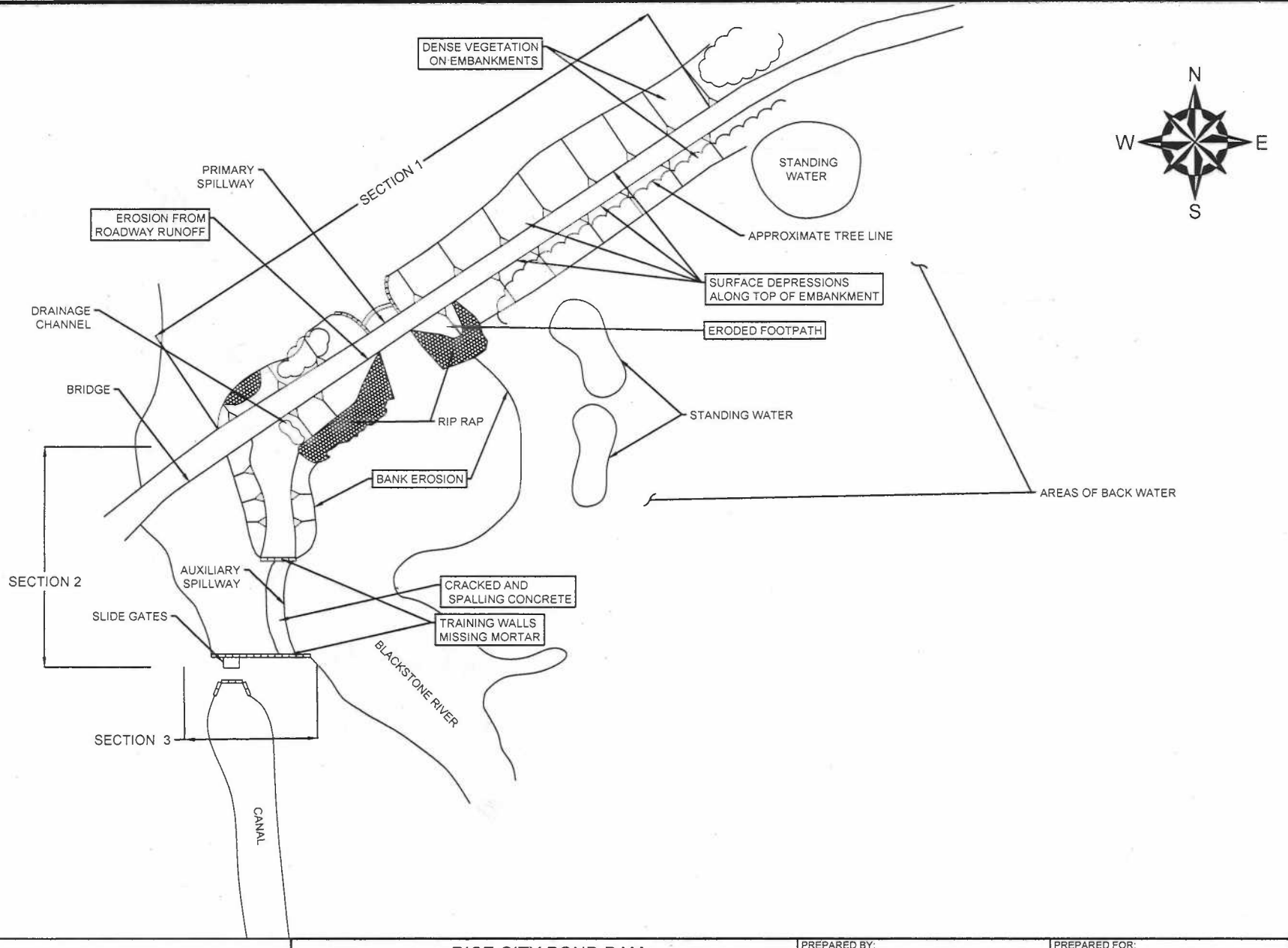

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RICE CITY POND DAM
UXBRIDGE, MASSACHUSETTS
NID ID# MA00935

DAM SITE SKETCH

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
Massachusetts DCR
251 Causeway St, Suite 900
Boston, MA 02114

PROJ MGR: DJS	REVIEWED BY: DJS	CHECKED BY: CWC	FIGURE
DESIGNED BY: DJS	DRAWN BY: CK	SCALE: N.T.S	5
DATE: 3/29/2019	PROJECT NO. 19798.29	REVISION NO.	

DAM SAFETY INSPECTION

NAME OF DAM: Blackstone Canal West Embankment ~~Dam~~ STATE ID #: MA00937

AKA NAME: _____ WATERCOURSE NAME: _____

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: MA HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: Historic/Cultural/

PURPOSE OF DAM: _____

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: _____ OTHER ATTENDEES: HJ, SH

WEATHER CONDITIONS: _____

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: Unable to observe AUXILIARY SPILLWAY TYPE: _____

NUMBER OF OUTLETS: _____ TYPE OF OUTLETS: _____

HAS THE DAM BEEN BREACHED OR OVERTOPPED? unknown

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? No

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No - Mill, Mill parking

ACCESS CONDITIONS TO THE SITE: up stream side - walk/drive around building; inside - three basement

SECURITY DEVICES? interior of mill - plexiglass

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Blackstone Canal West Embankment INSPECTION DATE: 8/21/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	WET AREAS (NO FLOW)	N/O - did not walk slope
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	"
	SLIDE, SLOUGH, SCARP	N/O
	EMBANKMENT-ABUTMENT CONTACT	good
	SINKHOLE/ANIMAL BURROWS	N/O
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	moved grass
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Blackstone Canal West Embankment — INSPECTION DATE: 8/21/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth, retained by masonry @ base
	SLIDE, SLOUGH, SCARP	~~N~~ N/O
	SLOPE PROTECTION TYPE AND COND.	Stone armor/wall @ base deteriorating
	SINKHOLE/ANIMAL BURROWS	N/O
	EMBANKMENT-ABUTMENT CONTACT	good
	EROSION	some erosion of asphalt path
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	~~Mowed~~ grass, herbaceous veg
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	asphalt + stone paths
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	N/O
	HORIZONTAL ALIGNMENT	good
	RUTS AND/OR PUDDLES	N/O
	VEGETATION (PRESENCE/CONDITION)	Mowed grass, somewhat sparse
	ABUTMENT CONTACT	good
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: Part of asphalt path eroding @ end of rails

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	NO
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE	N/O		
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL	NO		
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	N/O
	FOUNDATION SEEPAGE	N/O
	SLIDE, SLOUGH, SCARP	N/O
	WEIRS	2 weirs/structures in millrace D/S of building
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	herbaceous vegetation growing in Mill race
	ACCESSIBILITY	No access to canal except thru mill floor; only minimal security devices around millrace
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS: canal under building leads to millrace
Millrace

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

PRIMARY SPILLWAY unable to observe

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	Stone masonry - good alignment, minor voids
	SPILLWAY CONTROLS AND CONDITION	Sluice gate
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	under building
	DEBRIS	logs + sticks between training walls
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS: turtles + fish living in approach area, turtles use debris for sunning

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19.

