

GP-016 DOCUMENTATION REPORT

Dam No. 03908 Sluice Gate Replacement



Eastford, CT

December 2025



Karl F. Acimovic

Executive Summary

The Crystal Pond Association (CPA) performed maintenance work on Dam #03908 on Saturday November 22, 2025. The dam is an earthen embankment located at the northeast corner of Crystal Pond in the town of Eastford. The work performed included an in-kind replacement of the timber sluice gate and steel trash rack at the low-level outlet structure with the work authorized under CTDEEP's *Dam Safety General Permit to Conduct Repairs and Alterations to Dams/GP-016*. The items replaced exhibited deterioration from many years of service with advanced deterioration in the zone subject to wet and dry cycles. This report is prepared to satisfy the record keeping requirement in Section 5(b)2 of the General Permit.

Authorization

Consulting Engineer Karl Acimovic, PE, under contract with the CPA prepared an application for Dam Maintenance Repairs for Dam #03908 under the CTDEEP's Dam Safety General Permit Program in November 2024. The application was made under GP-016, and CTDEEP authorized the work with conditions in their letter dated December 20, 2024. (enclosure No. 1)

Preconstruction Phase

CPA made approximate measurements of materials being replaced and procured the replacement materials. The materials included hard wood timber for the hanger post and sluice gate, and stainless-steel hardware.

The trash rack was removed in advance of the proposed gate replacement day to allow for detailed measurements which were used to fabricate a replacement rack. A stainless-steel trash rack was fabricated with geometry generally matching the existing carbon steel trash rack being replaced. A volunteer work crew of CPA members was established, and arrangements were made for use of the key equipment required for the planned work including but not limited to a backhoe; inflatable pipe plug; compressor; generator; and miscellaneous power tools.

CPA notified CTDEEP employee Kyle Zukauskas of the proposed work date one week in advance per Section 5(b)1 and received an email acknowledgement for the planned date.

Consulting Engineer Karl Acimovic coordinated the planned work with CPA President Rick Bray, PE, and delegated the primary field oversight of the replacement work to Rick including the required documentation of the work performed.

CPA partially opened the gate on the low-level outlet on October 31 commencing the normal winter drawdown of Crystal Pond and targeting an elevation approximately 30" below the primary spillway elevation for the date of the planned repair.

Construction Phase

The sluice gate was closed at 5:00 AM on the morning of November 22, 2025, to allow the water level on the backside of the dam to normalize before the work began. It is noted that the presence of a substantial beaver dam several hundred yards downstream of the Crystal Pond Dam creates an impoundment and backwater at the low-level outlet pipe. The backwater elevation varies with storm events and the amount of the gate opening. On the morning of construction, the backwater elevation was just above the mid-point of the 24" outlet pipe. (Figure 1)

The work crew mobilized to the site at 7:00 AM with equipment and materials. The work plan was discussed including jobsite safety. The work crew included: Tim Brooks, Andy Hustus, Duane Kallgreen, Rick Bray, Wayne Somero and Scott Willet.

The temperature was in the mid to high thirties with light to moderate rain. A work tent was erected

on the dam where power equipment was being used for the on-site fabrication of the replacement timber gate and post. (Figure 2)

An inflatable pipe plug was inserted into the 24" cast iron outlet pipe and pressurized to 20 psi. The pipe plug pressure was determined based on product literature and based on a calculation of the static pond water pressure to be retained. Approximately 2.5' of static head was the pressure that the plug was required to resist. It is noted that the use of the blocking plug to stop flow during the gate replacement was a deviation to the proposed work plan in the General Permit application which reflected the intent to use a sandbag cofferdam and steel plate at the inlet side of the low-level outlet structure. This change was made as an improved construction method with less effort to deploy, increased safety and a shorter duration for deployment. At the time of the initial application, it was not known that CPA would have access to a commercial grade pipe plug.

A timber strut was deployed at the outlet to provide redundancy against slip for the blocking plug, and the gate was opened a small amount to allow the outlet pipe to fill and to test the stability and water tightness of the blocking plug. The plug held without any sign of movement or leakage.

The gate was closed and the steel frame with the attached mechanical system including the pinion gear was raised from the concrete outlet structure while the pinion gear was turned effectively "walking" the frame off the track gear mounted to the timber gate hanger. The frame assembly was set aside. The timber gate and attached hanger were then removed using the backhoe. (Figures 3 and 4)

Detailed measurements of the timber gate and hanger were made, and replacement members matching the dimensions were fabricated and assembled. (Figure 5) The track gear was removed from the original post and mounted to the replacement post with stainless hardware.

