



– *WINTERGREEN WOODS DAM* –
VISUAL INSPECTION REPORT



Dam Name: Wintergreen Woods Dam
CTDEEP ID#: 15912
Owner: Town of Wethersfield
Town: Wethersfield, Connecticut
Consultant: GZA GeoEnvironmental, Inc.
Date of Inspection: September 27, 2016





Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION
MANAGEMENT

655 Winding Brook Drive
Suite 402
Glastonbury, CT 06033
T: 860-286-3900
F: 860-652-8590
www.gza.com



April 17, 2017
GZA File No. 05.0045906.00

Mr. Derrick Gregor, P.E.
Town Engineer, Town of Wethersfield
505 Silas Deane Highway
Wethersfield, Connecticut 06109

Re: Visual Inspection Report
Wintergreen Woods Dam
CTDEEP # 15912

Dear Mr. Gregor:

In accordance with our proposal dated August 28, 2015 and our Notice to Proceed dated July 21, 2016 attached to the Town of Wethersfield Purchase Order Number: 20166877-000, GZA GeoEnvironmental, Inc. (GZA) has completed a visual inspection of the Wintergreen Woods Dam located in Wethersfield, Connecticut. Our site visit was performed on September 27, 2016 by Matthew A. Taylor, P.E., David M. Barstow, P.E., and Anthony Trani of GZA GeoEnvironmental, Inc. (GZA) and Don Moisa of Town of Wethersfield. At the time of the inspection, the weather was cloudy with a temperature of approximately 65° Fahrenheit.

The purpose of our efforts was to assess the current condition of the dam and to prepare an updated, formal Regulatory Inspection of the dam in accordance with the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) Dam Safety Regulation 22a-409, pertaining to inspection frequency. Our services and report are subject to the Limitations found in **Appendix D**.

Wintergreen Woods Dam is currently classified by the Connecticut Department of Energy and Environmental Protection (CTDEEP) as **Class AA (Negligible) Hazard Potential**. Based on our visual inspection, the dam has been judged to be in **POOR** condition, in GZA's opinion. The primary reasons for the "Poor" Condition rating are the right embankment has been partially breached and the spillway concrete is severely spalled. Refer to **Appendix A** for the condition rating definitions as per the Connecticut Dam Safety regulations.

The deficiencies at the dam observed during the visual inspection include but are not limited to:

1. The right embankment is currently partially breached immediately adjacent to the right training wall of the spillway.
2. The reinforced concrete of the training walls and spillway is severely spalled with exposed steel rebar;

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3. The concrete apron is cracked and missing sections at the left and right embankment contacts and undermined where it discharges to Folly Brook;
4. The low-level outlet could not be located and is assumed to be inoperable;
5. The embankment crest is rutted from foot traffic and bare soil areas are exposed; and
6. Thick brush growth and trees on the upstream and downstream slopes and crest of the dam.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can unsafe conditions be detected.

In accordance with the State of Connecticut Regulation of the Department of Environmental Protection concerning Dam Safety Inspection and Classification (Section 22a-409-2), Wintergreen Woods Dam appears to meet the criteria for a **Class AA (Negligible)** Hazard Potential dam and no change to the hazard classification is recommended. Class AA Hazard Potential Dams are exempt from periodic regulatory inspection and submittal of this report to Inland Water Resources Division of CTDEEP is not required.

A further discussion of our evaluation and recommended actions are presented in the Inspection Report. The report includes: (a) CTDEEP Dam Inspection Form; (b) Limitations; (c) Photo Log and Photo Location Plan; and (d) Historic Drawings.

We are happy to have been able to assist you with this inspection. Please contact the undersigned if you have any questions or comments regarding the content of this Inspection Report.

Sincerely,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "D. Barstow".

David M. Barstow, P.E.
Project Manager

A handwritten signature in blue ink, appearing to read "P. Baril".

Peter H. Baril, P.E.
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "M. Taylor".