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal West Embankment	INSPECTION DATE	8/21/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	N/O
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

Potential Recommendation Notes

Removal? - NO

Owner wants to maintain as attraction

Would have to be coordinated w/ removal/alterations @ East Bank Gate + Rice City Pond Dam

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Turtle + fish observed in canals

Notes:

Owner concern about inadequate water in canal

- controlled @ Rice City Pond Dam
  - repairs → omitted bargeboard hardware
    - weir too low
      - too little water to canal

if doesn't rain for 3 days, canal nearly dries up

Has to put sluicegate down; had intended to use as an attraction

Check w/ Riverbank/River Farm DCR welcome center

Park Super - Jodi Madden 508-769-1021

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

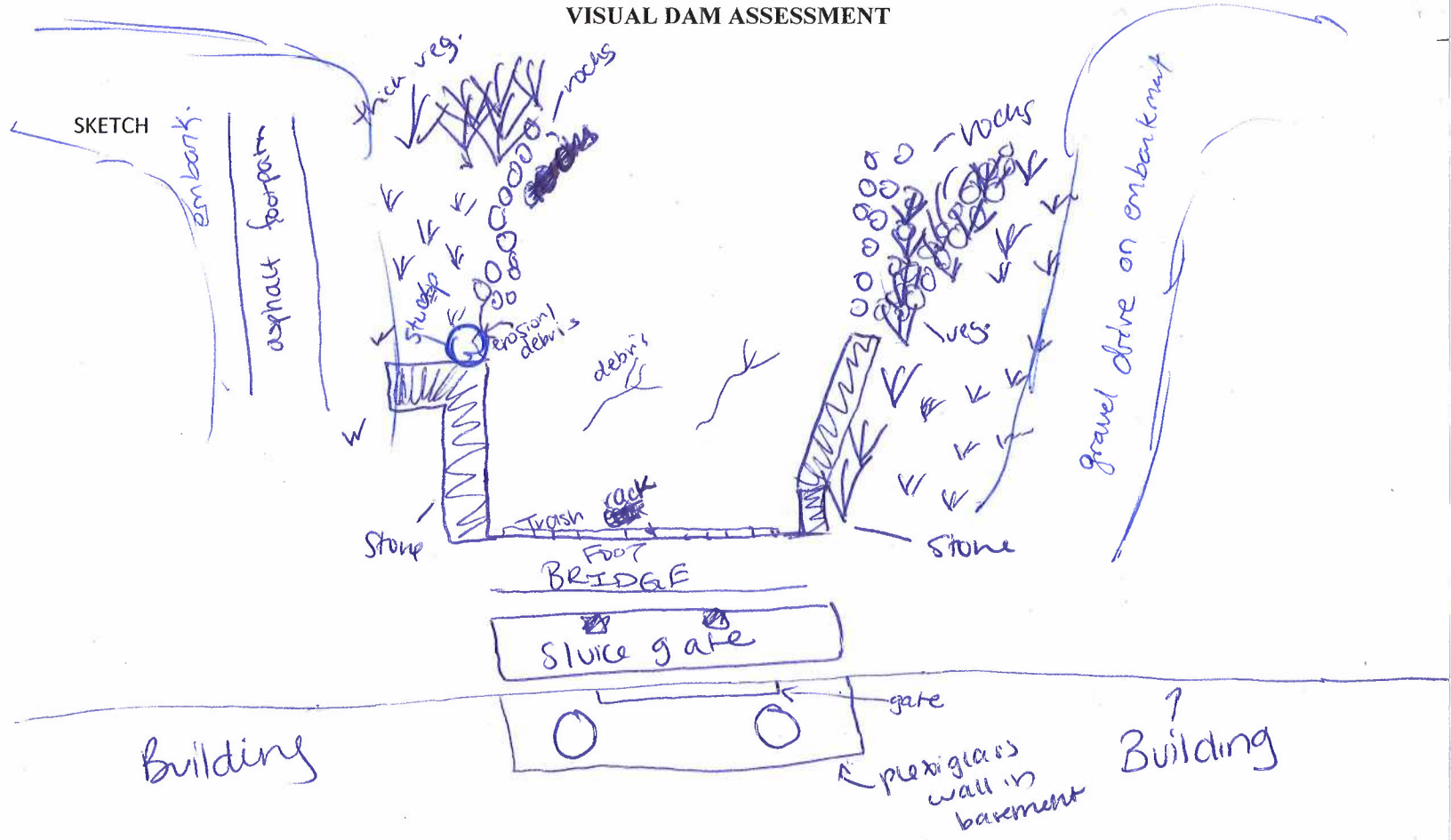
1. *Overview of dam from upstream*
2. *Overview of dam from downstream*
3. *Overview of upstream face from right abutment*
4. *Overview of upstream face from left abutment*
5. *Overview of dam crest from right abutment*
6. *Overview of dam crest from left abutment*
7. *Overview of downstream face from right abutment*
8. *Overview of downstream face from left abutment*
9. *Overview of spillway from upstream*
10. *Overview of spillway from downstream (tailrace or channel area)*
11. *Overview of right training wall*
12. *Overview of left training wall*
13. *Overview of weir*
14. *Overview of stilling basin*
15. *Overview of downstream channel*
16. *Overview of gatehouse exterior*
17. *Overview of gatehouse interior*
18. *Overview of operators*
19. *Outlet inlets and discharge points*
20. *Overview of reservoir*
21. *Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)*

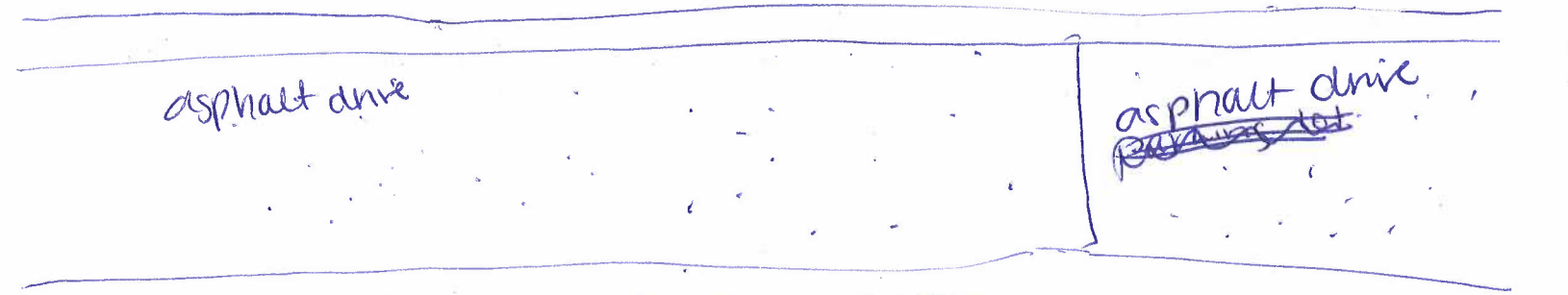
Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