The replacement gate and post were then lowered into its position within the concrete outlet structure. (Figure 6) The steel frame with pinion gear was then lowered back onto the post track gear reversing the removal process. The nuts were installed on the threaded anchors that protrude from the concrete outlet structure securing the gate assembly.

The gate was opened and closed several times to confirm proper alignment and operation. There were no issues and the gate was closed, and the blocking plug was deflated and removed from the outlet pipe.

The trash rack was then lifted into place and secured to the anchor studs that were reused. (Figure 7) This completed the replacement, and all excess materials including waste were removed from the site for disposal in accordance with applicable federal, state and municipal law.

As Built

The timber sluice gate and hanger post were fabricated from red oak to dimensions matching the members replaced. The gate is 33 1/2" wide with a height of 32" and a thickness of 1 1/2". It is comprised of four equal pieces 8" in height butted and stacked. Oak strapping timber runs vertically on each side of the gate to secure the planks together. Countersunk stainless steel 1/2" diameter carriage bolts were used to connect the strapping and gate planks.

The hanger post is 3 3/4" x 6" x 10'-6". Countersunk stainless steel 1/2" diameter carriage bolts were used to connect the hanger post with the gate planks and the cast iron track gear.

The existing cast iron mechanical drive assembly including the steel frame is in good condition and was reused.

The trash rack was fabricated from stainless steel with the same out to out dimensions as the gate being replaced – 5'-8" wide by 4'-0 1/2" in height. The top and bottom support angles were 3 x 3 x 1/4" and the rack screen was comprised on 3/8" square bar stock. Individual bars were spaced at 3" and secured to the support angles with fillet welds. (enclosure No. 2)

Impact on Site

The total construction time was approximately 4.5 hours with the pipe plug in place for 3 hours. All equipment was positioned on the grass covered earthen embankment, and the rubber-tired equipment used (backhoe, pickup and trailer) did not cause any rutting and there was no evidence of erosion during the work. Work crews did enter the Crystal Pond Brook on the outlet side to deploy and remove the blocking plug, but this was done by hand without any disturbance to vegetation within or adjacent to the brook.

A visual survey of the immediate work area was performed, and no evidence of the State-listed special concern status plant *Bidens beckii* (Beck's water-marigold) was identified. While this plant is present at Crystal Pond per the Natural Diversity Database, CTDEEP noted they did not anticipate an adverse impact from our proposed work given the small footprint and time of year (during winter drawdown).

The work was performed without altering CPA's historical practice of lowering the pond elevation for the winter season, and the gate will be closed in the late winter to allow the water level to return to its "pond full" elevation in the early spring, again in the same manner used historically. It is noted that the replacement gate, just like the gate it replaced, does not and is not intended to make a "tight seal" over the low-level outlet pipe. There is always nominal flow around the perimeter of the pipe when the gate is in the closed position maintaining some flow to the Crystal Pond Brook immediately downstream of the dam.

Enclosure 1 – CTDEEP GP-016 Authorization No: DS-202411449

Enclosure 2 – Sluice Gate and Hanger As-built Drawing



Figure 1 - Outlet pipe with pipe plug in place



Figure 2 – Work tent in place on dam for fabrication



Figure 3 – Mechanical drive and gate assemblies removed from concrete outlet structure



Figure 4 – Existing timber gate and hanger post with moderate deterioration



Figure 5 – Fabrication of replacement gate hanger with track gear secured



Figure 6 – Replacement gate and hanger in position prior to trash rack installation



Figure 7 – Concrete outlet structure with replacement gate and trash rack installed



Figure 8 – CPA volunteer work crew



Crystal Pond Association
P.O. Box 349
Eastford, CT 06242

Attn: Rick Bray, President, rick.b@snet.net

Re: Crystal Pond Dam, ID# 3908; Hazard Class BB, Moderate Hazard Potential, Eastford
General Permit to Conduct Repairs and Alterations to Dams.
GP-016 - Approval of Filing Required
Authorization No: DS-202411449

Dear Mr. Bray:

This letter approves the general permit filing received on November 15, 2024 for the proposed work to Crystal Pond Dam. With this letter, you may proceed with the activities authorized within the following general permit sections:

- 3a (2) Minor repair, removal, and replacement of trash racks, gate valves and sluice gates, as well as associated hardware.

You must review the General Permit and comply with all applicable permit requirements and conditions specific to the above listed activities. Failure to do so may subject you to revocation of the authorization and possible enforcement actions to obtain compliance. A copy of the permit has been enclosed for your convenience and is also available on the Dam Safety Website at www.ct.gov/deep/dams. The authorization and eligible activity requirements are in section 3(a) starting on page 7 and section 3(b) beginning on page 11 of the permit. The permit conditions in Sections 5 and 6 begin on page 17 of the permit.