Matthew A. Taylor, P.E.
Principal-in-Charge

Enclosures:
CTDEEP Dam Inspection Report Form

Appendices

- A. Overall Dam Condition Selection Standards
- B. Hazard Classification of Dams
- C. Photo Location Plan and Photo Log with Site Sketch
- D. Limitations
- E. Historic Drawings



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:	Wintergreen Woods Dam	Inspection Date(s):	9/27/2016
Alternate Dam Name(s):	---	CT Dam ID #:	15912
Location (Municipality):	Wethersfield	Temperature / Weather:	~65°F /Cloudy
Registered?: Yes or No If yes, provide the 9 digit registration number found on the notification letter.	No	Pool Level: See Instructions	~1/2-inch above spillway crest.
Emergency Action Plan?: Yes or No If Yes, see instructions	No	Impoundment Use: use options listed in instructions	Recreation
Hydraulic and Hydrologic Analysis?: Yes or No If Yes, see instructions	No	Stability Analysis?: Yes or No If Yes, see instructions	No
Overall Condition: (refer to Appendix A located at the end of this form): Poor			

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
Matthew Taylor, P.E.	Associate Principal	GZA GeoEnvironmental, Inc.
David Barstow, P.E.	Project Manager	GZA GeoEnvironmental, Inc.
Anthony Trani	Assistant Project Manager	GZA GeoEnvironmental, Inc.
Don Moisa	Operations Coordinator	Town of Wethersfield

Owners and Operators: If there is more than one owner or operator, copy the empty table below for each owner or operator and paste right below the previous table, then complete the information for each

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject report. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes by email via deep.damsafety@ct.gov.

Indicate if Owner or Operator: Owner

Name: Town of Wethersfield (Contact: Jeff Bridges, Town Manager)

Mailing Address: 505 Silas Deane Highway

City/Town: Wethersfield

State: CT

Zip Code: 06109

Phone: (860) 721-2801

ext.: ---

Emergency Phone: ---

***E-mail: jeff.bridges@wethersfieldct.gov**

Part II: General Dam Information

General Description: Wintergreen Woods Dam is an earthen embankment dam with a maximum height of about 4.5 feet and a total length of approximately 200 feet. The right embankment is about 140-feet long and the left embankment is about 35-feet long. Existing topography serve as the abutments for the embankments. **Currently, there is an 18-foot-wide, 2- 3-foot deep breach in the right embankment, immediately adjacent to the right training wall of the spillway.**

The 16-foot-wide, reinforced concrete spillway consists of a 1-foot-high, broad crested weir. The 4.5-foot-long (left and right) training walls are integral to the spillway and are in line with the spillway. A concrete-reinforced, rip rap discharge apron is located downstream of the spillway. The discharge apron is about 25-feet-long and extends onto the dam crest on the left and right embankments. The spillway discharges to Folly Brook. The impoundment is used for recreation.

Hazard Classification: AA	Dam Height (ft): 4.5
Dam Length (ft): 200	Spillway Length (ft): 16
Spillway Type: Broad crested weir	Normal Freeboard (ft): 1
Drainage Area (square miles): 0.78 (500-acres)	Impoundment Area (at principal spillway crest, in acres): 1

