

# DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

County Executive Kathleen M. Falk 1919 Alliant Energy Center Way • Madison, Wisconsin 53713 Phone: (608) 266-4018 • Fax: (608) 267-1533 Commissioner / Director Gerald J. Mandli

# MONDAY, MARCH 17, 2008

# ATTENTION ALL REQUEST FOR PROPOSAL (RFP) HOLDERS

# RFP NO. 108040 - ADDENDUM NO. 1

## ENGINEERING SERVICES FOR BABCOCK & TENNEY DAM FAILURE ANALYSIS, STABILITY ANALYSIS, PERMANENT BENCHMARKS AND AN EMERGENCY ACTION PLAN

# **<u>BIDS DUE</u>**: THURSDAY, MARCH 20, 2008, 2:00 PM. DUE DATE AND TIME ARE NOT CHANGED BY THIS ADDENDUM.

This Addendum is issued to modify, explain or clarify the original Request for Proposal (RFP) and is hereby made a part of the RFP. Please attach this Addendum to the RFP.

# PLEASE MAKE THE FOLLOWING CHANGES:

## 1. Additional Information

- A. Lake Mendota Dam refers to Tenney Locks, and Lake Waubesa Dam refers to Babcock Locks.
- B. Additional site plans, "as-builts", past Inspection, Maintenance, and Failure Analysis Reports, and digital contour data will be available to the successful consultant at no charge.
- C. Add additional DNR Inspection Report information, which is attached to this addendum, to RFP packet.
- D. Add additional DNR letter, dated January 2, 2008, which is attached to this addendum, to RFP packet.
- E. The scope of the Engineering services is only to meet DNR Inspection Report Requirements.
- F. Engineering Budget for Phase I & II is not to exceed \$25,000.00.

#### 2. Scope of Work

Phase I, Item 5:

Change: "Stability Analysis (Babcock Dam ONLY)", to: "Stability Analysis (Both Dams)"

Phase I:

Add: "Item 6. The Dam Failure Analysis and Stability Analysis should be based on NR 333 and

#### Addendum No. 1 RFB No. 108040

NR 116 and will need to be analyzed under normal pool, normal pool with ice, and design flow. It should be looked at for sliding and overturning. Also recommended is the use of Design of Small Dams (from US Dept. of the Interior) as a reference."

If any additional information about this Addendum is needed, please call John Schraufnagel at 608/266-4798.

Enclosed: Additional DNR Inspection Report information - 71 pages Additional DNR letter, dated January 2, 2008 - 1 page ÷. . . . . .

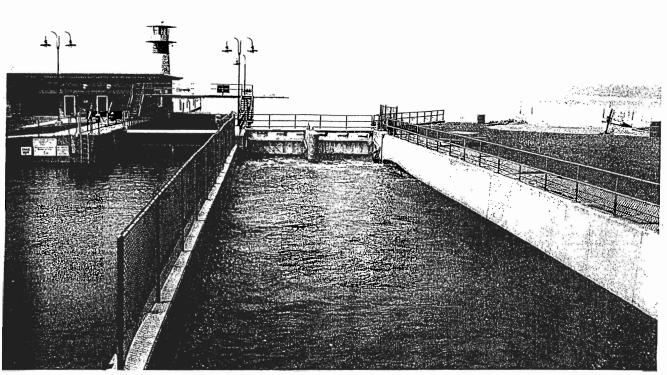


Photo 1 - View of dam from downstream. Two tainter gates on right of wall and lock on left Photo 2 - View looking downstream from bridge over Sherman Avenue



Left and right are determined while looking downstream.

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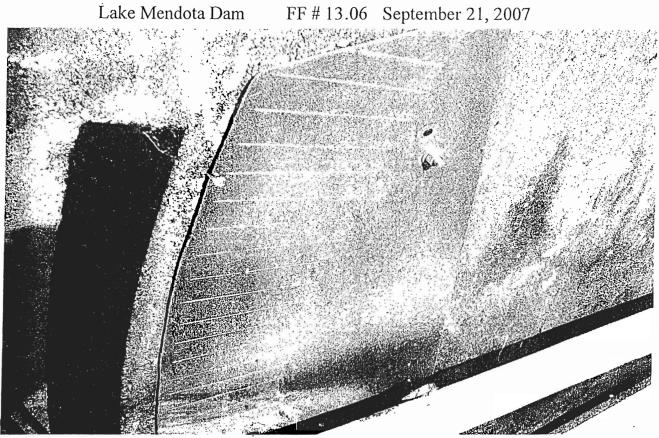
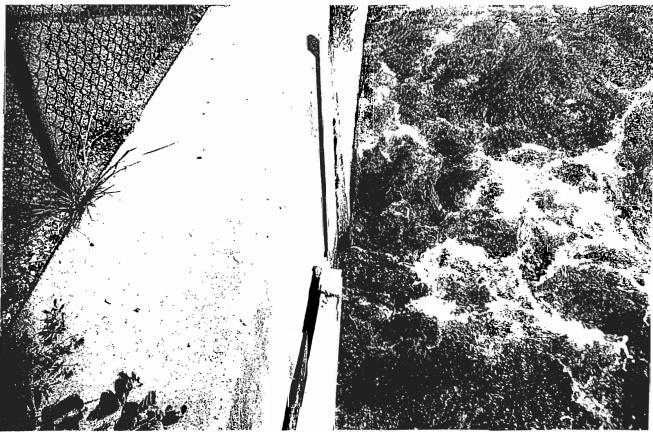


Photo 3 - View graduations showing how much the tainter gate is open Photo 4 - View of left side of left tainter gate. Note patched wall with some minor shifting



Left and right are determined while looking downstream.

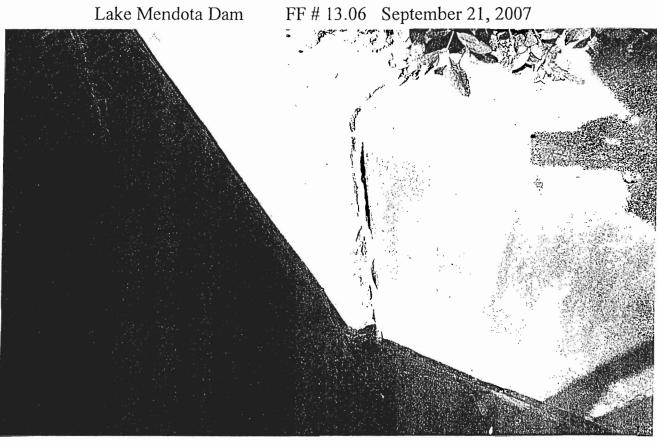
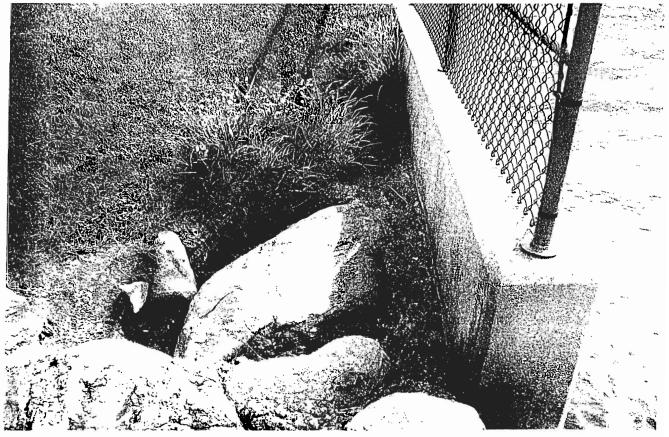


Photo 5 - View of left retaining wall upstream of the tainter gate. Not minor crack separation Photo 6 - View of upstream end of left retaining wall. Note erosion working its way behind wall



Left and right are determined while looking downstream.

Name of Dam: LAKE ME	Date: Date:	91	21	10-1
	, SUE JOSHEFF, KEN JOHNSON F.F#:	13.	06	>
Owner's Name: DANG (	Key Seq #:	57	78	
Street:				
City, State, Zip Code:				
County: DANE	Phone:			
Weather and Site conditions: PA	ETTY CLOUDY, WINDY, 80° Email:			
	GENERAL	A	Actio	n
Item	N Notes/ Observations	M	I	R
1 Monuments/Benchmarks				Ŕ
Location:	BRIDGE DISK KRIDGE FROM 2003	I		<u> </u>
Elevation	1-15- 159-39			
	- BRONZE CAP ON DIS RTZABUT WALL O	E (	00	10 0
	P-13-759-34 -BRONZE CARON DIS RTZABUT. WALL O			<i>C J</i>
2 Pool Level				
Normal/Operating:				
Maximum:				
Minimum:				
3 Access Road	SHERMAN AVENUE - PARKING LOTS			
	ON BOTH SINES - GOOD ACCESS			
4 Signage/ Security	Kitchangely to day to be the second			
Portage:	SHARA "DAM" & "TAKE OUT " SIGNIS			
Dam Warning:	2'			
Downstream Hazard:	- 0K-			
Fencing/Railings/Catwalks:				
5 Hazard Section				
A. D/S Development	RESIDENTIAL			
Density: Distance:	ACOSTERN /TAC			
Type (Residential, Commercial,				
Industrial):				
B. Channel Crossing				
	Idge, Ford, Culvert, Trestle, Other (Explain) (Circle One)	l		
Dimensions:	150° D/S is stream AVE.			
D/S distance:	The Martine My Charles			
Traffic Level (Local, CTH,				
Rail Road, STH, Interstate, etc):				
C. Distance to nearest D/S	Internet MADICAL			
community/impoundment:	IN CITY OF MADISON			
Name:				
D. Fotimated Hazard (				
D. Estimated Hazard (based	EST. SIGNIFICANT			
= Noted; M= Monitor	Action Suggestion 1. Requires immediate action			_
Investigate; R= Repair	2. Plan to do soon			
<b>F.=</b> Field File; $\mathbf{RT} = \text{Right}$ ; $\mathbf{LT} = \text{Left}$	3. Do when convenient			
S = Upstream; D/S = Downstream				
ditional Comments:				1
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				EMBANKMENT	.8	
D	escription: second second second		n an	ana ang ang ang ang ang ang ang ang ang	and the second	. Acti
L		-				MI
	Item		N	Location on Emba	nkment and Deficiency	
.1	Vegetation:	:	No problem			
	A. Trees	-				. L
	, Quantity (<5, sparse, dense)		SPA	RSF, VERY	LARGE EMBANKA	"ENT
	Diameter					
	Location	:				
	·	$\vdash$				
	B. Brush					
	Quantity (sparse, dense):		VERY	LITTLE		
	Location:					
	C. Ground cover					
·	Type (grass, crown vetch, other):		GRASS	, ROTS		
	Quantity (bare, sparse, adequate,		• •	//		
	dense):				· .	
	Appearance (too tall, too short,					
	good):					
				· · · · · · · · · · · · · · · · · · ·	•	
2	Grosion		No problem	Not applicable	Could not inspect	
A	. Wave erosion (Beaching):					
	Scarp: Length/ Width:				F RET. WALL SO.	ME
	Location:		Eposto	N WORKING	BEHIND WALL	
L	· · ·					
B	. Runoff Erosion (Gullies)	R				
	Quantity:					
	Length/ Width/ Depth:					
	Location:					
Ir	nstabilities	1	No problem	Not applicable	Could not inspect	
A.	Slides	A				
	Transverse:					
	Longitudinal:					
	Scarp: Length/ Width:					
	Crack Length/ Width:					
		_	•			
B.	Cracks:					
	Transverse:					
	Longitudinal:					
	Length/ Width/ Depth:					
	Location:					
	· Other:					
C. 1	Bulges/ Depressions					
	Size:	•				
	Height/ Depth:					
	Slope (Too Steep)					
-	, D/S					
Vot	ed; M= Monitor	Ac	tion Suggestion		iate action	
	stigate; <b>R</b> = Repair			2. Plan to do soon		
	ield File; <b>RT</b> = Right; <b>LT</b> = Left			3. Do when conven	ient	
	Jpstream; D/S = Downstream					
dd	itional Comments:					
uu					-	

