

APPENDIX A

Project Area Photographs
& Figures



Figure 1 Annotated photo of Project area looking from southeast (GSE 2014).

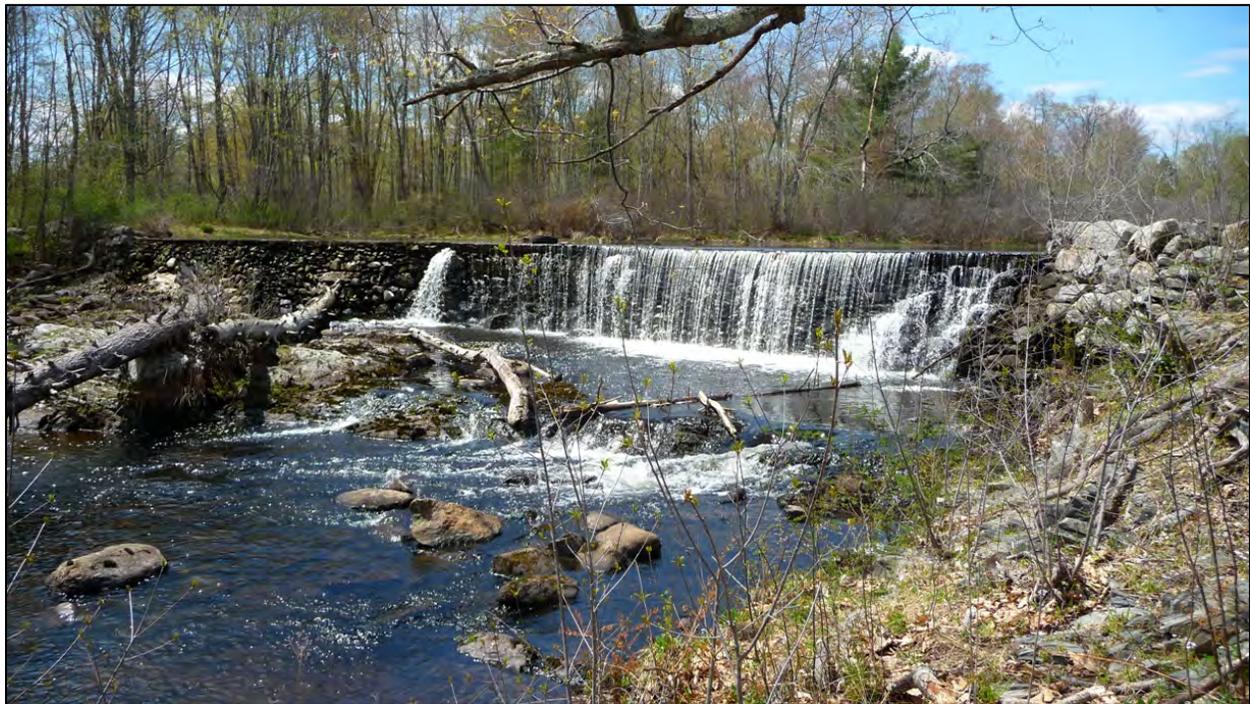


Figure 2 Primary spillway of Millie Turner Dam (Source: DER).



Figure 3 Looking upstream to impoundment from Turner Dam (GSE 2014).



Figure 4 Looking up raceway to east auxiliary spillway (GSE 2014).



Figure 5 View of headpond with east auxiliary spillway in background (Stantec 2010).



Figure 6 Looking upstream from Hollis Street Bridge to Turner Dam (GSE 2014).



Figure 7 Looking upstream at backwatered Nissitissit approximately 2,800 ln. ft. upstream of dam (GSE 2014).



Figure 8 Looking northwest from parking lot across pond to Turner Dam (GSE 2014).

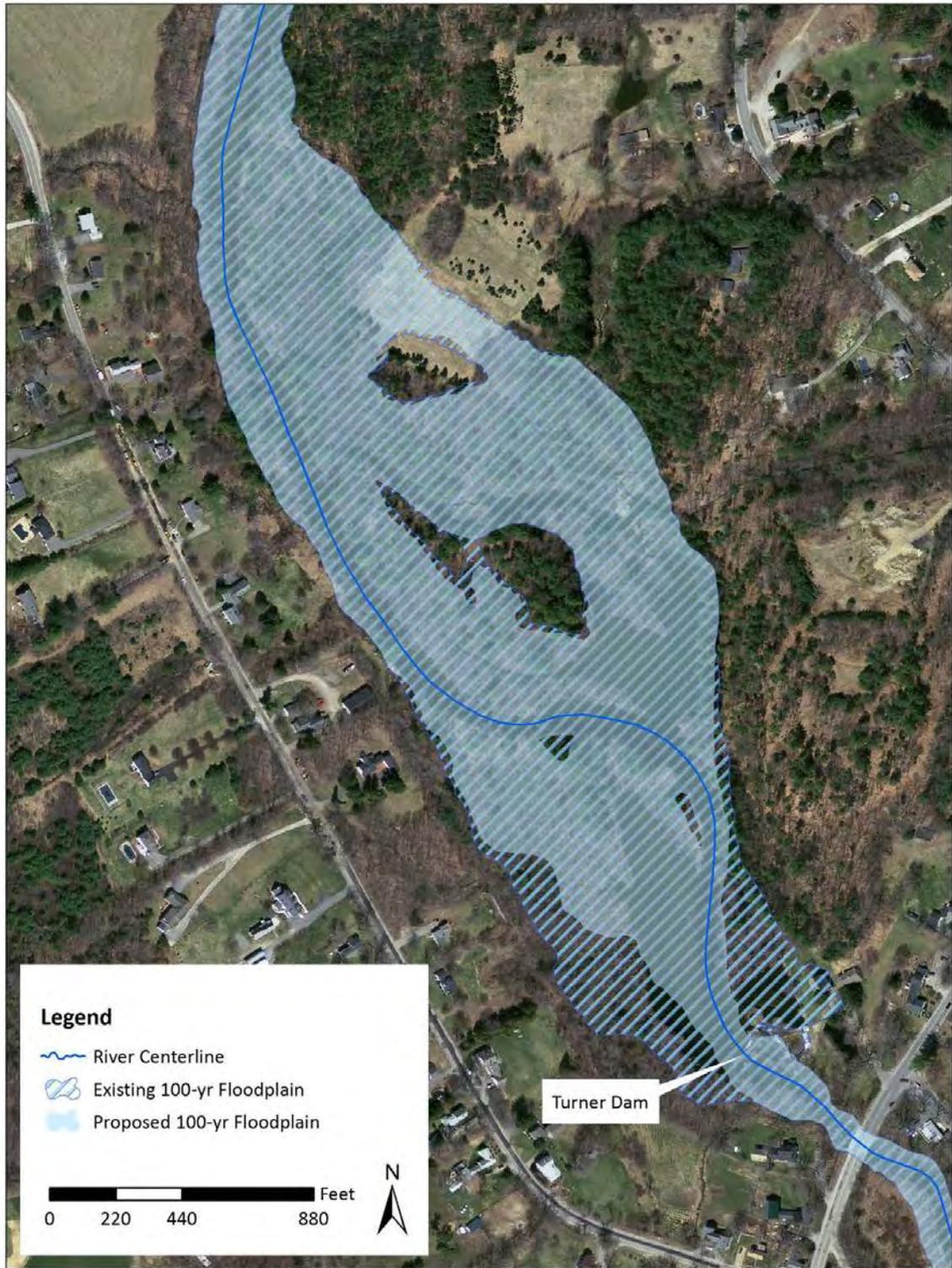


Figure 9 Comparison of Existing vs. Proposed 100-yr Floodplain under the Proposed Action (GSE 2014).

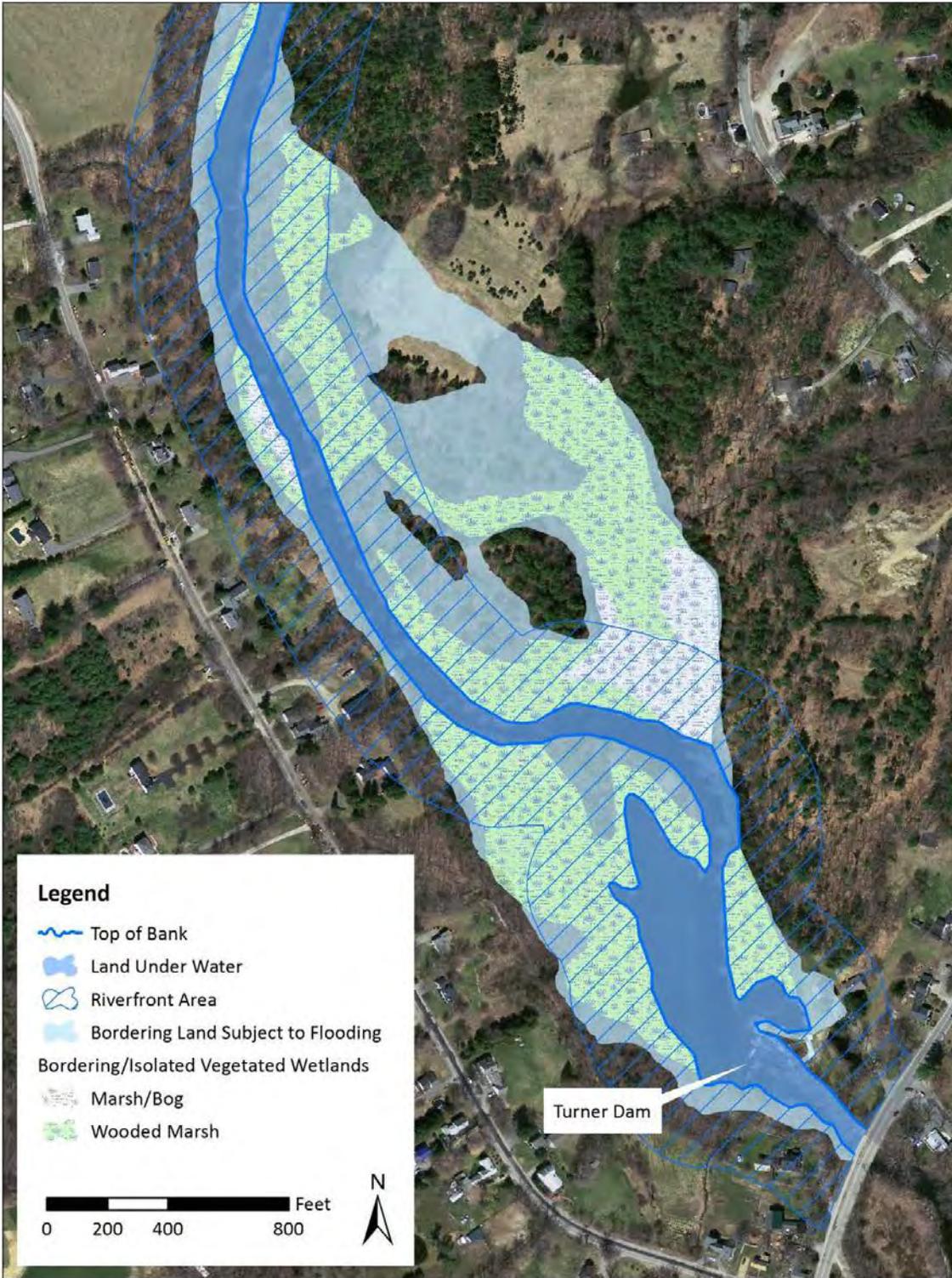


Figure 10 Existing wetland boundaries within Project vicinity (GSE 2014).

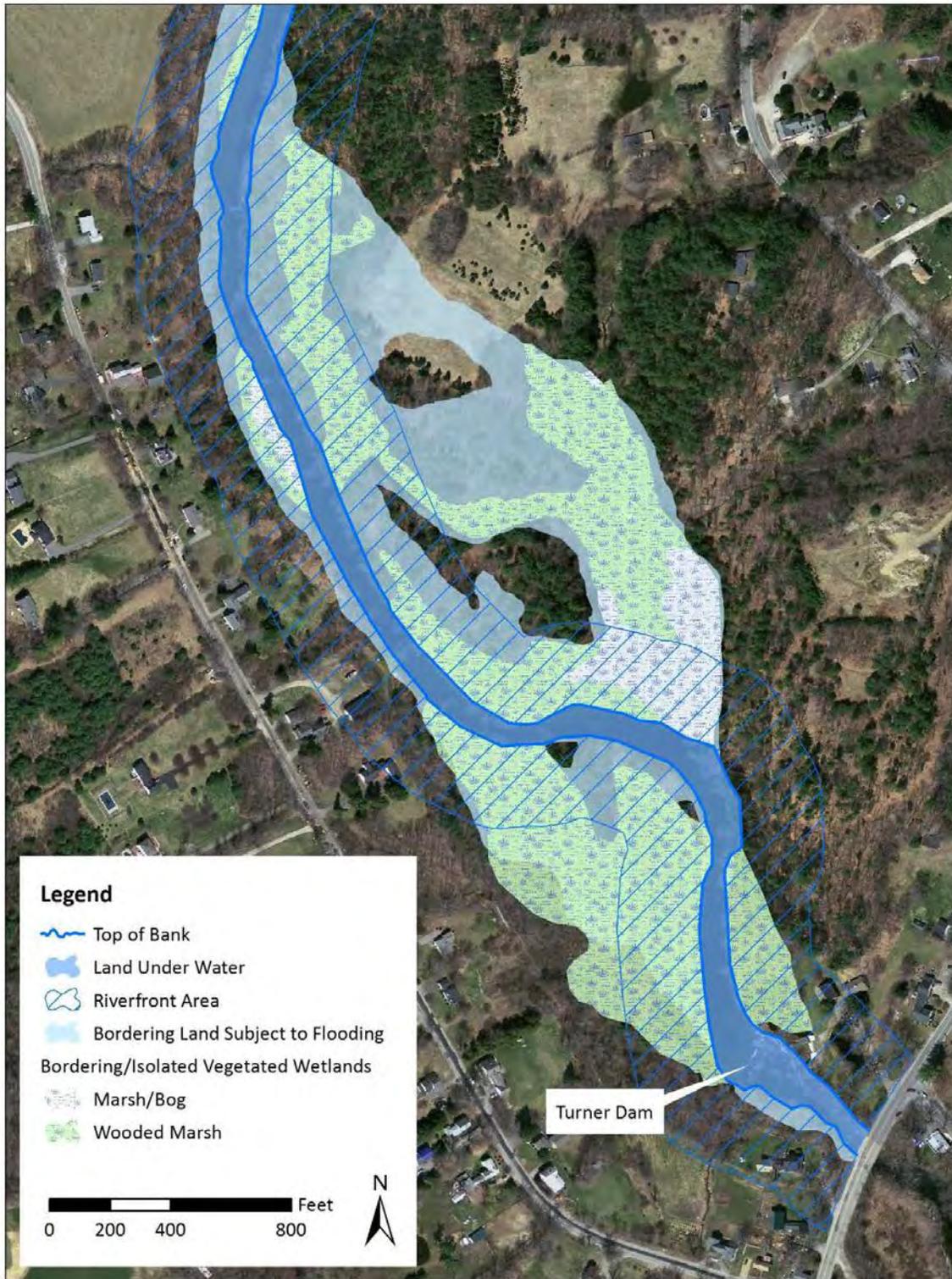


Figure 11 Anticipated wetland boundary from implementation of the Proposed Action (GSE 2014).

APPENDIX B

Rare, Threatened, & Endangered Species Consultation

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION

Originating Person(s): Bill Bennett, Partners for Fish and Wildlife Program
New England Field Office, Concord, NH

Telephone Number(s): (603) 223-2541

Date: June 16, 2015

I. Service Program(s) and Proposed Activity: Partners for Fish and Wildlife Program.

The proposed Turner Dam Removal Project will breach the Millie Turner/Blake Mill Dam, a 256-ft long gravity structure constructed of earthen fill and masonry, spanning the mainstem Nissitissit River in Pepperell, Massachusetts. The dam blocks all fish passage, impedes natural stream process, and is considered a “High” hazard and in “Poor” and “Unsafe” condition according to the Massachusetts Office of Dam Safety. The project is a partnership between the US Fish and Wildlife Service (Service), Massachusetts Division of Ecological Restoration (DER), Massachusetts Division of Fisheries and Wildlife (MA DFW), Trout Unlimited, the Nashua River Watershed Association, the private dam owner, and the Nashoba Conservation Trust. The Project is expected to have a net ecological benefit by restoring natural stream processes to the watershed and reconnecting 20 miles of high quality coldwater habitat for native Eastern brook trout (*Salvelinus fontinalis*), American eel (*Elliptio complanata*), and other aquatic organisms within the Nissitissit River. Public safety will also be enhanced by removing the risk of a potential catastrophic failure of the dam.

The preferred approach will remove 100 feet of Turner Dam’s primary spillway. The breach will have a minimum bottom width of 70 feet with side slopes along the breach face of 1.5H:1V or steeper. The full vertical height of the structure would be removed to eliminate any potential barrier to fish passage, and pass without limitation the modeled 500-year storm event.

The impoundment will be drawn down in a controlled manner prior to demolition of the spillway to minimize in-water work. In-water work would also occur during seasonal low flows between September 1 and October 15 to minimize turbidity and potential impacts to state-listed mussels. Prior to and during construction, the MA DFW Natural Heritage and Endangered Species Program will conduct mussel surveys and translocate all state-listed mussels out of the project action area.

Construction activity will be limited to the dam structure and an access area from an unpaved parking lot and drive. Swamp mats will be laid along the upstream face of the dam spillway after the impoundment is dewatered to facilitate access. No trees or forest habitat will be cleared during construction. Once breached, the river will be allowed to naturally form a meandering channel through the impoundment that will transport the accumulated sediments downstream.

II. Pertinent Species within the Area

Northern Long-eared Bat

Effective May 4, 2015, the northern long-eared bat (*Myotis septentrionalis*) was federally listed as a threatened species under the Endangered Species Act (80 FR 17974). Although the northern long-eared bat may be present in the action area, we are not aware of any recent records confirming their presence. During the summer, northern long-eared bats roost singly or in colonies in forested habitat underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. During the evening, northern long-eared bats can be found foraging in a variety of forested and non-forested habitats, including wetlands. During winter, northern long-eared bats hibernate in caves and mines (hibernacula) with constant temperatures, high humidity, and no air currents. Factors affecting the species include modifications to bat hibernacula, disturbance of hibernating bats, and loss of forest habitat including forest fragmentation.

