

Saratoga Mill Dam Inspection Report

Field File No. 67.23

Key Sequence No. 630

Waukesha County, Wisconsin



Prepared for:

**City of Waukesha
Waukesha, Wisconsin**

January 2019

January 8, 2019

Ms. Katie Jelacic, PE
City of Waukesha Engineering Division
City Hall Annex
130 Delafield Street
Waukesha, WI 53188

Re: Dam Safety Inspection Report, Saratoga Mill Dam
WDNR Field File No. 67.23, Key Sequence No. 630

Dear Ms. Jelacic,

Ayres Associates completed an inspection of the Saratoga Mill Dam on October 3rd and November 6th, 2018, in accordance with Wisconsin Department of Natural Resources (WDNR) guidelines. Two visits were made to the site because flows were above normal on October 3rd. On November 6th flows were lower, but still higher than normal. The following list describes recommendations based on our inspection and due dates based on the WDNR's suggested time frames. Please note that dam structures are referenced from left to right while looking in a downstream direction.

1. Benchmarks

December 1, 2019

There are no benchmarks on the dam. NR 333 requires that all large dams have one benchmark on the dam and two benchmarks off the dam. One benchmark is required on the dam and should be set in an accessible location such as the deck of the overlook above the spillway. It may be possible to tie benchmark into existing off-site benchmarks such as benchmarks on the downstream bridge. Benchmarks should be in NAVD88 datum.

2. IOMP and EAP

June 1, 2019

Ayres Associates is in the process of preparing an Emergency Action Plan (EAP) and Inspection, Operation and Maintenance Plan (IOMP). Final plans will be submitted to DNR for approval by the date above

Summary of Required Work and Schedule

The following schedule has been established for completing the necessary modifications, repairs, and/or reports.

Item	Completion Date
1. Benchmarks	December 1, 2019
2. Submit EAP and IOMP	June 1, 2019

Ms. Katie Jelacic
January 8, 2019
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Note the Saratoga Mill dam does not include earthen embankments, an auxiliary spillway nor a lake drain. In the 2010 inspection of the dam, seepage was noted on the right abutment near the stairs. This seepage was not observed during either site visit in 2018. We also could not visually inspect downstream of the spillway for scour or undermining. We recommend that in a period of low flows, the City visually inspect the dam to document the presence of adequate riprap at the toe of the spillway.

The inspection checklist, consultant checklist, certification, and photos from the inspection are enclosed, along with a CD containing electronic files. We have sent the same items to the WDNR representative. The inspection process will be complete when the WDNR sends you a letter which approves our inspection and recommendations. Be sure to inform the WDNR prior to performing any work on the dam other than routine maintenance.

Please let us know if we can be of further assistance to you.

Sincerely,

Ayres Associates Inc

A handwritten signature in black ink, appearing to read "Chris Goodwin".

Christopher T. Goodwin, PE
Manager, Water Resources
GoodwinC@AyresAssociates.com
Direct: 715.831.7682

Enclosures

cc: Michelle Hase, WDNR

Name of Dam:	Saratoga Mill Dam	Date:	10/3/2018
Inspectors:	Chris Goodwin	F.F #:	67.23
Owner's Name:	City of Waukesha	Key Seq #:	630
Street:	130 Delafield Street		
City, State, Zip Code:	Waukesha, WI 53188		
County:	Waukesha	Owner's Phone:	262.524.3587
Weather and Site conditions:	Cloudy, 65 degrees	Email:	kjalacic@waukesha-wi.gov

GENERAL				Action		
Item	N	P	Notes/ Observations	M	I	R
1 Monuments/Benchmarks						2
Location:	No benchmark on dam					
Elevation:						
Datum:						
2 Pool Level						
Normal/Operating:	Pool about 6 inches to foot high during October Visit, revisited site on November 6					
Maximum:	Flow still elevated on November 6th					
Minimum:						
Staff Gage			No staff Gauge			
3 Access Road						
	City Park					
4 Signage/ Security						
Portage/route:	x	x				
Dam Warning:	x	x				
Downstream Hazard:			City			
Fencing/Railings/Catwalks:			Good			

Additional Comments:

