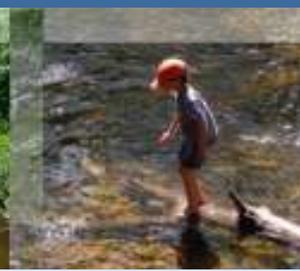




Connecticut Department of Energy and Environmental Protection



Changes in Connecticut's Dam Safety Program

May 1, 2014

Arthur P. Christian II, P.E.



Connecticut Department of Energy and Environmental Protection



Connecticut Department of Energy and Environmental Protection

Nepaug Reservoir Dam – New Htfd.



Connecticut Department of Energy and Environmental Protection

Regulated Dams

A “regulated dam” is any dam which by breaking away or otherwise might endanger persons or property. (CGS 22a-401)

- DEEP regulates over 3,043 dams
- 75% of regulated dams are privately owned
- State of CT is largest single owner with 265 dams
- Municipalities own 512 dams



CGS 22a-401 through 22a-411

Major provisions of existing Dam Safety Statutes:

- Permits for Construction, Alteration or Removal
- Authority to Issue Orders for Repair of Unsafe Dams
- Dam Registration and Inspection Programs



RSCA 22a-409-1 through 22a-409-2

Major provisions of our existing Dam Safety Regulations establish:

- Dam Hazard Classes
- Inspection Frequency
- Inspection Criteria



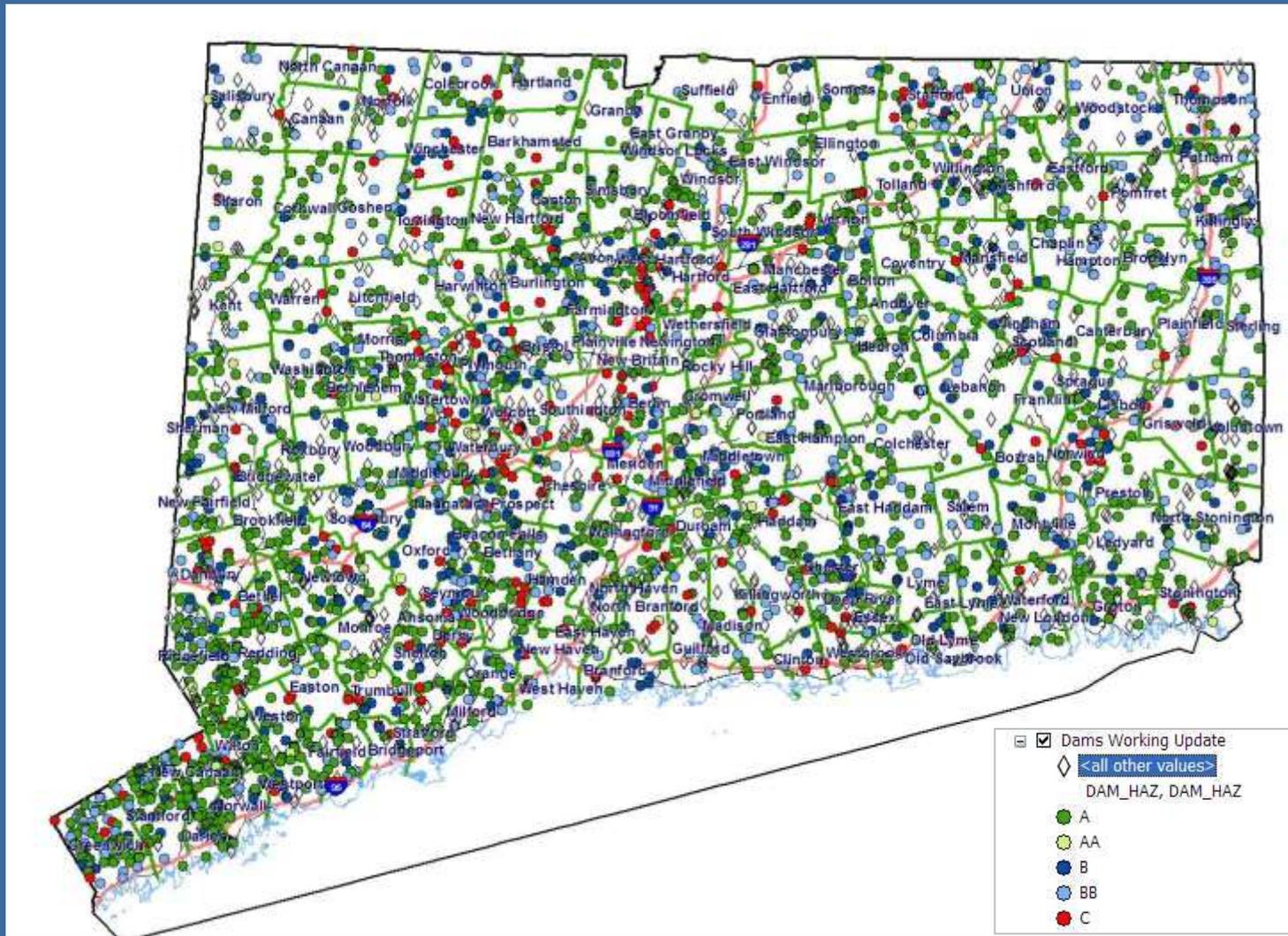
Dam Safety Regulatory Program

An effective state dam safety regulatory program contains 5 components:

1. maintaining an inventory of all dams,
2. periodic inspection of regulated dams,
3. implementation of the permitting and enforcement program elements including technical assistance to dam owners,
4. emergency operation planning and response, and
5. public awareness outreach.