		EMBANKMENTS (	Cont.)	
· · · · · · · · · · · · · · · · · · ·				Acti
Item	N		/ Observations	MI
4 Slope Protection A. Type (none, riprap, wave	No problem	and the second se		
berm, concrete slabs, loose formed	PIPR.	An or conc	in Al.	
concrete/asphalt):			ere minus	
B. Condition:	Gov			
				L
5 Other	No problem	n Not applicable	Could not inspect	
A. Rodent burrows (few, many)				
B. Ruts				
Length/ Width/ Depth				
Location				
C. Other				
				I
6 Alignment	No problem	Not applicable	Could not inspect	
A. Vertical	0,0007	OPAING PT	>	
Low area Elevation Difference	1	orring Prof		
Location				
Location.				
B. Horizontal	X		·	
				LL.
C. Width	R			
Too narrow:				
Location:		Net and leads		
Cracks/Slumps:	✓ No problem	Not applicable	Could not inspect	
Embankment drains:				L
Type/Flow:				
Location:				
Seepage/ Wetness:				
Hummocky:				
No	8.50			
Seepage Wet area:	No problem	Not applicable	Could not inspect	
Boil:				
Sinkhole:				
Aquatic vegetation:				
Rust colored deposits:				
Other:				
Sediment in Flow:				
Flowrate: Location:				
Location.				
loted; M= Monitor	Action Suggest	ion 1. Requires imme	diate action	
vestigate; R= Repair	. 88	2. Plan to do soor		
= Field File; <b>RT</b> = Right; <b>LT</b> = Le	ft	3. Do when conv	enient	
Upstream; D/S = Downstream		•		
dditional Comments:				
		pection Checklist		
Name:	F.F. #:		Date:	Page of

		SPILLW	AYPRINCIPAL	- FIX	ED CREST	Ac
Item	N		Notes/ Obs			M
1 Fixed Crest		No problem	Not applicab	le	Could not inspect	
A. Dimensions						
Top Width	h:					
B. Materials		· ·				
		· · · · · · · · · · · · · · · · · · ·				
C. Shape (sharp-crested,						
broad-crested, ogee, chute, gated,						
overflow, morning glory,						
dropbox, labyrinth) D. Debris						
Prevention (racks, booms, etc.)						
					··· • •	
E. Concrete Condition *	1					
	<u> </u>					L
	1					
F. Flashboards (none, number):	<u> </u>	· · · · · · · · · · · · · · · · · · ·				
Type (Metal, wood):						
Dimensions:						
Operability:						
G. Abutments			•			
Condition: *		-				
Seepage/wetness:					2	
		5				
H. Drains	N	o problem	Not applicable	I.C	ould not inspect	
Type; Weep holes/ Relief						
						~
drains/ Other:						
drains/ Other: Flow Rate:	l l					
drains/ Other: Flow Rate:	]					
drains/ Other:	]					
drains/ Other: Flow Rate: I. Other	] ]	tion Suggestion 1	Domina immediate e	ation		
drains/ Other: Flow Rate: I. Other Noted; <b>M</b> = Monitor	]		Requires immediate a	ction		
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair		2.	Plan to do soon	ction		
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I	Jeft	2. 3.	Plan to do soon Do when convenient			
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2.	Plan to do soon		ow	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
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drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor ivestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor ivestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor ivestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
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drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
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drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
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drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I	Jeft	2. 3. ontrolled = Gated	Plan to do soon Do when convenient Uncontrolled =		ow	
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drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments: //pe of Concrete Problems: Spa	Left Co	2. 3. NO = Fixe racks, exposed rebar,	Plan to do soon Do when convenient Uncontrolled =	Overfl bug h	oles, efflorescence, popout	
drains/ Other: Flow Rate: I. Other Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments: //pe of Concrete Problems: Spa	Left Co	2. 3. NO = Fixe racks, exposed rebar,	Plan to do soon Do when convenient Uncontrolled = 0	Overfl bug h	oles, efflorescence, popout	

	SPILLW	AY-PRINCIPAL - GA	ATES	Actio
Item	N	Notes/ Observa	tions	MI
1 Gates	No problem	Not applicable	Could not inspect thoroughly	у
A. Types (lift/slide, tainter(radial),				
stoplogs, leaf, roller, flashboards, needles, other):	2 TAINTER	67.775		
Number and Size:		C TTES		
B. Stoplogs	·			
Dimensions:	NONE			Ll
Condition:				
C. Abutments				
Condition: *	NO APPR PR	-obloms 6001	COND.	harmondd.
Seepage/wetness:				
D. Piers (number, shape)	1 Good C			
Condition: *	-			
E. Operability	I IRIES	MANJALLY CA	RANKED 3 TURN	
Type of Operator:	HAC EPANIE	TED MARKS ONS		- 0.1 F
Condition(chain, cables, hoists):	trath 100	KEN & EANCED	IN - CRANES	P
Security(locked?):	Land Free Contraction		IN - CRANES	Comover
Backup Operator:				
F. Access	OPERATOR'S	DECE		
G. Condition				
Rust:	AL - I			
Seals (leakage):	NONE APPR.			
H. Ice protection				
Type (Heaters, Bubblers,	HEATERS IN	NONTER		Lll
Barriers, Other)				
I. Debris				
Prevention (Rack, boom, etc.)	NONE CA	BLE IN FRON	TOF DAM LOU	I.D. CATCH
	LANGE	v - v ,		
J. Condition of Flowway				
	Nor OBSERVER	1		
	<u>г</u>			F 1
K. Drains	· · ·			
Type (Weep holes/ Relief drains/	N.			
Other): Flow rate:	NOT OBSERV	EA .		
Location:				
L. Other	1		I	
	]		L	l
Noted; M= Monitor	Action Suggestion 1. R	equires immediate action		
nvestigate; R= Repair		an to do soon		
= Field File; <b>RT</b> = Right; <b>LT</b> = Le		when convenient		
= Upstream; D/S = Downstream	Controlled = Gated	Uncontrolled = Overf	low	
itional Comments and/or Sketch	:			
ype of Concrete Problems: Spal	- · · · ·			
· · · · · · · · · · · · · · · · · · ·	ODEVCOMDING COSUNG Croze/	nan cracks, isolated crack	, disintegration, other	
. ho			<u> </u>	
ho Name:	Dam Inspectio F.F.#:			of

		SPILLWAYPRI	the second distance of the second			Ac
Item	N	i i i i i i i i i i i i i i i i i i i	the second s	ations		M
1 Whistle Tubes		Full circle/ Whistle tube	Half circle riser	Glory hole (Drop In	leť)	
A. Inlet Riser Diameter						
B. Outlet pipe *						
Dia: Type:						
	· · ·					·
C. Low level draw /Inlet Pi	the second se					
What kind & Siz	ze:					
D. Debris/Trash Rack			,			
E. Antivortex	l				l	
F. Material					T	
					Ĺ	l
G. Alignment		•			L	
Noted; M= Monitor	A =	tion Suggestion 1. Req	uiroo immodiato	ion		
ivestigate; R= Repair	Ac		to do soon	lon .		
ivosugate, it itepan		2. 1 Iai				
= Field File: <b>RT</b> = Right: LT	= Left	3. Do y	when convenient			
= Field File; <b>RT</b> = Right; <b>LT</b> = Upstream; <b>D/S</b> = Downstrea		3. Do water and the state of th	when convenient Uncontrolled = O	verflow		
	am Co			verflow		
= Upstream; D/S = Downstrea	am Co atch:	ntrolled = Gated		verflow		
= Upstream; D/S = Downstrea	am Co atch:			verflow		
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= Upstream; D/S = Downstrea	am Co atch:	ntrolled = Gated		verflow		
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= Upstream; D/S = Downstrea	am Co atch:	ntrolled = Gated		verflow		
= Upstream; D/S = Downstrea	am Co atch:	ntrolled = Gated		verflow		
<u>= Upstream; D/S = Downstrea</u> itional Comments and/or Sk	am Con etch:	ntrolled = Gated	Uncontrolled = O	· · ·		
<u>= Upstream; D/S = Downstrea</u> tional Comments and/or Sk	am Con etch: //o	ntrolled = Gated	Uncontrolled = O	g holes, efflorescence, po	opouts,	
= Upstream; D/S = Downstrea	am Con etch: //o	ntrolled = Gated ONE acks, exposed rebar, misa nbing, scaling, craze/map Dam Inspection C	Uncontrolled = O lignment, joints, bu cracks, isolated cra Checklist	g holes, efflorescence, po ck, disintegration, other	opouts,	