Small Whorled Pogonia

Effective October 19, 1993, the plant small whorled pogonia (*Isotria medeoloides*) was reclassified from being federally listed as endangered to threatened under the Endangered Species Act (58 FR 53904). Although the species may be present in the action area, we are not aware of any recent records confirming their presence. A member of the orchid family, the small whorled pogonia is an herbaceous perennial occurring in young and maturing mixed-deciduous or mixed deciduous/coniferous forests that have sparse to moderate ground cover and an open understory canopy. The plant usually has a single grayish-green stem with a whorl of five or six leaves near the top of the stem and below the flower. The plant flowers between May and June with a single or pair of greenish-yellow flowers, which are self-pollinated by mechanical means. Once pollinated, a capsule forms containing several thousand seeds. The primary threats to the small whorled pogonia include habitat loss and degradation as well as collection for commercial or personal use.

III. Station Name and Action:

Station: New England Field Office, Concord, NH

Action: Funding from Disaster Relief Appropriations Act of 2013 provided through the Department of Interior and National Fish and Wildlife Foundation and Technical Assistance from the Service's Partners for Fish and Wildlife Program

IV. Location

The Millie Turner/Blake Mill Dam (Turner Dam) impounds the Nissitissit River in the Town of Pepperell, Massachusetts approximately one mile upstream of its confluence with the Nashua River. The dam's coordinates are 42.674856, -71.581874 and is located just upstream of the Hollis Street Bridge/Route 111. The dam also occurs within the Nissitissit River Wildlife Management Area, which is a 340-acre property composed of three parcels along the Nissitissit.

V. Determination of Effects

A. Explanation of effects of action on species and critical habitats listed in II

Northern Long-eared Bat

The project area is within the mapped range of the northern long-eared bat (80 FR 17974). No known hibernacula or maternity roost trees occur within the project area; however, foraging individuals from the adjacent forest may utilize the riparian corridor within the project area. Because no trees will be cut or removed during the project, we do not expect the project to have any effect upon the northern long-eared bat.

Small Whorled Pogonia

The project area is within the mapped range of the small whorled pogonia (58 FR 53904). No individuals are known to occur within the project area and habitat is not suitable within the areas of ground disturbance. We do not expect the project to have any effect upon the small whorled pogonia.

B. Explanations of actions to be implemented to reduce adverse effects

Northern Long-eared Bat

Adverse effects are not anticipated, therefore, no measures to reduce effects are needed.

Small Whorled Pogonia

Adverse effects are not anticipated, therefore, no measures to reduce effects are needed.

VI. Effect Determination and Response Requested

A. Listed Species Determination:

Northern Long-eared Bat

As previously described, the Turner Dam Removal Project will have no effect on the northern long-eared bat or its habitat.

Small Whorled Pogonia

As previously described, the Turner Dam Removal Project will have no effect on the northern long-eared bat or its habitat.

B. Response Requested: None required

VII. Reviewing Ecological Services Office Evaluation

A. Concurrence: **Concur**

B. Formal Consultation Required: **No**

C. Conference Required: **No**

D. Nonconcurrence: **N/A**

Remarks: This consultation was reviewed by Susi vonOettingen, Endangered Species Specialist, with the New England Field Office.

Bill Bennett

Bill Bennett, Fish and Wildlife Biologist
Originating Official

6/18/15

Date

[Signature]

Thomas R. Chapman, Supervisor
New England Field Office
Reviewing Official

6/18/15

Date

*Ack'd
6/18*



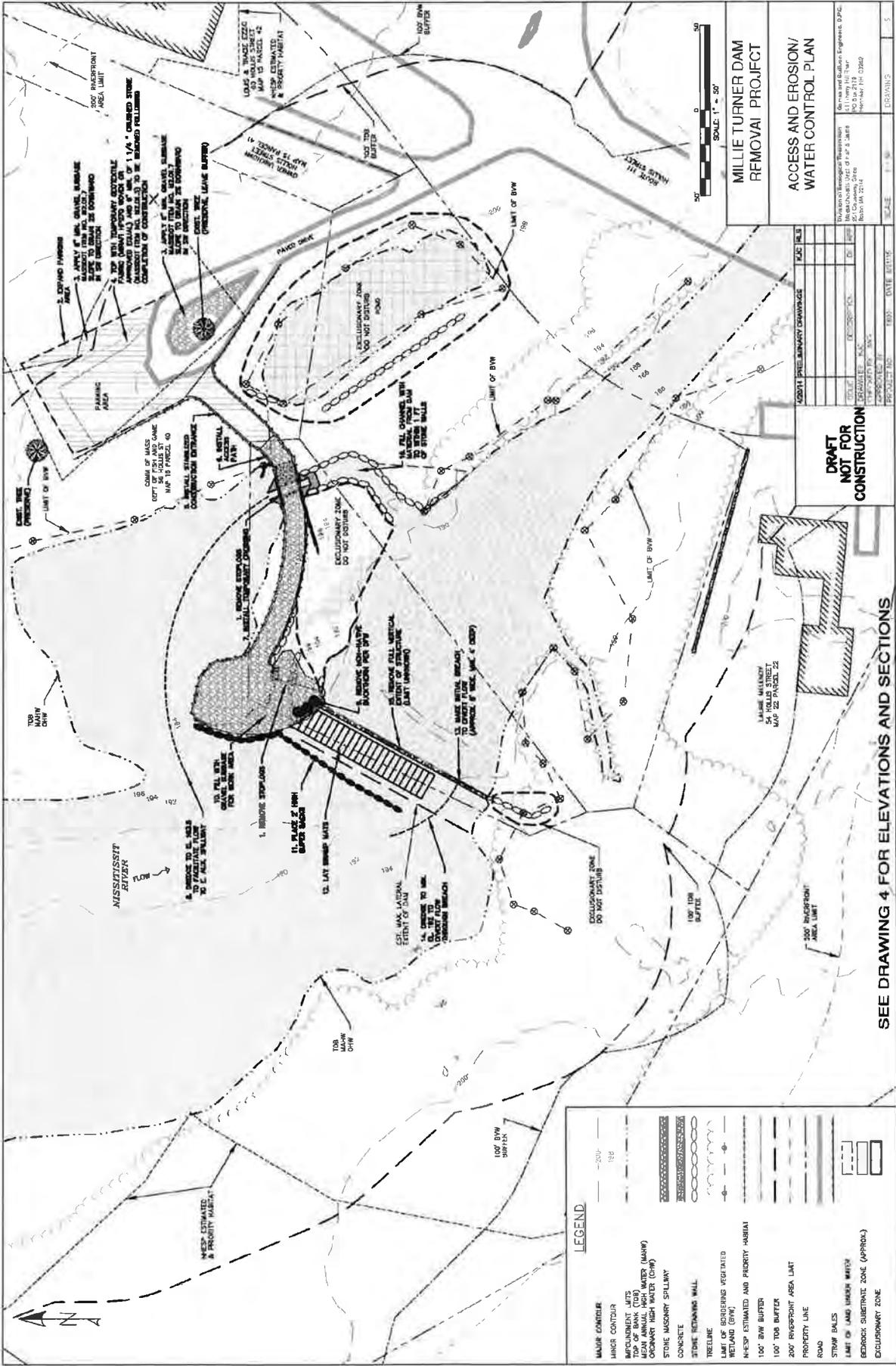
Figure 1 USGS Topo Quad of Pepperell showing location of Dam



Figure 2 Aerial view of dam looking Southwest



Figure 3 Aerial view of dam looking Southeast



LEGEND

MAJOR CONTOUR	--- 200' ---
MINOR CONTOUR	--- 100' ---
IMPLEMINT LITS	--- 100' ---
TOP OF BANK (TUB)	--- 100' ---
MEAN ANNUAL HIGH WATER (MAHW)	--- 100' ---
CONCRETE REMAINING (CR)	--- 100' ---
STONE REMAINING (SR)	--- 100' ---
CONCRETE	--- 100' ---
STONE REMAINING WALL	--- 100' ---
TREELINE	--- 100' ---
LIMIT OF BODERING VEGETATED WETLAND (B/W)	--- 100' ---
100' B/W BUFFER	--- 100' ---
100' TUB BUFFER	--- 100' ---
200' RIVERFRONT AREA LIMIT	--- 100' ---
PROPERTY LINE	--- 100' ---
ROAD	--- 100' ---
STUMP BALS	--- 100' ---
LIMIT OF LAND UNDER MATS	--- 100' ---
BEDROCK SUBSTRATE ZONE (APPROX)	--- 100' ---
EXCLUSION ZONE	--- 100' ---

**MILLIE TURNER DAM
REMOVAL PROJECT**

**ACCESS AND EROSION/
WATER CONTROL PLAN**

SCALE: 1" = 50'

DATE	DESCRIPTION	BY	CHKD

**DRAFT
NOT FOR
CONSTRUCTION**

SEE DRAWING 4 FOR ELEVATIONS AND SECTIONS

Division of Biological Resources
 25 Columbia Street
 Boston MA 02114
 Project No. 02-0349

SCALE: 1" = 50'

DRAWING: 5

Habitat Management Plan for Freshwater Mussels and the Millie Turner Dam Removal, Pepperell, MA

Background:

The Millie Turner Dam in Pepperell, Massachusetts is proposed for removal in efforts to restore fish passage and habitat connectivity along the Nissitissit River. The Massachusetts Division of Fisheries and Wildlife (MDFW) is an abutting landowner on the project area and a partner in the restoration effort. The project area includes habitat of species of freshwater mussels protected under the Massachusetts Endangered Species Act (MESA). The Natural Heritage and Endangered Species Program (NHESP) of MDFW is the regulatory and management agency for species protected under MESA, and will be implementing onsite protective measures to manage potential risks to MESA listed mussels in the project area.

Task 1: Survey of Mussel Distribution in Nissitissit River

- Preliminary searches of 1.4 km river upstream of the Millie Turner Dam to a point beyond the influence of the dam impoundment were conducted in September 2013 and September 2014 by MDFW Staff under the supervision of NHESP Aquatic Ecologist.
- Preliminary searches of 2 km of river downstream of the Millie Turner Dam to the confluence of the Nashua River were conducted between August 2014 and July 2015.
- All suitable habitats for *Alasmidonta varicosa*, *Alasmidonta undulata*, *Margaritifera margaritifera*, and *Strophitus undulatus*, (i.e. “Target Species”) were searched visually using a combination of snorkel and view buckets.
- Coordinates of each mussel occurrence were mapped and the surrounding reaches (up to 100 m) were identified as targets for semi-quantitative census, and semi-quantitative sampling using the random placement of 1 m² quadrats covering 1.5% of the stream bed.
 - Semi-quantitative Census: Each reach was sampled using view buckets and snorkeling by a team of 1-4 observers. Locations of each individual of the Target Species were marked with a surveyor’s flag. Upon completion of the census, a 1 m² quadrat was placed on the substrate centered on the target mussel. The quadrat was thoroughly searched both visually and tactile for additional mussels. One quarter of the quadrat was randomly chosen for excavation to 10 cm, and all sediments were sifted through a 6 mm mesh screen. Mussels were identified to species, measured (shell length and height), and given a shell condition score (1 through 5, where 1 = minimal erosion, 5 = highly eroded). All individuals of the Target Species were tagged with a plastic, individually numbered tag (Floy-tag; 3 x 5 mm), mounted with cyanoacrylate cement. Total area covered by quadrats is variable depending on the number of Target Species individuals found in the timed census. Mussels were held in the water in a mesh bag to minimize exposure and stress prior to and after processing. Once the all mussels in the quadrat were processed, mussels were returned to the sediment and bedded anteriorly into the substrate, posterior end up.
 - Semi-quantitative Sampling: Following the Semi-quantitative census, each 100 m reach was divided into five 20 m sections, and a single cross-stream transect was randomly placed within each section. Along each transect, three 1 m² quadrats were randomly placed and searched using tactile and visual searching. If a randomly placed quadrat overlapped the location of a quadrat from the Semi-quantitative Census, the location of the randomly placed quadrat was adjusted 1 m in either direction and this was noted in the final analysis. One

0.25 m² of the quadrat was excavated to 10 cm and all sediments were sifted through a 6 mm mesh screen. All targeted mussels were measured and tagged as above. Mussels were held in the water in a mesh bag to minimize exposure and stress prior to and after processing. Once the all mussels in the quadrat were processed, mussels were returned to the sediment and bedded anteriorly into the substrate, posterior end up.

- This approach of double sampling incorporates an increased detection probability at finding rare species, while still utilizing a random distribution of samples for excavation. Relative abundance of targeted and common species (Catch per Unit Effort) will be calculated from Census counts. Final species densities will be calculated from counts of targeted species from quadrats placed during the Census and random Sampling Efforts.
- During 2014 Census and Sampling efforts, no animals were translocated. Each site will be revisited and Census and Sampling efforts will be repeated once during May – July 2015. Excavated area during May-July 2015 efforts will increase in size to 1 m² to incorporate subsurface sampling area of greater than 1.5% of the total substrate within each sample reach.

Task 2: Selection of Translocation Sites

- Translocation sites (i.e. where animals will be moved to) will be chosen in May 2015, in areas greater than 1.5 km upstream from the Millie Turner Dam, and upstream of the extent of the impoundment.
- Sites will be chosen using preliminary searches to define similar suitable habitat, or reaches where the targeted species is documented.
- A control site, consisting of similar habitat to the translocation site will be selected from the same reach, and within 500 m of the translocation site. The site will be monitored at the same schedule as the translocation site, and useful in comparison of any effects of translocation on the resident mussels.
- Prior to translocation efforts, translocation and control sites will be surveyed using the same Semi-quantitative Census and Sampling approach as donor sites. All individuals of targeted mussel species native to the Translocation site will be assessed, tagged and returned to their original location in the same manner as their translocated counterparts.

Task 3: Translocation of Targeted Mussel Species

- Targeted mussel species will be translocated during two phases. First, during the semi-quantitative census and sampling events in May-July 2015. Second, mussels found within the drawdown zone of the impoundment during dam removal.
- Mussels found during 2015 sampling events in the targeted survey reaches will be translocated to the designated translocation site upon completion of that site, or the end of the work day.
- Prior to the initiation of dam removal, areas of suitable habitat outside of the designated survey reaches will be searched again for any additional targeted mussels. If found, individuals will be tagged (as above) and translocated to the designated translocation site.
- During the dam removal and associated impoundment drawdown, volunteers and MA DFW staff will walk the banks of the river and visually search for mussels in the dewatered area, retreating to deeper water, and for targeted mussels within the wetted stream channel. All mussels will be collected and identified to species by a MA DFW biologist. The common and abundant Eastern

Elliptio (Elliptio complanata) may be replaced back into the wetted stream channel in the affected reach, rather than translocated upstream. All individuals of four targeted species will be tagged, measured and translocated to the designated translocation site.

- To minimize stress from translocation, all mussels will be held in mesh bags in the stream, coolers of stream water, or wrapped in wet towels in the shade, and held for no longer than 6 hours prior to translocation.

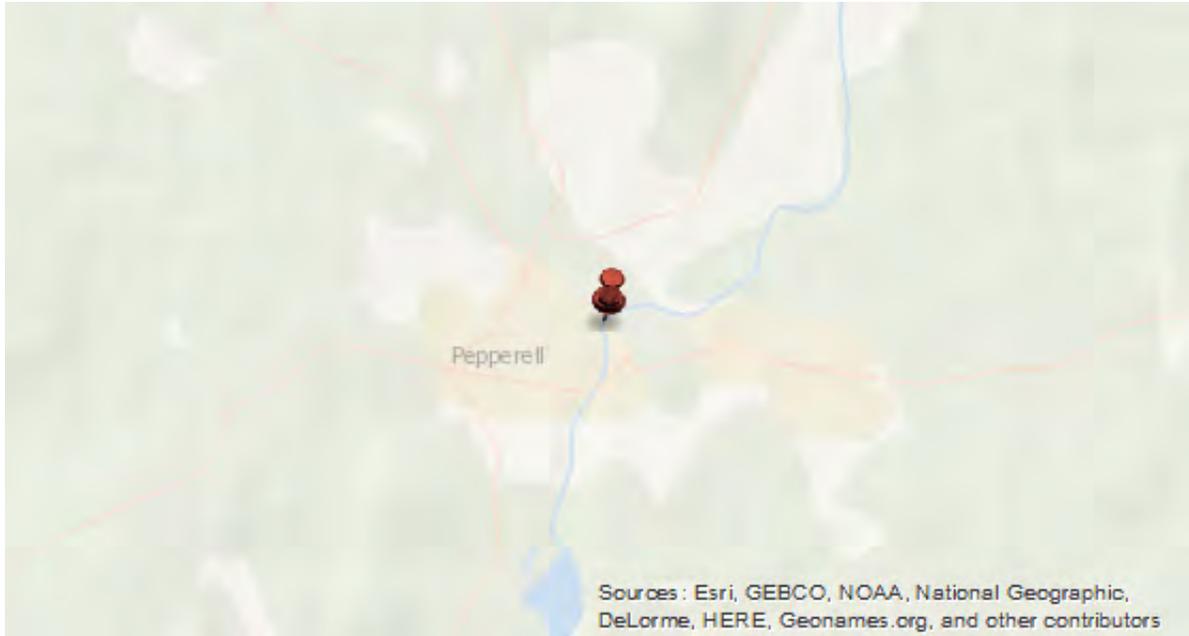
Task 4: Monitoring of Translocated Mussels

- Translocation and control sites will be monitored once within 30 days of the translocation using a semi-quantitative Census approach. No excavation will be conducted. If mussels appear to be in distress or the habitat patch appears to be unstable or unsuitable, mussels may be moved to another location or temporary refugium.
- Translocation and control sites will be monitored once in the calendar year following translocation and dam removal and again 3-5 years following dam removal. Surveys and monitoring will be conducted using the same 2-part methodology that was used in the initial surveys.
- Translocation and control sites will be incorporated into the long-term monitoring schedule of the MA DFW mussel program. Survey methods and periodicity are subject to change depending on the availability of resources and adaptive management as new methods and/or technologies are developed. Activities within and along the Nissitissit may also necessitate shifting of methods or periodicity to ensure maximum survival of translocated individuals.

Data Reporting and Consistency with Previous Habitat Management Plans:

- The methods described here are consistent with, but exceed, those required by MA NHESP when appropriate for projects leading to Habitat Management Exemptions or Conservation Management Permits, and meet the Program's standards for surveys and translocations of freshwater mussels listed under the Massachusetts Endangered Species Act (MESA).
- All data collected will be submitted to NHESP databases, and reports will be submitted for internal review and used to inform conservation and management planning of the Division.