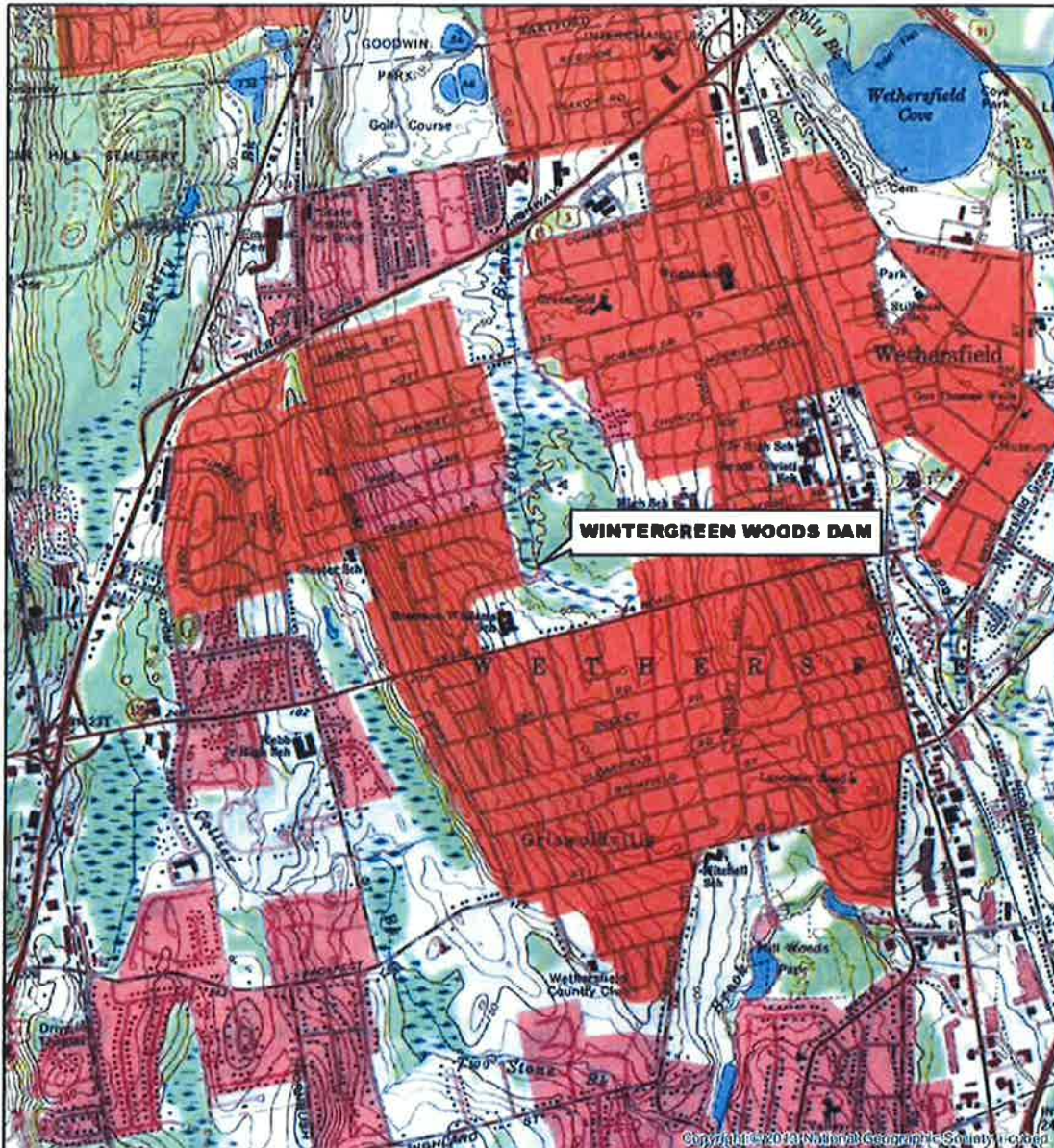
Watercourse(s): Spillway discharges to Folly Brook which flows north to Goodwin Park.


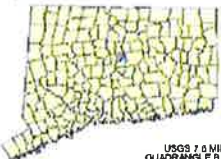

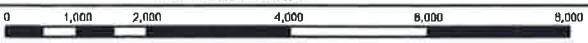
OTHER INFORMATION: Based on the Proposed Wintergreen Woods Weir plan referenced below, the low-level outlet consists of an approximately 10-foot-long, 8-inch-diameter ductile iron pipe with an invert at El. 50.25 feet. A gate valve is shown on the downstream side of the spillway. The top of the discharge apron is at about Elevation 53 feet near the spillway. The low-level outlet is not visible. The discharge apron may have been constructed over the low-level outlet.

References:

1. "Dam Registration Form, Department of Environmental Protection, State of Connecticut", undated; and
2. Plan entitled "Proposed Wintergreen Woods Weir", dated August 14, 1968, prepared by Town of Wethersfield, Department of Public Work, Engineering Division, Sheet 6 of 6.