SPILLWAYPR	NINCIPAL - OUTLET EROSION CONTROL & UNDERMINING	• •		
	· · · · · · · · · · · · · · · · · · ·		ctio	
Item	N Notes/ Observations	M	I	I
1 Outlet Erosion Control	No problem Not applicable Could not inspect thoroughly			
A. Type (none, endwall, plunge				
pool, energy dissipation structure	NOT OBSERVED			
rock lined channel, apron)				
B. Scour				
B. Scour	NOT BSEEVED			
C. Material		TT		
a. Riprap: Avg Diameter:			L	
Condition (adequate, sparse,				
displaced, weathered):				
Bedding fabric- (Yes/ No):				
b. Concrete *				
Dimensions/Location:				
D. Sidewall/Headwall				
Misalignment:				
, Location: Description:				
E. Separated Joint / Loss of			Т	
Joint Material:	1	L		
Location:				
Description:				
F. Natural				
	· ·			
2 Undermining	No problem Not applicable Could not inspect thoroughly		- <u>T</u>	
Location:				$\neg$
Description:				
= Noted; M= Monitor	Action Suggestion 1. Requires immediate action			=
= Investigate; R= Repair	2. Plan to do soon			
F.= Field File; $RT = Right; LT = I$	Left 3. Do when convenient			
S = Upstream; D/S = Downstream	Controlled = Gated Uncontrolled = Overflow			
dditional Comments:				
	·			
				ł
	•			
Type of Concrete Problems: Spa	alling, cracks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts,			
	honeycombing, scaling, craze/map cracks, isolated crack, disintegration, other			

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			and the second	PILLWAYAU	XILIARY			
D	escription:	•.	,					cti
	Item	Ν		Notes/ Ob	servations		M	1
	1 Dimensions							
	Length/ Width:							
	Outfall Slope:							
2	2 Type (turf, reinforced turf,							
	riprap, block, concrete):							
1, 'S	3 Signs of usage					L		
	(debris, bent grass, etc.):							
4	4 Vegetation:		No problem					
	A. Trees					L		
	Quantity (<5, sparse, dense): Diameter:							
	Location:							
	B. Brush					L		
	Quantity (sparse, dense):							
	Diameter:							
	Location:							
	C. Ground cover:			•		L		
	Type (grass, crown vetch, other)							
	Quantity (bare, sparse, adequate							
	dense):							
$\downarrow$	Appearance (tall, short, good):							
_	Slopesprotection	N	ot applicable			· · · · · · · · · · · · · · · · · · ·		
ŀ	A. Type (none, riprap, wave					.L		
	berm, concrete slabs, other):							
ŀ	Condition:		T	· · · · · · · · · · · · · · · · · · ·				
_	Erosion	N	problem	Not applicable	Could not inspect		r	
A	A. Wave erosion (beaching):				:			
	Scarp: Length/ Width:							
L	Location:							
B	B. Runoff erosion (Gullies)					L		
	Quantity:							
	Length/ Width/ Depth:							
a .	Location:	1						
	nstabilities		problem	Not applicable	Could not inspect			-
A	. Slides							
	Transverse Length:							
	Longitudinal Length: Scarp: Length/ Width:							
	Location:			,				
	Crack Length/ Width:							
	Location:							
Je		A	ion Suggestion 1 T	Lequires immediate	action			
	ited; <b>M</b> = Monitor estigate; <b>R</b> = Repair	ACI		lan to do soon				
	Field File; RT = Right; LT = Left			o when convenier	ht.			
	Upstream; $D/S = Downstream$		J. 1		n			
_	onal Comments:							
uc	onai Comments.							
·v,	pe of Concrete Problems: Spall	ing c	racks, exposed rehar	misalignment iou	nts bug holes, efflorescence	popouts		
J					ted crack, disintegration, ot			
			Dam-Inspectio					-

			COD				
	Item	N	The second se	LLWAYAUXILIARY (Cont.) Notes/ Observations		Actio	-
	B. Bulges: (Depressions,			Notes/ Observations	M		
	Hummocky):						L
		ze:					
	Height/ Dep						
ł	8 Other		No problem	Not applicable Could not inspect			
ŀ	A. Rodent burrows (few, man					T	
	A. Rodene buillows (lew, main Locatio				L	I	
	B. Ruts	<u>.                                    </u>	1				
	Locatio	n.	_1				
	Length/ Width/ Dept						
	C. Other (debris):		T				
			1				
F	9 Outlet erosion control		No problem	Not applicable Could not inspect thorough	 V		
$\vdash$	A. Type (none, endwall, plunge				<u>}</u>		
	pool, energy, dissipation structure	re	1				
	rock-lined channel, apron						
	Condition (Scour?						
	B. Material	//	······································				
	Riprap: Avg. diameter				L	l	
	Condition (adequate, sparse	1					
	displaced, weathered)						
	Bedding fabric (Yes/No)						
	C. Concrete *		Not applicable	1			
	a. Condition *		riot appriouoto				
	b. Cracking *					-+-	
	Dimensions/Location:	.[]			L		
	c. Sidewall/ Headwall*	·					
	Misalignment:				L		
	Location:						
	Description:	1					
	d. Joints						
	Separated:	[]			L		
	Loss of material:						
	Loss of material.						
	Description:	1					
	D. Natural				T İ		-
	D. Maturat	1					
10	Undermining	N	lo problem	Could not inspect thoroughly		1	
10	· Location:			Jeoura not inspoor morouginy			
	Description:						
	~ • • • • • • • •						
N=	Noted; M= Monitor	A	ction Suggestion	1. Requires immediate action			-
	nvestigate; R= Repair		86	2. Plan to do soon			
	= Field File; RT = Right; LT = I	_eft		3. Do when convenient			
	= Upstream; $D/S$ = Downstream						
	litional Comments:						٦
				1 ONG			
				NONE			
	Type of Concrete Problems: S	Spalling		rebar, misalignment, joints bug holes, efflorescence, pop	outs,		1
*	Speci Concerci Liconomici S				-		- 1
*		honey	combing, scaling,	craze/map cracks, isolated crack, disintegration, other			
*		honey		craze/map cracks, isolated crack, disintegration, other pection Checklist			$\frac{1}{2}$

			Act
Item	N	Notes/ Observations	M
1 General	. None found	Does not have one	
A. Type of lake drain			
(isolated control/intake tower,			
valve vault with outlet conduit			
valve in riser/drop inlet siphon):			
Size:			
B. Operated (Yes/ No)			
Lake drain components			
A.Concrete structure			
Location:			have been a second s
Description:*			
Condition:*			
B. Valve control (operating			
device):			L
No operating device; No stem			
Bent/Broken Stem; Access			
Other:			
Operability:		4 .	
C. Valve/Sluice gate			L
Quantity:			
a. Metal deterioration (surface			
rust, minor, moderate, extensive,			
other):			
Location:			
Flow rate:			
. Misalignment			
. Leakage - Flow rate			
. Outlet conduit			
Size:			_
Material:			·
Condition:			
. Energy dissipater			
Type (endwall, plunge pool			hand the second s
impact basin, stilling basin,			
rock-lined channel, none):			
Condition:*			
ted; M= Monitor	Action Suggestio		
stigate; R= Repair		2. Plan to do soon	
Field File; <b>RT</b> = Right; <b>LT</b> = Lef	t <sup>.</sup>	3. Do when convenient	
Jpstream; D/S = Downstream			
onal Comments:	larro	,	•
	None		

				L	Act	ti
	Item	N	Notes/ Observations	M		I
1	Est. Capacity (Kw):				T	
	. Date last used:					
	Current Use:					
2	Item:		,			
	A. Headrace general					
	Gates/ Trashracks:					
	Vegetation/ Erosion:					
	Sloughs/Slides/Cracks:					
	Seepage Wetness:					
	Rodent Burrows:					
	Concrete:					
	B. Tailrace			·		
	Scour:					
	Vegetation/Erosion:					
	Sloughs/Slides/Cracks:					
	Seepage wetness:					
	Rodent burrows:					
	Concrete:					
0	C. Foundation: general					-
	Concrete:		·			-
	Seepage:					
	Integrity:					
D	. Superstructure			T		
	Condition:					
						-
			KLONE			
			NONE			
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ve = F = L	ied; <b>M</b> = Monitor stigate; <b>R</b> = Repair ield File; <b>RT</b> = Right; L <b>T</b> = Lef Jpstream; <b>D/S</b> = Downstream		n Suggestion 1. Requires immediate action 2. Plan to do soon			
ve = F = L	red; <b>M</b> = Monitor stigate; <b>R</b> = Repair ield File; <b>RT</b> = Right; L <b>T</b> = Lef		n Suggestion 1. Requires immediate action 2. Plan to do soon			
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	D/S Channel		butments		. Groin
	HW TW		ill Crest		ow Embankment . Groin
ggested Survey po	ints:				
omments:					
ench Mark Inforn	nation:				
IS END LT LOCK WALL		8.89	853.20		
OTTOM OF WHITE IDE EMID VALL D/S		19.80	842.29		
BOTTOMOF LOCK S. IDG MID WALL 6/S	·	22,24	839,85		
NAU OF MID NAU O DIS		10-93	851.16		
DP OF LT WALL US MOST		8-94	853,15		
LT WALL TOP C GATE	naturi	8.91	8 53.18		
BOTTOM C MITO PT OF WASTE		20:43	841.66		
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D/S ++,0 SVRFACE		14.83	847.26		
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BM 689-C 8,	69		853.40		
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N5			11,65	8 50,44		
VASTE OPER. BRIDGE VER RT GATE			8.92	853,17		
VASTE OPER, RIAGE OVER LT GATE			8.93	853.16		· · ·
T GATE			11.09	851.00		
T GATE			11,26	850,83		
IS END WERMID			10.91	851.18		
PATH			8.73	853.36		
SED			21.63	840.46		
ISKON BRIDGE			2.68	859,41		(.52)
M			8.95	853,14		(140) CLOSE OFF BY 0.26
.			v			
			-			3

# OPERATION AND MAINTENANCE PLAN XXXX LAKE DAM

1

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#### I. INTRODUCTION AND DEFINITION OF GENERAL RESPONSIBILITIES

#### A. Introduction

This manual describes a plan of operation, maintenance, and inspection for the Village of XXXX, XXXX Lake Dam. This manual should be periodically reviewed and modified to reflect operational and structural changes. The inspection and maintenance forms, and other applicable figures are designed for easy revision.