Map of Dam Inventory



Connecticut Department of Energy and Environmental Protection

Connecticut Dams by Hazard Class

Dam Hazard Class	# of Dams	% of Dams
C - High Hazard	267	6%
B - Significant Hazard	277	6%
BB - Moderate Hazard	717	16%
A - Low Hazard	1788	39%
AA - Negligible Hazard	1496	33%

3049 regulated dams

Negligible (AA) hazard dams are not under DEEP jurisdiction

544 High and Significant hazard dams in CT



Class C Dams (High)



Higganum Reservoir Dam, Haddam

Connecticut Department of Energy and Environmental Protection



Class C Dams (High)



Higganum Reservoir Dam, Haddam

Connecticut Department of Energy and Environmental Protection



Class C Dams (High)



Jennings Pond Dam, Chester

Connecticut Department of Energy and Environmental Protection



Class C Dams (High)



Jennings Pond Dam, Chester

Connecticut Department of Energy and Environmental Protection



Class C Dams (High)



Jennings Pond Dam, Chester

Connecticut Department of Energy and Environmental Protection



Class B Dams (Significant)



Paper Goods Pond, Berlin

Connecticut Department of Energy and Environmental Protection



Class B Dams (Significant)



Paper Goods Pond, Berlin

Connecticut Department of Energy and Environmental Protection



Class B Dams (Significant)



Mirror Lake Dam, Meriden

Connecticut Department of Energy and Environmental Protection



Class B Dams (Significant)



Mirror Lake Dam, Meriden

Connecticut Department of Energy and Environmental Protection



Class BB Dams (Moderate)



City Hall Pond, Milford

Connecticut Department of Energy and Environmental Protection



Class BB Dams (Moderate)



City Hall Pond, Milford

Connecticut Department of Energy and Environmental Protection

Class BB Dams (Moderate)



Carrington Pond, Beacon Falls

Connecticut Department of Energy and Environmental Protection



Class BB Dams (Moderate)



Carrington Pond, Beacon Falls

Connecticut Department of Energy and Environmental Protection



Class A Dams (Low)

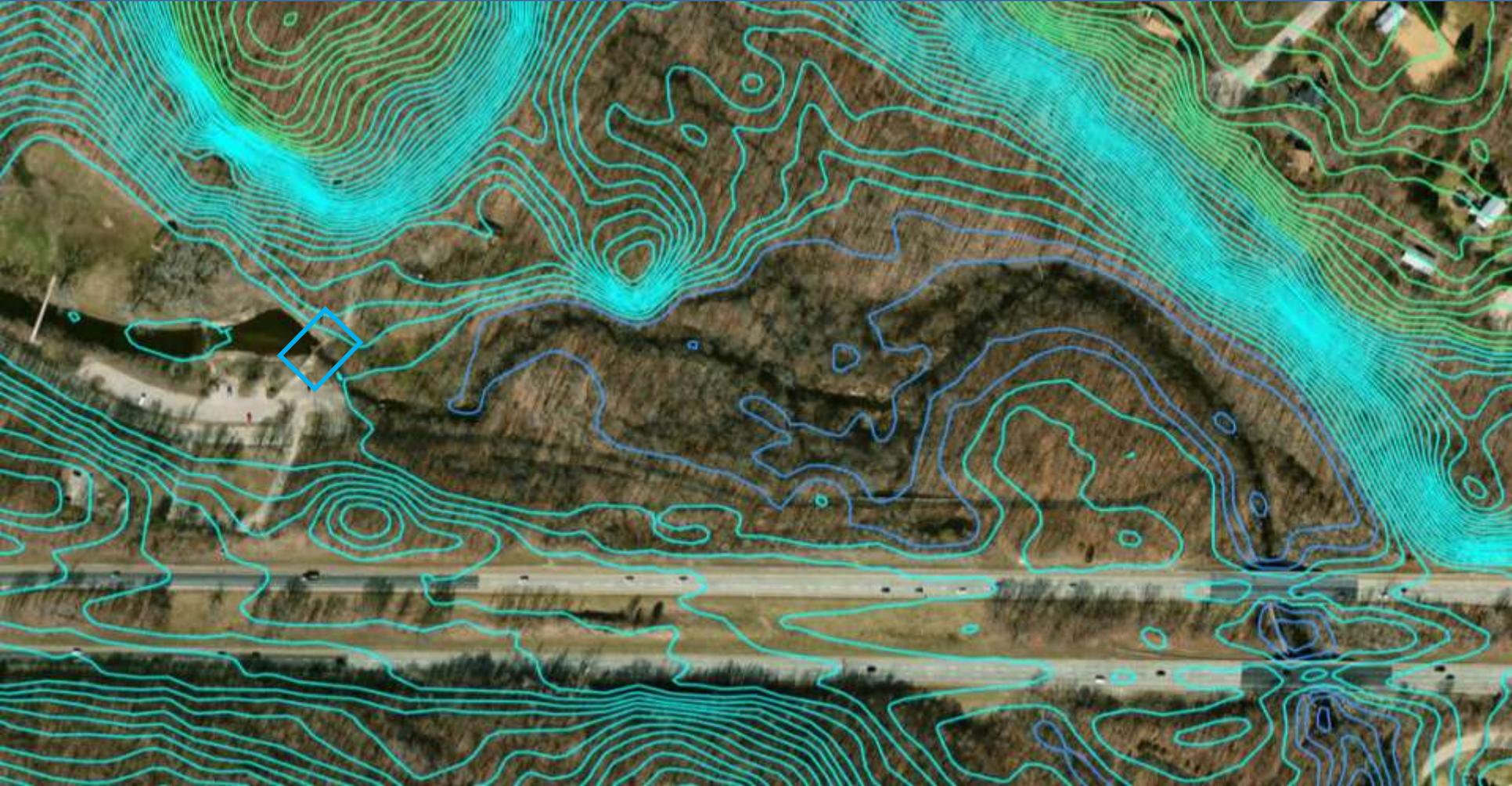


Old Mine Park Pond, Trumbull

Connecticut Department of Energy and Environmental Protection



Class A Dams (Low)



Old Mine Park Pond, Trumbull

Connecticut Department of Energy and Environmental Protection



Class A Dams (Low)