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.



Query Results

Map Scale = 1:72,224

Degrees, Minutes, Seconds: Latitude = 42°40'8" N, Longitude = 72°25'27" W

Decimal Degrees: Latitude = 42.67, Longitude = -71.58

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

APPENDIX C

Section 106 Consultation



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>

RECEIVED

JUL 03 2015

MASS. HIST. COMM

52461

July 2, 2015

Ref: Millie Turner/Blake Mill Dam Removal (MHC # RC.52467)
Nissitissit River, Hollis Street, Pepperell, MA

Brona Simon, Director
State Historic Preservation Officer
Massachusetts Historic Commission
The Massachusetts Archives Bldg.
220 Morrissey Boulevard
Boston, MA 02125

Dear Dr. Simon:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration is pleased to present to you the final technical report, *Archaeological Reconnaissance Survey at the Millie Turner/Blake Mill Dam Removal Project Pepperell, Massachusetts*, prepared by Barbara Donohue. The *Historical and Archaeological Site Avoidance and Protection Plan* (Plan) has also been updated as requested in your letter sent to Barbara Donohue on May 19, 2015, and is included in the Reconnaissance Survey's Appendix. Enclosed with this letter you will find two copies of the final Plan and a CD with the technical report abstract and bibliographic information, so the Massachusetts Historical Commission (MHC) can incorporate this information into their Inventory.

The Service has determined that the project will have "no adverse effect" (36 CFR 800.5(b)) on historic resources, as recommended in your letter to Karen Kirk Adams of the U.S. Army Corps of Engineers, dated August 11, 2014. The project designs and specifications are now being revised to incorporate recommendations in the Plan that avoid impacts to archaeological and historic resources contributing to the Blake's Machine Shop Complex and the Lawrence/Blake/Turner House. We have enclosed the draft Existing Conditions Site Plan Sheet for your review, which shows the sensitive archaeological resources within the project area. A project Cultural Resource Consultant will be on site to assist with monitoring activities and insuring archaeological and historic resources are protected throughout the Preconstruction, Construction, and Post-Construction Phases.

RECEIVED

U. S. Fish & Wildlife Service

JUL 17 2015

New England Field Office

Concord, NH 03301

Brona Simon
July 2, 2015

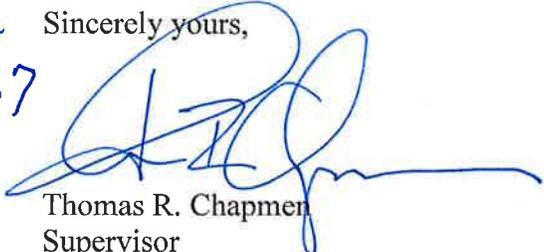
Interpretive panels for the Blake Machine Shop Complex will be developed with the assistance of the project's Cultural Resource Consultant, in consultation with the Pepperell Historical Commission and Pepperell Historical Society. The final content and placement of the interpretive panels will be submitted to the MHC for review and comment before installation.

If you have any questions, or require additional information, please contact Bill Bennett of this office at 603-227-6422, or by email at william_bennett@fws.gov.

CONCURRENCE:
7/14/15

BRONA SIMON
STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION
RC.52467

Sincerely yours,



Thomas R. Chapmen
Supervisor
New England Field Office

Enclosures

Brona Simon
July 2, 2015

3

cc: (without enclosure)
Lindsey Lefebvre, USACOE-New England District
Alex Hackman, MA Division of Ecological Restoration
Diane Cronin, Pepperell Historical Commission
Susan Smith, Pepperell Historical Society
Paula Terrasi, Pepperell Conservation Commission
Barbara Donohue, Cultural Resource Consultant
ES: WBennett:7-2-15:603-223-2541



May 19, 2015

The Commonwealth of Massachusetts

Barbara Donohue
51 Warwick Road
West Newton, MA 02465

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

RE: Millie Turner/ Blake Mill Dam Removal, Nissitissit River, Hollis Street, Pepperell, MA.
MHC # RC.52467.

Dear Barbara:

Staff of the Massachusetts Historical Commission have reviewed the draft Historical and Archaeological Site Avoidance and Protection Plan for the Millie Turner/Blake Mill Dam Removal, received May 12, 2015, for the project referenced above.

Please submit the final avoidance and protection plan to the MHC that incorporates the following comments.

Please include an additional figure that shows the locations of proposed protective fencing and signage at historic features and sensitive resource areas in relation to the proposed project impact areas. Plan figure #2 may be used as the base map for the additional figure.

Please add an additional sentence to the end of the first stipulation in B. Preconstruction Phase on page 7 that reads: "The installation and removal of protective fencing and signage shall be conducted at the direction of the project Cultural Resource Consultant."

Please add the following additional stipulation to Section C. Construction Phase on page 3: The installation and removal of all construction fills and/or matting required for construction, access, equipment and materials storage and/or staging for the project shall be monitored by the project Cultural Resource Consultant.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), the Secretary of Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 Fed. Reg. 190(1983)), and Massachusetts General Laws, Chapter 9, Sections 26A-27C (950 CMR 70). If you have any questions or need further information, please contact Jonathan K. Patton of my staff.

Sincerely,

A handwritten signature in cursive script that reads "Brona Simon".

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Alex Hackman, Division of Ecological Restoration, MA DFG
Bill Bennett, USFW
Karen Kirk Adams, USACOE-New England District
Kate Atwood, USACOE-New England District



The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 11, 2014

Barbara Donohue
51 Warwick Road
West Newton, MA 02465

RE: Millie Turner/ Blake Mill Dam Removal, Nissitissit River, Hollis Street, Pepperell, MA.
MHC # RC.52467.

Dear Barbara:

Staff of the Massachusetts Historical Commission have reviewed the draft technical report, *Archaeological Reconnaissance Survey at the Millie Turner/Blake Mill Dam Removal Project, Pepperell, Massachusetts*, for the project referenced above.

Please submit two copies of the final technical report that incorporate final archaeological site avoidance and protection plans for the Blake Machine Shop site, and a CD with the technical report abstract and bibliographic information, to the MHC so that the results of the survey can be incorporated into the MHC's Inventory.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), the Secretary of Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 Fed. Reg. 190(1983)), and Massachusetts General Laws, Chapter 9, Sections 26A-27C (950 CMR 70). If you have any questions or need further information, please contact Jonathan K. Patton of my staff.

Sincerely,

A handwritten signature in cursive script that reads "Brona Simon".

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Alex Hackman, Division of Ecological Restoration, MA DFG
Karen Kirk Adams, USACOE-New England District
Kate Atwood, USACOE-New England District



The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 11, 2014

Karen Kirk Adams
Chief, Permits and Enforcement Branch
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

RE: Millie Turner/ Blake Mill Dam Removal, Nissitissit River, Hollis Street, Pepperell, MA.
MHC # RC.52467. EEA # 15209.

Dear Ms. Adams:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the draft technical report, *Archaeological Reconnaissance Survey at the Millie Turner/Blake Mill Dam Removal Project, Pepperell, Massachusetts*, received July 30, 2014, for the project referenced above. The MHC has also received the Environmental Notification Form (ENF) for the project.

The project requires review and permitting by the US Army Corps of Engineers. MHC will review the project under Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) and looks forward to consultation and a determination of effect by the Corps for the project.

Results of the archaeological reconnaissance survey identified multiple historic archaeological features associated with the 19th century Blake's Machine Shop Complex. These historic archaeological resources retain integrity within a 19th century historic industrial and rural landscape at this location, important to the development of Pepperell during the Industrial Revolution period and therefore in MHC's staff opinion, are eligible under Criteria A and D at the local level of significance. However, the MHC Form F completed for the Millie Turner/Blake Dam indicates that the existing dam is a reconstruction circa 1956, constructed by members of the Paugus Rod & Gun Club after the former dam was washed out in 1954. Since the dam was never used as a power source for industrial use, it is the MHC's opinion that the dam is noncontributing to the Blake Machine Shop Complex.

The technical report includes multiple recommendations for historic archaeological site avoidance and protection measures and additional identification and interpretation efforts (pp. 63 and 64) for the project. The MHC recommends that the placement and content of proposed interpretive panels for the Blake Machine Shop Complex be done in consultation with the Pepperell Historical Commission. Evaluation of the upstream mill pond for archaeological sensitivity after dam removal should be conducted in consultation with the MHC and the Massachusetts Board of Underwater Archaeological Resources (MBUAR).

Information included in ENF Dam Removal Plan #4 indicates that the dam removal has been designed to avoid and minimize impact to extant historic features on the property and will include only full vertical removal of the existing dam structure with preservation of the abutments. Heavy equipment access is proposed along a temporary gravel/geotextile access road from the existing parking lot.

The MHC requests that a written archaeological site avoidance and protection plan be developed and implemented for the project that incorporates the management recommendations noted in Section 5.2 Recommendations (pp. 63, 64) of the technical report, information included in ENF Dam Removal Plan #4 and technical report Figure 5-9 (pg. 62). The draft avoidance and protection plan should be submitted to the MHC and the Corps for review and comment.

In the MHC's opinion the Corps could make a determination of "no adverse effect" (36 CFR 800.5(b); 950 CMR 71.07(2)(b)(2)) for the project as proposed, on the condition that a final archaeological site avoidance and protection plan for the Blake Machine Shop Complex, that incorporates the MHC and Corps' comments on the draft plan, is implemented for the project as proposed.

The MHC looks forward to reviewing the information requested above, and to consultation to avoid adverse effects to significant historic and archaeological resources.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), M.G.L. c. 9, ss. 26-27C (950 CMR 70-71), MEPA (301 CMR 11) and 301 CMR 2. If you have any questions or require additional information, please contact Jonathan K. Patton at this office.

Sincerely,



Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Alex Hackman, Division of Ecological Restoration, MA DFG
Kate Atwood, USACOE-New England District
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
Maeve Valley Bartlett, EEA, Attn: Holly Johnson, MEPA Unit
DEP- CERO, Waterways
Victor Mastone, MBUAR
Pepperell Historical Commission
Barbara Donohue
Jill Griffiths, Gomez and Sullivan Engineers, PC



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Ref: Millie Turner/Blake Mill Dam Removal
Nissitissit River, Hollis Street, Pepperell, MA
Cultural Resource Investigations MHC # RC.52467

February 27, 2015

Bettina Washington
Wampanoag Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535

Dear Ms. Washington:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration (DER), have proposed completion of the Millie Turner/Blake Mill Dam Removal Project (Project) in Pepperell, Massachusetts. As the lead Federal agency for the cultural resource assessment of the Project, we are inviting you to participate as a consulting party in the section 106 review of the Project, in accordance with 36 CFR 800.2 of the National Historic Preservation Act.

The proposed Project will involve the removal of the Millie Turner/Blake Mill Dam to restore watershed function, improve water quality, and provide fish passage to the Nissitissit River (see enclosed location map and photographs). The Project will remove the Dam's spillway in its entirety down to the natural streambed (bedrock) between the stone abutments. The Project design and implementation would mitigate any adverse impacts to historical/archaeological resources. These include preserving the Dam's stone abutments and raceways, creating interpretive materials (e.g., signage for the site), and developing an Archaeological Site Avoidance and Protection Plan that details protective measures to be taken during construction. The Project is currently in the design and permitting phase, with Dam removal expected to occur in late summer 2015.

Barbara Donohue, a Registered Professional Archaeologist under contract with the DER, has completed a Reconnaissance Survey (Phase 1A) for the Project. This includes a technical report, Archaeological Reconnaissance Survey at the Millie Turner/Blake Mill Dam Removal Project, Pepperell, Massachusetts; and a Massachusetts Historical Commission (MHC) Inventory Form

Bettina Washington
February 27, 2015

2

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If you indicate that you would like to become a consulting party, we will provide additional project information and copies of the Project's cultural resource documentation for your review. Should you wish to provide us with any additional information or want to review any of the Project documents, please feel free to contact the Service. We will also keep you informed of our communications with the MHC as the Project progresses.

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Sincerely yours,



Acting For
Thomas R. Chapman
Supervisor
New England Field Office

Enclosures

Bettina Washington
February 27, 2015

3

cc: (without enclosure)
Brona Simon, MHC
Alex Hackman, MA Division of Ecological Restoration
Paula Terrasi, Pepperell Conservation Commission
D.J. Monette, USFWS, Hadley, MA
ES: WBennett:2-27-15:603-223-2541



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Ref: Millie Turner/Blake Mill Dam Removal
Nissitissit River, Hollis Street, Pepperell, MA
Cultural Resource Investigations MHC # RC.52467

February 27, 2015

Ramona Peters
Tribal Historic Preservation Officer
Mashpee Wampanoag Indian Tribal Council, Inc.
483 Great Neck Road South
Mashpee, Massachusetts 02649

Dear Dr. Peters:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration (DER), have proposed completion of the Millie Turner/Blake Mill Dam Removal Project (Project) in Pepperell, Massachusetts. As the lead Federal agency for the cultural resource assessment of the Project, we are inviting you to participate as a consulting party in the section 106 review of the Project, in accordance with 36 CFR 800.2 of the National Historic Preservation Act.

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Ramona Peters
February 27, 2015

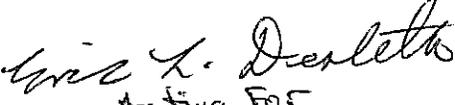
2

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Sincerely yours,



Tom L. Deslattes
Acting For

Thomas R. Chapman
Supervisor
New England Field Office

Enclosures

Ramona Peters
February 27, 2015

3

cc: (without enclosure)
Brona Simon, MHC
Alex Hackman, MA Division of Ecological Restoration
Paula Terrasi, Pepperell Conservation Commission
D.J. Monette, USFWS, Hadley, MA
ES: WBennett:2-27-15:603-223-2541



United States Department of the Interior



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Ref: Millie Turner/Blake Mill Dam Removal
Nissitissit River, Hollis Street, Pepperell, MA
Cultural Resource Investigations MHC # RC.52467

February 27, 2015

Victor Mastone, Director
Massachusetts Board of Underwater Archaeological Resources
251 Causeway Street, Suite 800
Boston, MA 02114

Dear Mr. Mastone:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration (DER), have proposed completion of the Millie Turner/Blake Mill Dam Removal Project (Project) in Pepperell, Massachusetts. As the lead Federal agency for the cultural resource assessment of the Project, we are inviting you to participate as a consulting party in the section 106 review of the Project, in accordance with 36 CFR 800.2 of the National Historic Preservation Act.

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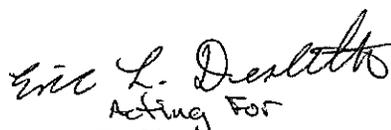
Victor Mastone, Director
February 27, 2015

2

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Sincerely yours,

Handwritten signature of Eric L. Deslattes in cursive script.

Acting For
Thomas R. Chapmen
Supervisor
New England Field Office

Enclosures

Victor Mastone, Director
February 27, 2015

3

cc: (without enclosure)
Brona Simon, MHC
Alex Hackman, MA Division of Ecological Restoration
Paula Terrasi, Pepperell Conservation Commission
ES: WBennett:2-27-15:603-223-2541



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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70 Commercial Street, Suite 300
Concord, NH 03301-5087
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Ref: Millie Turner/Blake Mill Dam Removal
Nissitissit River, Hollis Street, Pepperell, MA
Cultural Resource Investigations MHC # RC.52467

February 27, 2015

Diane Cronin
Pepperell Historical Commission
Town Hall
1 Main Street
Pepperell, MA 01463-1644

Dear Ms. Cronin:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration (DER), have proposed completion of the Millie Turner/Blake Mill Dam Removal Project (Project) in Pepperell, Massachusetts. As the lead Federal agency for the cultural resource assessment of the Project, we are inviting you to participate as a consulting party in the section 106 review of the Project, in accordance with 36 CFR 800.2 of the National Historic Preservation Act.

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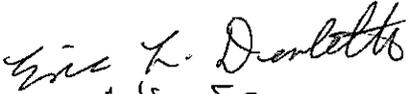
Diane Cronin
February 27, 2015

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Sincerely yours,


Acting For
Thomas R. Chapmen
Supervisor
New England Field Office

Enclosures

Diane Cronin
February 27, 2015

3

cc: (without enclosure)
Brona Simon, MHC
Alex Hackman, MA Division of Ecological Restoration
Paula Terrasi, Pepperell Conservation Commission
ES: WBennett:2-27-15:603-223-2541



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Ref: Millie Turner/Blake Mill Dam Removal
Nissitissit River, Hollis Street, Pepperell, MA
Cultural Resource Investigations MHC # RC.52467

February 27, 2015

Susan J. Smith
Pepperell Historical Society
50 Shattuck Street
Post Office Box 573
Pepperell, Massachusetts 01463

Dear Ms. Smith:

The U.S. Fish and Wildlife Service (Service), as lead Federal agency, and its project partner, the Massachusetts Division of Ecological Restoration (DER), have proposed completion of the Millie Turner/Blake Mill Dam Removal Project (Project) in Pepperell, Massachusetts. As the lead Federal agency for the cultural resource assessment of the Project, we are inviting you to participate as a consulting party in the section 106 review of the Project, in accordance with 36 CFR 800.2 of the National Historic Preservation Act.