 <p>GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>  <p>USGS 15 MINUTE QUADRANGLE BASE MAP HARTFORD SOUTH, CONNECTICUT 1987</p>	<p>WINTERGREEN WOODS DAM LOCUS</p>		<p>N</p> 
	<p>WETHERSFIELD, CONNECTICUT</p>		
	<p>Source: TOPOI maps are USGS topographic maps, Copyright:© 2011 National Geographic Society, i-cubed and are provided by zqzonline.com.</p>		
	<p>PROJ MGR: DMB</p>	<p>REVIEWED BY: MAT</p>	
<p>DESIGNED BY: AJT</p>	<p>DRAWN BY: AJS</p>	<p>DATE: SEPTEMBER 2016</p>	<p>FIGURE 1</p>
<p>THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSIDERED AS A PRIMARY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.</p>			
 <p>Scale in Feet</p>			

© 2016 - GZA GeoEnvironmental, Inc. J1_46,600_45,999\46906 h08 Town of Wethersfield\49906 00.dwg\GIS\mxd\LOCUS WGRN WOODS.mxd, 9/29/2016, 10:47:29 AM, m.m. strubel

Part IV: Dam/Embankment/Dike Information

Number of Dam/Embankments/Dikes: (2) Two

All directional references relate to looking downstream i.e. right is northeast and left is southwest.

Dam/Embankment/Dike Name (see instructions): left embankment

General Description: The left embankment is an approximately 35-foot long earthen embankment. Existing topography functions as the left abutment. A walking path is located on the crest of the embankment. The right abutment ties into the spillway and discharge apron. The upstream and downstream embankment slopes were not visible due to the heavy brush, vegetation and trees.

General Condition: Poor

Concrete Condition: N/A

Stone Masonry: N/A

Settlement/Alignment/Movement: The walking path on the dam crest was rutted from foot traffic. Heavy vegetation obscured the view of the upstream and downstream embankment slopes.

Seepage/Foundation Drainage: None observed

Riprap: None Observed

Erosion/Burrows: None Observed

Vegetative Cover: Heavy vegetation/brush and several mature trees (up to 12" diameter) were observed on the upstream and downstream slopes. Portions of the crest were vegetation/brush but the crest predominately bare soil due to the walking path.

Other: N/A

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Dam/Embankment/Dike Name (see instructions): right embankment

General Description: The right embankment is an approximately 140-foot long earthen embankment. Existing topography functions as the right abutment. A walking path is located on the crest of the embankment. The left abutment ties into the spillway and discharge apron. The upstream and downstream slopes were not visible due to the heavy brush, vegetation and trees.

General Condition: Poor

Concrete Condition: N/A

Stone Masonry: N/A

Settlement/Alignment/Movement: An 18-foot-wide, 2- to 3-foot deep breach in the right embankment was observed to the right of the spillway. An approximate 4.5-foot-wide channel of water (about 6 inches deep) was observed flowing through the breach in the embankment and discharging to Folly Brook. In addition, the walking path on the dam crest was rutted from foot traffic. Heavy vegetation obscured the view of the upstream and downstream embankment slopes.

Seepage/Foundation Drainage: None observed

Riprap: None Observed

Erosion/Burrows: None Observed

Vegetative Cover: Heavy vegetation/brush and several mature trees (up to 12" diameter) were observed on the upstream and downstream slope. Portions of the crest had vegetation/brush but the crest was predominately bare soil due to the walking path.

Other: Several logs were observed within the dam breach. A wooden board was placed over the logs and is used as a bridge over the breach.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part V: Principal Spillway, Training Walls, Apron

Number of Principal Spillways: (1) One

Spillway Type (see instructions): Broad Crested Weir

General Description: The 16-foot-wide, reinforced concrete spillway consists of a broad crested weir at about El. 54.5 feet. The 4.5-foot-long (left and right) training walls are integral to the spillway and are in-line with the

spillway. The top of the training walls is at about El. 55.5 feet. There is a mass-poured concrete apron (an apparent repair effort) on the downstream side of the spillway. The concrete appears to have been placed over the rip rap downstream of the spillway. The apron is about 25-feet-long and extends onto the dam crest on the left and right embankments. The top of the spillway is about 12 inches above the discharge apron.