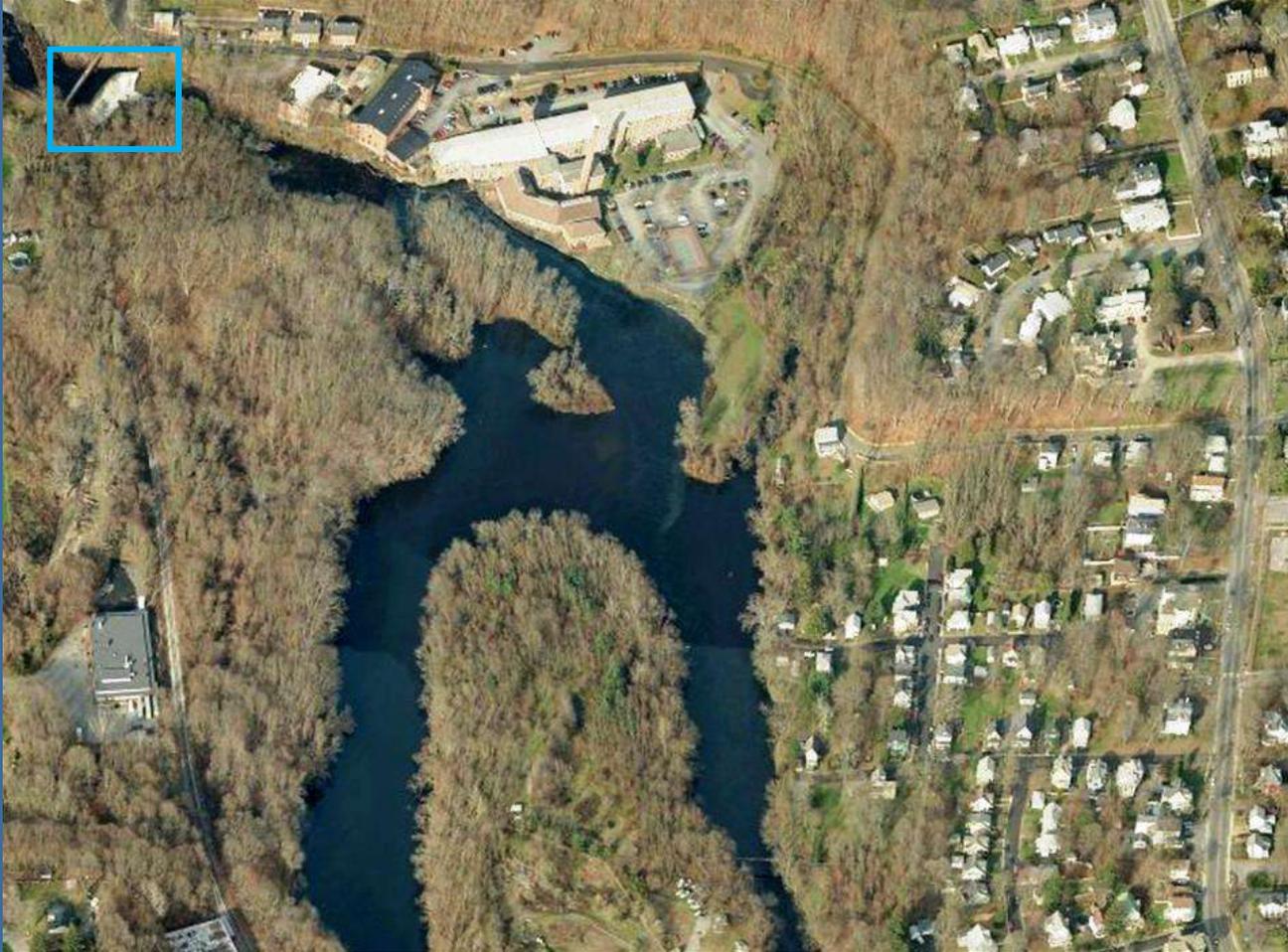


Falls Mill Pond Lower Dam, Norwich

Connecticut Department of Energy and Environmental Protection



Class A Dams (Low)



Falls Mill Pond Lower Dam, Norwich

Connecticut Department of Energy and Environmental Protection



Class AA Dams (Negligible)



New Pond Dam, Cromwell

Spring Street Skate Pond Dam,
Wethersfield



Class AA Dams (Negligible)



New Pond Dam, Cromwell

Spring Street Skate Pond Dam,
Wethersfield



Public Act 13-197



House of Representatives

File No. 884

General Assembly

January Session, 2013

(Reprint of File No. 88)

Substitute House Bill No. 6441

As Amended by House Amendment

Schedules "A", "C" and "D"

Approved by the Legislative Commissioner

May 31, 2013

AN ACT CONCERNING THE DAM SAFETY PROGRAM AND MOSQUITO CONTROL.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. Section 22a-401 of the general statutes is repealed and the following is substituted in lieu thereof (*Effective October 1, 2013*):



Connecticut Department of Energy and Environmental Protection

New Exemptions

CGS 22a-403 (Revised)

When the applicant receives a dam construction permit, statute exempts dam owners from the requirement for:

- Tidal Wetlands and a Structures-Dredging permit.
- Flood Management Certification pursuant to 25-68d of the CGS.



Engineer Certification

CGS 22a-404 (Revised)

Requires that a professional engineer sign a certification statement on all work on a dam pursuant to a permit or order issued by the Commissioner.



Registration

CGS 22a-409(b) (Revised)

Requires:

- Registration of all dams regardless of when constructed.
- Notification to DEEP upon transfer or sale of dam.
- Establishment of registration fees by regulation.



Owner Responsible Inspection

CGS 22a-409(c) (Revised)

Requires Dam Owners to ensure a regulatory inspection is conducted by a professional engineer in accordance with a schedule determined by hazard class.



EAPs

CGS 22a-409 (New)

- Establishes a requirement for dam owners to develop Emergency Action Plans (EAPs) for high and significant hazard dams and update plans every 2 years.
- Requires DEEP to develop regulations for establishing content and key criteria of the EAP.



General Permit

CGS 22a-411 (Revised)

Modified the provisions of the General Permit portion of the statute to allow for quicker turn around times. This modification of the statute allows us to generate non-filing and filing only categories for future general permits.



Regulations Need to be Modified

- Inspection Regulations from 1984 are in the process of being revised to reflect “owner responsible inspection” requirement of the Public Act.
- Emergency Action Plans are required for High and Significant Hazard dams. New regulations are being drafted to implement this requirement.



Draft Regulations: Adding Definitions

- Emergency Action Plan
- Qualified Professional
- Regulated Dam
- Regulatory Inspection



Proposed Changes to Regulation 409-1(b)

- All dams shall be registered by October 1, 2015.
- DEEP will update inventory of Low (A) hazard dams prior to initiating the inspection notification process for these dams.
- All Negligible (AA) hazard dams shall be exempt from regulatory inspection.



Changes to Regulation 409-2

- Statute changed to reflect that each dam owner is responsible for hiring an engineer to inspect their dam at the required interval.