This manual was prepared for the Village of XXXX, by XXXX. This manual was prepare to conform with Wisconsin Administrative Code, Department of Natural Resources Section, Chapter NR 333 Dam Design and Construction Standards, Paragraph NR 333.07, "Hydraulic Design and Safety Requirements (4) Safety Measures Requirements."

#### **B.** Purpose and Intent

The purpose of operations and maintenance (O&M) plan is to provide the Village of *XXXX* Dam Operator and other officials with the following:

- Basic Guidelines which assist the operator / officials to
  - Perform routine and annual safety inspections
  - Properly document the inspections
  - Properly document maintenance related costs
  - Routinely observe river flows and determine gate operating levels.
- Guideline inspection checklist items for routine and annual safety inspections.
- A series of reproducible master forms which will assist documenting
  - Routine and annual safety inspections
  - Maintenance related costs

#### C. Description of the XXXX Lake Dam

The XXXX Lake Dam is located in the SW ¼ of SectionXX. TXXN, RXXE, on the XXXX River (See Figure 8 "As-Built Information"). The dam lies within village limits adjacent to the south right-of-way of the STH XX bridge. The dam is used for recreational opportunities, aesthetic values and to help govern water level conditions. There are approximately 490 square miles (313,600 acres) in the upstream drainage area. The watershed is comprised of crop and forest lands.

The XXXX River flows into XXXX Lake downstream from the dam. XXXX Lake flows into the XXXX River. There are scattered rural residences and agricultural buildings along the XXXX River.

The XXXX Lake Dam was designed by XXXX in 19XX for the Village of XXXX. XXXX, Wisconsin constructed the dam in 19XX. The structure is constructed of reinforced concrete, Steel "H" and sheet piles, and earthen embankment materials (See Figure 7 As-Built Information"). The dam is approximately XX feet long.

Water flows through XX refurbished tainter gates and XX splashboard bays. The tainter gates serve both to maintain lake levels and as emergency drawdown devices. The XX splashboard bays control headwater levels through removable splashboards. The average observed river flow is 360 cubic feet per second. The dam was designed to be submerged under 100-year flood conditions.

#### D. Key Personnel and Their Responsibilities

The Village XXXX is the Owner/Operator of this XXXX County Dam. The Village of XXXX is responsible for both the routine and other preventative maintenance and operation of the dam.

Only the Dam Operator and trained Village employees may operate the dam spillway levels. The Dam Operator and Village support staff are required to maintain and inspect the dam. The operator is responsible for routine, monthly and annual inspections. More thorough inspections are required after high river flow conditions have subsided. The operator also is responsible for routine weekly and day by day monitoring when high flow conditions exist.

The operator should notify adjacent upstream and downstream operators about changes to the gate levels. Flood water levels may require the operator to change gate operating levels. The operator should coordinate changes with adjacent dam operators.

The XXXX Lake Dam does not have an "Early Warning System Device". The operator and trained officials must be able to identify potentially dangerous river flow conditions. Potential flood conditions are characterized by the following:

- Extended periods of greater than average precipitation or combined melting periods with greater than average precipitation.
- Rapidly increasing headwater levels (greater than 2" increase per hour).

#### II. OPERATION

Inspection, maintenance, and operation procedures are needed to ensure the public safety. Inspection is a requirement of maintenance. The operator can only reasonably maintain the dam in working order through active inspection. The following sections should be used to guide routine operation, inspection, maintenance, and emergency action.

#### A. Operational Procedures

#### 1. General Surveillance Provisions

The XXXX Dam is routinely observed each month and inspected twice a year. Thorough inspections also occur after high flow conditions have subsided.. Flow conditions are routinely monitored weekly and day by day when high flow conditions exist. Routine and required preventive maintenance is performed by the Department of Public Works. Site inspection and flow monitoring records are kept on file at the Village Department of Public Works.

#### a. Adjacent Upstream "XXXX Dam"

The adjacent upstream "XXXX Dam" has only a measuring strip gage device. The dam is operated by the XXXX County Park and Forestry Department. Listed below is the necessary contact information:

XXXX County Park and Forestry Department XXXX Parks Administrator XXXX Dam Operator XXXX XXXX, WI XXXX PH XXXX

#### b. Early Warning System

High water levels or increasing floodwater levels can be monitored by the measuring strip gage device. (The dam does not have an automatic warning device.) Upstream water levels (headwater) are controlled by tainter gates and splashboards. Adverse weather conditions may combine to create rising water conditions. The Dam Operator should be prepared to remove all splashboards in advance of high flow conditions. Higher than normal headwater conditions could prevent removing the splashboards.

The Dam Operator is responsible initiating and maintaining constant communication with the "XXXX Dam" Operator. Operation of both

dams, especially during flood flows, affects one another. Changes (and anticipated changes) in dam operation should be immediately communicated with the "*XXXX* Dam" Operator. The Dam Operator should also coordinate post flood dam operation with the "*XXXX* Dam" Operation.

Since an operator is not continuously on-site at the XXXX Dam, two upstream upstream spotters have been appointed by the XXXX Village Board. The spotters having ready access to the upstream end of the flowage and will monitor the water levels and immediately notify the XXXX Dam Operator of changes.

#### 2. Response During Periods of Darkness

The dam is not equipped with lights. Lights adjacent to STH XXXX and XXXX Street partially illuminate the dam. The Village Fire Department and County Sheriff Department have spotlight equipped vehicles if necessary. Hand-held flashlights could also aid night illumination.

#### 3. Identification of Emergency

The XXXX Lake Dam does not have an automated flood system. The Dam Operator and Village Officials will need to monitor weekly, monthly and seasonal weather conditions to help identify floodwater conditions. Flood conditions are characterized by significant increases in depth over relatively short periods of time. Depth increases in excess of 2" per hour need to be carefully evaluated. Listed below are important factors which require consideration in light of potential emergency flood situations:

- Initial Water Elevation and Gate Operation
- Previous Weather History (days and weeks) which includes past rainfall
- Predicted Weather
- Upstream and Downstream Dam Operation Procedures

#### 4. Emergency Repair Supplies and Resources

Dam repair materials are not stockpiled at the dam for emergencies. Minor repairs would be evaluated by the EAP Coordinator and Dam Operator. The Dam Operator would coordinate repairs. Heavy equipment is available from the Village of XXXX, XXXX County Highway Commission and local contractors. Repair materials would need to be obtained from nearby sources. The operator should have an identified source of embankment repair materials for emergency use.

Major repairs would coordinated through the EAP Director and Dam Operator. *XXXX* constructed the dam in 19*XX* and could provide valuable assistance.

#### 5. Coordination or Floodwater Flows

Upstream flows may be regulated from the adjacent XXXX Dam. The XXXX Lake level can only be lowered through the tainter gates and splashboards during higher than normal flows. The dam has no headwater or tailwater gages or an automatic warning device. The XXXX upstream dam only has a measuring strip gage device. Upstream water levels (headwater) levels are controlled by the tainter gates and splashboards headwater. Adverse weather conditions may combine to create rising water conditions. The Dam Operator should be prepared to remove all splashboards in advance of high flow conditions. Higher than normal headwater conditions could prevent removing the splashboards.

In conjunction with the daily, weekly, and monthly monitoring of flows, the Dam Operator shal regulate lake levels accordingly by the use of the tainter gates and splashboards. The Dam Operator shall take action to release water when a 2 inch increase in the water level is recorded.

The Dam Operator is responsible for coordinating high water flows with the adjacent upstream and downstream dam operators.

#### 6. Winter Drawdown

Each splashboard should be removed during the fall before the lake freezes. Winter ice formation can damage splashboards. Spring thaws may also produce ice jam conditions at the dam. The boards should be removed to prevent damage to the splashboards.

The splashboards may be replaced in the spring after threats of ice damage have diminished. The tainter gates should additionally be opened prior to replacing the splashboards. Opening the tainter gates provides the following:

- Ensures proper tainter gate operation.
- Removes previously deposited silt materials from behind the tainter gates. This also prevents "clogging" of the dry fire hydrant.
- Allows detailed inspection and maintenance of the splashboards bays and the splashboard dowels.
- Allows removal of debris from the splashboard bays.

#### B. Inspection

Inspection is a necessary part of operation since early detection of gradual changes can reduce maintenance costs. Routine inspections provide a way to monitor the dam performance. All inspections should be performed by properly trained persons. Listed below are the several categories of inspections:

- Daily /Weekly
  - River flow observations
  - Precipitation Records
- Monthly
  - Operating Equipment
  - Safety Equipment
  - Performance and Superficial Structure
- Yearly
  - Structural
  - Operating and Safety Equipment
- 10 year Department of Natural Resources
- After High Flow Conditions have Subsided (post storm)

The categories are time based with increasing considerations. Daily/weekly and monthly inspections require little time to perform. These inspections provide insight on how the dam is operating under current weather conditions. They also provide insight if the dam is mechanically operable for emergencies. River flow conditions should also be regularly monitored. The water depth measuring strip on the upstream abutment provides the easiest way to consistently monitor water levels. Water levels and gate operating positions should be recorded on Figure 1 "Daily/Weekly Inspections Observations".

Yearly inspections are designed to evaluate how the dam performed throughout the year and what is the dam's condition. This inspection evaluates how the dam has changed from its original as-built plan condition. Detailed photo documentation provides a permanent record of changing conditions. Cracking conditions can be carefully monitored by placing a ruler within the photo. Larger scale repair and maintenance items should be identified for correction. These inspections are best performed mid-year after the higher spring flows have subsided. State code requires that copies of a thorough annual inspection report be submitted to the Wisconsin Department of Natural Resources (WDNR).

A ten-year WDNR inspection is required by Ch 31.19 State Statutes. The dam must be inspected by dam safety officials. This coordinated inspection thoroughly details a minimum of the following:

- Structures Integrity ( concrete, piling, up / downstream conditions )
- Dam Equipment Operation (gate operators, winches, etc.)
- Dam Safety Equipment Operation (fences, signage)

Post storm inspections should be made as soon as flood water conditions have subsided. This dam is susceptible to damage during high flow conditions because it is designed for submergence during the 100 year flood. Listed below are key elements to be inspected after storm flows have subsided:

- Vegetation: high flow damage
- Earthen Fill: slope, riprap, and abutment stability, seepage
- Tainter Gates: operation
- Flashboard Bays: board damage .Gate Openings: deposited debris

Figure 2 "Inspection and Maintenance Checklist" may be used for routine, annual, and post storm inspections.