General Condition: Poor

Concrete Condition: Poor – spalling and 1.5-inches of rebar were observed on the principal spillway and spalling and rebar were observed on the left training wall.

Stone Masonry: N/A

Settlement/Alignment/Movement: None observed

Cracks: None observed

Scouring/Undermining: The discharge apron is damaged and the concrete is missing in several areas near the embankment contacts. The apron is eroded and undercut by up to about 2 feet on the right and left sides and at the discharge end, where it ties into Folly Brook.

Seepage/Foundation Drainage: None observed (however tailwater conditions limited visual observation)

Other: N/A

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part VI: Auxiliary Spillway, Training Walls, Apron

Number of Auxiliary Spillways: (0) None

Part VII: Downstream Channel

Number of Downstream Channels: (1) One

Channel Name (see instructions), include Watercourse Name: Folly Brook

General Description: Folly Brook is a natural brook which flows to the north through woodlands consisting of brush and mature trees.

General Condition: Satisfactory

Scouring: None observed, submerged channel

Debris: A broken television was observed in the brook at the end of the discharge apron. Vegetation and brush were observed overhanging the downstream channel.

Riprap: None observed, submerged channel

Other: Undercutting was observed on the left bank of the downstream channel. The bank undercutting was observed starting at the apron and extending approximately 100 feet downstream.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part VIII: Intake Structure(s)

Number of Intake Structures: (0) None

Part IX: Outlet Structure(s)

Number of Outlet Structures: (0) None

Part X: Miscellaneous Features

List miscellaneous features: Wintergreen Woods Dam is accessed via a footpath located on the east side of the intersection of Wells Farm Drive and Western Boulevard. Wintergreen Woods Dam is approximately 300 feet

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part XI: Downstream Hazard Classification Reassessment

Downstream Hazard Classification:

Wintergreen Woods Dam is located east of the intersection of Western Boulevard and Wells Farm Drive. The downstream channel for the dam is the north flowing Folly Brook. The downstream area is undeveloped and wooded except for an access road and bridge over Folly Brook approximately 1,000-feet downstream (north) of the dam. Further breaching of the dam would allow flood water to reach the downstream area. However, it is unlikely flood waters would affect the access road, roads to the east (minor roads for a housing development approximately 750 feet downstream of the dam) or Nott Street approximately 3,200 feet downstream of the dam, further downstream, given that the dam is currently partially breached and these areas are currently unaffected by this partially breached condition.

In accordance with the State of Connecticut Regulation of the Department of Environmental Protection concerning Dam Safety Inspection and Classification (Section 22a-409-2), Wintergreen Woods Dam appears to meet the criteria for a Class AA (Negligible) Hazard Potential dam and no change to the hazard classification is recommended, in GZA's opinion.

Part XII: Recommendations *(See instructions for identifying recommendations)*

Recommendations: The following recommendations and remedial measures generally describe the recommended approach to address the current deficiencies at the dam. Prior to undertaking any maintenance, repairs or remedial measures, the applicability of dam safety and environmental permits should be considered.

1. Repair the breach in the right embankment. Backfill the area with low permeability fill placed in the dry and in compacted in controlled lifts.
2. Repair the portions of the embankment that have been undercut/undermined at the edges of the concrete discharge apron using either compacted low permeability fill or flowable fill.
3. Repair the deteriorated concrete and exposed rebar on the spillway weir and training walls to mitigate further deterioration.
4. Consider performing the recommended repair work during the dry season to limit the amount of water control (i.e. coffer damming) needed to allow the work to occur in the dry.

Recurrent Maintenance Recommendations:

GZA recommends the following recurrent maintenance-level activities that can be undertaken by Owner and do not require engineering design or a dam safety permit.

1. Remove trees and brush on dam embankments (upstream and downstream slopes).
2. Backfill the rutting on the dam crest. Consider adding crushed stone to reduce foot traffic induced erosion.
3. The low-level outlet should be located and its operability should be determined.