Additional Changes to Regulation 409-2

The Commissioner is keeping the ability to inspect any dam for any reason, including but not limited to the following:

- To Audit Inspections
- When an Owner fails to undertake a Regulatory Inspection
- When necessary to investigate a complaint
- As determined necessary after a flood event



Maintaining Inspection Frequency

Hazard Class	Inspection Frequency
Class A (low)	10 years
Class BB (moderate)	7 years
Class B (significant)	5 years
Class C (high)	2 years



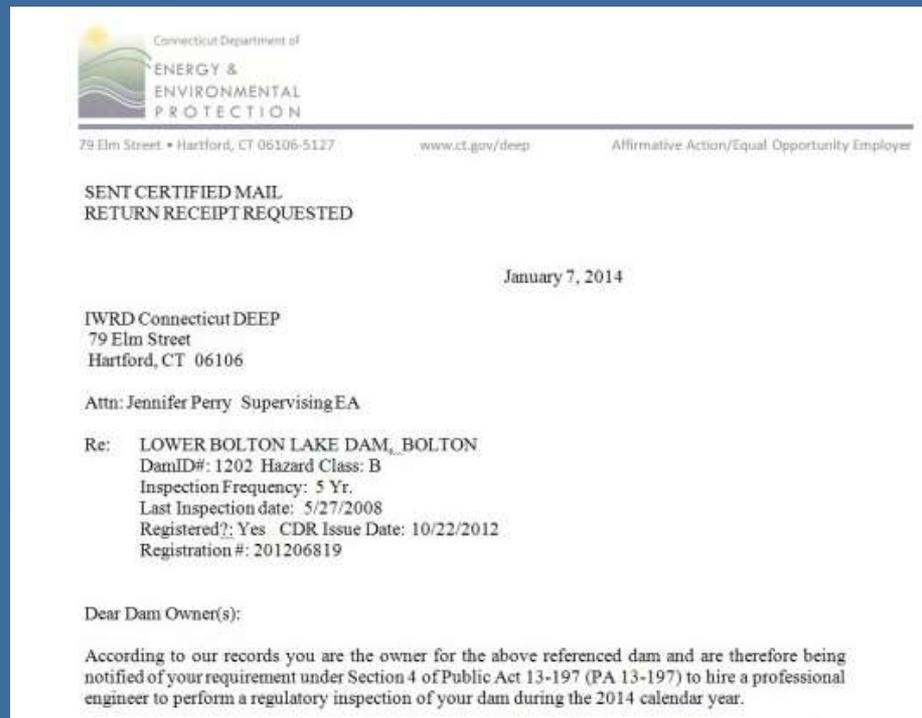
Informal Owner Inspection

- In addition to the regulatory inspection required by these regulations, the owner shall:
 - Inspect High (C) and Significant (B) hazard dams at least quarterly.
 - Inspect a Moderate (BB) hazard dam at least annually.
 - Inspect a Low (A) hazard dam at least every two years.
- The owner shall maintain written records of these inspections and make them available to the Commissioner upon request.



DEEP Notification of Required Inspection

Must be issued by DEEP prior to January 15 of every calendar year. There were 300+ letters (351 dams) issued on January 7, 2014.



sample letter



Connecticut Department of Energy and Environmental Protection

Dam Selection Criteria

High (C) and Significant (B) Hazard Dams that were due for inspection based on frequency interval.



Hiring an Engineer – Fact Sheet



70 Elm Street • Hartford, CT 06106-0127

www.ct.gov/deep

Affirmative Action/Equal Opportunity Employer

Hiring an Engineer

A Fact Sheet for Connecticut Dam Owners

Connecticut (CT) Public Act No. 13-197 requires Department of Energy and Environmental Protection (DEEP) to notify dam owners to inspect their dams. To do this the owner must hire a professional engineer who is licensed in CT to conduct a dam safety inspection & prepare a corresponding report. Inspections and reports shall be conducted in accordance with the latest Connecticut dam safety and other applicable statutes and regulations.

This fact sheet provides owners with helpful information on contacting, interviewing, reviewing references and experience, and hiring a consulting engineer to perform a dam safety inspection or prepare other necessary studies/reports. This fact sheet provides advice to dam owners, but should not be construed as requiring certain courses of action be taken with respect to hiring an engineer.

As a dam owner, you will need to hire an engineer who is licensed to practice in the State of Connecticut. This engineer should have experience and be knowledgeable in the field of dam design and dam safety, including inspection of existing dams, and in determining the deficiencies common to the type of dam that you own, and the types of dams in the state. Your engineer should have knowledge of the statutes and regulations governing dams in CT.

The selected engineer will be working for you and will provide a written inspection report for you using a form specified by the DEEP to submit to DEEP, stating recommendations for repair, maintenance, monitoring or reconstruction. Other required documents may include an Operation and Maintenance Plan and an Emergency Action Plan if required for your dam.

Hiring an engineer: While the process of hiring an engineer is similar to hiring other contractors, there are a few key elements that you may wish to pay particular attention to:

1. First, you will need to find an engineer. The Association of State Dam Safety Officials (ASDSO) has a directory of dam safety resources, which can be found here: [ASDSO 2010 Directory](#). The directory is not all-inclusive and does not in any way represent DEEP's recommendations of the qualifications of a specific engineer or engineering firm. Other sources may be checked for a list of dam safety engineers (e.g. the yellow pages directory). It is highly recommended that you contact at least three engineers to have a representative comparison of your choices.
2. Next interview the engineer: Once you have contacted an engineer or firm, you should meet and talk with the engineers that will be undertaking the inspection/study prior to hiring. The engineer can and should provide a list of references for work that he or she has done with other dam owners and the types of services (inspection, plan preparation,

A Fact Sheet for CT Dam Owners: Hiring an Engineer Page 2 of 2 Effective December 18, 2013

construction oversight, etc.) provided to the owners. Please note that DEEP Dam Safety staff will not recommend any particular engineer. See below for typical/sample questions/comments for the engineer.

- a. Are you licensed in the state of CT? You can look up/verify active licenses here: [CT License Lookup](#).
 - b. How many years of experience do you have with dam inspection, design, or repair? Is there a specific area in dam safety that you specialize in?
 - c. Which dams have you inspected and when? Ask them for a list of recent inspections.
 - d. Please provide me with references (owner name and contact information) for the dams that you have worked on that include completion of inspection reports, emergency action plans, or design repairs to a dam. When was this work completed?
 - e. Are you familiar with DEEP's new inspection requirements that are effective as of 2014?
 - f. Have you ever prepared an Emergency Action Plan (EAP) or Operation & Maintenance Plan (O&M) for a dam?
 - g. Are you willing to modify the inspection report or EAP (if applicable), if DEEP does not accept it? Will there be an additional charge for this modification?
3. Check references: This is an important step in the process. Call other dam owners and communities with which the engineer has worked with. Ask if they had any issues working with the individual. Ask if they completed the work on time, within budget and according to the approved plans.
 4. Hire your engineer: After you have contacted an engineer and checked references, the next step is to get a written estimate for the required work. If you are satisfied with this engineer, you may hire him or her, if not, you can of course "seek a second opinion" and discuss your needs with another engineer or firm, check references, and obtain a written estimate. Note: If you have an engineer on staff that has dam inspection or EAP/O&M preparation experience, you may be able to forego the hiring process.