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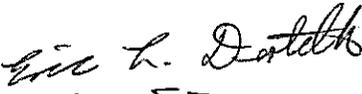
Susan J. Smith
February 27, 2015

2

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Sincerely yours,



Acting For

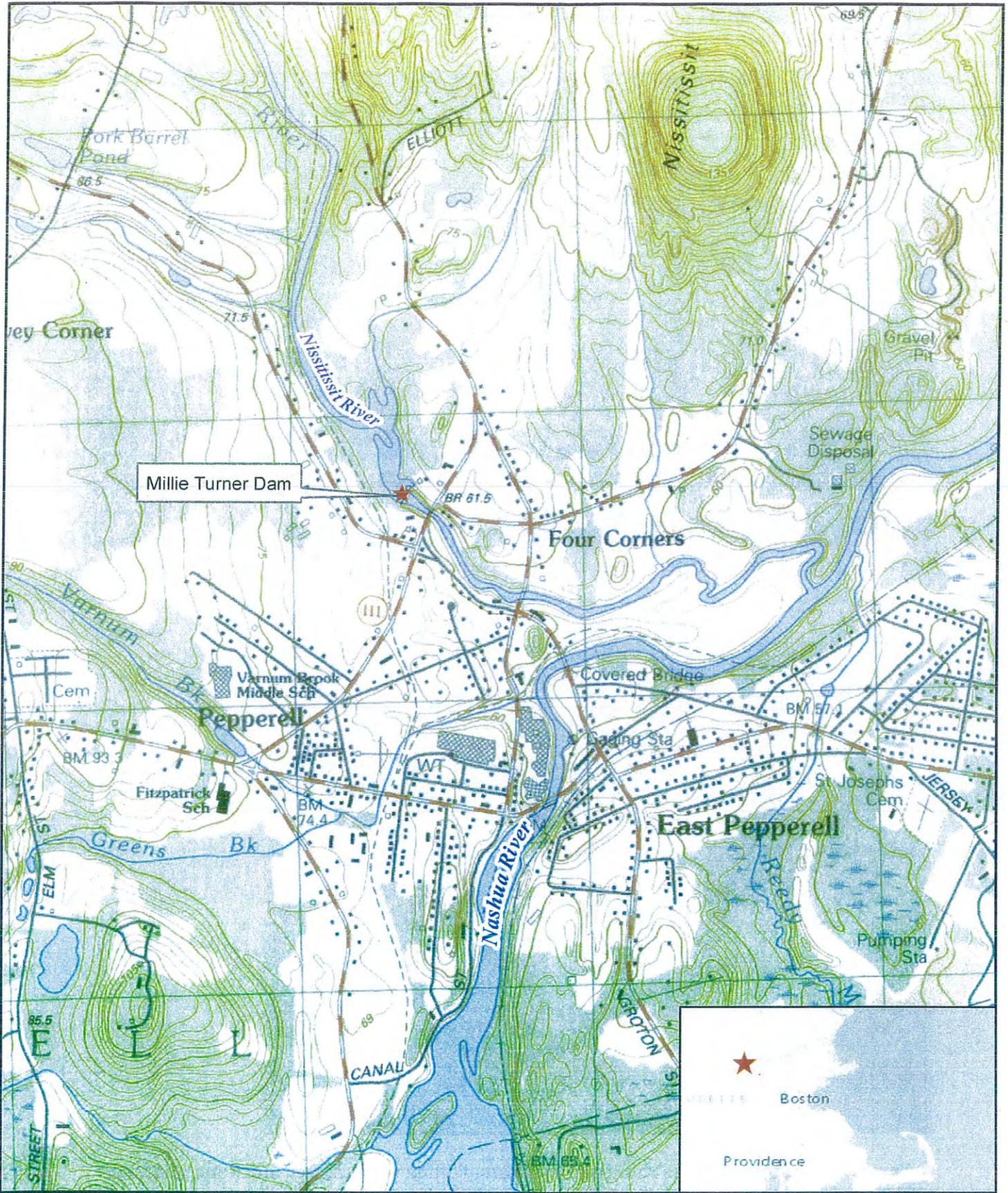
Thomas R. Chapmen
Supervisor
New England Field Office

Enclosures

Susan J. Smith
February 27, 2015

3

cc: (without enclosure)
Brona Simon, MHC
Alex Hackman, MA Division of Ecological Restoration
Paula Terrasi, Pepperell Conservation Commission
ES: WBennett:2-27-15:603-223-2541



Millie Turner/Blake Mill Dam Removal Project

Locator Map
Pepperell, MA

Legend

★ Millie Turner Dam

USGS Quad Pepperell
ESRI BaseMaps
By BB_012315



Section 106 Invitation Enclosure
Millie Turner/Blake Mill Dam Removal Project
Photos & Figures

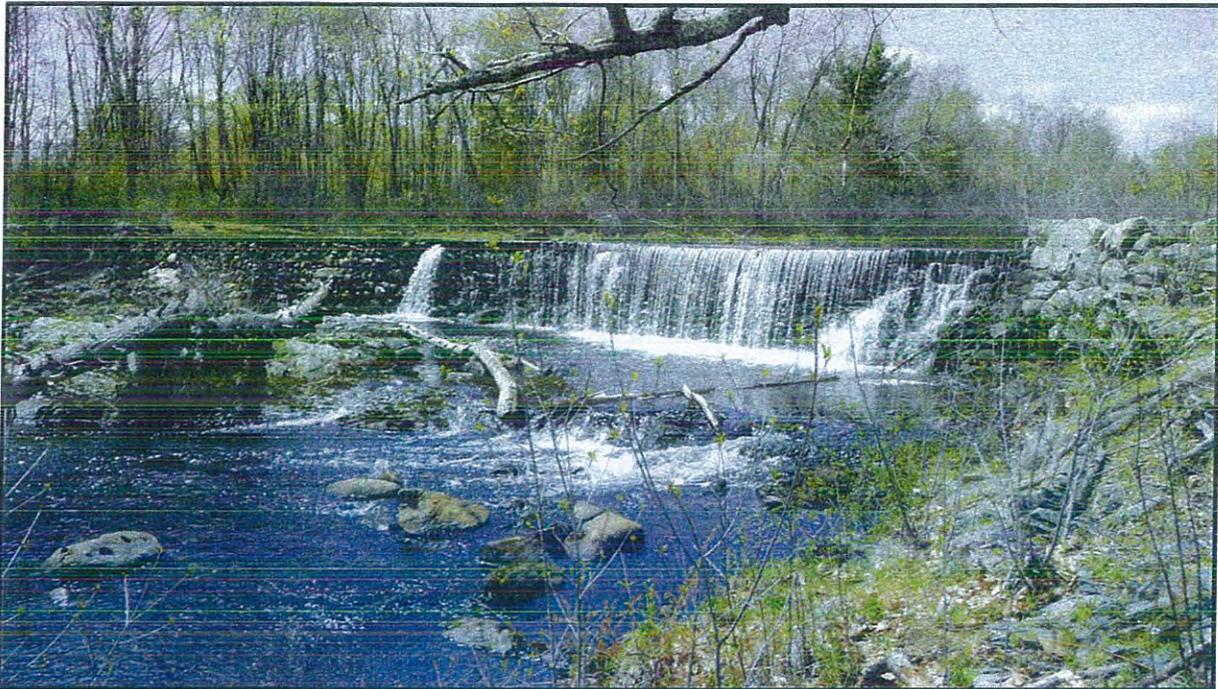


Figure 1 View of Millie Turner Dam looking upstream

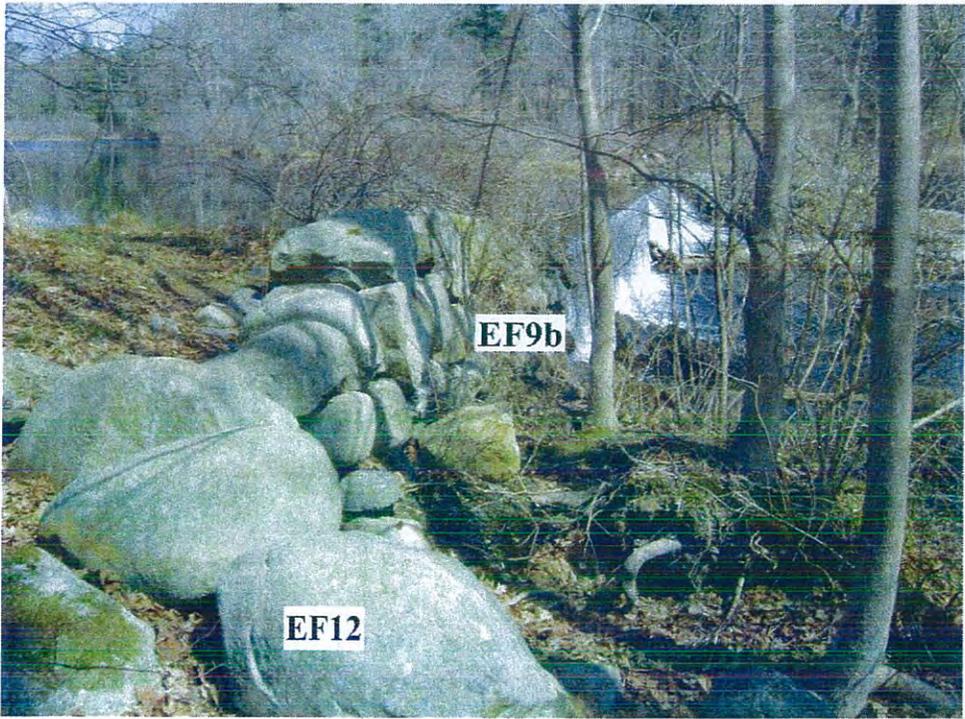


Figure 2 Looking easterly at dam from location of stone wall (EF12) and stone abutment (EF9)

APPENDIX D

Project Draft Designs

MILLIE TURNER DAM REMOVAL

PEPPERRELL, MA

DIVISION OF ECOLOGICAL RESTORATION
 MASSACHUSETTS DEPT. OF FISH & GAME
 251 CAUSEWAY STREET
 BOSTON, MA 02114

DIVISION OF FISHERIES AND WILDLIFE
 NORTHEAST DISTRICT
 85 FITCHBURG ROAD
 AYER, MA 01432

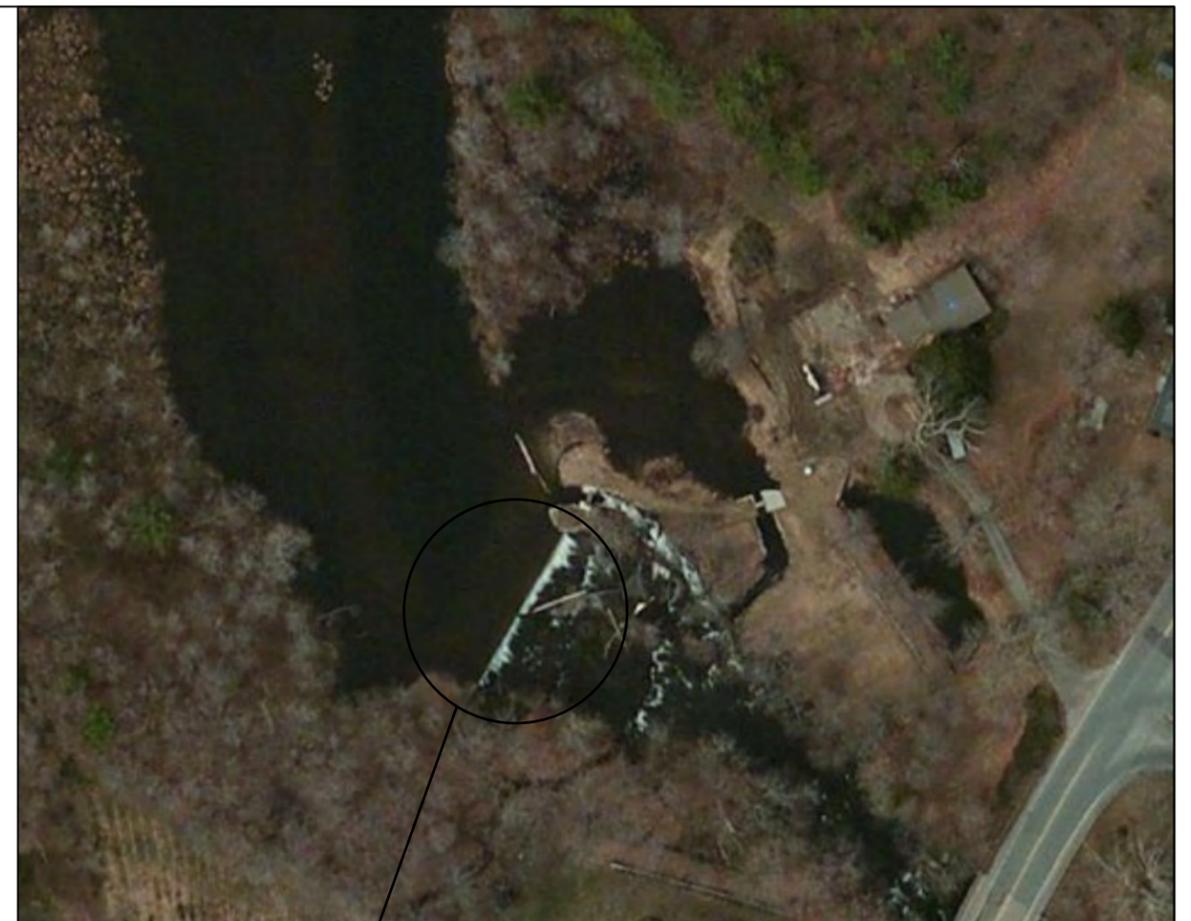
SUPPORTED BY PROJECT PARTNERS:
 NASHUA RIVER WATERSHED ASSOCIATION
 TROUT UNLIMITED
 NASHOBA CONSERVATION TRUST
 US FISH AND WILDLIFE SERVICE
 MASSACHUSETTS OUTDOOR HERITAGE FOUNDATION

DRAFT FINAL DRAWINGS - 100% COMPLETE DESIGN

NOT TO BE USED FOR CONSTRUCTION

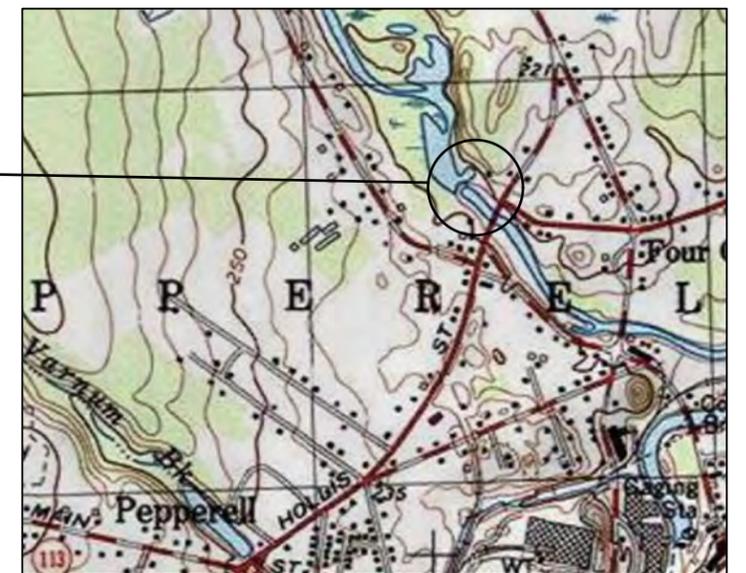
DRAWING NO.	TITLE
1	COVER SHEET
2	GENERAL NOTES
3	EXISTING SITE PLAN
4	EXISTING ELEVATIONS AND SECTIONS
5	EXISTING SITE PLAN - SENSITIVE CULTURAL RESOURCES
6	ACCESS AND EROSION/WATER CONTROL PLAN
7	ACCESS AND EROSION/WATER CONTROL DETAILS
8	PROPOSED SITE PLAN
9	PROPOSED RACEWAY ACCESS PATH DETAILS
10	PROPOSED ELEVATIONS AND SECTIONS

ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO THE ENGINEER WITHOUT DELAY.
 THE COPYRIGHTS TO ALL DESIGNS AND DRAWINGS ARE THE PROPERTY OF GOMEZ AND SULLIVAN ENGINEERS, DPC. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY GOMEZ AND SULLIVAN ENGINEERS, DPC IS FORBIDDEN.



SOURCE: USGS

PROJECT SITE



SOURCE: USGS

MILLIE TURNER DAM
 REMOVAL PROJECT

COVER SHEET

DRAFT NOT FOR CONSTRUCTION	4/20/14	PRELIMINARY DRAWINGS	KJC	RLS	Division of Ecological Restoration Massachusetts Dept. of Fish & Game 251 Causeway Street Boston, MA 02114	Gomez and Sullivan Engineers, D.P.C. 41 Liberty Hill Road PO Box 2179 Henniker, NH 03242	
	3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS			
ISSUE	DESCRIPTION	BY	APP				
	DRAWN BY: KJC						
	CHECKED BY: JWG						
	APPROVED BY:						
PROJECT NO.	1699	DATE:	6/30/15	SCALE:	NONE	DRAWING:	1

DATA SOURCES

- DATUM: HORIZONTAL – NAD 1983 STATE PLANE MASSACHUSETTS MAINLAND (FT); VERTICAL – NAVD 88. CONTOUR INTERVAL: 2 FT.
- BATHYMETRIC DATA WITHIN THE IMPOUNDMENT COLLECTED BY CR ENVIRONMENTAL, INC. ON JUNE 6, 2013.
- ALL OTHER TOPOGRAPHY DERIVED FROM LIDAR TERRAIN DATA OBTAINED ON MAY 6–7, 2011 (VERTICAL ACCURACY APPROX. 1 FT; AVAILABLE FROM MASSGIS).
- EXISTING STRUCTURE ELEVATIONS & TOPOGRAPHY SUPPLEMENTED WITH SURVEY DATA COLLECTED BY GOMEZ AND SULLIVAN ENGINEERS ON JUNE 6, 2013 USING AN RTK GPS (ACCURACY APPROX. 0.03–0.1 FT HORIZONTALLY AND 0.05–0.2 FT VERTICALLY). THE FOLLOWING BENCHMARKS WERE USED FOR THE SURVEY: BM (EL. 238.789 FEET NAVD88). LOCATION INFORMATION IS AVAILABLE FROM MASSDOT.
- WETLAND BOUNDARIES DELINEATED BY MASSACHUSETTS DIVISION OF FISHERIES & WILDLIFE (DFW) IN JUNE 2013. OTHER REGULATED RESOURCE AREA BOUNDARIES OBTAINED FROM MASSGIS OR DELINEATED ACCORDING TO MASSACHUSETTS REGULATIONS.
- PROPERTY BOUNDARIES DIGITIZED FROM A 2010 SUBDIVISION PLAN BY GEOD CONSULTING.

GENERAL NOTES

- CONTRACTOR SHALL NOTIFY DIG SAFE MASSACHUSETTS AT 811 OR 1–888–344–7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION. SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS ARE NOT TO BE INCLUDED IN THE REQUIRED 72 HOUR NOTICE.
- CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF EXCAVATION.
- CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS CONTAINED IN RELEVANT PERMITS.
- CONTRACTOR SHALL COORDINATE WITH MASSACHUSETTS DIVISION OF FISHERIES & WILDLIFE NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP) TO INITIATE MUSSEL RELOCATION (TO BE PERFORMED BY OTHERS) PRIOR TO COMMENCING ANY WORK AT THE SITE. CONTRACTOR SHALL NOTIFY THE NHESP AND THE DFW NEW ENGLAND DIST. AT 2 WEEKS AND 72 HOURS PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL AVOID DISTURBANCE TO ANY DOCUMENTED OR POTENTIAL CULTURAL OR ARCHEOLOGICAL RESOURCES. AREAS OF PARTICULAR HISTORICAL SENSITIVITY SHALL BE DELINEATED WITH EXCLUSIONARY FENCING AS INDICATED.
- WORK PERFORMED BY OTHERS WILL INCLUDE SITE RESTORATION AND ENHANCEMENT ACTIVITIES TO BE CONDUCTED BY LANDOWNER DAVID BABIN.