#### 1. Equipment

The Dam Operator and qualified officials should be adequately equipped for inspection. The following are recommended inspection related equipment items:

- Camera with flash.
- Ruler with graduations large enough to be identified on photos
- Knives for prying cracks and removing materials
- Boat with 15 feet graduated rod to check upstream and downstream depths and scour locations.
- Blueprint copy of site map or Figure 3 "Site Plan" to note locations of problems and changing conditions.

#### C. Maintenance

The XXXX Lake Dam is constructed of reinforced concrete and steel, fabricated components and earthen embankment mat~rials. The dam has relatively few maintenance items and operating compon:."nts. The dam has an estimated life of 100 years when properly maintained. Periodic maintenance and item replaceme~t are expected and preventative maintenance activities will increase with time. Figure 2, "Inspection and Maintenance Checklist" lists these minimum items requiring maintenance.

Maintenance should be regularly performed. Routine, annual, and post storm inspection results will dictate how often and to what degree maintenance is required. Most items can be repaired by the Dam Operator or Village personnel. Larger repair items may be required by qualified contractors. Generally, questionable repair items should be inspected by a qualified engineer and if required, repaired by contractors. Figure 4 lists each inspection item with an average repair frequency and description. Figure 5 is a maintenance report which should be used to document maintenance activities.

#### 1. Maintenance Frequency

Maintenance should be routinely performed. Some items require more frequent attention than others. Figure 4 provides a guideline for how often features may require maintenance and repair.

• Waterproof filler materials may be removed from construction joints by flood waters and settling of the structure. Waterproof filler materials should be maintained as outlined by the contractors or product suppliers specifications.

#### 2. Budget Considerations

The XXXX Lake Dam is constructed of reinforced concrete and steel, fabricated components, and earthen embankment materials. Periodic maintenance and item replacement are expected. Preventive and regular maintenance items are both to be expected and will increase with time. The dam contractor and component fabricators will be able to provide guidelines for routine maintenance and replacement. The operator should expect to use expendable items as fencing, paint, lubrication, riprap materials, etc. Riprap, geotextile fabric and embankment fill materials should be stockpiled for both emergency and routine use. Other expendable items should be budgeted based on manufacurers recommendations and owners experience. Funds should be allocated for larger overhaul items and repairs even though they may not always be predicted.

#### D. As-Built Plans and Photo Documentation

The As-Built plans and photographs detail construction dimensions, materials, and installed conditions. The photos were selected to document how key features should be maintained. The photos are referenced to Figure 6, "Photo Documentation of As-Built Conditions"

Figure 7 "As-Built Information" summarizes as-built information for key dam features. As-Built plans and photo documentation are located with the Village of *XXXX* Dam Operator and Village Hall. Copies of the master As-built plans for the *XXXX* Lake Dam are on file with *XXXX*.

#### E. Emergency Action Plan

An Emergency Action Plan (EAP) was created to comply with State of Wisconsin Administrative Code, Department of Natural Resources Chapter NR 383. This code requires an EAP to be prepared by the local unit of government and concurred by the Division of Emergency Government.

The purpose of this EAP is to provide the Village of XXXX, XXXX County, and Emergency Warning Agency designated officials with specific guidelines for emergency action in the event that high flood water conditions on a dam failure occurs.

The intent of this plan is primaily to protect the lives of the Village of XXXX and XXXX County citizens and secondarily to reduce property damage.

The underlying intent of the plan is to provide a specific schedule of events to do the following:

- 1. Monitor/assess dam structure conditions to help predict dam behavior at all water level conditions.
- 2. Provide basic levels of required communication for various water level conditions (Including dam overflow, dam failure, etc.)
- 3. Provide for a required yearly coordination meeting between all emergency contacts, landowners directly affected by immediate dam failure, and designated safety officials.
- 4. Define each agencies/persons duties for public notification securing.
- 5. Provide detailed response actions for the particular emergency.

An observer other than the designated officials may notice unexpected high flows, potential dam failure or a dam failure. An observer noticing unusual behavior should

immediately notify the Village of *XXXX* Police Department at *XXXX*. Further action/response will depend on whether Condition A or B exists, as described below:

. .

• Condition A: Failure of the XXXX Lake Dam is imminent or has occurred.

•

• Condition B: A potentially hazardous situation is developing at the *XXXX* Lake Dam.

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# III. FIGURES

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Number	Contents
1	Daily /Weekly Inspection Observations
2	Inspection and Maintenance Check List
3	Site Plan
4	Inspection, Maintenance, and Repair Frequency Guidelines
5	Maintenance and Expenditure Records
6	Photo Documentation of As-Built Conditions
7	As-Built Information

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# **IV. REFERENCES**

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# V. LOCATIONAL MAP

# ATTACHMENT 4

# SAMPLE OPERATION PLAN

Dam Name:
Date:
Owner Name:
WHO
1. Who operates the dam? (Owner or other agent/employee)
Address:
Telephone:
2. Who is the backup operator?
Address:
Telephone:
3. Who maintains the dam?
Address:
Telephone:
4. Who must be called in an emergency?
Address:
Telephone:
WHAT
1. What downstream structures would be affected by a flood?
<ol> <li>What minimum flow, if any, is required for downstream users?</li> <li>25% of natural low flow is minimum allowable</li> </ol>

<u>ر</u>

.

3. What impoundment levels are required to protect upstream users?

Maximum Elevation Normal Elevation Minimum Elevation

#### WHEN

- 1. When are gates operated during storm events?
- 2. When are gates operated during normal conditions?

#### WHERE

- 1. Where is emergency power?
- 2. Where is engineering assistance?

#### HOW

- 1. How are gates operated?
- 2. How often is mechanical equipment operated?

# ATTACHMENT 5

#### SAMPLE INSPECTION/MAINTENANCE PLAN

#### DAILY

Note water surface elevation Check security and safety devices Make required changes in gates and valves Check spillway outflow channel for debris Record pertinent information in Determine reservoir inflow Check toe and/or gallery drain flows Read weather gauges and record data Check log or safety boom Check instrumentation schedule

# MONTHLY

1. Dam and Reservoir

Check condition of: crest of dam upstream and downstream faces visible portions of foundation abutment contacts galleries stilling basin(s) critical landslide areas reservoir area drainage systems, toe drains measuring devices rodent problems security and safety devices

3. Outlet Works

Grease hydraulic gate hanger Check signs that warn public near 2. Electrical System

Check:

standby gasoline-engine-driven generator run for a minimum of 1 hour keep battery charged gas supply

Replace:

light bulb

4. Spillway

Check:

for debris in inlet channel for operation of gates fence condition and caution signs

#### QUARTERLY

1. Outlet Works Operating instructions - up to date and legible 2. Spillway

Check and clear bridge drains

Check gate air vents on downstream face Clean gate control switchboxes Clean inside of motor control cabinet

#### SEMI-ANNUALLY

1. Outlet Works

Check:

hydraulic oil lines oil reservoir level in hydraulic system rubber seals and seal clamp bar hoist cables - lubricate

Lubricate gate rollers

2. Electrical System and Equipment

Change oil in standby gasoline-enginedriven generator

Check:

exposed electrical wiring outlet works valve house gate hoists spillway bridge

3. Spillway

Check:

paint on gates hoist cables - lubricate mechanical hoist bearings flexible coupling bearings gear cases hoist gear case, replace grease spur gear units and gear motors

ANNUALLY

1. Outlet Works

2. Dam and Reservoir

Paint:

metalworks color-coded valves woodwork and trim

Exercise gates and valves Check condition of interior and exterior of outlet conduit Review the Standard Operating Procedure (SOP)

3. Spillway

Check and repaint metalwork:

on spillway bridge gates fence

Operate and exercise gates Examine stilling basin and downstream channel 4. Electrical

Check:

electrical conduits pull-boxes switches outlet works valve house gate hoists spillway galleries

#### **5-YEAR PERIOD**

Examine intake structure and stilling basin which normally are under water -less frequent if experience indicates

# OWNER'S INSPECTION CHECKLIST

Dam Name:	
Date of Inspection:	
Owner's Name:	

Any rapid or great change in the condition of your dam should be immediately reported to the State Dam Safety Engineer, Dick Knitter, (608) 266-1925 or the State Warning Center (608) 266-3232.

	NO	YES	<u>IF YES</u>
Surface Cracks?			Monitor <sup>1</sup>
Slumping or cracking on the upstream or downstream side?			Contact state agency or engineer
Erosion from runoff, wave action or pedestrian/vehicle traffic?			Repair and stabilize
Embarkment/spillway seepage?			Monitor <sup>2</sup>
Seepage water muddy? Boils?			Contact state agency or
Top of the dam settled?			Monitor <sup>3</sup>
Loss of riprap?			Replace and maintain
Trees, brush or burrows on dike? dike			Clear trees, brush, fill holes and seed bare
Spillways blocked?			Clear spillway immediately
Exposed metal rusty?			Clean and paint
Concrete deterioration or cracks?			Monitor <sup>4</sup>

Cracks or uneven movement?		Monitor <sup>5</sup>
Scour?		Monitor <sup>6</sup>
Pipe joint separation?		Repair
Gates non-operation?		Repair and make operational
Trash racks blocked?		Clean out debris

<sup>1</sup>Monitoring surface cracks in the embankment includes tracking the speed with which the cracks widen, and documenting this development through the use of photographs or instrumentation records. Any rapid development requires immediate notification of the State Dan Safety Engineer.

<sup>2</sup>Monitoring seepage involves determining the quality and quantity of flow through the embankment/dike/spillway. Measure the quantity per unit time, if possible, and note any solid materials carried in the flow, such as sand or other fines. Excessive flows and/or turbid flows require immediate notification of the State Dan Safety Engineer.

<sup>3</sup>Settlement of the top of the dam can be caused by surface erosion or by internal compaction. Rapid settlement requires immediate notification of the State Dam Safety Engineer.