Please visit the DEEP Dam Safety website to become familiar with the applicable requirements: [CT Dam Safety Website](#)

If you have questions about this matter or need further assistance – contact DEEP's Dam Safety Section at 860-424-3706 or DEEP.DamSafety@ct.gov.



Connecticut Department of Energy and Environmental Protection

History of Dam

Become familiar with the history of the dam.



Connecticut Department of Energy and Environmental Protection

File Review Request Form



Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Inland Water Resources Division



DEEP Dam Safety File Review Request Form

Complete this form to request a review of Dam Safety files.

Hours of Operation: Monday through Friday, 8:30 a.m. – 11:45 a.m. & 1:00 p.m. – 4:00 p.m.

(Closed for State of CT Holidays)

Email your completed request form to: DDEP.DamSafety@ct.gov

You will receive an electronic response from DEEP confirming your request.

If you have any questions, Contact the Dam Safety Program at 860-424-3706

Name(s) of Individuals reviewing Dam Safety files: _____

Company Name: _____

Mailing Address: _____

City/Town _____ State _____ Zip Code _____

Phone: _____ ext: _____

E-mail: _____

Date Requested: _____ AM PM

Alternate Date Requested: _____ AM PM

File(s) to be reviewed (include Dam name(s) and CT Dam ID #s): _____

Refer to File Review Procedures on the following page



Connecticut Department of Energy and Environmental Protection

File Review



Connecticut Department of Energy and Environmental Protection

Dam Inspection Report Form



Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Inland Water Resources Division



DAM SAFETY PROGRAM DAM INSPECTION REPORT FORM – FOR REGULATORY INSPECTION

Please complete this form in accordance with the instructions (DEEP-DAM-INST-002).

Part I: Summary of Dam Inspection

Dam Name: <input type="text"/>	Inspection Date(s): <input type="text"/>
Alternate Dam Name(s): <input type="text"/>	CT Dam ID #: <input type="text"/>
Location (Municipality): <input type="text"/>	Temperature /Weather: <input type="text"/>
Registered?: Yes or No If yes, provide the 9 digit registration number found on the notification letter. <input type="text"/>	Pool Level: See Instructions <input type="text"/>
Emergency Action Plan?: Yes or No <input type="text"/> If Yes, see instructions	Impoundment Use: use options listed in instructions <input type="text"/>
Hydraulic and Hydrologic Analysis?: Yes or No <input type="text"/> If Yes, see instructions	Stability Analysis?: Yes or No <input type="text"/> If Yes, see instructions
Overall Condition: (refer to Appendix A located at the end of this form) <input type="text"/>	

Persons present at the inspection <i>(select the tab button in the last cell to the right to create another row)</i>		
Name	Title/Position	Representing
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>



Dam Inspection Report Form Instructions



Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Inland Water Resources Division



INSTRUCTIONS FOR DAM INSPECTION REPORT FORM FOR REGULATORY INSPECTION

The following instructions have been formulated to be utilized in conjunction with the "Dam Safety Program Dam Inspection Report Form - For Regulatory Inspection" for the regulatory inspection of dams. These instructions are, out of necessity, somewhat general in nature and therefore may not specifically address all features of any given dam. However, the instructions and inspection report form will be suitable for all dam sites and can be readily modified to report on features/conditions not specifically listed.

The dam inspection report must include a sketch of the plan view of the dam to aid in the description of its condition. The dam inspection report must also include photographs of all significant areas and of an overall view of the dam. These photographs will serve as a baseline for comparison of present vs. future conditions.

The inspection procedure should include a review of available information from all potential sources i.e., the DEEP Dam Safety Program files, town halls, the dam owner, previous engineers or owners. The [Guidelines for Inspection and Maintenance of Dams](#) may also be used as a reference. The engineer must contact DEEP to request an appointment to undertake a file review by submitting a completed form entitled "DEEP Dam Safety File Review Request Form" which can be found on the [Dam Safety website](#).

Upon completion of the report, the Professional Engineer Certification section and the Owner Signature section must be completed and submitted to the DEEP Dam Safety Program. Typically, each dam should have its own separate report. Do not include reports for other dams or other impoundments within the same pdf or hard copy. However, if an impoundment has multiple dams and/or dikes which have been given CT Dam ID #'s, they may all be included in a single report. When including additional structures with CT Dam ID #'s within a single report for the impoundment, be sure to include the various CT Dam ID #'s of those structures in addition to the main dam. If unsure, contact the Dam Safety Program staff.

If possible, the dam owner/operator should be present at the inspection to provide specific information about the dam and its operation.

Many of the categories of features observed for the inspection of dams and their appurtenances are very similar in nature and can be readily described and explained once, rather than being repeated throughout these instructions. Do not leave any questions blank; if a question is not applicable please write in "N/A".

On page 2 of the form in the header please type in the dam name, dam ID number and the date of the inspection. This will become the continuous header throughout the inspection report.



Connecticut Department of Energy and Environmental Protection

Report Form: Registration Number

Re: LOWER BOLTON LAKE DAM, BOLTON
DamID#: 1202 Hazard Class: B
Inspection Frequency: 5 Yr.
Last Inspection date: 5/27/2008
Registered?: Yes CDR Issue Date: 10/22/2012
→ Registration #: 201206819 ←



Report Form: EAP

Form

the notification letter.

Emergency Action Plan?: Yes or No If Yes, see instructions	<input type="checkbox"/>
---	--------------------------

Instructions

EMERGENCY ACTION PLAN? Y/N: Is there an existing Emergency Action Plan (EAP) for the dam? In accordance with Public Act 13-197 Section 5, High and Significant Hazard Classified dams need to have an EAP. If yes, include the date it was last updated. If more space is needed to describe the existing plan, place additional description into “Other Information” in Part II of this form.