CONSTRUCTION WASTE MANAGEMENT PLAN

- SITE SHALL BE KEPT WELL ORGANIZED, SIGNED, AND FREE OF WASTE MATERIALS, DEBRIS, AND RUBBISH AT ALL TIMES. GOOD HOUSEKEEPING PRACTICES SHALL BE MAINTAINED ON A CONTINUOUS BASIS FROM WORK SITE TO WORK SITE. DISPOSAL OF ANY WASTE MATERIALS ON THE CONSTRUCTION SITE IS PROHIBITED.
- SANITARY, WASTE DISPOSAL, AND EMPLOYEE FACILITIES SHALL BE PROVIDED BY CONTRACTOR.
- ALL WATER RESOURCES (E.G., GROUND AND SURFACE WATERS), INCLUDING ALL DRAINS AND CATCH BASINS, SHALL BE PROTECTED FROM LEACHING AND/OR RUN–OFF OF CHEMICAL POLLUTANTS, SOLID WASTES, AND CONSTRUCTION SITE DEBRIS. ALL CATCH BASINS SHALL BE MAINTAINED FREE FLOWING.
- ALL COMBUSTIBLE WASTE MATERIALS SHALL BE PLACED IN COVERED METAL CONTAINERS AND PROMPTLY DISPOSED OF IN AN APPROVED MANNER AT AN APPROVED WASTE DISPOSAL FACILITY.
- STORAGE AND/OR USE OF CHEMICALS, FUELS, OILS, GREASES, BITUMINOUS MATERIALS, SOLIDS, WASTE WASHINGS, AND CEMENT SHALL BE HANDLED APPROPRIATELY AS TO PREVENT LEACHING OR SURFACE RUNOFF INTO PUBLIC WATERS OR DRAINS. ALL AUTHORITY APPROVED STORAGE AREAS FOR THESE MATERIALS MUST BE DIKED.
- ALL ROADWAYS SHALL BE MAINTAINED FREE OF DEBRIS. STABILIZED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED TO CAPTURE DEBRIS FROM WHEELS OF CONSTRUCTION VEHICLES. VEHICLES SHALL BE INSPECTED AT ENTRANCES BEFORE TURNING ONTO THE ROADWAY AND EXCESS DEBRIS SHALL BE REMOVED.
- IDLING OF CONSTRUCTION EQUIPMENT SHALL BE LIMITED TO MINIMIZE EMISSIONS AT THE SITE.

CONSTRUCTION ROAD STABILIZATION

- DEFINITION: THE STABILIZATION OF TEMPORARY CONSTRUCTION ACCESS ROUTES, ON–SITE VEHICLE TRANSPORTATION ROUTES, AND CONSTRUCTION PARKING AREAS.
- PURPOSE: TO CONTROL EROSION ON TEMPORARY CONSTRUCTION ROUTES AND PARKING AREAS.
- CONDITION WHERE PRACTICE APPLIES: ALL TRAFFIC ROUTES AND PARKING AREAS FOR TEMPORARY USE BY CONSTRUCTION TRAFFIC.
- DESIGN CRITERIA: CONSTRUCTION ROADS SHOULD BE LOCATED TO REDUCE EROSION POTENTIAL, MINIMIZE IMPACT ON EXISTING SITE RESOURCES, AND MAINTAIN OPERATIONS IN A SAFE MANNER. HIGHLY EROSION SOILS, WET OR ROCKY AREAS, AND STEEP SLOPES SHOULD BE AVOIDED. ROADS SHOULD BE ROUTED WHERE SEASONAL WATER TABLES ARE DEEPER THAN 18 INCHES. SURFACE RUNOFF AND CONTROL SHOULD BE IN ACCORDANCE WITH OTHER STANDARDS.
- ROAD GRADE: A MAXIMUM GRADE OF 12% IS RECOMMENDED, ALTHOUGH GRADES UP TO 15% ARE ACCEPTABLE FOR SHORT DISTANCES.
- ROAD WIDTH: 14 FT (9 FT MINIMUM) FOR ONE–WAY TRAFFIC, OR 24 FT MINIMUM FOR TWO–WAY TRAFFIC.
- SIDE SLOPE OF ROAD EMBANKMENT: 2:1 OR FLATTER.
- COMPOSITION: USE A 6–INCH LAYER OF MASSDOT APPROVED GRAVEL SUB–BASE OR EQUIVALENT.
- MAINTENANCE: ACCESS ROUTES AND PARKING AREAS SHALL BE INSPECTED PERIODICALLY FOR CONDITION OF SURFACE AND TOPDRESSED WITH NEW GRAVEL AS NEEDED.

SOIL EROSION AND SEDIMENTATION CONTROL

- ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE MASSACHUSETTS EROSION AND SEDIMENTATION CONTROL GUIDELINES AND APPLICABLE NPDES STANDARDS.
- ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY MAJOR SOIL OR STREAM DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- ALL DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN FOURTEEN (14) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING WITH A NATIVE SEED MIXTURE APPROVED BY DFW. MULCH, WATER AND ANCHOR AS NECESSARY TO ESTABLISH GRASS AND PREVENT LOSS TO WIND OR EROSION. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS SHALL BE MULCHED WITH SMALL GRAIN STRAW AT A RATE OF TWO (2) TONS PER ACRE IN ACCORDANCE WITH STATE STANDARDS.
- PERMANENT VEGETATION SHALL BE SEEDING WITH A NATIVE SEED MIXTURE APPROVED BY DFW ON ALL EXPOSED AREAS IMMEDIATELY AFTER FINAL GRADING. MULCH SHALL BE USED AS NECESSARY FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
- ALL CRITICAL AREAS SUBJECT TO EROSION (E.G., ACCESS PATH AND ROADWAY EMBANKMENTS) SHALL RECEIVE STONE STABILIZATION PER THE DETAILS ON DRAWING 7. ANY ADDITIONAL AREAS SUBJECT TO EROSION (E.G. MATERIAL STOCKPILES) SHALL RECEIVE A TEMPORARY SEEDING WITH A NATIVE SEED MIXTURE APPROVED BY DFW, IN COMBINATION WITH STRAW MULCH, AT A RATE OF TWO (2) TONS PER ACRE IN ACCORDANCE WITH STATE STANDARDS.
- SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE SHALL BE SPRINKLED WITH WATER UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED, OR MULCH SHALL BE APPLIED IN ACCORDANCE WITH STATE STANDARDS FOR EROSION CONTROL.
- ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHTS–OF–WAY SHALL BE REMOVED IMMEDIATELY.
- STOCKPILE AND STAGING LOCATIONS DETERMINED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE. ALL SOIL STOCKPILES SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH NOTE #3 AND PROTECTED BY STRAW BALES ON THE DOWNHILL SIDES.
- THE CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION AND THAT HAVE NOT BEEN FINALLY STABILIZED, STABILIZATION PRACTICES, STRUCTURAL PRACTICES, AND OTHER CONTROLS AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS AFTER THE END OF ANY STORM THAT PRODUCES AT LEAST 0.5 INCHES OF RAINFALL AT THE SITE. WHERE SITES HAVE BEEN FINALLY STABILIZED, SUCH INSPECTION SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH UNTIL FINAL COMPLETION. CRITICAL AREAS AND AREAS WHERE VEHICLES EXIT THE SITE SHALL BE INSPECTED DAILY.

WATER CONTROL

- THE RECOMMENDED CONSTRUCTION PERIOD IS AUGUST 15 TO OCTOBER 15 TO TAKE ADVANTAGE OF LOW FLOWS AND ACCOMMODATE MUSSEL RELOCATION WORK. DURING AUGUST 15 THROUGH OCTOBER 15, THE MEDIAN FLOW IS 32 CFS, AND A FLOW OF 91 CFS IS EXCEEDED 10% OF THE TIME.
- PRIOR TO CONSTRUCTION, THE AUXILIARY SPILLWAYS SHALL BE CLEARED OF ANY STOPLOGS TO DRAW DOWN THE IMPOUNDMENT AS LOW AS FLOWS WILL ALLOW.
- DURING CONSTRUCTION, FLOW WILL BE DIVERTED THROUGH AN INITIAL BREACH IN THE PRIMARY SPILLWAY.
- SANDBAGS (SUPER SACKS OR SIMILAR) SHALL BE USED TO DIVERT FLOW TO THE BREACH AND PROTECT THE WORK AREA.
- THE INITIAL BREACH WILL ACCOMMODATE ABOUT 40 CFS WITH A WATER DEPTH OF 2 FEET, OR UP TO APPROXIMATELY 240 CFS FLOWING FULL. IN THE EVENT OF FLOWS HIGHER THAN THE CAPACITY OF THE INITIAL BREACH, WORK SHALL BE SUSPENDED AND EXCESS WATER WILL FLOW OVER THE PRIMARY SPILLWAY.
- CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT DAMAGE TO WORK OR EQUIPMENT BY HIGH WATER OR STORMS.

CONSTRUCTION SEQUENCE

- PRIOR TO CONSTRUCTION, REMOVE ANY EXISTING STOPLOGS IN AUXILIARY SPILLWAYS TO ALLOW IMPOUNDMENT TO REcede FROM FACE OF DAM TO THE EXTENT POSSIBLE (IDEALLY TO THE 194–FOOT CONTOUR OR BELOW). PROCEED ONLY AFTER DEWATERED SEDIMENTS HAVE STABILIZED TO THE SATISFACTION OF OWNER’S REPRESENTATIVE.
- INSTALL STRAW BALES, EXCLUSIONARY FENCING, OIL BOOM, AND ANY ADDITIONAL EROSION CONTROLS THAT MAY BE ADDED AT THE DISCRETION OF OWNER’S REPRESENTATIVE.
- FLAG LIMITS OF CLEARING, TO BE APPROVED BY OWNER’S REPRESENTATIVE PRIOR TO ANY TREE OR VEGETATION REMOVAL. CLEAR AND GRUB ALONG APPROVED ACCESS ROUTES AND PARKING AREA EXPANSION.
- CONSTRUCT PARKING AREA EXPANSION/IMPROVEMENTS AS INDICATED.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE, ACCESS PATH, AND TEMPORARY AUXILIARY SPILLWAY CROSSINGS AS INDICATED.
- DREDGE ENTRANCE TO HEADPOND (UPSTREAM OF NORTHEAST CORNER OF DAM) APPROXIMATELY TO ELEVATION 193.5 TO FACILITATE FLOW TO EAST AUXILIARY SPILLWAY.
- UTILIZE GRAVEL SUBBASE TO ENLARGE EXISTING BEACH AREA AND FILL INLET CHANNEL TO WEST AUXILIARY SPILLWAY TO CREATE A STABLE WORKING PLATFORM FOR TRUCK LOADING AND TURN–AROUND.
- PLACE SANDBAGS (SUPER SACKS OR SIMILAR) ALONG UPSTREAM FACE OF PRIMARY SPILLWAY BEYOND MAXIMUM LATERAL EXTENT OF DAM (APPROXIMATELY FOLLOWING THE 194–FOOT CONTOUR) AT A HEIGHT OF 2 FEET.
- LAY SWAMP MATS ATOP DEWATERED SEDIMENT ALONG UPSTREAM FACE OF PRIMARY SPILLWAY TO ACCESS FULL LENGTH OF STRUCTURE, AND ALONG EAST AUXILIARY RACEWAY TO ACCESS SEDIMENT DEPOSIT AREA.
- PRESERVE EXISTING AUXILIARY SPILLWAYS, RACEWAYS, AND STONE ABUTMENTS TO PRIMARY SPILLWAY. UP TO 5 FEET OF ADJACENT PRIMARY SPILLWAY SECTIONS MAY ALSO BE PRESERVED TO SUPPORT THE ABUTMENTS AS NECESSARY. ANY RETAINED SPILLWAY SECTIONS SHALL HAVE A MAXIMUM SIDE SLOPE OF 1.5:1 AND SHALL BE PROTECTED BY GRADING UPSTREAM SEDIMENT AT A 3:1 SLOPE OR FLATTER.
- MAKE AN INITIAL BREACH NEAR THE RIVER RIGHT (SOUTHWEST) EDGE OF THE PRIMARY SPILLWAY, ADJACENT TO THE 5–FOOT–WIDE SECTION TO BE PRESERVED TO SUPPORT THE REMAINING STONE ABUTMENT, APPROXIMATELY 5 FEET WIDE AND 4 FEET DEEP WITH A MINIMUM INVERT ELEVATION OF 192 FEET.
- DREDGE A TEMPORARY CHANNEL THROUGH SEDIMENT UPSTREAM OF BREACH TO TIE INTO 192–FOOT CONTOUR, FACILITATING FLOW THROUGH BREACH.
- COMMENCE REMOVAL OF PRIMARY SPILLWAY, PROCEEDING FROM RIVER RIGHT (SOUTHWEST) TO RIVER LEFT (NORTHEAST). AS SECTIONS OF THE DAM ARE REMOVED, GRADE UPSTREAM SEDIMENT AT A 3:1 SLOPE OR FLATTER. REMOVE UNNEEDED SWAMP MAT SECTIONS AND SAND BAGS INCREMENTALLY AS WORK PROGRESSES NORTHEASTWARD. REMOVE FULL VERTICAL EXTENT OF DAM (I.E., TO BEDROCK OR BELOW) TO THE SATISFACTION OF THE OWNER’S REPRESENTATIVE.
- DISPOSE OF EXCAVATED MATERIALS AS FOLLOWS: REMOVE CONCRETE, METAL, AND MANUFACTURED TIMBER FROM THE SITE FOR LAWFUL DISPOSAL OR RECYCLING. STOCKPILE NATIVE STONE IN PARKING AREA AND/OR WITHIN EAST RACEWAY CHANNEL AS DIRECTED BY OWNER’S REPRESENTATIVE. DEPOSIT EXCESS SEDIMENT EVENLY WITHIN THE EAST RACEWAY CHANNEL AS INDICATED, AND/OR WITHIN THE RIVER CHANNEL.
- SEDIMENT DEPOSITED IN EAST RACEWAY CHANNEL WILL BE TOPPED WITH GRAVEL AND STONE DUST BY OTHERS.

PROJECT SIZE AND RESOURCE AREA CHANGES

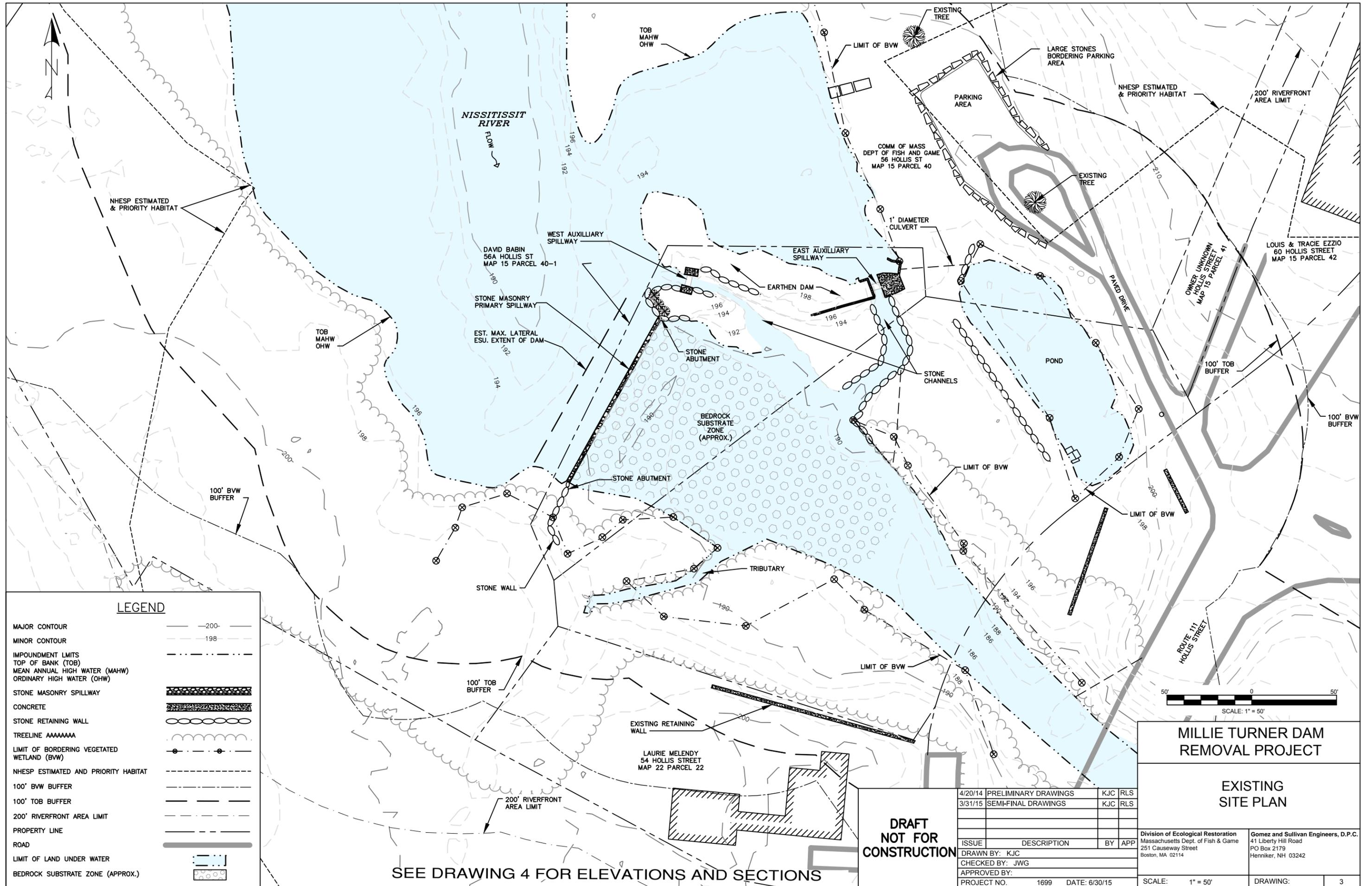
	AREA (ACRES)			CHANGE DURATION
	EXISTING	CHANGE	TOTAL	
LAND				
BUILDING FOOTPRINTS	0	0	0	N/A
INTERNAL ROADWAYS	0.13	0	0.13	N/A
PARKING/ OTHER PAVED AREAS	0.06	0	0.06	N/A
OTHER ALTERED AREAS	0.07	–0.05	0.02	PERMANENT
UNDEVELOPED AREAS	0.52	0.05	0.57	PERMANENT
TOTAL SITE	0.77	0	0.77	N/A
INLAND WETLANDS				
BANK (MI)	3.24	–0.19	3.05	PERMANENT
BORDERING VEGETATED WETLANDS	17.25	2.14	19.39	PERMANENT
ISOLATED VEGETATED WETLANDS	0.01	0	0.01	N/A
LAND UNDER WATER/OHW/ MHW	13.25	–2.14	11.11	PERMANENT
BORDERING LAND SUBJECT TO FLOODING	49.72	–3.09	46.63	PERMANENT
ISOLATED LAND SUBJECT TO FLOODING	0	0	0	N/A
RIVERFRONT AREA	74.68	–1.04	73.64	PERMANENT

- STONE STEPS AT SOUTH END OF EAST RACEWAY CHANNEL, STONE BENCHES, SHRUB PLANTINGS, AND KIOSKS WILL BE INSTALLED BY OTHERS.
- REMOVE ANY SWAMP MATS AND SAND BAGS FROM THE SITE. REMOVE THE TEMPORARY EAST AUXILIARY SPILLWAY CULVERT AND STEEL PLATES AND FILL WITH GRAVEL SUBBASE AS INDICATED.
- REMOVE 1 1/4” CRUSHED STONE AND GEOTEXTILE FABRIC FROM TOP OF CONSTRUCTION ENTRANCE.
- ACCESS PATH WILL BE TREATED WITH STONE DUST BY OTHERS.
- AUXILIARY SPILLWAY FILL SLOPES AND ANY DISTURBED AREAS WILL BE LOAMED AND SEEDING WITH AN APPROVED NATIVE SEED MIXTURE BY OTHERS.
- REPAIR PAVED DRIVEWAY, TO THE SATISFACTION OF THE OWNER’S REPRESENTATIVE, IF NECESSARY.
- REMOVE EROSION CONTROL AND OTHER CONTAINMENT MEASURES ONLY AFTER ALL AREAS ARE STABILIZED WITH VEGETATIVE COVER TO THE SATISFACTION OF OWNER’S REPRESENTATIVE.