<sup>4</sup>Concrete deterioration may be patched through routine maintenance procedures. Extreme deterioration should be examined by an engineer. Severe cracking or rapid changes require immediate notification of the State Dam Safety Engineer.

<sup>5</sup>Cracks or displacement of the abutments may occur over time. Monitoring includes determining the rate of change. rapid separation requires immediate notification of the State Dam Safety Engineer.

<sup>6</sup>Scour can be determined by probing the streambed. Abrupt changes or rapid erosion of the streambed requires immediate notification of the State Dam Safety Engineer.

# EMERGENCY ACTION PLAN XXXX Dam XXXX COUNTY, WISCONSIN

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# APPENDICES

APPENDIX A: DAM OWN6R/OPERA TOR EMERGENCY TELEPHONE LIST APPENDIX B: EMERGENCY NOTIFICA TION FLOW CHARTS APPENDIX C: EQUIPMENT

# EMERGENCY ACTION PLAN XXXX DAM XXXX COUNTY, WISCONSIN

### INTRODUCTION

This section describes the purpose of this Emergency Action Plan (EAP); describes the dam hazard area; identifies those responsible for dam operation and implementation of the EAP; and describes the procedures for training participants, and reviewing, testing, and updating the EAP

### PURPOSE AND INTENT

The purpose of this EAP is primarily to safeguard lives and secondarily to reduce property damage of citizens XXXX County who live along XXXX Creek in the event of flooding caused by a large volume of runoff from or failure of XXXX Dam. This EAP provides dam and contact information and describes actions to take in the event of such flooding.

#### **DESCRIPTION OF DAM**

XXXX Dam is located on XXXX Creek in XXXX County, Wisconsin, in Section XX, TXXN, RXXW. The dam is owned by the XXXX County Land Conservation Department. The dam creates a 1.87-acre impoundment used for flood control. The drainage area at the dam is 0.58 square miles. The reservoir flood storage capacity is 37.2 acre-feet at the emergency spillway crest, elevation 1223.49 feet. Downstream of the dam, XXXX Creek winds through steep forested valleys with flat agricultural flood plains and runs into XXXX Structure 29. Exhibit 1 is a plan and section of XXXX Dam. All report elevations are referenced to USGS datum. Add 0.51 feet to report elevations to obtain elevations shown on the drawings.

The main components of the dam are:

- Homogenous earth embankment, approximately 250 feet long, with a crest elevation of 1225.49 feet and an approximate structural height of 36 feet.
- 2.5H:1V upstream embankment slope with a 8-feet-wide berm at elevation 1210.49 feet, a 14-feet-wide crest, and 2.5H:1V downstream embankment slope.
- Grass-Ined overflow chute emergency spillway, 20 feet wide with a crest elevation of 1223.49 feet, located at the right abutment.
- Concrete rectangular drop inlet principal spillway, 3 feet by 3 feet, with a crest elevation of 1210.49 feet.
- Concrete conduit and outlet, 18 inches in diameter with an outlet invert elevation of 1190.99 feet.
- Unlined stilling pool.

The Soil Conservation Service (SCS) designed and funded construction of the dam under Public Law 566. Dam construction was completed in 1961. No significant modifications have been made to the dam since its construction.

#### HAZARD AREA

#### Area That Would Be Affected by a Breach or Major Flooding

A dam failure analysis was performed to determine the area that would be inundated if the dam were to fail during the 100-year flood on XXXX Creek. The analysis extended approximately 2.01 miles downstream from the XXXX Dam to just past XXXX Structure 29. The hydraulic shadow ends 1.79 miles downstream of the dam. Exhibit 2 is a hydraulic shadow map showing the area that would be inundated by a 100- year dam failure flood. Exhibit 3 shows 100-year flood profiles for the river reach studied.

#### **Populations Affected**

No residences, buildings, or campgrounds would be inundated by the dam failure flood or 100-year flood.

#### **Critical Facilities**

No critical facilities, such as hospitals, rescue and relief facilities, water supply facilities, hazardous waste facilities, or bridges, are in the hazard area.

#### **RESPONSIBILITY AND AUTHORITY**

#### **Dam Operation and Maintenance**

The XXXX County Land Conservation Department maintains the dam and Allen XXXX is the dam operator. An emergency phone number list is in Appendix A.

The dam operator works at the XXXX County Conservation Office and observes the dam two to three times a year during inspections and routine maintenance. The operator is also on call during high water conditions.

The address and telephone number of the dam operator are:

XXXX County Conservationist Work address and telephone number: 820 Industrial Drive, Suite 3 XXXX, WI XXXX (608) XXXX Home address and telephone number: 820 XXXX XXXX, WI XXXX (608) XXXX

### EAP Coordinator and Participants

Allen XXXX, XXXX County Conservationist, is the EAP Coordinator and has overall responsibility for implementing the EAP, including training participants and periodic reviewing, testing, and updating of the EAP.

The address and telephone number of the EAP Coordinator are as follows:

XXXX County Conservationist Work address and telephone number: 820 Industrial Drive, Suite 3 XXXX WI XXXX (608) - XXXX Home address and telephone number: 820 XXXX XXXX,WI\_XXXX (608)\_XXXX

The EAP participants are the following:

XXXX, County Sheriff XXXX, County Emergency Government Director

The telephone numbers for the participants are listed on the notification charts in Appendix B. The procedures for carrying out the phases of the EAP are described in the subsection titled "Levels of Emergency and Notification Procedures."

### PERIODIC TRAINING. REVIEW. UPDATING. AND TESTING

The EAP coordinator's duties include the following:

- Training EAP participants to handle an emergency situation at XXXX Dam.
- Annually reviewing the EAP with EAP participants for any required changes and distributing copies of the revised plan to participants.
- Testing the EAP.
- Submitting EAP revisions and testing reports to the Wisconsin Department of Natural Resources.

#### **Review and Updating**

Annually the EAP Coordinator verbally reviews the plan with EAP participants to explain the procedures to follow in the event of an emergency, address any changes that need to be made in the plan, answer questions regarding the procedures, and test their understanding of the plan. The EAP participants review the plan for possible changes, including:

- Changes in personnel.
- Changes in telephone numbers.
- New conditions that would affect flood flows or the extent of damage due to a dam failure.

The EAP Coordinator promptly makes the needed changes in the EAP and distributes a revised plan to all participants. If changes are made in the EAP at any other time, the EAP Coordinator also verbally reviews these changes with the participants and distributes a revised plan.

#### Testing

The EAP Coordinator is responsible for conducting a test simulating a dam failure. Testing the plan familiarizes the EAP participants with the plan, helps estimate the time needed for notification, and helps reveal any plan deficiencies. The EAP Coordinator initiates the test by contacting the XXXX County Sheriff. EAP participants must perform their required actions as if in a real emergency. When executing the test, each participant states their name and position and indicates that this is only a test.

To assess the degree of success of the test, the EAP Coordinator requests that each participant comment about the execution of the notification procedures, discuss any problems encountered, and suggest any changes that would improve the EAP. The EAP Coordinator keeps this information on file for comparison with future tests and revises the EAP if needed.

#### APPROVAL

Key EAP participants need to approve the EAP by signing and dating the approval form on the following page. By signing the approval form, they agree to their responsibilities to review the EAP process and carry out the plan.

EAP Approv	al Form
We, the undersigned, this date acknowledge this pla procedure to protect life and reduce property damag	
Allen XXXX XXXX County Conservationist	Date
Dale XXXX XXXX County Sheriff	Date
Gordon XXXX County Emergency XXXX Government Coordinator	Date

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# **IDENTIFICATION OF EMERGENCY**

This section describes the events or conditions that indicate an emergency, defines the levels of emergency, and describes how EAP participants and the public should be notified in the event of an emergency.

# EVENTS OR CONDITIONS THAT INDICATE AN EMERGENCY

An emergency exists when dam failure has occurred or when dam failure is imminent. Floods are a major cause of dam failure, and the dam should be monitored during high water conditions. However, failure may also occur during normal conditions, and this failure can be the most dangerous because the resulting flood would be sudden.

- Conditions indicating potential failure include, but are not limited to, the following:
- Slumping or sloughing of the embankment.
- Excessive erosion on the embankment, below the spillway, or at the abutments.
- Excessive seepage or cloudy seepage through the abutments or embankments.
- Settlement or cracking in the embankment.
- Piping or boils in the embankment.
- Large cracks in the concrete spillway.
- Noticeable movement of the spillway.

The most common cause of failure for dams like XXXX Dam is a flood or high water event that erodes the embankment and eventually results in a breach. Ice buildup can also be a factor in dam failure because it creates additional stress on the dam. If ice builds up on the drop inlet spillway, it can block flow and lead to a high water condition.

# LEVELS OF EMERGENCY AND NOTIFICATION PROCEDURES

The first step in the notification process is to identify that there is a potential problem with the dam and to assess its seriousness.

The two levels of emergency are an alert condition and a warning condition:

- An alert condition indicates that a potentially serious condition is developing and failure could occur if conditions do not improve.
- A warning condition indicates that failure of the dam is imminent or has already occurred.

Notification charts for an alert condition and a warning condition are in Appendix B. These notification charts list contact names and telephone numbers.

#### **Alert** Condition

If a potentially serious situation is developing, the observer contacts the EAP Coordinator, who can then make a decision as to what further steps are required. The EAP Coordinator informs the Sheriff of the situation. The Sheriff may then decide to contact the *XXXX* County Emergency Government.

#### Warning Condition

If failure is imminent or has occurred, the observer contacts the EAP Coordinator who will then contact the County Sheriff. The Sheriff contacts the *XXXX* County Emergency Government and then the Wisconsin State Warning Center, and the Monroe County Highway Commissioner, so they can set barricades and reroute traffic, if needed. The Sheriff also contacts the news media and the public. The Wisconsin State Warning Center will contact the Wisconsin Department of Natural Resources Duty Officer and the State Dam Safety Engineer.

The top priority in the notification process is the protection of human life, and the order of those notified in a warning condition may need to be modified to meet this priority.

After carrying out the notification procedures, the EAP Coordinator or the Sheriff proceed to the dam. The dam is approximately 15 miles from *XXXX*, the county seat. After arriving at the site, they will closely monitor the dam, assess damage, and develop a plan for repair in coordination with the State Dam Safety Engineer.