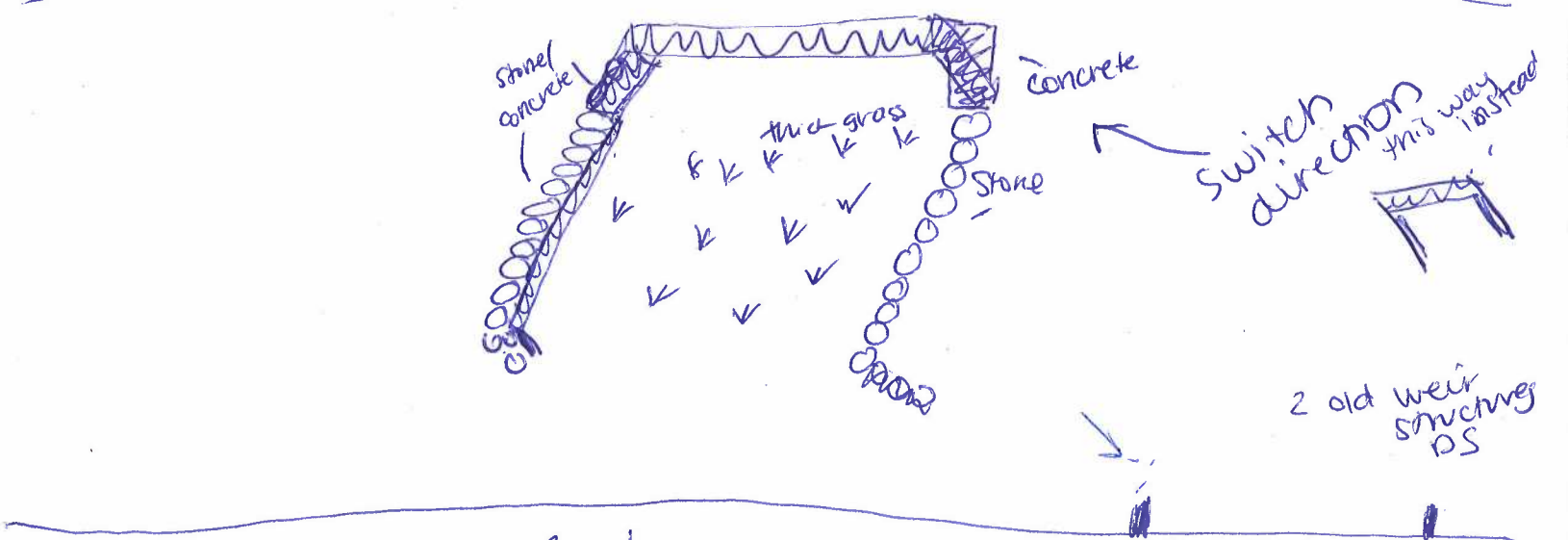
Blackstone Canal West 8/21/19

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan

VISUAL DAM ASSESSMENT







DAM SAFETY INSPECTION

NAME OF DAM: Old Ice Pond Dam STATE ID #: _____

AKA NAME: _____ WATERCOURSE NAME: Inman Pond

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: _____ HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: _____

PURPOSE OF DAM: Recreational

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: 8/19/19 NAME OF INSPECTOR: Rachael Weiter

TIME OF INSPECTION: _____ OTHER ATTENDEES: SH, HJ

WEATHER CONDITIONS: Sunny, Mostly Clear, Humid

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: _____ AUXILIARY SPILLWAY TYPE: _____

NUMBER OF OUTLETS: _____ TYPE OF OUTLETS: _____

HAS THE DAM BEEN BREACHED OR OVERTOPPED? yes, when beavers dammed up + spring in 1990s

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? NO

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? Unknown

ACCESS CONDITIONS TO THE SITE: Dirt road behind private home

SECURITY DEVICES? —

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS unable to observe due to tree cover
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	Heavy shrubs/vines/trees
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	grass, some erosion
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19.

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	heavy trees + vines
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

INSTRUMENTATION N/O

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

DOWNSTREAM AREA Unable to observe; check aerial photos

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	
	FOUNDATION SEEPAGE	
	SLIDE, SLOUGH, SCARP	
	WEIRS	
	DRAINAGE SYSTEM	
	INSTRUMENTATION	
	VEGETATION	
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	concrete? + Stone armor
	WEIR TYPE	
	SPILLWAY CONDITION	unable to observe; ~~Concrete~~ obscured by veg
	TRAINING WALLS	N/A?
	SPILLWAY CONTROLS AND CONDITION	N/A?
	UNUSUAL MOVEMENT	
	APPROACH AREA	clear
	DISCHARGE AREA	unable to observe
	DEBRIS	wood debris piled on spillway
	WATER LEVEL AT TIME OF INSPECTION	~1 ft below shoreline

ADDITIONAL COMMENTS: estimated 8' wide by owner

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS: unable to reach to observe
owner estimates that spillway is 8' wide

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Old Ice Pond Dam	INSPECTION DATE	8/19/19.

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS: owner does not believe one is present

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

Potential Recommendation Notes

Removal?

Bob's great grandfather built the dam
- all cement around the pond
- a lot of cement knocked off... when overtopped something about beavers

Breach/Spillway Adjustments?

- made it higher... at some point

Repurposing?

used to have a bridge on it
Road washed away
- family can't repair but wants to + repair camp
- last repaired in 1980s
- owner wanted to know when there would be more info; provided date of public mtg

Fish/eel passage?

Notes:

Water chestnuts present; large pile of pulled weeds on shore
Beaver problems previously; beaver deceiver device still potentially on dam

foxes deer
fishes beaver
turkey

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

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2. ***Overview of dam from downstream***
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5. ***Overview of dam crest from right abutment***
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8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