Report Form: H&H

Form

Hydraulic and Hydrologic
Analysis?: Yes or No
If Yes, see instructions

Instructions

HYDRAULIC & HYDROLOGIC ANALYSIS? Y/N: Is there an existing Hydraulic and Hydrologic Analysis for the dam? If yes, what was the conclusion of the analysis and when was it performed? Include a brief, concise conclusion, for example, “passes the 100-year storm event with 6 inches of freeboard”. If more space is needed to describe the existing analysis, place additional description into “Other Information” in Part II of this form.



Report Form: Stability Analysis

Form

Stability Analysis?:

Yes or No

If Yes, see instructions



Instructions

STABILITY ANALYSIS? Y/N: Is there an existing Stability Analysis for the dam? If yes, what was the conclusion of the analysis and when was it performed? Include a brief, concise conclusion noting any issues with the stability identified in the analysis. If more space is needed to describe the existing analysis, place additional description into “Other Information” in Part II of this form.



Report Form: Overall Condition

Form

Overall Condition: (refer to [Appendix A](#) located at the end of this form)

Instructions

OVERALL CONDITION: Recommend an overall condition for the entire dam structure, which incorporates all of the parts of this report. Use [Appendix A](#), provided at the end of the inspection form and these instructions for reference. Include an explanation for the overall condition rating. The overall condition will remain the same until the DEEP reviews and accepts the report.



Appendix A

Appendix A: Overall Dam Condition Selection Standards

Condition	Definition
Good	Through file research and after a thorough visual inspection it has been determined that the dam is well maintained and no existing dam safety deficiencies are recognized. Only continued routine maintenance is required.
Satisfactory	Through file research and after a thorough visual inspection it has been determined that no significant deficiencies are recognized. Only minor maintenance is required and only minor flaws are noted.
Fair	Through file research and after a thorough visual inspection it has been determined that there are no critical deficiencies with the dam that would require engineering analysis with the following exception: the engineer may recommend that a hydrologic and hydraulic analysis be conducted due to the lack of adequate freeboard and/or the lack of spillway capacity documentation. A condition exists at the dam that may require some sort of additional monitoring.
Poor	Through file research and after a thorough visual inspection it has been determined that deficiencies are recognized that require engineering analysis and/or remedial action.
Unsatisfactory	Through file research and after a thorough visual inspection it has been determined that a deficiency is recognized that requires immediate or emergency action. Administrative/Enforcement action may be required as determined by the Dam Safety Program. Reservoir level restrictions may be necessary until the problem is resolved.



Typical Section of Report Form

Number of Dam/Embankments/Dikes: (if there is more than one dam/embankment or dike, reproduce this section and paste right below the previous section)

Dam/Embankment/Dike Name (see instructions):

General Description:

General Condition:

Concrete Condition:

Stone Masonry:

Settlement/Alignment/Movement:

Seepage/Foundation Drainage:

Riprap:

Erosion/Burrows:

Vegetative Cover:

Other:

Photos/Graphics/Sketches (insert either below this Part or in Parts XIII and XIV, refer to the instructions under Parts XIII and XIV for additional details)



Downstream Hazard Reassessment

Form

Downstream Hazard Classification: *(provide recommendation for the hazard class based on the Dam Safety regulation. See Instructions and [Appendix B.](#))*

Instruction

DOWNSTREAM HAZARD CLASSIFICATION:

Note any infrastructure located downstream of the dam site which exists including dwellings, highways, bridges, culverts, other dams and their hazard class*, or any significant development which may be impacted by flows from a dam breach. Record the approximate distances downstream from the dam and elevations above the streambed of bridges and culverts, including the size of the culvert opening and the amount of freeboard available at the road crossing, where relevant. Confirm the historic hazard classification if there's no change or recommend a new hazard classification and the justification for that change.

Provide recommendations for the hazard class based on the classifications as defined in the Dam Safety regulations and using best available data such as aerial photos, site visits, FEMA mapping and previously prepared inundation mapping. This part of the regulations is included in [Appendix B](#) provided at the end of the inspection form and these instructions.

Note that the hazard classification will remain the same until the DEEP reviews and either rejects or approves the recommended re-classification.

** Where the dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of this dam shall be at least as great as that of the downstream dam.*



Appendix B

Appendix B - Hazard Classification of Dams

- I. A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:**
- (i) no measurable damage to roadways;
 - (ii) no measurable damage to land and structures;
 - (iii) negligible economic loss.
- II. A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to agricultural land;
 - (ii) damage to unimproved roadways (less than 100 ADT);
 - (iii) minimal economic loss.
- III. A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to normally unoccupied storage structures;
 - (ii) damage to low volume roadways (less than 500 ADT);
 - (iii) moderate economic loss.
- IV. A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) possible loss of life;
 - (ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
 - (iii) damage to or interruption of the use of service of utilities;
 - (iv) damage to primary roadways (less than 1500 ADT) and railroads;
 - (v) significant economic loss.
- V. A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) probable loss of life;
 - (ii) major damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
 - (iii) damage to main highways (greater than 1500 ADT);
 - (iv) great economic loss.



Hazard Creep



Connecticut Department of Energy and Environmental Protection

Downstream Hazard Reassessment



Connecticut Department of Energy and Environmental Protection

Recommendations

Form

Recommendations: *(Each item should be numbered)*

1.

Instruction

All deficiencies identified in the previous parts of the dam inspection report should be numbered and reported below.

Items listed here may consist of maintenance, repairs requiring an engineered design and/or studies/analyses (prepared by a licensed professional engineer). Sample recommendations may include any of the following: removing of trees and brush; clearing debris from the spillway and/or downstream channel; patching concrete in small areas; restoring ruts; restoring burrows on embankments; restoring riprap; replacing or installing a toe drain system; root removal; repairing stone masonry components; spillway alterations; dam embankment modifications; repairing the intake structure; repairing the outlet structure; investigating spillway capacity; and preparing or updating an emergency action plan (for high and significant hazard classification dams).

The DEEP will review all of the recommendations and categorize each item as maintenance or repairs requiring an engineered design. Repair items that will require a design by a licensed professional engineer shall not be undertaken until a DEEP Dam Safety Permit is obtained.



Photographs/Graphics

Form

[insert photos/graphics here if not included in each part above]

Instruction

PART XIII: PHOTOGRAPHS/GRAPHICS

The report must include photographs of all the significant dam features including any problem areas observed. A photograph of an overall view of the dam should be taken as well. These photographs will help to serve as a baseline for the comparison of past as well as future conditions. Related photos should be referenced in each part of the report and may be inserted following each part within the report or placed in Part XIII of the form. See [Appendix C](#) for suggested photo locations to be included in the report.