MILLIE TURNER DAM REMOVAL PROJECT

GENERAL NOTES

DRAFT NOT FOR CONSTRUCTION	4/20/14	PRELIMINARY DRAWINGS	KJC	RLS	Division of Ecological Restoration Massachusetts Dept. of Fish & Game 251 Causeway Street Boston, MA 02114	Gomez and Sullivan Engineers, D.P.C. 41 Liberty Hill Road PO Box 2179 Henniker, NH 03242	
	3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS			
	ISSUE	DESCRIPTION	BY	APP			
	DRAWN BY: KJC						
	CHECKED BY: JWG						
	APPROVED BY:						
	PROJECT NO.	1699	DATE:	6/30/15	SCALE:	NONE	
					DRAWING:	2	



LEGEND

- MAJOR CONTOUR — 200 —
- MINOR CONTOUR - - - 198 - - -
- IMPOUNDMENT LIMITS
- TOP OF BANK (TOB) - - - - -
- MEAN ANNUAL HIGH WATER (MAHW) - - - - -
- ORDINARY HIGH WATER (OHW) - - - - -
- STONE MASONRY SPILLWAY [Pattern]
- CONCRETE [Pattern]
- STONE RETAINING WALL [Pattern]
- TREELINE AAAAAAA [Symbol]
- LIMIT OF BORDERING VEGETATED WETLAND (BVW) [Symbol]
- NHESP ESTIMATED AND PRIORITY HABITAT [Symbol]
- 100' BVW BUFFER [Symbol]
- 100' TOB BUFFER [Symbol]
- 200' RIVERFRONT AREA LIMIT [Symbol]
- PROPERTY LINE [Symbol]
- ROAD [Symbol]
- LIMIT OF LAND UNDER WATER [Symbol]
- BEDROCK SUBSTRATE ZONE (APPROX.) [Symbol]

SEE DRAWING 4 FOR ELEVATIONS AND SECTIONS

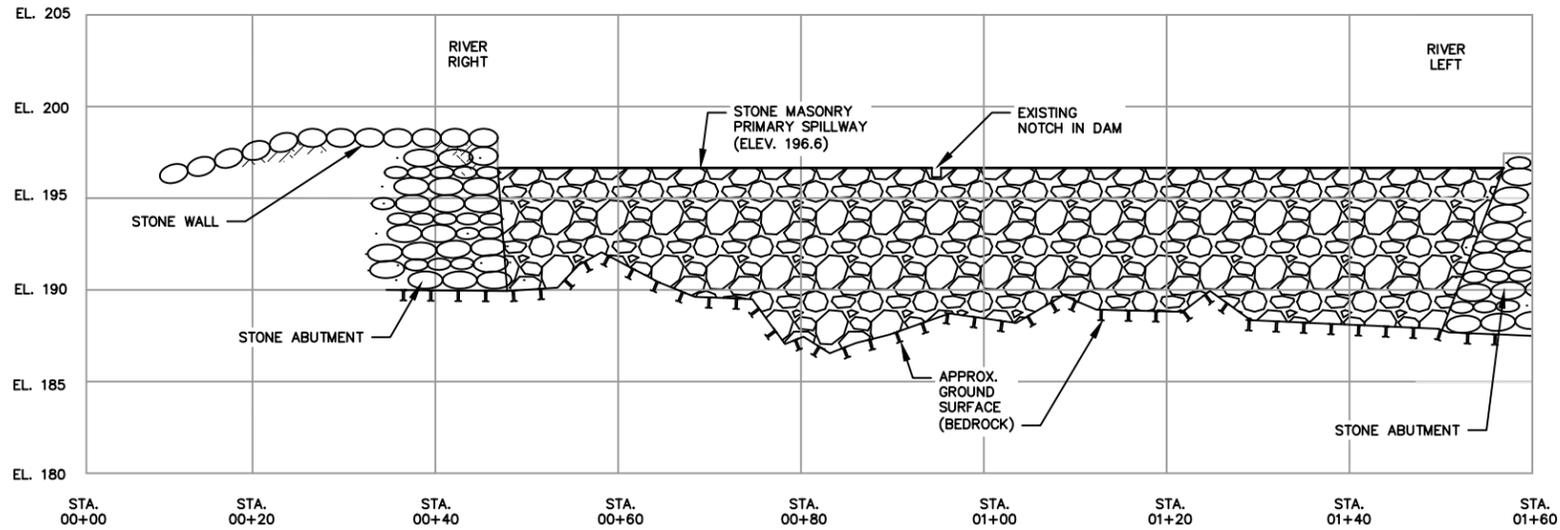
**DRAFT
NOT FOR
CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
DRAWN BY:	KJC		
CHECKED BY:	JWG		
APPROVED BY:			
PROJECT NO.	1699	DATE:	6/30/15

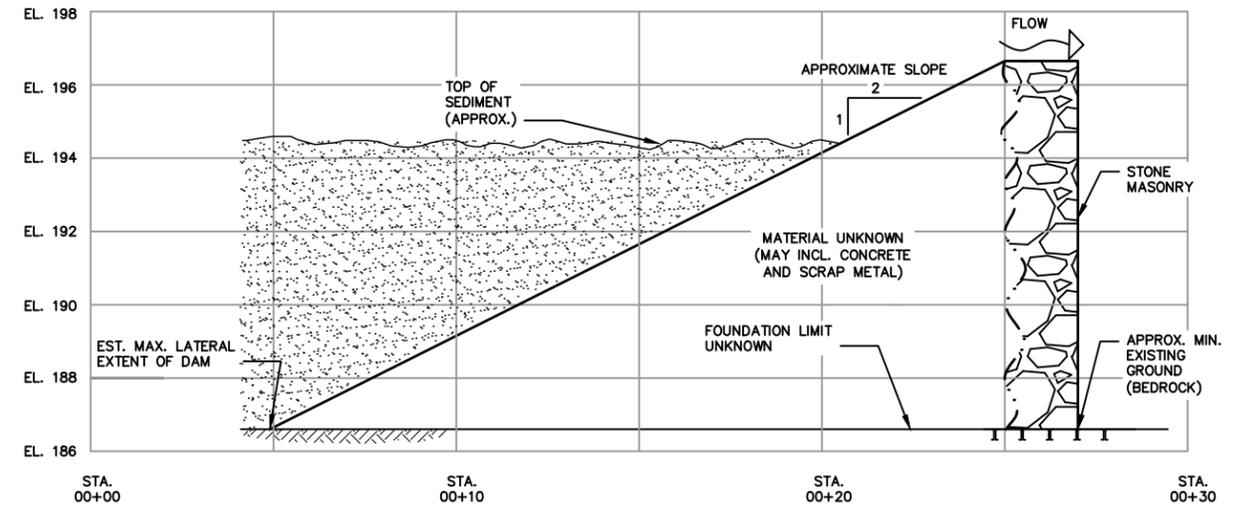
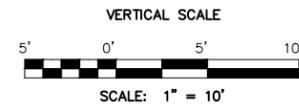
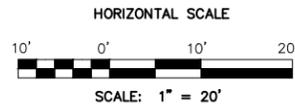
**MILLIE TURNER DAM
REMOVAL PROJECT**

**EXISTING
SITE PLAN**

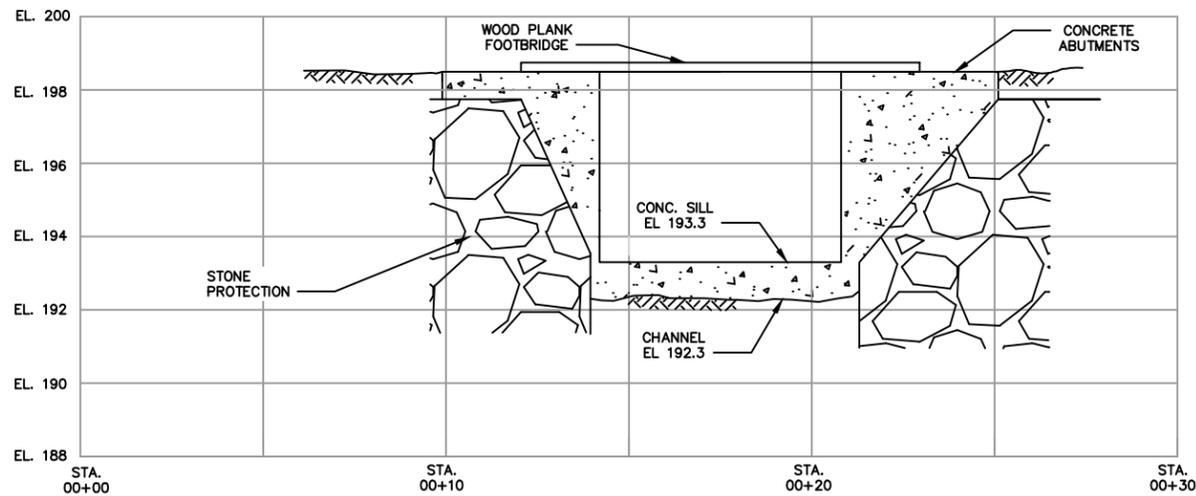
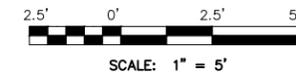
Division of Ecological Restoration Massachusetts Dept. of Fish & Game 251 Causeway Street Boston, MA 02114	Gomez and Sullivan Engineers, D.P.C. 41 Liberty Hill Road PO Box 2179 Henniker, NH 03242
SCALE: 1" = 50'	DRAWING: 3



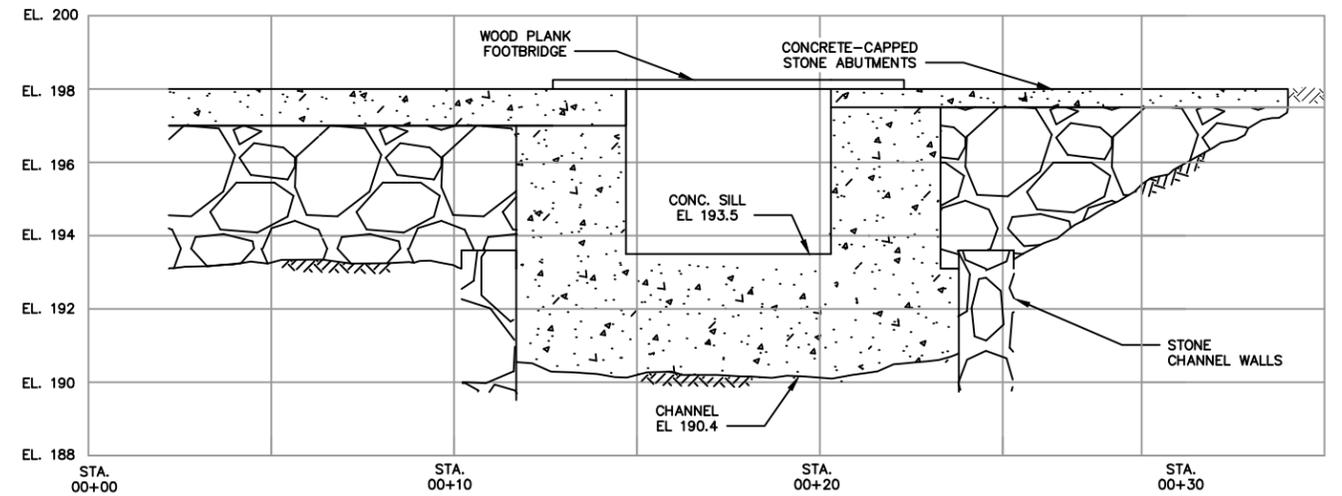
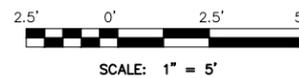
PRIMARY SPILLWAY ELEVATION
(LOOKING UPSTREAM)
2H:1V



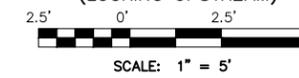
TYPICAL PRIMARY SPILLWAY SECTION



WEST AUXILLIARY SPILLWAY
(LOOKING UPSTREAM)



EAST AUXILLIARY SPILLWAY
(LOOKING UPSTREAM)



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CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
	DRAWN BY: KJC		
	CHECKED BY: JWJ		
	APPROVED BY:		
PROJECT NO.	1699	DATE:	6/30/15

**MILLIE TURNER DAM
REMOVAL PROJECT**

**EXISTING ELEVATIONS
AND SECTIONS**

Division of Ecological Restoration
Massachusetts Dept. of Fish & Game
251 Causeway Street
Boston, MA 02114

Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: AS SHOWN

DRAWING: 4

HISTORIC FEATURES IDENTIFIED IN THE PROJECT AREA

Feature ID*	Name	Date	Comments/Association
EF1	Paved drive	Late 19th - 20th C	Asphalt drive appears to have been created for access to gravel parking area
EF2	Gravel parking area	20th C	Hard-packed gravel; created for visitors
EF3	Pond	Mid 19th C	Mill pond created to power grist and saw mills to the south of Hollis Street. Features of the pond modified during ca 1956 reconstruction.
EF4	1' diameter culvert	Mid 19th C	Diversionary mill race to convey water from Moat 2 (F11) in river to the pond (EF3)
EF5	Earthen dam	Mid 19th C	Created to hold Moat 2 (F11); previously land by edge of river, may be location of 1838 machine shop due to identification of bricks (F10)
EF6	East auxiliary spillway/ cement covered head race gate	Mid-late 19th C	Associated with expansion of machine shop and may reflect infrastructure needed for the turbine as well as the rotary fire pump; likely location of one the steel water wheels as sluiceway was filled with steel bearings ca 1956.
EF7	West auxiliary spillway	Early to mid 19th C	Possibly associated with 1838 machine shop; waste gate; reconstructed ca 1956
EF8	Stone channels	19th C	Raceways likely associated with 2 periods of development for the machine shop; also may have been location of one of the steel water wheels; stone channels cleaned out and reconstruction ca 1956
EF9a, b	Stone abutments	Mid 18th-19 C	Possibly associated with stone abutments of eighteenth century dam across the Nissitissit River; abutment on east side of the river (EF9a) affected by reconstruction ca 1956; abutment on west side of the river (EF9b) does not appear to have been subjected to reconstruction ca 1956.
EF10	Stone masonry primary spillway	Mid 18th C location	Likely the location of the 18th century dam; the eastern section destroyed 1954; entire dam rebuilt ca 1956.
EF11	Tributary	18th C	Flows from spring easterly to river; appears to have no association with former mill activities
EF12	Stone Wall	18th-19th C ?	Appears as extension of stone abutment (EF9b), possibly property boundary wall.
F1a, b, c	Wooden fence	19th C	Define external property boundaries by historic Hollis Street and internal property features (pond).
F2	Marker	19th C	Granite highway/road marker associated with historic Hollis Street.
F3	Culvert	20th C	Created after Hollis Street realigned 1958.
F4a, b	Flume/end of tailrace	Late 19th century	Likely associated with location of turbine, also rotary fire pump; 4a location of flume (for penstock?) and 4b end of tailrace; both likely reconstructed ca 1956.
F5	Retaining wall	Mid - late 19th C	For driveway to machine shop complex according to Sanborn, for exit driveway according to Farnsworth.
F6	Driveway	Mid-late 19th C	Driveway to machine shop complex according to Sanborn, exit driveway according to Farnsworth.
F7	Historic Hollis Road	18th C	Location prior to 1958 realignment.
F8a, b, c, d	Head race gate to pond then overflow to river	Mid 19th C 8a and 8b; ca 1956 8c and 8d	F8a is head race gate for diversionary mill race that enters pond (8b) millrace associated with construction of the pond to provide water power to grist and saw mills to the south of Hollis Street; then 8a reconstructed ca 1956; 8c and 8d constructed ca 1956 as overflow for pond.
F9	Building foundation	Mid-late 19th C	Continues off northwest end of retaining wall (F5), Farnsworth painting suggests that the machine shop abutted the retaining wall.
F10	Bricks	Ca 1838?	Possibly associated with Blake and Ballard's 1838 Machine Shop.
F10	Moat 2	Mid to late 19th C	Associated with the creation of the pond to provide water power to saw and grist mills.
F11	Stone foundation	Mid to late 19th C	The location of a shed and then garage in Sanborn maps.
F12	Ferrous strap bolted to rocks	20th C	Odd feature, likely associated with ca 1956 repair of the dam.
F13	Rock formation	Ca 1956	Holding area for rocks/other materials associated with ca 1956 repair of the dam according to Freddie Farmer.