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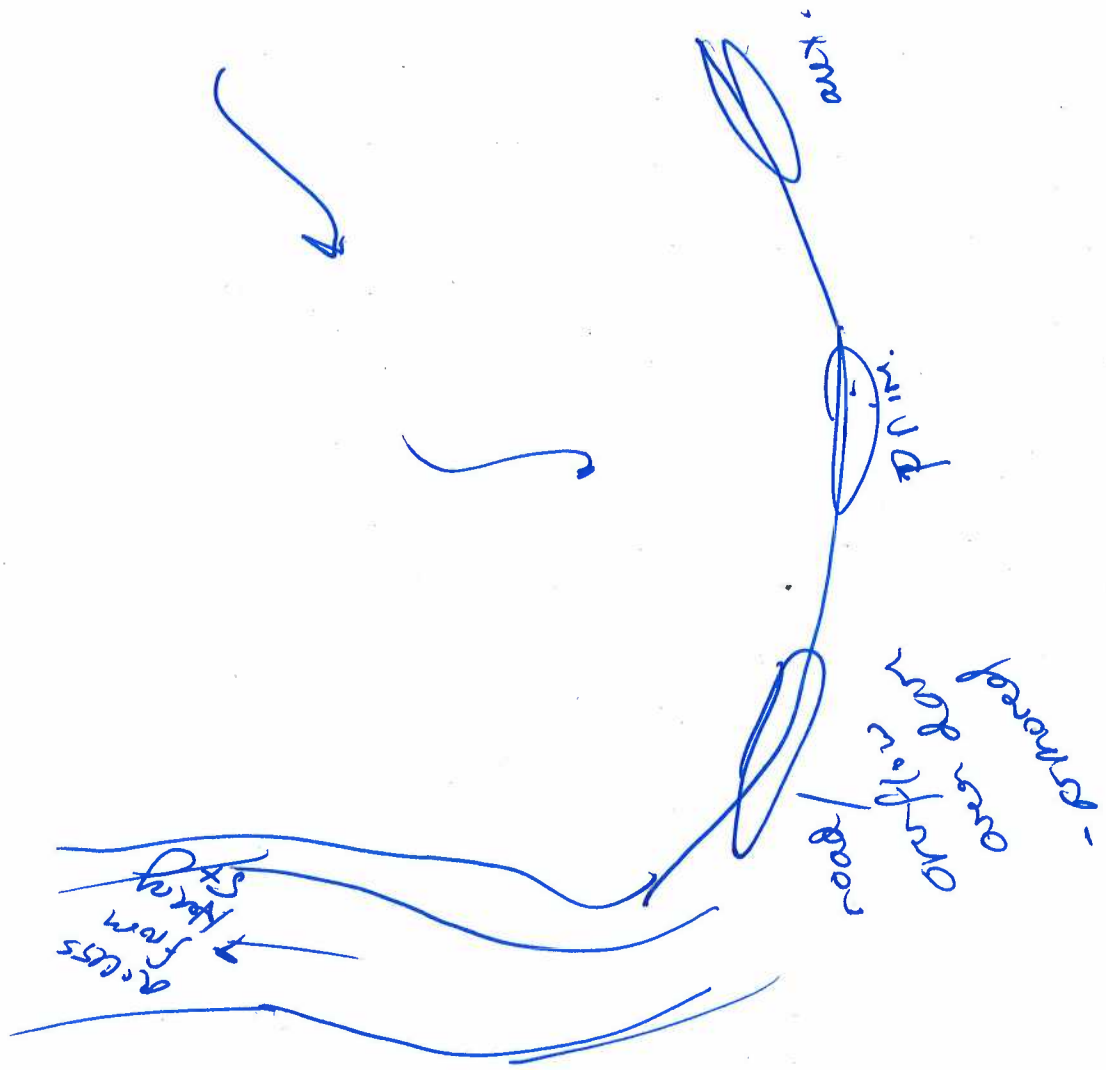
SKETCH



retaining pond for cows U/S?

DAM SAFETY INSPECTION

NAME OF DAM: Rivulet Village Pond Dam STATE ID #: MA02916

AKA NAME: _____ WATERCOURSE NAME: Taft Pond, Cold Spring Brook

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: MA HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: Stone masonry (granite block) spillway + earthen embankment

PURPOSE OF DAM: Recreation; Previously powered Mill

YEAR BUILT: _____

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19, on 8/22/19 form filled NAME OF INSPECTOR: RW

TIME OF INSPECTION: _____ OTHER ATTENDEES: HJ, SH

WEATHER CONDITIONS: Cloudy, ~~overca~~ light rain

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: BC granite block weir AUXILIARY SPILLWAY TYPE: /

NUMBER OF OUTLETS: 2 TYPE OF OUTLETS: Stacked stone culvert (@spillway) gated outlet (dike)

HAS THE DAM BEEN BREACHED OR OVERTOPPED? yes - multiple times

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? NO

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? yes - Rivulet St

ACCESS CONDITIONS TO THE SITE: Access via Foam Concepts LLC or by Boat from impoundm

SECURITY DEVICES? None except building + parking lot security

or from private parking lot to access dike

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
	EMBANKMENT (D/S SLOPE)	See Pave Report; vegetated
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
	EMBANKMENT (U/S SLOPE)	See Pave report; heavily vegetated
AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
	EMBANKMENT (CREST)	See Pave Report - heavily vegetated
AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
	INSTRUMENTATION N/O	
AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
	DOWNSTREAM WALLS	
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S WALLS	1. WALL TYPE	granite block/stone masonry
	2. WALL ALIGNMENT	good
	3. WALL CONDITION	good - mortar requires repointing
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: max:
	5. SEEPAGE OR LEAKAGE	seepage (flowing + non-flowing) evident @ multiple pts, esp. center of wall
	6. ABUTMENT CONTACT	good
	7. EROSION/SINKHOLES BEHIND WALL	N/O - access limited
	8. ANIMAL BURROWS	N/O, but 2 beaver building dams @ + around spillway
	9. UNUSUAL MOVEMENT	unknown
	10. WET AREAS AT TOE OF WALL	yes - see seepage
	11. VEGETATION	herbaceous + woody veg growing from wall @ multiple pts
	12. SCOUR/EROSION AT BASE OF WALL	N/O - access limited

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE		
UPSTREAM WALLS				
AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE	~~Unable to observe~~ granite block masonry		
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS: Unable to observe - U/S walls underwater + buried by sediment

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	N/O
	FOUNDATION SEEPAGE	N/O
	SLIDE, SLOUGH, SCARP	N/O
	WEIRS	N/O
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	large patch of sediment w/ herbaceous vegetation deposited in "stilling basin"(?) area between spillway + culvert
	ACCESSIBILITY	through Foam Concepts bldg +/or from east side of Rivulet St
	DOWNSTREAM HAZARD DESCRIPTION	foam concepts building, Rivulet St, water main, Residential neighborhood on Elm St, Commercial area + Rt 122

ADDITIONAL COMMENTS:

D/S area consists of granite apron flowing to dry-laid stone masonry culvert that extends beneath Foam Concepts building + Rivulet St.