Re-sizing/compressing jpg photos is recommended before inserting them into the report. Maximum recommended size for each photo is 250 Kb. Failure to resize will result in a report too large to submit by email attachment. Most emails are limited to 10 Mb in attachments. It is recommended that photos be sized to fit two per page.

The location of the photographs should also be shown on a photo location/orientation sketch as well for further clarity utilizing a number scheme. A description of the photograph should be given beneath each photo describing the viewpoint from which it is taken and the date. A date stamp on the photograph is optional.



Appendix C

Appendix C - PHOTOGRAPH INSTRUCTIONS

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(s)/dike(s) from upstream
2. Overview of dam(s)/dike(s) 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(s) from upstream
10. Overview of spillway(s) from downstream (tailrace or channel area)
11. Overview of right training wall(s)
12. Overview of left training wall(s)
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 area
21. Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)



Sketches

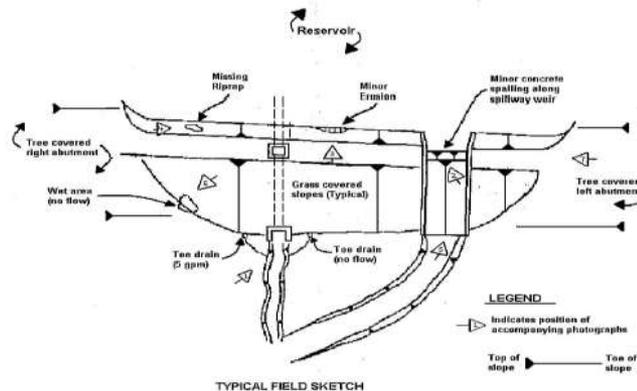
Form

This completed report must include a sketch of the plan view of the dam to aid in the description of its condition. Refer to the instructions for more detail and an example.

[insert sketches here if not included in each part above].

Instruction

A profile view along the centerline of the dam is also helpful when the structure is particularly complex, such as more than one spillway or spillways with more than one crest elevation. Major deficiencies such as seepage, depressions, cracking, etc., should be located on the sketch with accompanying distances from a known point to assure accurate location. If you need to describe additional dam appurtenances, such as a separate dike or elaborate spillway, additional sketches may be added. Related sketches should be referenced in each part of the report and may be inserted following each part within the report or placed in Part XIV of the form. For additional clarity separate sketches may be included for photo reference and for plan view of the key components of the dam. Refer to the example below.



PE Certification

Form

The following certification must be signed by a Professional Engineer

"I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment."

Signature of Professional Engineer

Date

Printed Name of Professional Engineer

Title

C/P.E. Number

Name of Firm

Affix P.E. Stamp Here



Instruction

Please submit a completed certification signed by a Professional Engineer. A Professional Engineer hired by the owner of the subject dam must complete this part.



Connecticut Department of Energy and Environmental Protection

Dam Owner's Signature

Form

The following statement must be signed by the Owner(s) of the subject Dam.

"The information provided in this report has been examined by me."

Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)

Note: Mail the completed inspection report to:

**DAM SAFETY PROGRAM
INLAND WATER RESOURCES DIVISION
CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106**

In addition, please send this completed report converted to Adobe portable document format (pdf) including a scan of the signature page via email to: DEEP.DamSafety@ct.gov

Instruction

Please submit a completed owner signature page for the subject dam.

Mail one copy of the completed inspection report to:

**DAM SAFETY PROGRAM
INLAND WATER RESOURCES DIVISION
CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106**

In addition, please send this completed report converted to Adobe portable document format (pdf) and using the electronic file naming convention below, including a scan of the signature page via email to: DEEP.DamSafety@ct.gov

DEEP-DAM-DSST-002

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Electronic File Naming Convention

Reports in Adobe Acrobat portable document format (pdf) for each dam must be named using the following file naming convention.

Name as follows: ##### Inspection Report YYYY-MM-DD DamName.pdf

Where

is the CT Dam ID # (do not insert leading "0"s).
Inspection Report is the words Inspection Report
YYYY-MM-DD is the date of the visual inspection with dashes in between as shown.
DamName is the generally recognized name of the impoundment/dam.
pdf is the adobe portable document format file extension.

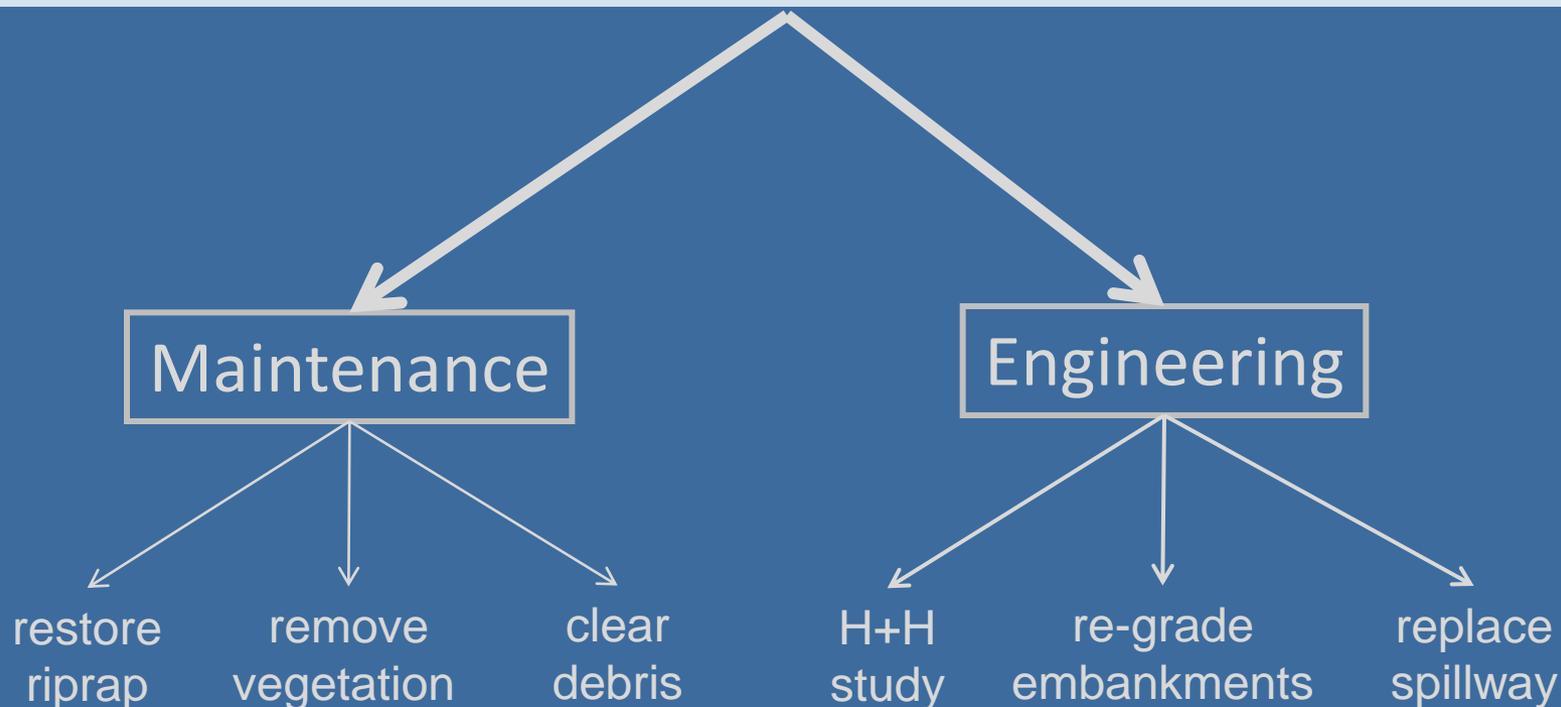
Do not use underscores (_) between the dam number or words. Use dashes in the date.