# **PREVENTIVE ACTION**

During an alert condition or warning condition, specific preventive actions may help to prevent or delay dam failure. Because the feasibility and effectiveness of a preventive action will depend on the specific situation, we advise the County to consult a qualified engineer before taking any preventive action. Preventive actions could include:

- Removing ice or debris from the drop inlet intake.
- Placing riprap in pipe outlet plunge pool if scour is occurring.
- Placing sandbags on the crest of the embankment.

Because of uncertainties about their effectiveness, these preventive actions should be carried out simultaneously with appropriate notification of an alert condition or warning condition.

A key person in implementing preventive actions XXXX Dam is the dam operator, who closely observes the dam and monitors water levels during high water conditions.

The contacts for equipment such as sand bags, that could be used at the dam for preventive action are listed in Appendix C.

# **REENTRY AND RECOVERY**

The XXXX County Sheriff's Department performs the reentry. The Sheriff's Department should inspect the private drive and CTH Y that crosses XXXX Creek for washouts or other hazardous conditions and perform surveillance of the rest of the accessible area downstream of the dam. This surveillance should include inspection of any water, gas, and sanitation lines. The area downstream of the dam is accessible from a private drive off of CTH Y. The Sheriff's Department should photograph and keep a log of observed damages.

#### **CALIBRATION**

Model calibrated to	Historical data	_FIS
Were any sensitivity analyses perform	ed	

### HAZARD RATING

Hazard	l rating	assigned	
--------	----------	----------	--

Development in hydraulic shadow \_\_\_\_\_

\_\_\_\_ Development in w/o dam fp/fw \_\_\_\_\_

\_\_\_\_ Inventory and identification of downstream structures

\_\_\_\_ All other information necessary to determine hazard rating

\_\_\_\_ Did we field check

Required pr	rinciple	spillway	capacity	
-------------	----------	----------	----------	--

total spillway capacity \_\_\_\_\_

Can dam pass design flow?

If yes, is there any freeboard? \_\_\_\_\_ How much? \_\_\_\_\_

# STABILITY ANALYSIS

Method used to calculate sliding	
	•

Overturning \_\_\_\_\_

foundation \_\_\_\_\_\_
Was embankment stability addressed? \_\_\_\_\_\_

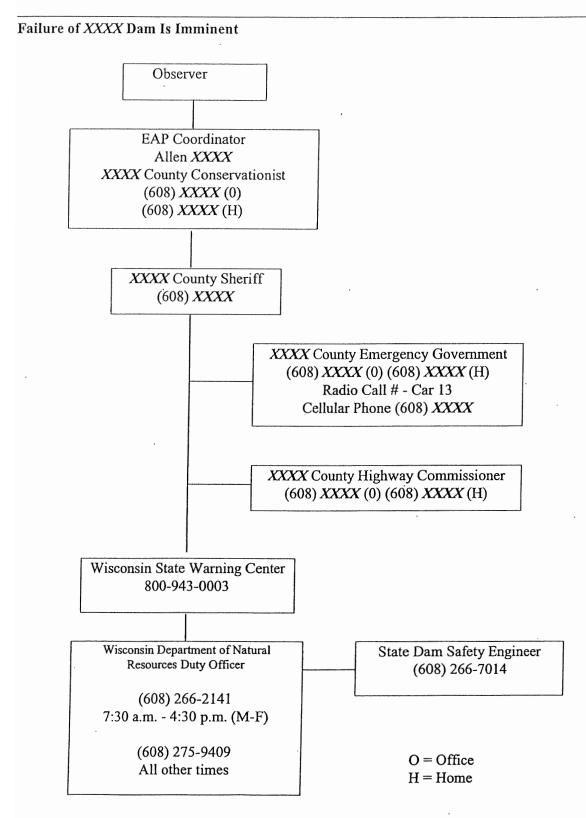
Do the embankment slopes and construction look stable?

Was subsurface investigation made? \_\_\_\_\_ If so how extensive? \_\_\_\_\_

Elevation	Factors of Safety		
	Sliding Overturning	Foundation	
Normal Pool			
Max Pool			
Max Load (ice, debris)			
Are factors of safety adequate			
Is the dam safe			

# NOTIFICATION FLOW CHART

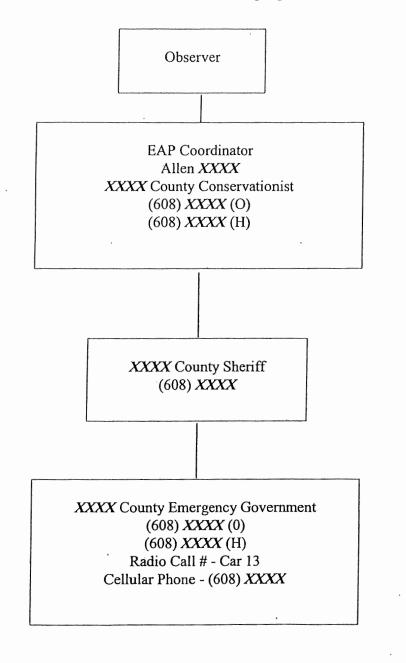
#### WARNING CONDITION



# NOTIFICATION FLOW CHART

### ALERT CONDITION

# Potentially Hazardous Situation Is Developing at XXXX Dam



O = Office H = Home

# EQUIPMENT LIST

	Approximate Number		
Type of Equipment	Available	Contact	Telephone Number

Sand bags

.

#### ATTACHMENT 3

#### SUGGESTED OUTLINE FOR EMERGENCY ACTION PLANS

Summary of Plan - Checklist of Key Actions

#### A. INTRODUCTION

- I. <u>Purpose & Intent</u> Why is an emergency action plan needed in the community? What will the plan do? Should include a statement such as "The purpose of this emergency action plan (EAP) is primarily to safeguard the lives and secondarily to reduce property damage of the citizens of Adams County, living along Spring Creek in the event of flooding caused by large runoff or failure of the Stoney Creek Dam."
- II. <u>Description of Dam</u> Provide a brief description of the dam including location, purpose, name of owner, date built. A sketch of the dam is also helpful. If more detail is needed, such as height, maximum storage capacity or other physical data, include in Appendix.
- III. <u>Hazard Area</u> Provide a brief description of the area that would be impacted by a breach or major flooding. Describe the populations affected and any critical facilities, such as hospitals, rescue and relief facilities, water supply and/or hazardous waste facilities, and bridges that may be significant. An inundation map should be included to show the extent of the hydraulic shadow, and a proposed time schedule of anticipated events based on historic data should also be included.
- IV. <u>Responsibility and Authority</u> Indicate the person or organization responsible for the maintenance and operation of the dam and the persons or groups responsible for implementing various phases of the EAP. The basic authority for carrying out the various components of the EAP should also be cited. See telephone list below.
- V. <u>Periodic Review, Testing and Updating</u> This section should provide the basis to update, extend, and improve the emergency action plan and to ensure readiness for executing the plan.

Include a schedule for carrying out periodic reviews of the plan by the participants at intervals not to exceed 1 year with updating for the changes in telephone numbers and personnel as they occur.

Include procedures and schedules for periodic testing of the plan. Special procedures for those aspects of the plan not susceptible to direct testing should be established and periodic exercise simulating emergencies carried out. Consideration should be given to updating (such as use of "controlled copies"), whereby plan holders are advised of any changes.

# **DAM OWNER/OPERATOR TELEPHONE LIST**

1.	State Warning Center
	(608) 266-3232
2.	Local Police/Sheriff Department
	()
3.	State Police/Patrol
	()
4.	Downstream and Upstream Dams and Operators
	• Dam Name
	• Telephone()
	• Dam Name
	• Telephone()
5.	Downstream Residence/Business
	()
6.	Hospital/Ambulance
	()
7.	State Dam Safety Agency
	Name: Richard J. Knitter, Wisconsin Department of Natural Resources, Bureau of Water Regulation & Zoning
	Telephone:(608) 266-1925
8.	Contractor Name: Telephone:
9.	Engineer Name:
<b>D</b> . (	Telephone:
Post	this list in a prominent place at the dam and give a copy to all of your operators.

VI. <u>Approval</u> - This section should provide the means by which all parties to the plan agree to their responsibilities to review the process and educate the public. The following is an example of a format that could be used:

We, the undersigned, this date acknowledge this (ANNEX or PLAN) as a part of the emergency operation procedure to protect life and reduce property damage in case of an emergency at the Stoney Creek Dam.

Signature, I.M. Dam owner	Date
Signature, County Sheriff, Adams County	Date
Signature, Mayor, City of Springfield	Date
Signature, Director of Springfield Civil Defense	Date
Signature, Chief of Springfield Police	Date

#### **B. IDENTIFICATION OF EMERGENCY**

The procedures and means for assuring timely and reliable identification and evaluation of potential or existing emergencies should be included. These would normally explain the events or conditions which indicate an emergency; define the levels of emergency and when each level is reached; describe the data and information collection system and how information is disseminated to the public; describe the analysis process; designate the responsible person(s); and ensure continuous coverage through designation of appropriate alternatives. Include media plan, shelter and food sites, utility shut-off, evacuation information.

For unattended dams, the surveillance and warning system should be described along with the expected reliability and backup system in place to assure that warning is given in the event of failure in the primary system.

#### C. PREVENTIVE ACTION

This section should discuss those preventive actions that need to be taken at the dam to prevent or delay failure after an emergency is first discovered. Because of uncertainties about their effectiveness, preventive actions usually would be carried out simultaneously with appropriate notification of an alert situation or warning situation.

#### **D. REENTRY AND RECOVERY**

This section should discuss the reentry procedures including road and bridge checks, water, gas and sanitation inspections, and damage documentation. Provide information on reentry routes, sanitation and help for the public, and mitigation opportunities.