Water main? (large pipe) embedded in streambed just inside D/S end of discharge culvert

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
PRIMARY SPILLWAY		
AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	~~broa~~ granite block
	WEIR TYPE	broad crested weir
	SPILLWAY CONDITION	good - potentially some leakage thru stones below
	TRAINING WALLS	stone masonry forming aux. spillway
	SPILLWAY CONTROLS AND CONDITION	N/O
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	sediment deposits, herbaceous vegetation
	DISCHARGE AREA	concrete apron + stilling basin surrounded by bldg on 3 sides
	DEBRIS	N/O - owners clean beaver debris daily
	WATER LEVEL AT TIME OF INSPECTION	≤ 1" above spillway crest

ADDITIONAL COMMENTS: could not observe from close distance

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
AUXILIARY SPILLWAY		
AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	granite blocks - laid integral to primary spillway
	WEIR TYPE	BCW
	SPILLWAY CONDITION	good - stones require re-pointing; veg growing in gaps
	TRAINING WALLS	stone masonry
	SPILLWAY CONTROLS AND CONDITION	red metal weir board channels appear bent in places; no weir boards evident
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	sediment deposit w/ emergent vegetation growing
	DISCHARGE AREA	same as prim. spillway
	DEBRIS	N/O
	WATER LEVEL AT TIME OF INSPECTION	~1"-4" below spillway crest

ADDITIONAL COMMENTS:

VISUAL DAM ASSESSMENT

DAM NAME		INSPECTION DATE
OUTLET WORKS		
AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	N/O
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	N/O
	SEEPAGE/LEAKAGE	N/O
	DEBRIS/BLOCKAGE	N/O
	UNUSUAL MOVEMENT	N/O
	DOWNSTREAM AREA	same as primary spillway
	MISCELLANEOUS	
ADDITIONAL COMMENTS:	unable to observe closely Beaver occasionally enter exit (on D/S side)	

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

Potential Recommendation Notes

Removal?

- Need to address flooding issues - could be open to idea of removal??

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

- Flooded 2x in building in past 3 years - spring '18 biggest flood
  2 inches concrete show flood mark -
- Foam concepts/parent company owns permits
- 3 new developments near facility that feed into the pond system
- under building → goes to direct channel → no masonry → concern
- issues w/ beaver debris blocking spillway - clear out often & diligently
- flooding - affects nearby homes, drains to the parking lot - backs up water to building
  ↳ beaver driven flooding, sometimes
- Gated/non-operative? emergency flood gate
- uses: recreation for factory workers, nearby residents (fishing)

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

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SKETCH

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM SAFETY INSPECTION

NAME OF DAM: Ironstone Reservoir ~~Pond~~ Dam STATE ID #:

AKA NAME: WATERCOURSE NAME:

DAM LOCATION INFORMATION

CITY/TOWN: LAT. / LONG.:

STATE: HAZARD CLASS:

GENERAL DAM INFORMATION

TYPE OF DAM: ~~Recreational~~ Earth

PURPOSE OF DAM: Rec, former ice pond

YEAR BUILT:

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: 9¼0 OTHER ATTENDEES: HJ, SK, David Tapscott, Steve Flagg

WEATHER CONDITIONS: Overcast, 74°, v. light breeze

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: concrete bcw AUXILIARY SPILLWAY TYPE: filled in stone channel ~3 years ago, c. 2016

NUMBER OF OUTLETS: 0 TYPE OF OUTLETS:

HAS THE DAM BEEN BREACHED OR OVERTOPPED? Unknown, not since 2007

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? No

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM?

ACCESS CONDITIONS TO THE SITE: walk from Flagg RV - only mowed partway

SECURITY DEVICES? No

Poor condition → work on dam

Have started process of dam removal - 2 years of investigation + permitting by Parr (Alan Orsey)
- Steve Flagg has results

"Last hurdle" - BJs has a fire suppression system in nearby body of water - is it connected to Reservoir

Need $ for removal

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Ironstone Reservoir Dam

INSPECTION DATE: 8/21/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	WET AREAS (NO FLOW)	
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	
	SLIDE, SLOUGH, SCARP	
	EMBANKMENT-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	eroded channel on left bank
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	heavy brush + large trees
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: too overgrown to inspect

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/2019

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	
	SLIDE, SLOUGH, SCARP	
	SLOPE PROTECTION TYPE AND COND.	
	SINKHOLE/ANIMAL BURROWS	
	EMBANKMENT-ABUTMENT CONTACT	some erosion along upstream shoreline
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	shrubs - too overgrown to inspect
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth - grass or other veg
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	good
	HORIZONTAL ALIGNMENT	difficult to observe - veg
	RUTS AND/OR PUDDLES	N/O
	VEGETATION (PRESENCE/CONDITION)	part - mowed grass; rest covered in thick brush
	ABUTMENT CONTACT	good
	CONDITION OF JOINTS (CONCRETE)	N/A

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/19

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	
	4. WEIRS	
	5. INCLINOMETERS	N/O
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE	N/O		
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	5. ABUTMENT CONTACT			
	6. EROSION/SINKHOLES BEHIND WALL			
	7. ANIMAL BURROWS			
	8. UNUSUAL MOVEMENT			
	9. VEGETATION			
	10. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Ironstone Reservoir Dam		INSPECTION DATE 8/21/19
DOWNSTREAM AREA		
AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	
	FOUNDATION SEEPAGE	
	SLIDE, SLOUGH, SCARP	
	WEIRS	
	DRAINAGE SYSTEM	
	INSTRUMENTATION	
	VEGETATION	
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS: Unable to observe due to thick vegetation

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME Ironstone Reservoir Dam INSPECTION DATE 8/21/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	concrete
	WEIR TYPE	broad crested weir
	SPILLWAY CONDITION	good-
	TRAINING WALLS	large (~1") crack w/ seepage in left TW; similar scour along rt TW + spillway joint
	SPILLWAY CONTROLS AND CONDITION	Stoplog channels present (metal, somewhat rusted) but no stoplogs
	UNUSUAL MOVEMENT	N/O
	APPROACH AREA	sedimented, lilypads + pickerelweed growing in approach
	DISCHARGE AREA	d/s channel narrows ~10 ft d/s of weir - btwn 2 trees
	DEBRIS	tree trunk trapped
	WATER LEVEL AT TIME OF INSPECTION	< 1 inch over spillway

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Ironstone Reservoir Dam	INSPECTION DATE	8/21/19

AUXILIARY SPILLWAY No

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	rock-lined earth channel
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS: No longer present. Filled in with soil c. 2016

DAM NAME Ironstone Reservoir Dam INSPECTION DATE 8/21/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal?

S. Flagg pursuing removal w/ Parr

Breach/Spillway Adjustments?

Repurposing?

Fish/eel passage?