N= Noted; P= Photo; M= Monitor

I= Investigate; R= Repair

F.F.= Field File; RT = Right; LT = Left

U/S = Upstream; D/S = Downstream

Action Suggestion 1. Requires immediate action

2. Plan to do soon

3. Do when convenient

GENERAL (Cont.)										
5 Hazard Section										
A. D/S Development										
Density:		Dense Urban								
Distance:		Dam is in City								
Type (Residential, Commercial, Industrial):		Residential and Commercial								
B. Channel Crossing										
Type:		Bridge								
Dimensions:										
D/S distance:		100 feet downstream								
Traffic Level (Local, CTH, Rail Road, STH, Interstate, etc):		Local								
C. Distance to nearest D/S community/impoundment:										
Name:		In City of Waukesha								
D. Anticipated Hazard (based on landuse and zoning):		Low								
E. Dam Failure Analysis										
Date Completed/Approved		1991								
Is map available?		Yes								
Are map & profile adopted?		Yes								
List adoption date:										
Verify validity of failure mode:										
Verify validity of DFA conclusions:										
F. Emergency Action Plan		Y	N	Comments, Explanation, and Description				M	I	R
1. Current plan posted?										2
2. Understood by Operator?										
3. Warning systems?										
4. Certification of last test?										
5. Remote operation?										
6. Revision Date?										
7. Habitable structures?										
8. Recreation areas?										
9. Changed hazard potential?										
10. New development?										
11. Other comments?										
Additional Comments:										
EAP and IOMP will be completed in 2018										
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Dam Inspection Checklist Saratoga Mill Dam F.F #: 67.23 Date: 10/03/18 Page 2 of 5										

SPILLWAY--PRINCIPAL - FIXED CREST										Action		
Item		N	P	Notes/ Observations						M	I	R
1 Fixed Crest		X		No problem				Not applicable			Could not inspect	
A. Dimensions												
Top Width:		Fixed crest wier 105 feet long.										
Crest Elevation:												
B. Materials												
C. Shape (sharp-crested, broad-crested, ogee, chute, gated, overflow, morning glory, dropbox, labyrinth)				Overflow ogee with 4 stop log bays								
D. Debris												
Prevention (racks, booms, etc.):		No prevention, no debris noted										
E. Concrete Condition *												
		Good										
F. Flashboards (none, number):												
Type (Metal, wood):		NA										
Dimensions:												
Operability:												
G. Abutments										3		
Condition: *		Good										
Seepage/wetness:		No wetness observed in either site visit										
H. Drains				No problem		x	Not applicable		x	Could not inspect		
Type: Weep holes, Relief drains, Other:												
Flow Rate:												
I. Other												
N= Noted; P= Photo; M= Monitor I= Investigate; R= Repair F.F.= Field File; RT = Right; LT = Left U/S = Upstream; D/S = Downstream												
Action Suggestion 1. Requires immediate action 2. Plan to do soon 3. Do when convenient Controlled = Gated Uncontrolled = Overflow												
Additional Comments:												
* Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts, honeycombing, scaling, craze/map cracks, isolated crack, disintegration, other												

Saratoga Mill Dam

F.F #: 67.23

Date: 10/03/18

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SPILLWAY-PRINCIPAL - GATES									Action			
Item	N	P	Notes/ Observations						M	I	R	
1 Gates	x	No problem	x	Not applicable		Could not inspect						
A. Types (lift/slide, tainter(radial), stoplogs, leaf, roller, flashboards, needles, other): Number and Size:												
B. Stoplogs Dimensions: Condition:			Stop Logs 5 foot good									
C. Abutments Condition: * Seepage/wetness:			Good									
D. Piers (number, shape) Condition: *			Good									
E. Operability Type of Operator: Condition(chain, cables,hoists): Security(locked?): Backup Operator:			no operator, not removed for spillway capacity Have to manually remove									
F. Access			Off overlook									
G. Condition Rust: Seals (leakage):			Good									
H. Ice protection Type (Heaters, Bubblers, Barriers, Other)			NA									
I. Debris Prevention (Rack, boom, etc.)			No prevention, no debris noted									
J. Condition of Flowway			Flows too high to check for scour. No evidence of scour									
K. Drains Type (Weep holes/ Relief drains/ Other): Flow rate: Location:			None									
L. Other												
N= Noted; P= Photo; M= Monitor Action Suggestion 1. Requires immediate action I= Investigate; R= Repair 2. Plan to do soon F.F.= Field File; RT = Right; LT = Left 3. Do when convenient U/S = Upstream; D/S = Downstream Controlled = Gated Uncontrolled = Overflow												
Additional Comments and/or Sketch:												
* Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts, honeycombing, scaling, craze/map cracks, isolated crack, disintegration, other												
Dam Inspection Checklist												
Saratoga Mill Dam	F.F #: 67.23								Date: 10/03/18	Page 4 of 5		

SPILLWAY--PRINCIPAL - WHISTLE TUBES						Action		
Item	N	P	Notes/ Observations			M	I	R
1 Whistle Tubes			Full circle/Whistle tube		Half circle riser		Glory hole (Drop Inlet)	
A. Inlet Riser Diameter								
B. Outlet pipe *								
Dia:		Type:						
C. Low level draw /Inlet Pipe								
What kind & Size:								
D. Debris/Trash Rack								
E. Antivortex								
F. Material								
G. Alignment								
N= Noted; P= Photo; M= Monitor Action Suggestion 1. Requires immediate action I= Investigate; R= Repair 2. Plan to do soon F.F.= Field File; RT = Right; LT = Left 3. Do when convenient U/S = Upstream; D/S = Downstream Controlled = Gated Uncontrolled = Overflow								
Additional Comments and/or Sketch:								
* Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts, honeycombing, scaling, craze/map cracks, isolated crack, disintegration, other								
Dam Inspection Checklist Saratoga Mill Dam F.F #: 67.23 Date: 10/03/18 Page 4 of 5								