*FEATURES LABELED WITH AN "EF" WERE IDENTIFIED ON THE PRELIMINARY EXISTING CONDITIONS PLAN; FEATURES LABELED WITH AN "F" WERE IDENTIFIED DURING A WALKOVER OF THE PROJECT AREA.

LEGEND

AREA OF ARCHEOLOGICAL SENSITIVITY



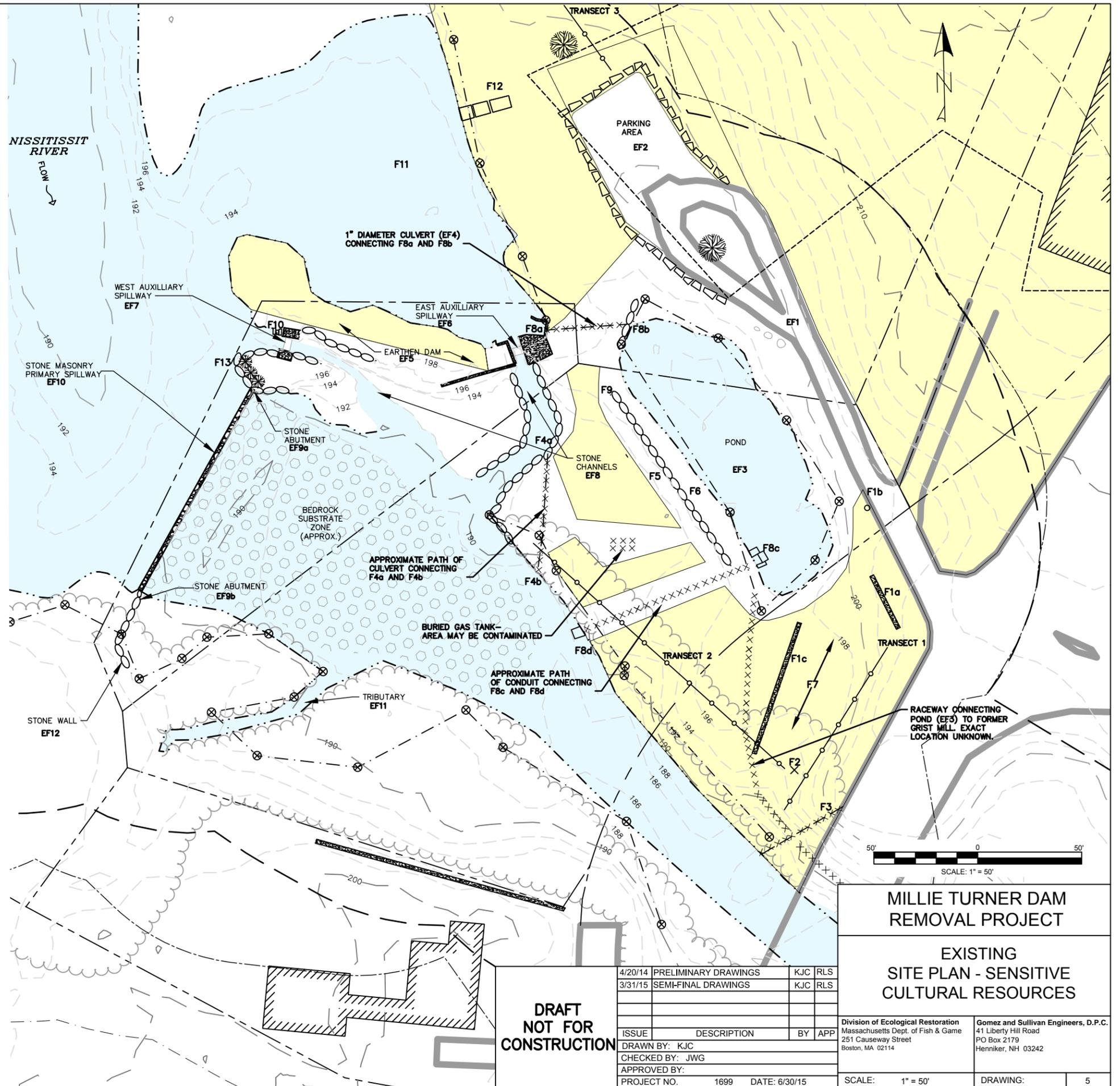
DISTURBANCE



TRANSECT



NOTE: REFER TO DRAWING 3 FOR FULL LEGEND.



**DRAFT
NOT FOR
CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
PROJECT NO.	1699	DATE:	6/30/15

MILLIE TURNER DAM REMOVAL PROJECT

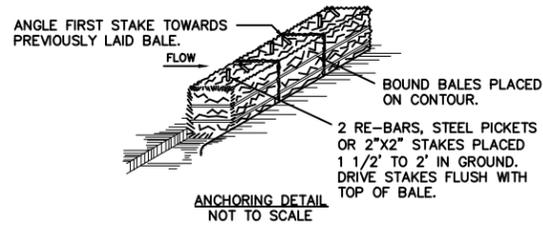
EXISTING SITE PLAN - SENSITIVE CULTURAL RESOURCES

Division of Ecological Restoration
Massachusetts Dept. of Fish & Game
251 Causeway Street
Boston, MA 02114

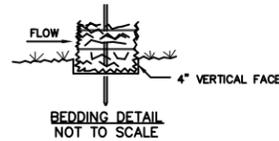
Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: 1" = 50' DRAWING: 5

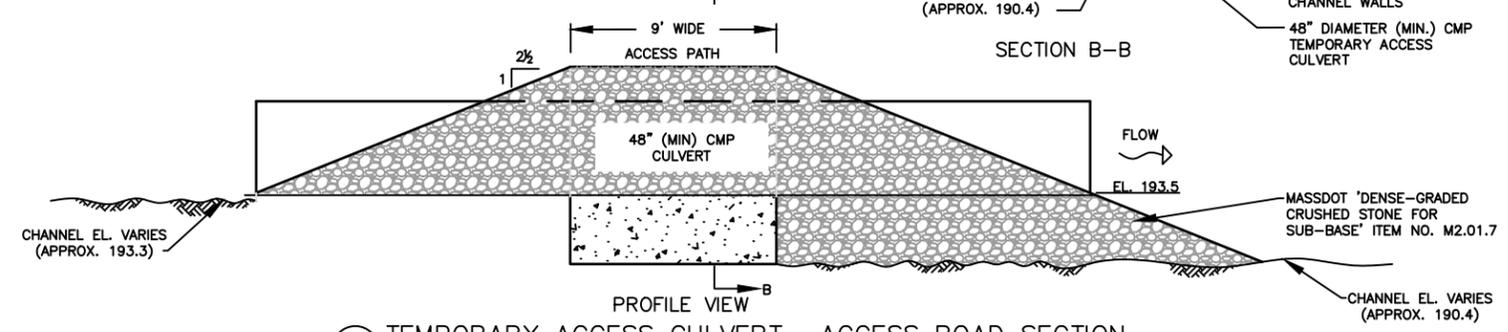
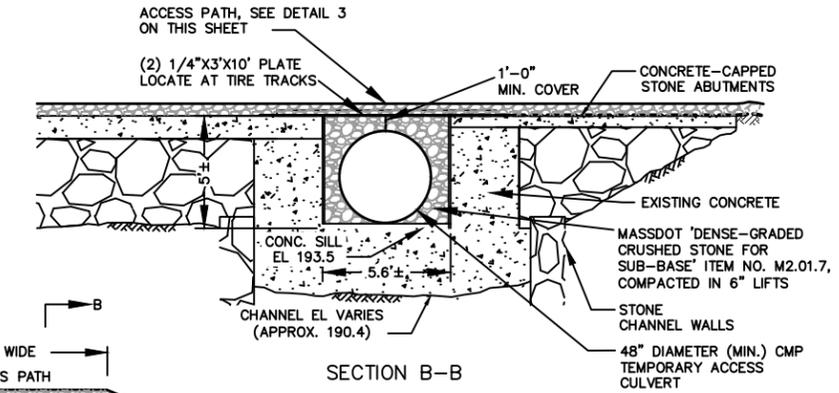
DRAINAGE AREA NO MORE THAN 1/4 ACRE PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.



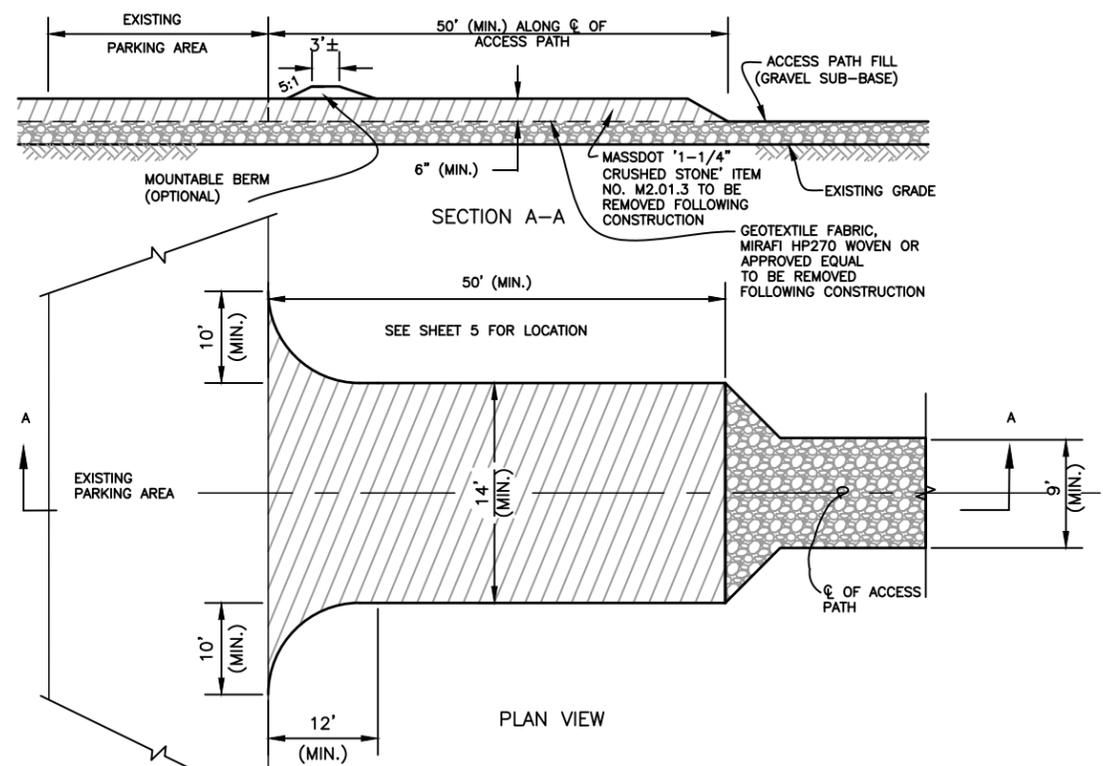
1 STRAW BALES
Scale: NONE



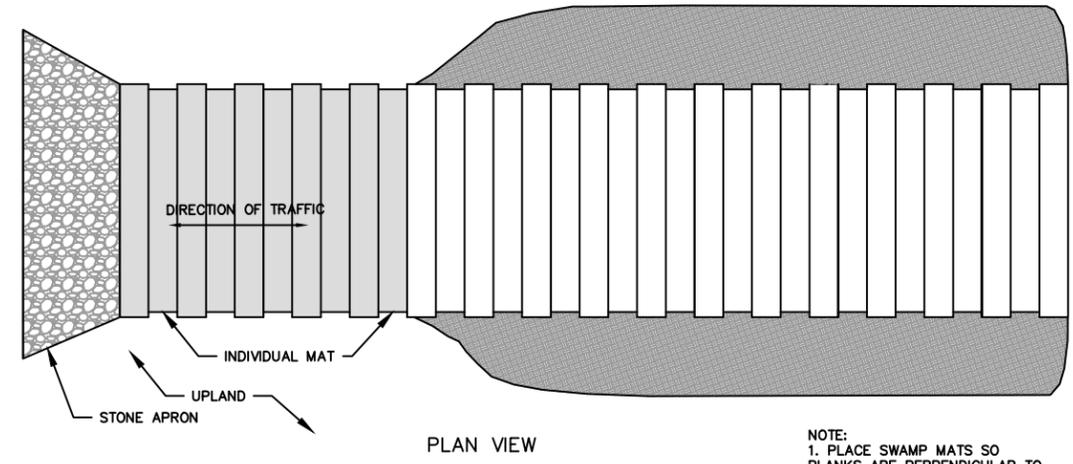
- CONSTRUCTION SPECIFICATIONS**
1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
 2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
 3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
 4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
 5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.



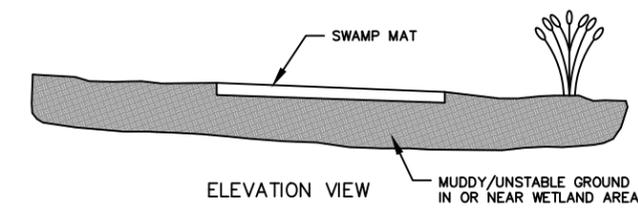
4 TEMPORARY ACCESS CULVERT- ACCESS ROAD SECTION
Scale: NONE



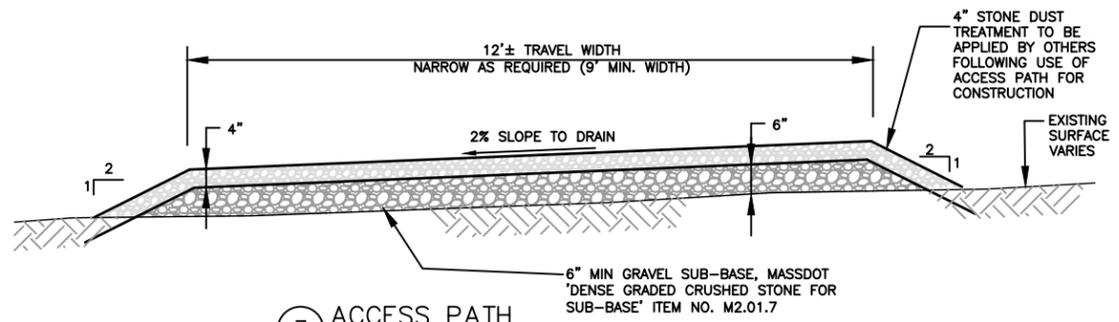
2 STABILIZED CONSTRUCTION ENTRANCE
Scale: NONE



- NOTE:**
1. PLACE SWAMP MATS SO PLANKS ARE PERPENDICULAR TO DIRECTION OF TRAFFIC.
 2. REMOVE SEDIMENT DEPOSITS ALONG EDGES OF MATS ON A REGULAR BASIS.



5 SWAMP MATS
Scale: NONE



3 ACCESS PATH
Scale: NONE

MILLIE TURNER DAM REMOVAL PROJECT

ACCESS AND EROSION/ WATER CONTROL DETAILS

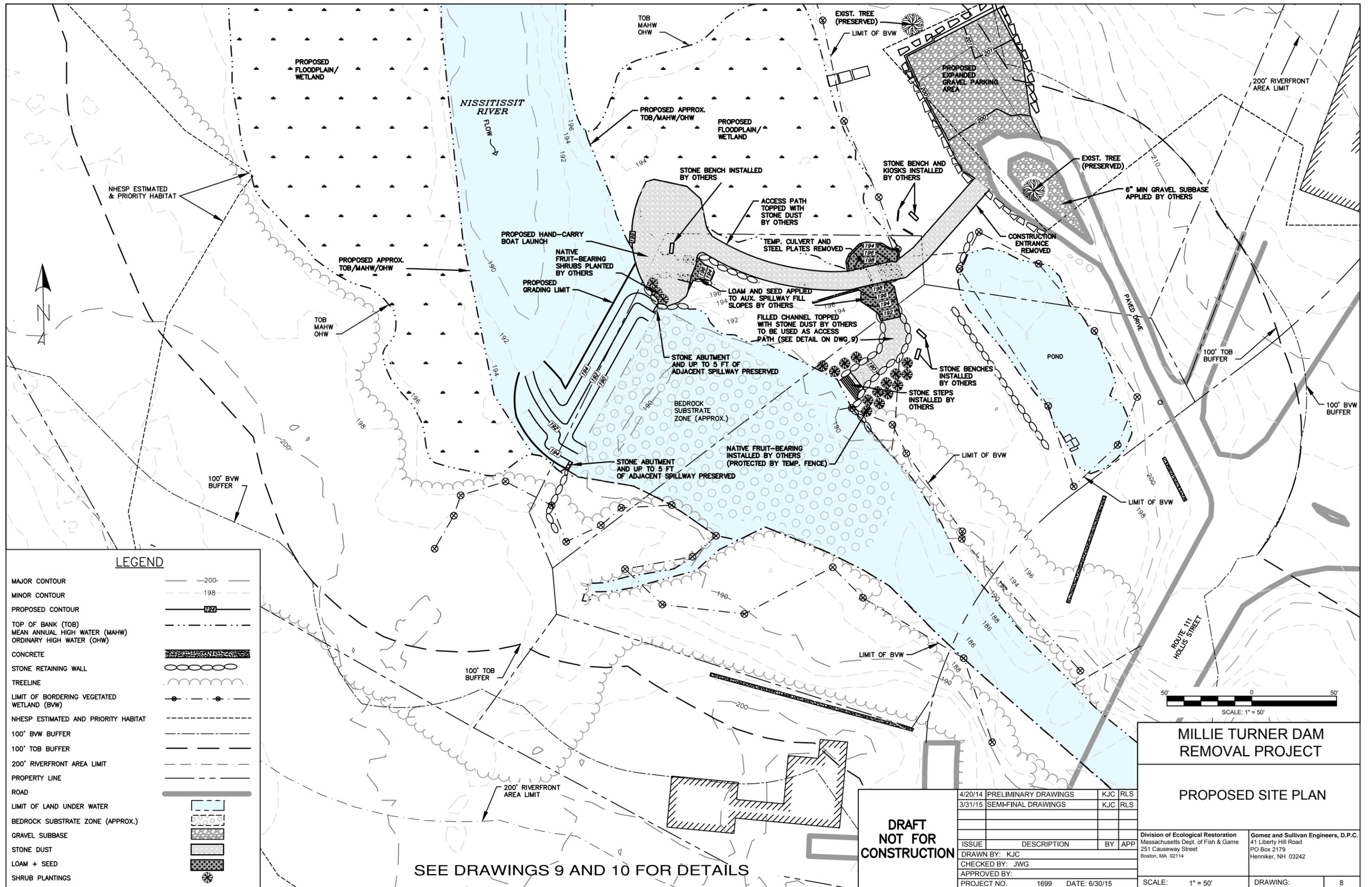
4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
DRAWN BY: KJC			
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SCALE: NONE DRAWING: 7