Notes:

Blackstone River Watershed ~~Organiz~~ Assoc. supports project but no $
- same group endorsed Uxbridges

Steve contacted Parr asking them to send us documents

Owned dam since 2007
Pond formerly used as ice pond
2011/2010 storms
didn't overtop

Dog on left abutment + 1 property visible on shores of impoundment

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

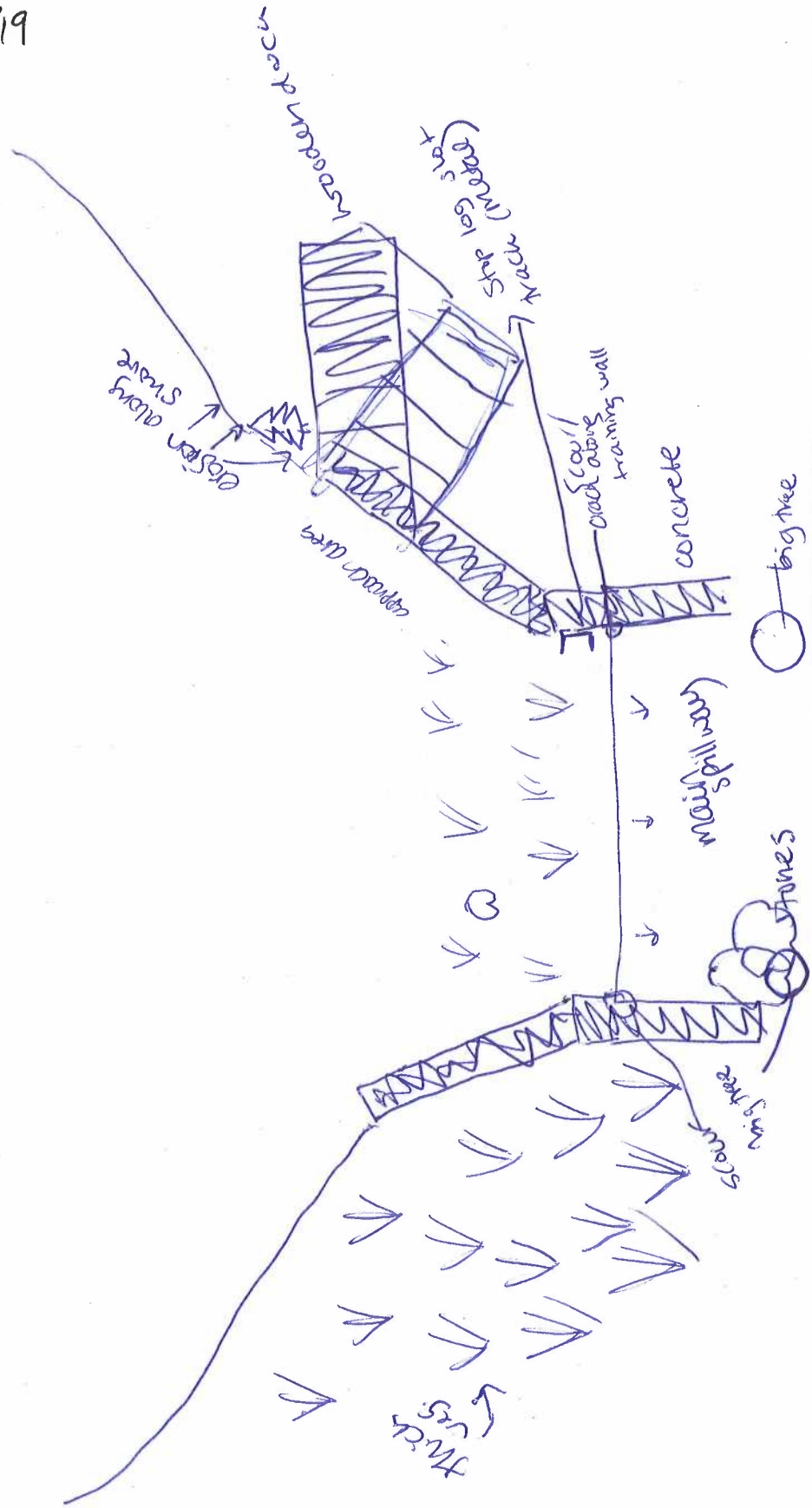
1. *Overview of dam from upstream*
2. *Overview of dam from downstream*
3. *Overview of upstream face from right abutment*
4. *Overview of upstream face from left abutment*
5. *Overview of dam crest from right abutment*
6. *Overview of dam crest from left abutment*
7. *Overview of downstream face from right abutment*
8. *Overview of downstream face from left abutment*
9. *Overview of spillway from upstream*
10. *Overview of spillway from downstream (tailrace or channel area)*
11. *Overview of right training wall*
12. *Overview of left training wall*
13. *Overview of weir*
14. *Overview of stilling basin*
15. *Overview of downstream channel*
16. *Overview of gatehouse exterior*
17. *Overview of gatehouse interior*
18. *Overview of operators*
19. *Outlet inlets and discharge points*
20. *Overview of reservoir*
21. *Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)*

Each photograph shall include a caption indicating the subject of the photograph as well as highlighting any specific deficiencies pictured. All photographs shall be presented with no more than two (2) photos per page. Photo location and orientation shall be indicated on the site plan included in the section entitled "Figures". Alternatively, for clarity, a separate figure can be provided in this appendix to show figure locations.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

Ironstone Reservoir Dam 8/21/19

SKETCH



DAM SAFETY INSPECTION

NAME OF DAM: Blackstone Canal East Gate STATE ID #: MA 03396

AKA NAME: _____ WATERCOURSE NAME: _____

DAM LOCATION INFORMATION

CITY/TOWN: Uxbridge LAT. / LONG.: _____

STATE: MA HAZARD CLASS: _____

GENERAL DAM INFORMATION

TYPE OF DAM: Concrete

PURPOSE OF DAM: retain canal - still used?; formerly mill water supply; now aesthetic/rec

YEAR BUILT: 1917 (stamped in concrete)

INSPECTION SUMMARY

DATE OF INSPECTION: 8/21/19 NAME OF INSPECTOR: RW

TIME OF INSPECTION: 10:30 OTHER ATTENDEES: HJ, SH

WEATHER CONDITIONS: overcast, 79°

GENERAL DAM DATA

PRIMARY SPILLWAY TYPE: Concrete BCweir w/ stop logs AUXILIARY SPILLWAY TYPE: —

NUMBER OF OUTLETS: 0 TYPE OF OUTLETS: /

HAS THE DAM BEEN BREACHED OR OVERTOPPED? unknown

IS THERE A FISH LADDER? (LIST TYPE IF PRESENT) No

DOES THE CREST SUPPORT A PUBLIC ROAD? NO - ~~supports road~~ bridge over spillway for trail

ROADS/DRIVEWAY IMMEDIATELY DOWNSTREAM OF DAM? No

ACCESS CONDITIONS TO THE SITE: walk on trail

SECURITY DEVICES? yes - ~~fence~~ wooden fences

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Blackstone Canal East Gate

INSPECTION DATE: 8/21/19

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	WET AREAS (NO FLOW)	N/O
	SEEPAGE (EARTH) OR LEAKAGE (CONCRETE)	N/O
	SLIDE, SLOUGH, SCARP	N/O
	EMBANKMENT-ABUTMENT CONTACT	good
	SINKHOLE/ANIMAL BURROWS	N/O
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	large trees, brush, herbaceous plants
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: heavily vegetated + V. Steep - difficult to observe closely.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Blackstone Canal East Gate — INSPECTION DATE: 8/21/19