In addition, the activities authorized by this general permit shall be conducted in accordance with the following special conditions:

1. **NDDB Species Protection.** The permittee shall conduct work in accordance with mitigation measures identified in NDDB Determination #202410555, attached hereto.
2. **Downstream Flow Maintenance.** The permittee shall maintain flow in Crystal Pond Brook downstream of Crystal Pond Dam throughout the drawdown and refill process in accordance with Section 26-141b-3 (11) of the Connecticut Stream Flow Standards and Regulations. Water shall be released in an amount no less than the minimum of either the rearing and growth bioperiod Q80 or the natural inflow of water.

Of particular note is the Reporting and Record Keeping Requirement in Section 5(b)2 on page 18 which is applicable to all eligible activities. This section requires a CT licensed professional engineer to prepare and submit a report describing the completed work. A record drawing showing the work actually completed, is required. These reports should be submitted by email attachment as Adobe Acrobat pdf (portable document format) to DEEP.DamSafety@ct.gov. If you are not able to email these documents, you may mail hard copies to the Dam Safety Program at the address on the letterhead.

If you have not already done so, you should contact the U. S. Army Corps of Engineers to determine federal permit requirements on your project. Contact information is as follows: the Corps' New England District, Regulatory Branch, 696 Virginia Road, Concord, MA 01742-2751; <http://www.nae.usace.army.mil/> or call 1-800-343-4789.

Lastly, the work authorized by this letter must be completed within three (3) years of the date of this letter. If you have questions regarding this general permit authorization or regarding the work being performed at your dam, please contact Kyle Zukauskas at Kyle.Zukauskas@ct.gov.

Sincerely,

December 20, 2024

Date

Nisha Patel

Nisha Patel, P.E.

Director

Water Planning and Management Division

Enclosure: Dam Safety GP-016 General Permit
NDDDB Determination #202410555

cc: Jim Larkin, Inland Wetland and Watercourses Commission Agent, Town of Eastford,
landuse@townofeastford.com
Karl Acimovic, P.E., karl277@earthlink.net



Connecticut
Department of Energy &
Environmental Protection

portal.ct.gov/DEEP

10/29/2024

Karl Acimovic
ACIMOVIC
588 Stonehouse Rd
Coventry, CT 06238
karl26535@outlook.com

Subject: Replacement of Sluice Gate at Crystal Pond Dam

Filing #: 119503

NDDB - New Determination Number: 202410555

Expiration Date: 10/29/2026

Location Description: Replacement of Sluice Gate at Crystal Pond Dam, West of Cove Rd and east of Cove Rd. West in Northeastern part of Eastford, CT.

Dear Karl Acimovic,

Our records show that there are known occurrences of the State-listed **Special Concern** status plant ***Bidens beckii*** (Beck's water-marigold) mapped within your proposed project area. Your application and supporting email indicate that work will take place during the Lake Association's annual 30 inch lake drawdown period between October 30th, 2024 and February 1st, 2025, therefore we have no concerns from the drawdown and small work footprint area having an impact on this State-listed plant population throughout the lake.

Plant: *Bidens beckii* (Beck's water-marigold)

State Protection Status: Special Concern

Habitat: Lakes, ponds, slow rivers and streams, fresh tidal coves

Blooms: August - September. Identifiable in leaf from about June until late fall.

Your submission information indicates that your project requires a state permit, license, registration, or authorization, or utilizes state funding or involves state agency action. This NDDB - New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations.

Please be aware of the following limitations and conditions:

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners,

private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits. Please fill out the [appropriate survey form](#) and follow the instructions for submittal.
- Your project involves the state permit application process or other state involvement, including state funding or state agency actions; please note that consultations with your permit analyst or the agency may result in additional requirements. In this situation, additional evaluation of the proposal by the DEEP Wildlife Division may be necessary and additional information, including but not limited to species-specific site surveys, may be required. Any additional review may result in specific restrictions or conditions relating to listed species that may be found at or in the vicinity of the site.
- If your project involves preparing an Environmental Impact Assessment, this NDDDB consultation and determination should not be substituted for biological field surveys assessing on-site habitat and species presence.
- The NDDDB - New determination for the Replacement of Sluice Gate at Crystal Pond Dam as described in the submitted information and summarized at the end of this document is valid until 10/29/2026. This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 10/29/2026.