SPILLWAY--PRINCIPAL - OUTLET EROSION CONTROL & UNDERMINING										
								Action		
Item	N	P	Notes/ Observations					M	I	R
1 Outlet Erosion Control			No problem			Not applicable	x	Could not inspect		
A. Type (none, endwall, plunge pool, energy dissipation structure rock lined channel, apron)	Apron									
B. Scour										
	No evidence of scour, but flows are elevated									
C. Material										
a. Riprap: Avg Diameter: Condition (adequate, sparse, displaced, weathered): Bedding fabric- (Yes/ No):										
b. Concrete * Dimensions/Location:										
D. Sidewall/Headwall										
Misalignment:	Good									
Location:										
Description:										
E. Separated Joint / Loss of Joint Material:										
Location:	None									
Description:										
F. Natural										
2 Undermining			No problem			Not applicable	x	Could not inspect		
Location:										
Description:										
N= Noted; P= Photo; M= Monitor I= Investigate; R= Repair F.F.= Field File; RT = Right; LT = Left U/S = Upstream; D/S = Downstream Action Suggestion Controlled = Gated 1. Requires immediate action 2. Plan to do soon 3. Do when convenient Uncontrolled = Overflow										
Additional Comments:										
* Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts, honeycombing, scaling, craze/map cracks, isolated crack, disintegration, other										

Saratoga Mill Dam (Key Sequence No. 630) October 3, 2019	
File Name	Description
0063010031801.jpg	Dam Warning Sign and Portage Route
0063010031802.jpg	Overflow Spillway from Right Overlook
0063010031803.jpg	Stop Logs
0063010031804.jpg	Downstream Bridge
0063010031805.jpg	Upstream View of Dam
0063010031806.jpg	Upstream View of Dam
0063010031807.jpg	Overflow Spillway from Left Abutment
0063010031808.jpg	Left Abutment



Saratoga Mill Dam
0063010031801.jpg
Dam Warning Sign and Portage Route



Saratoga Mill Dam
0063010031802.jpg
Overflow Spillway from Right Overlook



Saratoga Mill Dam
0063010031803.jpg
Stop Logs



Saratoga Mill Dam
0063010031804.jpg
Downstream Bridge



Saratoga Mill Dam
0063010031805.jpg
Upstream View of Dam



Saratoga Mill Dam
0063010031806.jpg
Upstream View of Dam



Saratoga Mill Dam
0063010031807.jpg
Overflow Spillway from Left Abutment



Saratoga Mill Dam
0063010031808.jpg
Left Abutment

Consultant Inspection Process Form – for dam inspected by outside consultant

Task		Date Completed	Responsible Party	
			Owner/ Consultant	DNR
Inspection Notification *Notify dam owner of DNR inspection date/time	X	09/24/18	X	
File Research *Review last inspection report, photos, database, aerial photos, ownership information, etc.	X	09/24/18	X	
Field Inspection *Physically inspect dam, conduct survey if required	X	10/03/18	X	
Inspection Checklist *Fill out form documenting observations during inspection	X	10/03/18	X	
Photo Documentation *Print and label photos, back up digital copies	X	10/03/18	X	
Review Sufficiency Rating *Complete Sufficiency Rating questionnaire based on current condition of the dam.				X
Review Hazard Rating *Review downstream development for changes, check if downstream zoning is adopted	X	10/03/18	X	
Review EAP *Review and update EAP, submit to DNR	X	11/15/18	X	
Review IOM *Review and update IOM, submit to DNR	X	11/15/18	X	
Inspection Report Submitted to DNR Regional Engineer	X		X	
Inspection Report Submitted to DNR Central Office				X
Response Letter *DNR letter which outlines work needed to be completed on the dam based on consultant inspection				X
Update database *Update owner contact information, follow-up dates, inspection dates, etc. on DNR database				X
Notify DNR of planned work * Determine if plans and specs are needed for the proposed dam work, issue proper permits or plan approvals			X	
Complete Required Elements *Owner completes required items listed in inspection report			X	
Enforcement *Pursue enforcement action against the dam owner if the required elements are not completed by the appropriate deadlines				X

Dam Name: Saratoga Mill Dam

Field File #: 67.23

Engineer Completing Form: Christopher T. Goodwin, PE

Key Sequence #: 630

Certification for Dam Inspection

Local Dam Name (PRINT): Saratoga Mill Dam

DNR Field File #: 67.23

I certify that I have completed the checklist truthfully and factually:

Certifier's Name (print): Christopher T. Goodwin, PE

Company Name: Ayres Associates

Signature: _____

Date: _____

Multidisciplinary: I am experienced in the technical disciplines or I am working with other professionals experienced in the technical disciplines to properly inspect this dam and appurtenant works. Technical disciplines, in addition to general civil engineering, may include geotechnical, geological, hydrologic, structural, and mechanical:

☒ Yes ☐ No

Engineer's Wisconsin Registration Number: 32520-6

Expiration Date: 7/31/2020

Engineer's Seal (optional):