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	TYPE (EARTH, CONCRETE, MASONRY)	earth
	SLIDE, SLOUGH, SCARP	N/O
	SLOPE PROTECTION TYPE AND COND.	N/O
	SINKHOLE/ANIMAL BURROWS	N/O
	EMBANKMENT-ABUTMENT CONTACT	Good
	EROSION	N/O
	UNUSUAL MOVEMENT	N/O
	VEGETATION (PRESENCE/CONDITION)	herbaceous veg, large + small trees
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS: heavily vegetated - difficult to observe

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	earth, w/ stone dust trail ~5' wide + grass to either side
	SURFACE CRACKING	N/O
	SINKHOLES, ANIMAL BURROWS	N/O
	VERTICAL ALIGNMENT (DEPRESSIONS)	minor depressions along trail
	HORIZONTAL ALIGNMENT	fair - difficult to observe due to veg
	RUTS AND/OR PUDDLES	v. minor ruts in trail
	VEGETATION (PRESENCE/CONDITION)	mowed grass w/ herbs/bush/small trees slightly encroaching/
	ABUTMENT CONTACT	good
	CONDITION OF JOINTS (CONCRETE)	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS
INSTR.	1. PIEZOMETERS	
	2. OBSERVATION WELLS	
	3. STAFF GAGE AND RECORDER	N/O
	4. WEIRS	
	5. INCLINOMETERS	
	6. SURVEY MONUMENTS	
	7. DRAINS	
	8. FREQUENCY OF READINGS	
	9. LOCATION OF READINGS	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

DOWNSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	1. WALL TYPE			
	2. WALL ALIGNMENT			
	3. WALL CONDITION			
	4. HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	
	5. SEEPAGE OR LEAKAGE			
	6. ABUTMENT CONTACT			
	7. EROSION/SINKHOLES BEHIND WALL			
	8. ANIMAL BURROWS			
	9. UNUSUAL MOVEMENT			
	10. WET AREAS AT TOE OF WALL			
	11. VEGETATION			
	12. SCOUR/EROSION AT BASE OF WALL			

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gates	INSPECTION DATE	8/21/19

UPSTREAM WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S WALLS	1. WALL TYPE	
	2. WALL ALIGNMENT	
	3. WALL CONDITION	
	4. HEIGHT: TOP OF WALL TO MUDLINE	min: max: avg:
	5. ABUTMENT CONTACT	
	6. EROSION/SINKHOLES BEHIND WALL	
	7. ANIMAL BURROWS	
	8. UNUSUAL MOVEMENT	
	9. VEGETATION	
	10. SCOUR/EROSION AT BASE OF WALL	

ADDITIONAL COMMENTS: Concrete cutoff wall extend out from spillway on U/S side of embankment
- minor spalling/delamination

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	N/O
	FOUNDATION SEEPAGE	N/O
	SLIDE, SLOUGH, SCARP	N/O
	WEIRS	N/O
	DRAINAGE SYSTEM	N/O
	INSTRUMENTATION	N/O
	VEGETATION	thick herbaceous veg. obscures view
	ACCESSIBILITY	steep walk down embankment - difficult
	DOWNSTREAM HAZARD DESCRIPTION	

ADDITIONAL COMMENTS: Drains directly into Blackstone R.

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME: Blackstone Canal East Gate INSPECTION DATE: 8/21/19

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
	SPILLWAY TYPE	concrete BC weir w/ stop logs & 4 gates
	WEIR TYPE	good - concrete @ gates appears newer than surrounding concrete
	SPILLWAY CONDITION	minor delamination; efflorescent cracks both training walls
	TRAINING WALLS	~~gates~~ unable to observe due to structure of dam
	SPILLWAY CONTROLS AND CONDITION	gates - unable to observe - ~~th~~ unsure when last operated
	UNUSUAL MOVEMENT	N/O
	~~APPROACH AREA~~	concrete apron - herbaceous veg encroaching from D/S area
	DISCHARGE AREA	heavily vegetated side channel of Blackstone R.
	DEBRIS	N/O
	WATER LEVEL AT TIME OF INSPECTION	~4" below top of stop logs; 6ft 2" below top of right TW

ADDITIONAL COMMENTS: Approach - clear of debris but ~~water~~ opaque - unable to observe below surface
woody veg growing from btwn stop logs

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	N/A
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan
VISUAL DAM ASSESSMENT

DAM NAME	Blackstone Canal East Gate	INSPECTION DATE	8/21/19

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS
OUTLET WORKS	TYPE	
	INTAKE STRUCTURE	
	TRASHRACK	N/A
	PRIMARY CLOSURE	
	SECONDARY CLOSURE	
	CONDUIT	
	OUTLET STRUCTURE/HEADWALL	
	EROSION ALONG TOE OF DAM	
	SEEPAGE/LEAKAGE	
	DEBRIS/BLOCKAGE	
	UNUSUAL MOVEMENT	
	DOWNSTREAM AREA	
	MISCELLANEOUS	

ADDITIONAL COMMENTS:

Potential Recommendation Notes

Removal?

Cultural/aesthetic/historical significance

Breach/Spillway Adjustments?

Repairs needed - see follow-up inspection + former inspection

Repurposing?

Fish/eel passage?

Notes:

PHOTOS

PHOTOGRAPHS INSTRUCTION PAGE:

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. ***Overview of dam from upstream***
2. ***Overview of dam from downstream***
3. ***Overview of upstream face from right abutment***
4. ***Overview of upstream face from left abutment***
5. ***Overview of dam crest from right abutment***
6. ***Overview of dam crest from left abutment***
7. ***Overview of downstream face from right abutment***
8. ***Overview of downstream face from left abutment***
9. ***Overview of spillway from upstream***
10. ***Overview of spillway from downstream (tailrace or channel area)***
11. ***Overview of right training wall***
12. ***Overview of left training wall***
13. ***Overview of weir***
14. ***Overview of stilling basin***
15. ***Overview of downstream channel***
16. ***Overview of gatehouse exterior***
17. ***Overview of gatehouse interior***
18. ***Overview of operators***
19. ***Outlet inlets and discharge points***
20. ***Overview of reservoir***
21. ***Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)***