Part XIII: Photographs/Graphics *(see instructions and Appendix C)*

Refer to Appendix C for Photographic Log.

Part XIV: Sketches

Refer to Appendix C and E for a Site Sketch.

Part XV: Professional Engineer Certification

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."



4/16/17

Signature of Professional Engineer

Date

Matthew A. Taylor

Associate Principal

26480

Printed Name of Professional Engineer

Title

CT P.E. Number

GZA GeoEnvironmental, Inc
Name of Firm

Affix P.E. Stamp Here



Part XVI: Owner Signature

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
Jeff Bridges (Town of Wethersfield)	Town Manager
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

APPENDIX A

OVERALL DAM CONDITION SELECTION STANDARDS

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.

APPENDIX B

HAZARD CLASSIFICATION OF DAMS

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.

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.)

APPENDIX C

PHOTO LOCATION PLAN AND PHOTO LOG WITH SITE SKETCH



Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 01	Date: 9/27/16
Direction Photo Taken: Southerly	
Photographer: D. Barstow	
Description: Overview of spillway and impoundment from downstream. Note severe spalling on spillway crest.	



Photo No.: 02	Date: 9/27/16
Direction Photo Taken: Southwesterly	
Photographer: D. Barstow	
Description: Overview of the spillway, apron and embankment crest from right of spillway. Note the heavy vegetation/brush on the upstream and downstream slopes and cracked apron.	





Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 03	Date: 9/27/16	Dam Breach	
Direction Photo Taken: Southwesterly			
Photographer: D. Barstow			
Description: Overview of right embankment near the spillway. Note heavy vegetation/brush on upstream and downstream slopes and dam breach near the apron. The logs and board serve as a bridge over the breach. Bare earth on the embankment crest.			

Photo No.: 04	Date: 9/27/16	
Direction Photo Taken: Southerly		
Photographer: D. Barstow		
Description: Overview of the upstream face of the left embankment. Note the thick brush and damaged concrete apron on embankment crest.		



Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 05	Date: 9/27/16
Direction Photo Taken: Northeasterly	
Photographer: D. Barstow	
Description: Overview of right training wall and upstream face of the right embankment. Note heavy brush.	



Training Wall

Photo No.: 06	Date: 9/27/16
Direction Photo Taken: Southwesterly	
Photographer: D. Barstow	
Description: Overview of crest on left embankment. Note the bare earth on crest and heavy vegetation on upstream and downstream embankment slopes.	





Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 07	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of crest on right embankment. Note the and heavy vegetation on upstream and downstream embankment slopes.	



Photo No.: 08	Date: 9/27/16
Direction Photo Taken: Southwesterly	
Photographer: D. Barstow	
Description: Overview of left training wall.	





Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 09	Date: 9/27/16
Direction Photo Taken: Southeasterly	
Photographer: D. Barstow	



Description:
Overview of apron. Note cracks and missing sections of apron.

Photo No.: 10	Date: 9/27/16
Direction Photo Taken: Southerly	
Photographer: D. Barstow	



Description:
Overview of weir and impoundment area. Note severe spalling and exposed steel rebar.



Client Name: Town of Wethersfield	Site Location: Wintergreen Woods Dam, Wethersfield, CT	Project No.: 05.0045906.00
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Photo No.: 11	Date: 9/27/16
Direction Photo Taken: Northwesterly	
Photographer: D. Barstow	
Description: Downstream channel (Folly Brook). Note television in brook and undercutting of left bank of the brook.	



Photo No.: 12	Date: 9/27/16
Direction Photo Taken: Northeasterly	
Photographer: D. Barstow	
Description: Undermining of apron at point of discharge to Folly Brook. Undermining is approximately 24-inches.	





Client Name:
Town of Wethersfield

Site Location:
Wintergreen Woods Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 13
Date: 9/27/16

Direction Photo Taken:
Westerly

Photographer:
D. Barstow

Description:
Overview of breach in the right embankment looking left towards spillway. The board is used as a bridge to cross the breach. The logs were placed to support the board.