If you have further questions, please contact me at the following:

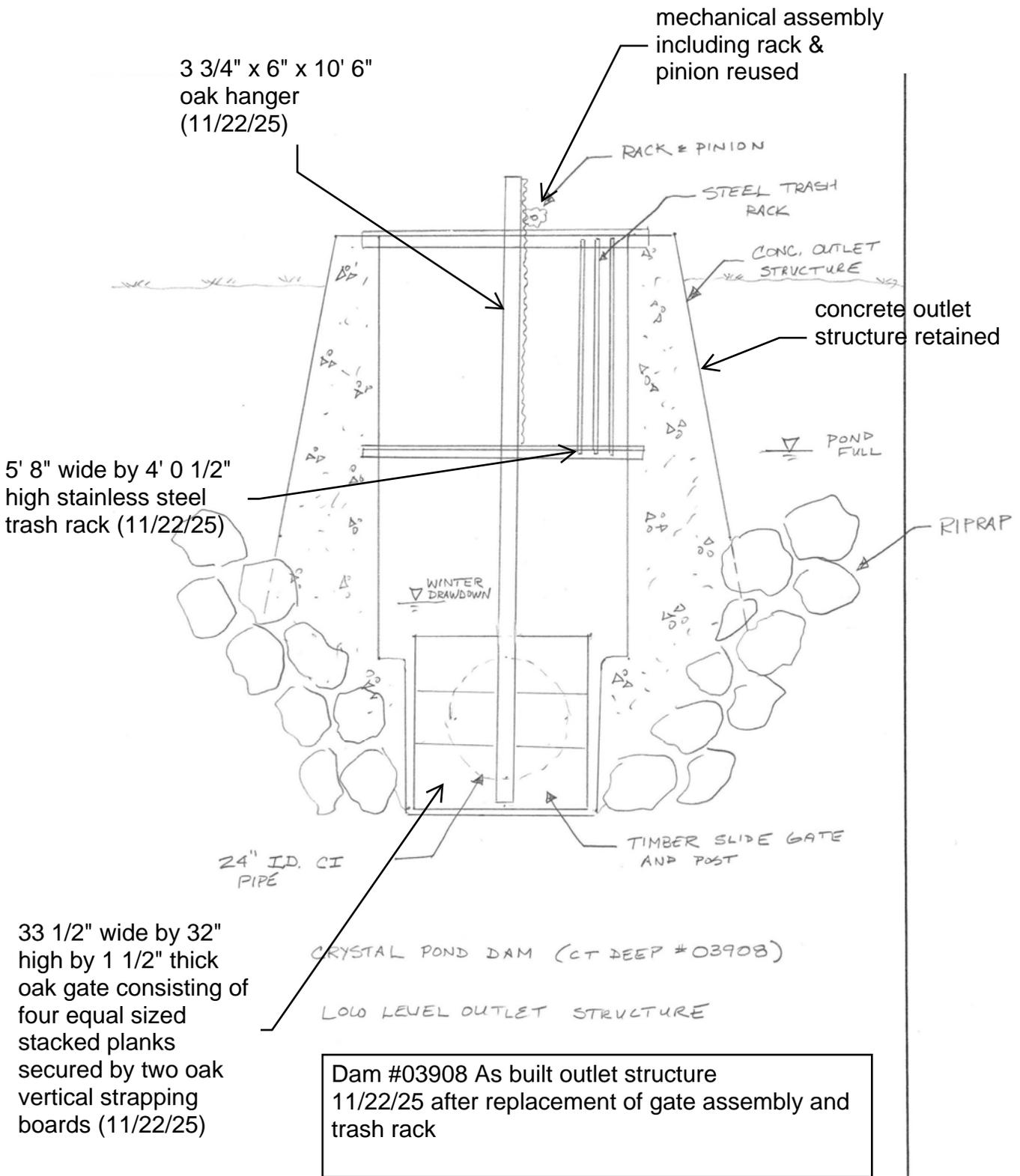
Vincent Long
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127
(860) 502-9786
Vincent.Long@ct.gov

Please reference the Determination Number 202410555 when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

Vincent Long
Wildlife Division- Natural Diversity Data Base
79 Elm Street
Hartford, CT 06106-5127
(860) 502-9786
Vincent.Long@ct.gov

Application Details:

Project involves federal funds or federal permit:	No
Project involves state funds, state agency action, or relates to CEPA request:	No
Project requires state permit, license, registration, or authorization:	Yes
DEEP enforcement action related to project:	
Project Type:	Dams
Project Sub-type:	Repair/modification of a Dam with a drawdown
Project Name:	Replacement of Sluice Gate at Crystal Pond Dam
Project Description:	The site consists of an existing earth embankment dam with a concrete intake structure and auxiliary concrete spillway.



ENCLOSURE 2