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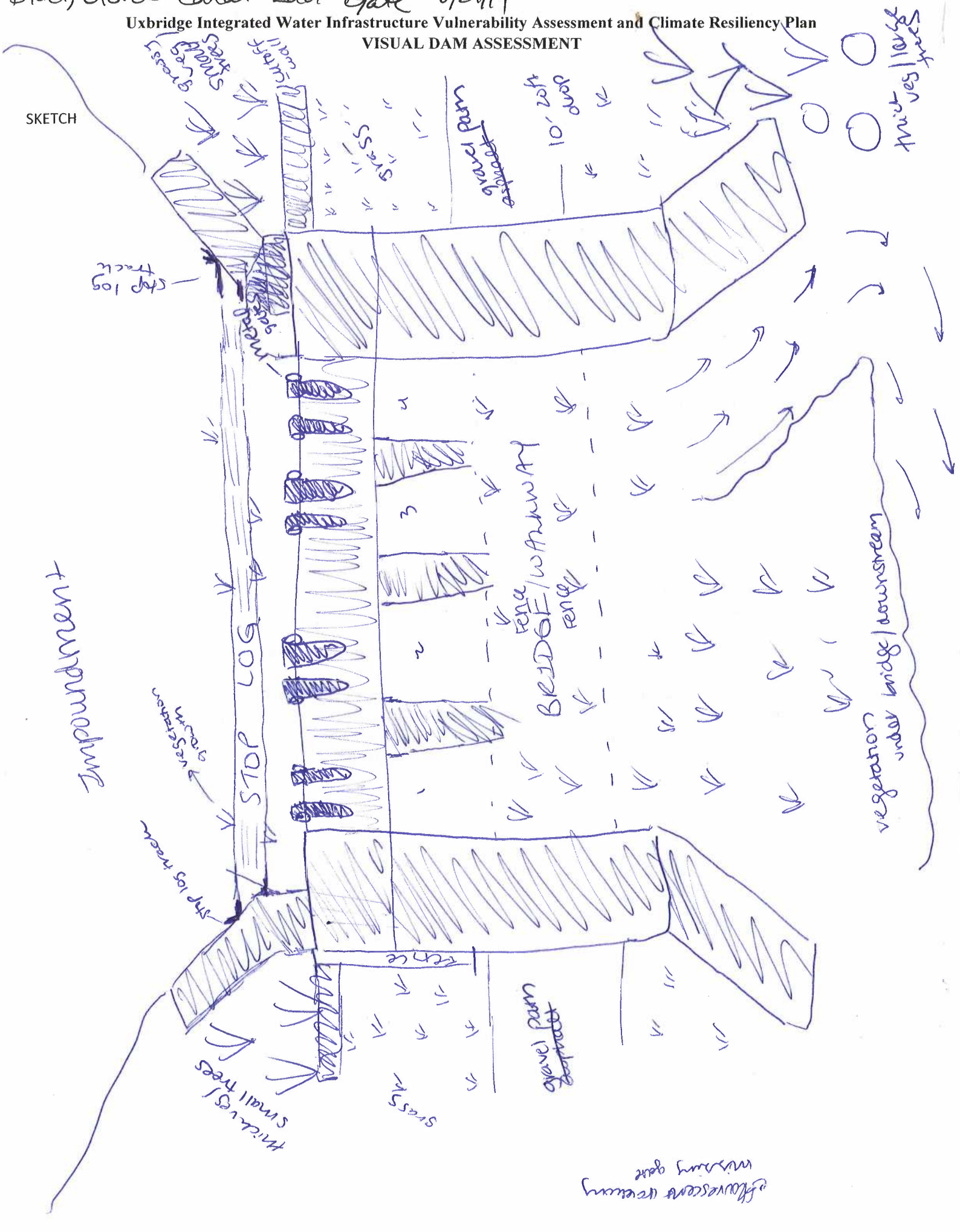
Blackstone Canal East Gate 8/21/19

Uxbridge Integrated Water Infrastructure Vulnerability Assessment and Climate Resiliency Plan

VISUAL DAM ASSESSMENT



FUSS & O'NEILL

Attachment C

Dam Assessment Scoring and Prioritization Results

Dam Assessment Scoring and Prioritization - Management Recommendations

Dam ID Number	Dam Name	Impoundment Name	Latitude	Longitude	Current Uses	Ability to Maintain	Failure Risk	Priority	Flood Mitigation Potential	Stream Continuity Potential	Management Recommendations
MA00895	Whitin Pond Dam		42.09341	−71.63780433	Flood control; Recreation	No	Moderate	High	No	Low	Consider removal
MA02916	Rivulet Village Pond Dam	Taft Pond	42.087568	−71.644477	Recreation	Yes	Severe	High	No	Low	Consider removal
MA00898	Rivulet Pond Dam	Rivulet Pond	42.08627	−71.64812	Recreation	Yes	Low	Low	No	Moderate/High	Consider adding AOP; Repair and maintain
MA01165	West River Pond Dam		42.083934	−71.607548	Recreation	No	Moderate	Medium	No	High	Consider removal
MA03216	Hecla Canal Diversion Structure		42.076	−71.615	N/A	No	Low	Low	No	Low	No action
MA02815	Old Ice Pond Dam	Inman Pond	42.07843	−71.59319	Recreational; Environmental resource	No	Low	Low	No	Low	Consider removal
MA00891	Lee Pond Dam		42.04735	−71.64482	Recreation	Yes	Moderate	Medium	No	High	Consider adding AOP; Repair and maintain Could be a candidate for removal but owner did not allow access for assessment.
MA00890	Lee Reservoir Dam		42.0446818	−71.65999207	Recreation; Aesthetic value	Yes	Low	Low	No	Moderate	Repair and maintain
MA02919	Ironstone Reservoir Dam		42.0263793	−71.61130101	Recreation	No	Moderate	High	No	High	Consider removal Owner is interested in potential MVP funding to help finance removal.
MA03396	Blackstone Canal East Embankment and Gate		42.0831907	−71.61993742	Recreation; Historic preservation	No	Moderate	Medium	No	Low	Repair and maintain
MA00937	Blackstone Canal West Embankment & Stanley Gate		42.0805597	−71.62055368	Recreation; Historic preservation	Possibly	Moderate	Medium	No	Low	Repair and maintain
MA00897	Caprons Pond Dam, Canal and Gates		42.076942	−71.628153	Recreation	Yes	Moderate	Medium	No	Low	Repair and Maintain
MA00935	Rice City Pond Dam		42.0982752	−71.62227149	Recreation; Flood control	Yes	Moderate	Medium	No	Low	Repair and Maintain
MA00896	Linwood Pond Dam	Linwood Pond	42.0981258	−71.64737363	Recreation	Yes	Moderate	Medium	No	Low	Repair and maintain
	371 Aldrich Street		42.027802	-71.640815	Property owner stated that he uses it to control level of impoundment	No	Moderate	High	No	Not Assessed	Consider removal in conjunction with culvert replacement
	Dam on Albee Road		42.04074	-71.597227	Unknown	No	Moderate	Medium	No	Not Assessed	Consider removal (replace outlet structure with appropriately sized culvert; maintain road embankment)
	Bacon Street Dam		42.06685	-71.606473	Aesthetic value	Yes	Moderate	Medium	No	Not Assessed	No action
	Home Brew Dam		42.077652	-71.607558	None	No	Low	High	No	Not Assessed	Consider removal
	Dam on Marywood Street		42.076626	-71.637239	Recreation; Aesthetic value	No	Moderate	Medium	No	Not Assessed	Repair and maintain
	Albee Road Weir		42.037248	-71.593672	None	No	Low	Low	No	Not Assessed	No action