Photo No.: 14
Date: 9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:
Overview of breach in the right embankment looking right towards the embankment.





Client Name:

Town of Wethersfield

Site Location:

Wintergreen Woods Dam, Wethersfield, CT

Project No.:

05.0045906.00

Photo No.:
15

Date:
9/27/16

Direction Photo Taken:
Easterly

Photographer:
D. Barstow

Description:
Overview of breach in the right embankment. Note cracks and missing sections of apron.



APPENDIX D

LIMITATIONS



USE OF REPORT

1. GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of the Town of Wethersfield (Client) for Wintergreen Woods Dam and for the stated purpose(s) and location(s) identified in the Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

SUBSURFACE CONDITIONS

4. If presented, the generalized soil profile(s) and description, along with the conclusions and recommendations provided in our Report, are based in part on widely-spaced subsurface explorations by GZA and/or others, with a limited number of soil and/or rock samples and groundwater /piezometers data and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
5. Water level readings have been made in test holes (as described in the Report), monitoring wells and piezometers, at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the groundwater and piezometer levels, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, reservoir and tailwater levels, the presence of subsurface utilities, and/or natural or artificially induced perturbations.

GENERAL

6. The observations described in this report were made under the conditions stated therein. The conclusions presented were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.
7. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein available to GZA at the time of the evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.



8. Any GZA hydrologic analysis presented herein is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the site's spillway, impoundment, and drainage network has not been evaluated.
9. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the structure or site, or to structures on the site was unavailable or limited, GZA renders no opinion as to the condition of that portion of the site or structure. In particular, it is noted that water levels in the impoundment and elsewhere and/or flow over the spillway may have limited GZA's ability to make observations of underwater portions of the structure. Excessive vegetation, when present, also inhibits observations.
10. In reviewing this Report, it should be realized that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued inspection and care can there be any chance that unsafe conditions be detected.

COMPLIANCE WITH CODES AND REGULATIONS

11. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.
12. This scope of work does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

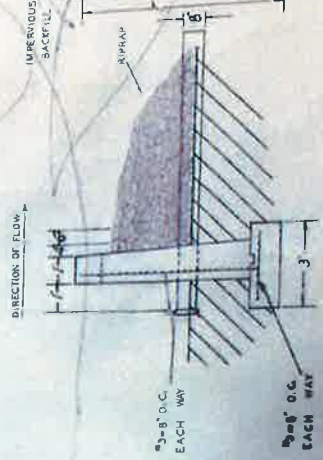
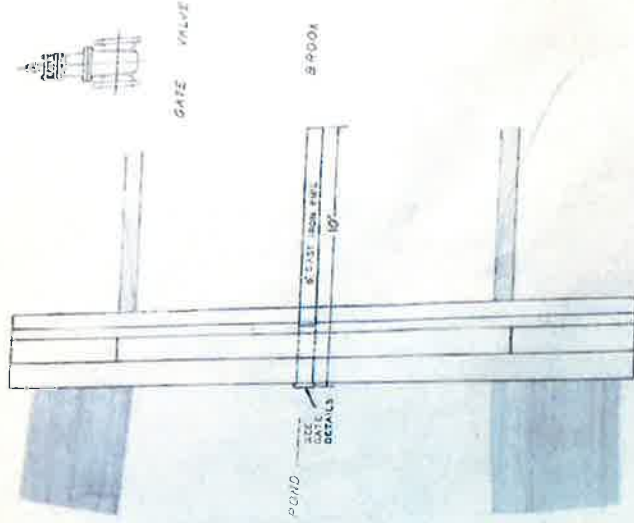
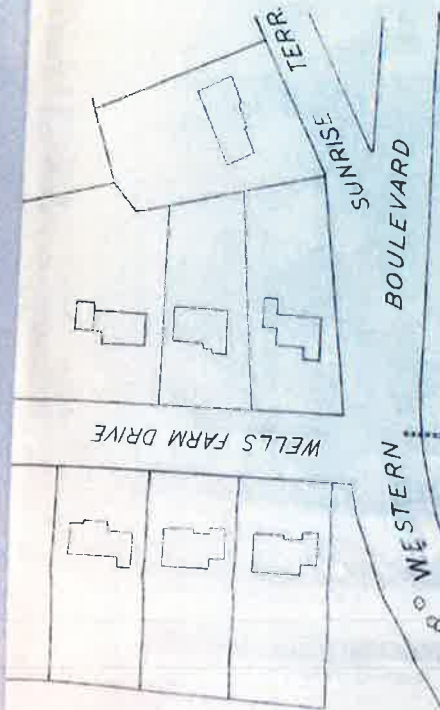
COST ESTIMATES