DRAFT NOT FOR CONSTRUCTION



LEGEND

MAJOR CONTOUR	— 200 —
MINOR CONTOUR	- - - 198 - - -
PROPOSED CONTOUR	— 194 —
TOP OF BANK (TOB)	- - - - -
MEAN ANNUAL HIGH WATER (MAHW)	- - - - -
ORDINARY HIGH WATER (OHW)	- - - - -
CONCRETE	[Stippled pattern]
STONE RETAINING WALL	[Circular stone pattern]
TREELINE	[Wavy line]
LIMIT OF BORDERING VEGETATED WETLAND (BVW)	[Dashed line with circles]
NHESP ESTIMATED AND PRIORITY HABITAT	[Dotted line]
100' BVW BUFFER	[Dashed line]
100' TOB BUFFER	[Dashed line]
200' RIVERFRONT AREA LIMIT	[Dashed line]
PROPERTY LINE	[Dashed line]
ROAD	[Thick solid line]
LIMIT OF LAND UNDER WATER	[Blue shaded area]
BEDROCK SUBSTRATE ZONE (APPROX.)	[Hexagonal pattern]
GRAVEL SUBBASE	[Dotted pattern]
STONE DUST	[Cross-hatched pattern]
LOAM + SEED	[Stippled pattern]
SHRUB PLANTINGS	[Starburst symbol]

SEE DRAWINGS 9 AND 10 FOR DETAILS

**DRAFT
NOT FOR
CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
PROJECT NO.	1699	DATE:	6/30/15

**MILLIE TURNER DAM
REMOVAL PROJECT**

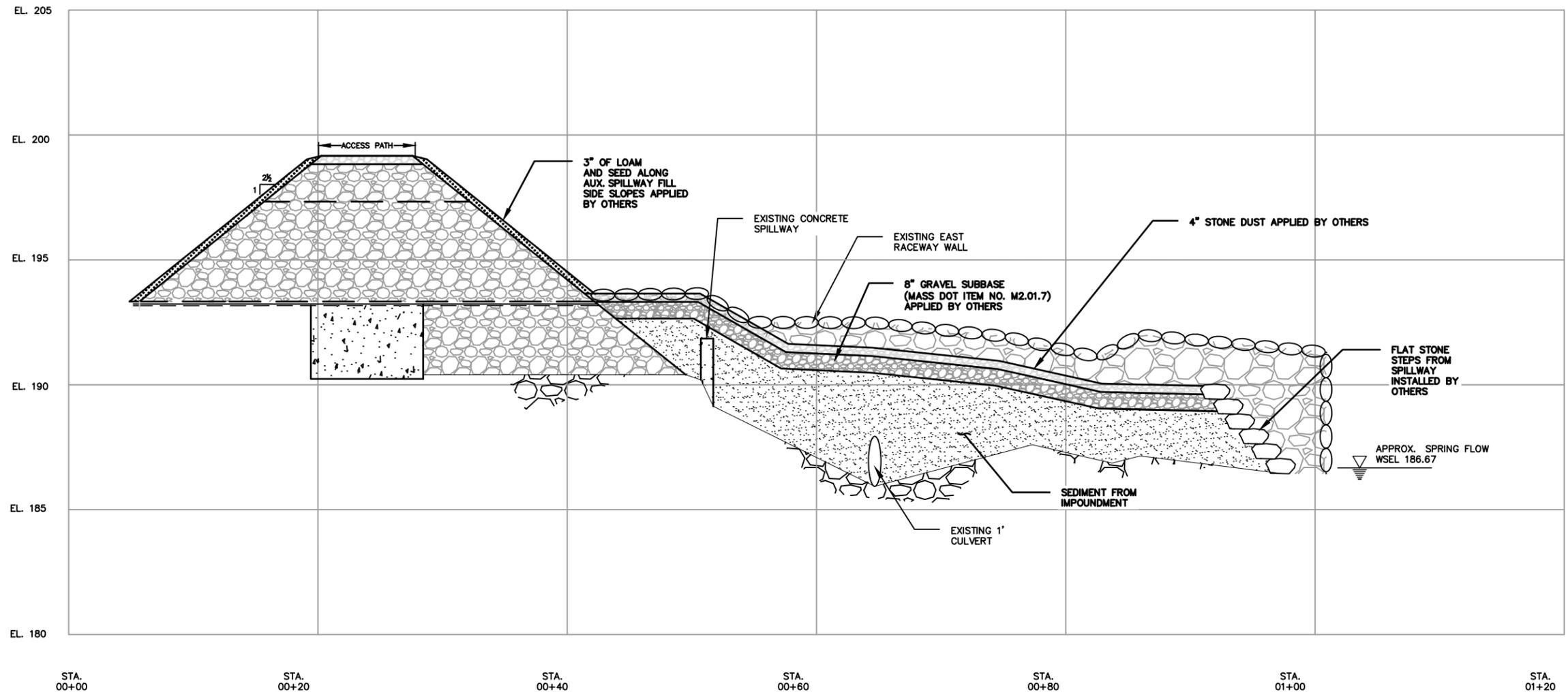
PROPOSED SITE PLAN

Division of Ecological Restoration
Massachusetts Dept. of Fish & Game
251 Causeway Street
Boston, MA 02114

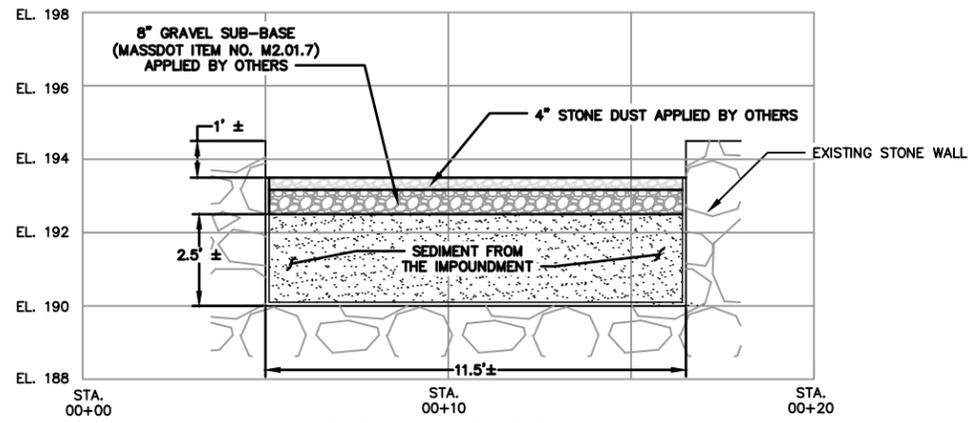
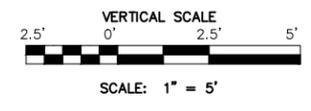
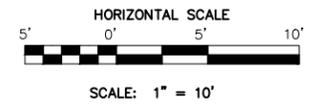
Gomez and Sullivan Engineers, D.P.C.
41 Liberty Hill Road
PO Box 2179
Henniker, NH 03242

SCALE: 1" = 50'

DRAWING: 8



PROFILE VIEW
2H:1V



TYPICAL SECTION



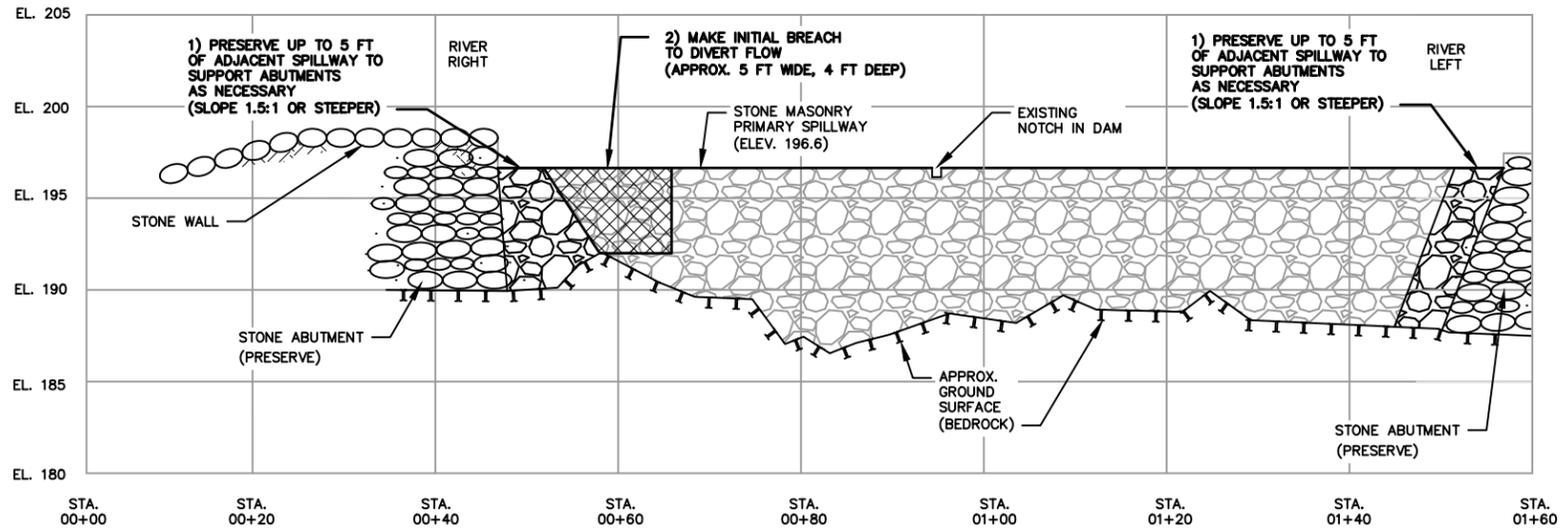
**DRAFT
NOT FOR
CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
	DRAWN BY: KJC		
	CHECKED BY: JWG		
	APPROVED BY:		
PROJECT NO.	1699	DATE:	6/30/15

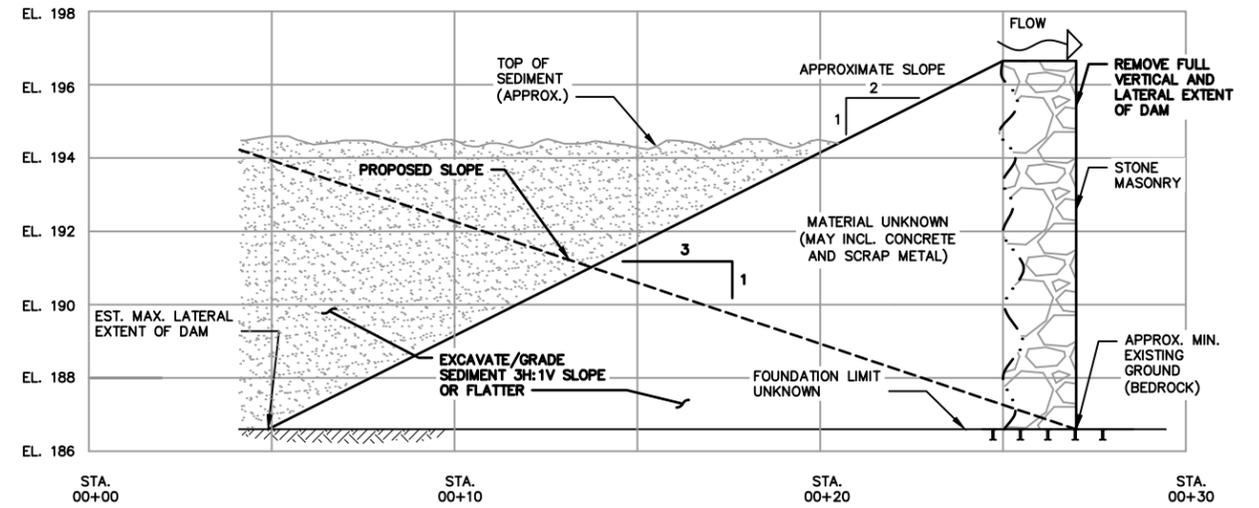
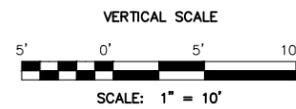
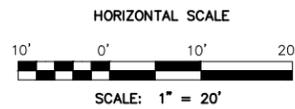
**MILLIE TURNER DAM
REMOVAL PROJECT**

**PROPOSED RACEWAY
ACCESS PATH DETAILS**

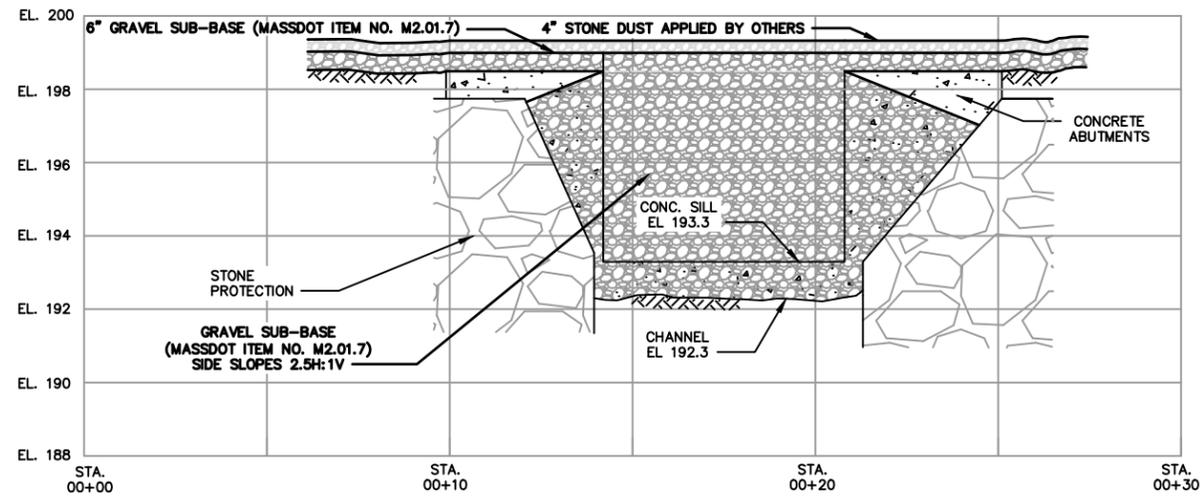
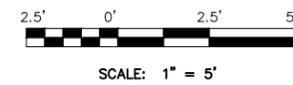
Division of Ecological Restoration Massachusetts Dept. of Fish & Game 251 Causeway Street Boston, MA 02114	Gomez and Sullivan Engineers, D.P.C. 41 Liberty Hill Road PO Box 2179 Henniker, NH 03242
SCALE: AS SHOWN	DRAWING: 9



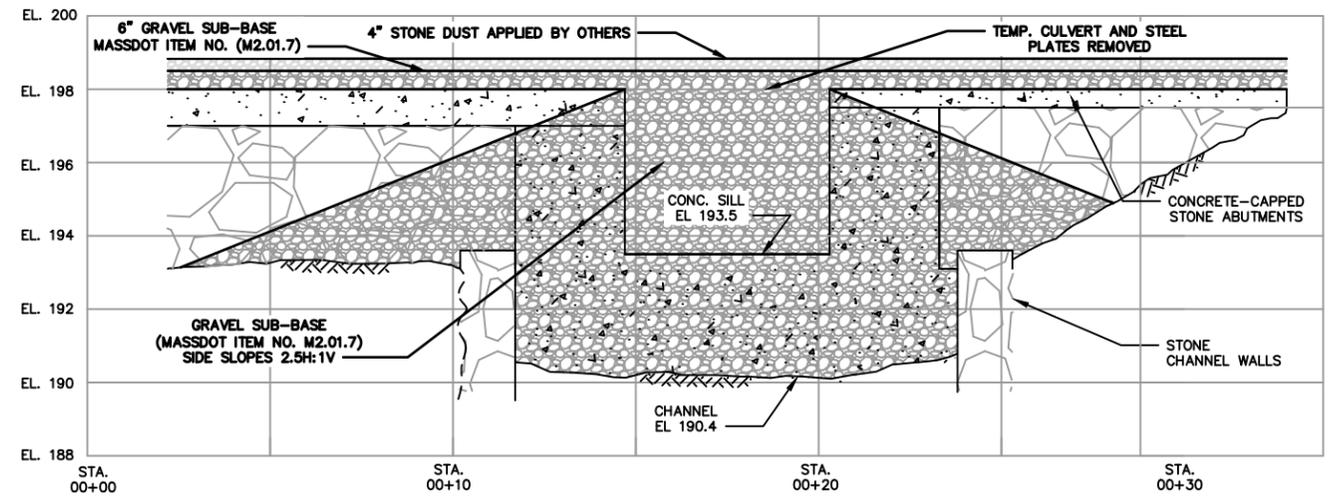
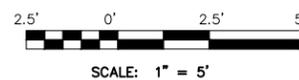
PRIMARY SPILLWAY ELEVATION
(LOOKING UPSTREAM)
2H:1V



TYPICAL PRIMARY SPILLWAY SECTION



WEST AUXILIARY SPILLWAY
(LOOKING UPSTREAM)



EAST AUXILIARY SPILLWAY
(LOOKING UPSTREAM)



**DRAFT
NOT FOR
CONSTRUCTION**

4/20/14	PRELIMINARY DRAWINGS	KJC	RLS
3/31/15	SEMI-FINAL DRAWINGS	KJC	RLS
ISSUE	DESCRIPTION	BY	APP
	DRAWN BY: KJC		
	CHECKED BY: JWG		
	APPROVED BY:		
PROJECT NO.	1699	DATE:	6/30/15

**MILLIE TURNER DAM
REMOVAL PROJECT**

**PROPOSED ELEVATIONS
AND SECTIONS**

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Boston, MA 02114

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Henniker, NH 03242

SCALE: AS SHOWN DRAWING: 10