If you have any questions, please contact the Dam Safety Program at 860-424- 3706 or by email at DEEP.DamSafety@ct.gov



Connecticut Department of Energy and Environmental Protection

Recommendations



If You See Something, Say Something!



Connecticut Department of Energy and Environmental Protection

Maintenance

- Some examples of maintenance include:
 - removal of trees and brush,
 - clearing debris from the spillway and/or downstream channel,
 - patching concrete in small areas,
 - restoring ruts and burrows on embankments,
 - restoring riprap, and
 - repairing stone masonry components.



Maintenance



Engineering

- Some examples of Engineering include:
 - a hydrologic and hydraulic study of the dam and spillway,
 - reconstruction of earthen embankments, spillway training walls, installation of a toe drain, installation of a new spillway or modification of an existing spillway, and
 - additional studies such as under water investigation or a stability analysis.



Engineering



Response Letter

- Recommendations are formalized into a letter by DEEP for the dam owner.
- If DEEP issues an Order, it will be to repair or remove the unsafe dam.



Repair or Remove?

Why Dam Removal?

If a dam no longer serves a purpose or provides benefit, removal could be a viable option.

Economic Benefits

- Eliminate maintenance costs
- Reduces public safety hazard
- Eliminate liability



Repair or Remove?

Ecological Benefits

- Improve biological diversity
- Reconnect seasonal fish habitat
- Normalize water temperature, sediment transport
- Improve dissolved oxygen concentrations



Rutan Dam, Stonington



Overtopping from a storm on March 30, 2010

Connecticut Department of Energy and Environmental Protection



Rutan Dam Repair vs. Removal



Resulting damage on March 31, 2010

Connecticut Department of Energy and Environmental Protection



Rutan Dam Removal Project



Removal process during summer 2012

Connecticut Department of Energy and Environmental Protection



Rutan Dam Area After Removal



Connecticut Department of Energy and Environmental Protection

Fundraising Contacts



Gwen MacDonald, Save the Sound



Sally Harold, The Nature Conservancy



Amy Singler, American Rivers



Connecticut Department of Energy and Environmental Protection

Rejection/Re-Inspection: Heavy Flow



Rainbow Reservoir Dam in Windsor



Connecticut Department of Energy and Environmental Protection

Rejection/Re-Inspection: Snow Cover



Horse Brook Dam in Plainfield



Connecticut Department of Energy and Environmental Protection

Rejection/Re-Inspection: Overgrown Vegetation



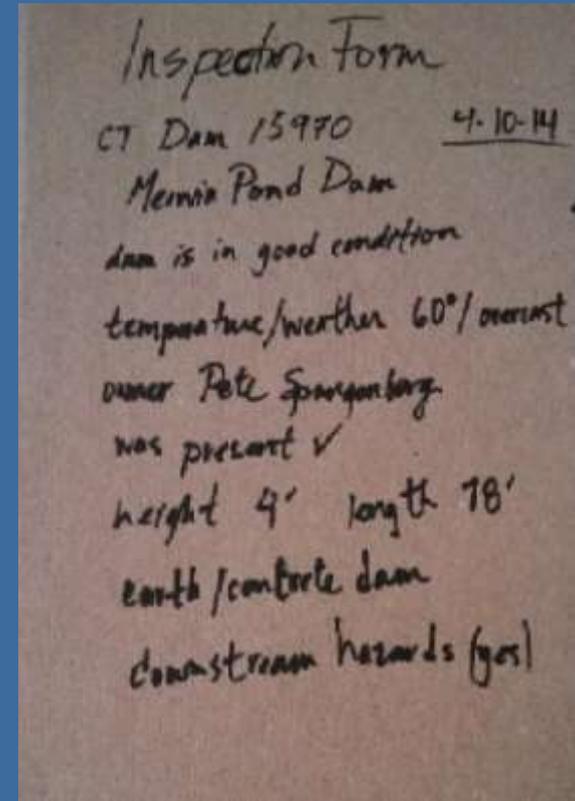
Quillinan Reservoir Dam in Ansonia



Connecticut Department of Energy and Environmental Protection

Rejection: Other

- Form is not filled out properly and completely.
- DEEP form is not utilized.



Submittal of Inspection Report

- Deadline for undertaking the inspection is December 31, 2014.
- Deadline for submission of the Inspection Report Form is March 15, 2015.



Review of Inspection Report

- DEEP reviews/audits reports.
- DEEP personnel may visit dam site to verify or confirm observations contained in report.
- DEEP issues Maintenance Request or Maintenance and Engineering Request to dam owner based on the recommendations contained in the report. Engineer and town to receive copies of requests.



Questions?

Arthur P. Christian II, P.E.
Supervising Civil Engineer
CT DEEP Dam Safety
art.christian@ct.gov
860-424-3880

DEEP Dam Safety
www.ct.gov/deep/dams
DEEP.DamSafety@ct.gov
860-424-3706