13. Unless otherwise stated, our cost estimates are for comparative, or general planning purposes. These estimates may involve approximate quantity evaluations and may not be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over the labor and material costs required to plan and execute the anticipated work, our estimates were made using our experience and readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

ADDITIONAL SERVICES

14. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX E
HISTORIC DRAWINGS

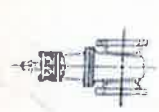


TOWN OF WETHERSFIELD
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION

**PROPOSED
 WINTERGREEN WOODS
 WEIR**

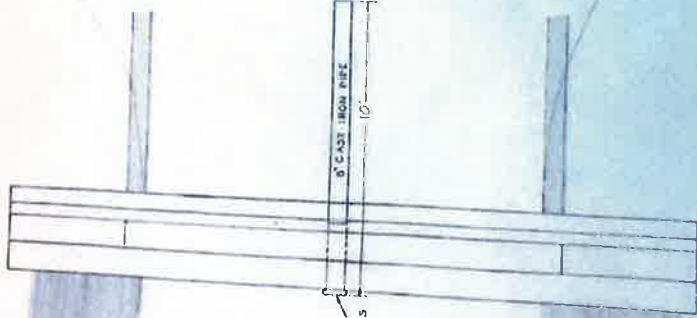
E.C.	M.R.	DATE	NO.
8-14-68	1-40'		

SCALE 1"=2'



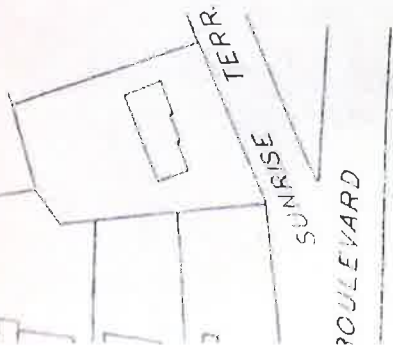
GATE VALVE

BRICK



POWD

SEE GATE DETAILS



SUNRISE TERR.

BOULEVARD

PROPOSED PROJECT



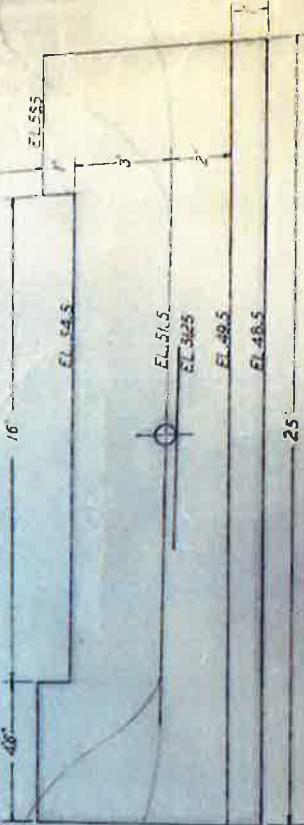
DIRECTION OF FLOW

IMPERVIOUS BACKFILL

RIPRAP

3'-8" D.C. EACH WAY

3'-8" D.C. EACH WAY



16'

EL. 54.5

EL. 51.5

EL. 50.25

EL. 49.5

EL. 48.5

25'

SCALE 1"=1'

SS-286

MAP NO. 11-1683 FILE NO. 11-40

ETHERSFIELD	
PUBLIC WORKS	
PERMISSION	
POSED	
WOODS	
IR	
CR	
40	