#### Appendices

- A. Flood workers: names, addresses and phone numbers
- B. Critical facilities: contact, location and phone number
- C. Structures in hazard area: residents names, potential access problems
- D. Shelters: contact, address, phone number, capacity
- E. Map of evacuation routes
- F. Equipment (vehicles, sand bags, walkie-talkies, short wave, etc.): contact, phone number

· Summary Sheet Mame of Dam Mendota Locks File No. 13.6 County Dane Tr Location NW 3 SE Section 12 T 7 N, R 9 Stream Yahara River Mame of lake Held by Dan Mendota Present Owner City of Madison Existing Rench Marks Benchmark 689-C is a brass marker set in the downstream end of the right abutment wall of locks. Elevation 853.00. 853.40 Benchmark 689-D is a one inch bronze disk on upstream walkway of 857.07 bridge below dam on center line of locks. Elevation 95 \$52.47 0.0 = 847.82 1 F#7.42 B.M. 689-E is a chiseled square in left upstream unlikular of bridge on Sherman Boad just upstream of last post of guard fence on bridge ELEV. = 8

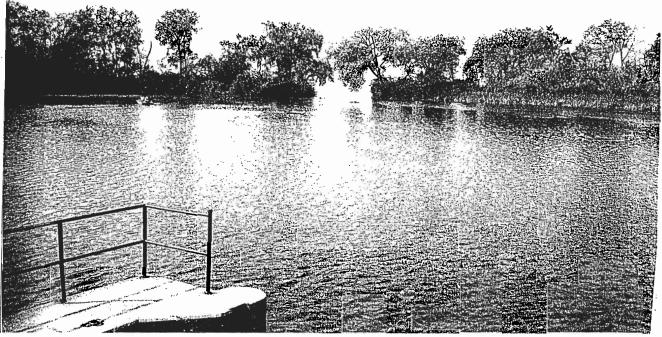
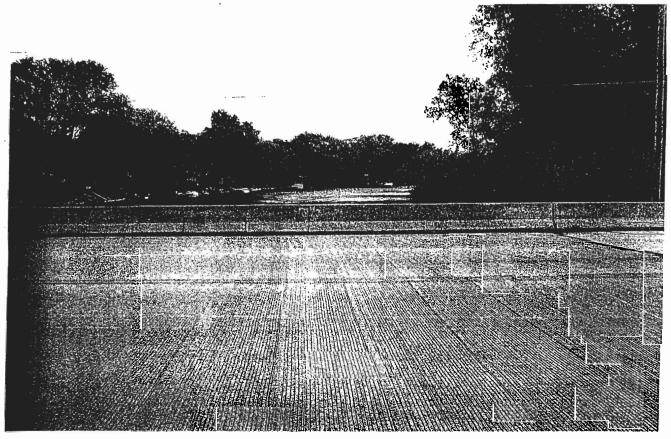


Photo 1 - View from dam looking upstream Photo 2 - View from Highway 51 bridge looking downstream



Left and right are determined while looking downstream.

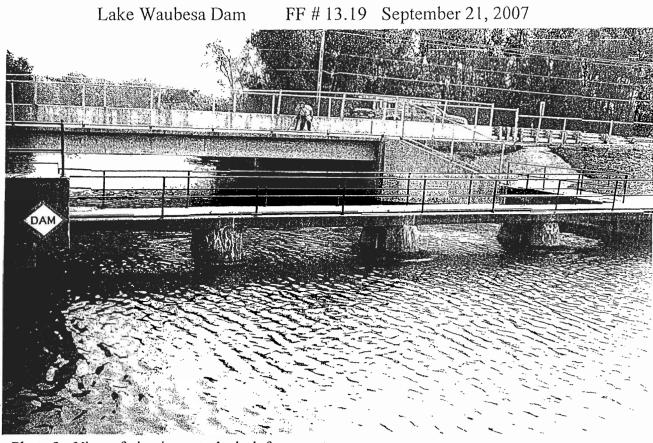
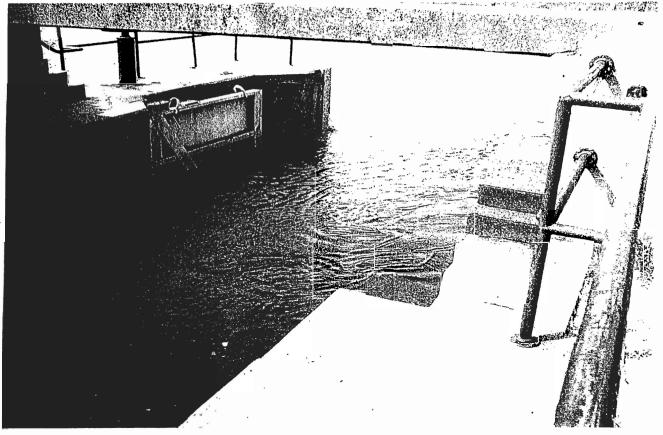


Photo 3 - View of piers/operator's deck from upstream Photo 4 - View of lock portion of dam. Currently not operational



Left and right are determined while looking downstream.

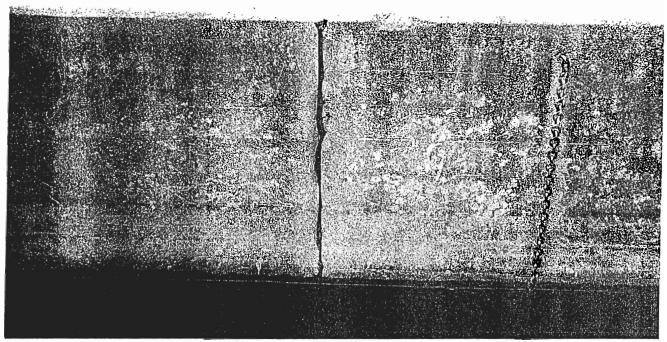
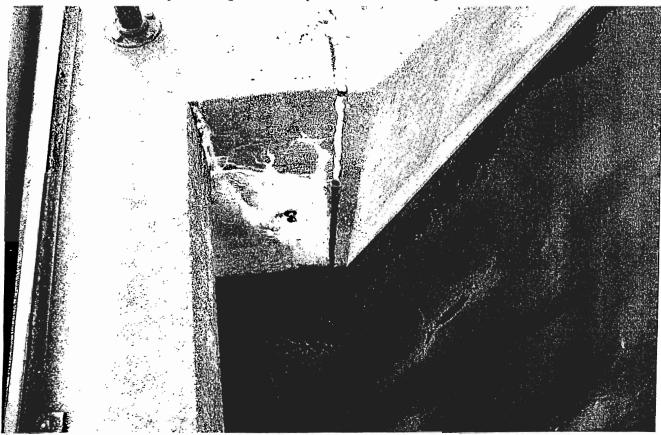


Photo 5 - View of cold joint in concrete (in lock). Fill joint with crack filler Photo 6 - View of cold joint at right side of operator's deck. Fill joint with crack filler



Left and right are determined while looking downstream.

Name of Dam: LAKE WAL	Date: Date:	9/21/07
	SVE JOSHEFF, KENS JOHNSON F.F#	
Owner's Name: DANE CO		
Street:		
City, State, Zip Code:		
County: $AANE$	Phone:	
	TZT CLONSY, WINSY, 80° Email:	
	GENERAL	Action
Item	N         Notes/ Observations	MI
1 Monuments/Benchmarks		
Location: Elevation:	BLIGHEB-13-385-92 ON D/S RTOF BRIDGE FO BM 691-B	
2 Pool Level Normal/Operating: Maximum: Minimum:	GAGE ON N/S LT OF LOCK @ 6.00 ALSO ON N/S LT OFLOCK	+1-(w.n)
3 Access Road	FROM PARKING LOT IN PARK	
t Signage/Security Portage: ♪ Dam Warning: ♪	TAKE OUT & DAM SIENS CHANGE	
Downstream Hazard: Fencing/Railings/Catwalks: Hazard Section	UK	
A. D/S Development Density: Distance: Type (Residential, Commercial, Industrial):	JESIDENTIAL ABOVE F.P.	
Dimensions: D/S distance: Traffic Level (Local, CTH, Rail Road, STH, Interstate, etc):	idge, Ford, Culvert, Trestle, Other (Explain) (Circle One) HWY 51 RIGHT AT THE JAM	
C. Distance to nearest D/S community/impoundment: Name:	STATE SAMPLEY IN MAG	
D. Estimated Hazard (based	EST SIGNIFICANT LOW BASED ON SUBMERG	ENCE
Noted; <b>M</b> = Monitor nvestigate; <b>R</b> = Repair = Field File; <b>RT</b> = Right; L <b>T</b> = Left = Upstream; <b>D/S</b> = Downstream	Action Suggestion1. Requires immediate action2. Plan to do soon3. Do when convenient	
itional Comments:		
	Dam Inspection Checklist	

the second	Kanada Kanada Magazina	Act M I
the second	Leasting on Eachard and Definion on	
	Location on Embankment and Deficiency	
X No problem		
ļ	~	
	,	·
No problem	Not applicable Could not inspect	
1		
No problem	Not applicable   [Could not inspect	<u> </u>
· · ·		
		••••••••••••••••••••••••••••••••••••••
Action Suggestion	1. Requires immediate action	
	2. Plan to do soon	
	3. Do when convenient	
KAIDIT	- HWY 51 VERY CARCO-	
		$\sim$
LERY G		
	No problem	No problem       Not applicable       Could not inspect         No problem       Not applicable       Could not inspect

Dam Increation Charlelist

	EM	BANKMENTS (Cont.)	
			Acti
Item	N	Notes/ Observations	MI
4 Slope Protection	K No problem	Not applicable Could not inspect	
A. Type (none, riprap, wave			
berm, concrete slabs, loose formed			
concrete/asphalt): B. Condition:			
D. Condition.	I		L
5 Other	No problem	Not applicable Could not inspect	
A. Rodent burrows (few, many)			
Locatio	n:		
B. Ruts			
Length/ Width/ Depth	1		
Locatio	<u>n:</u>		
C. Other			
Alignment	X No problem	Not applicable Could not impract	
A. Vertical	No problem	Not applicable Could not inspect	
Low area			LI
Elevation Difference	1		
Location	1		
B. Horizontal			
C. Width	l		
Too narrow: Location:			
Toe	No problem	Not applicable Could not inspect	
Cracks/Slumps:		Not applicable   [Could not inspect	
Embankment drains:			
Type/Flow:			
Location:			
Seepage/ Wetness:			
· Hummocky:			
Seepage Wet area:	✓ No problem	Not applicable Could not inspect	
Boil:			
Sinkhole:			
Aquatic vegetation:			
Rust colored deposits:			
Other:			
Sediment in Flow:			
Flowrate:			
Location:			
loted; <b>M</b> = Monitor	Action Suggestion	1. Requires immediate action	
vestigate; <b>R</b> = Repair	Action Suggestion	2. Plan to do soon	
Field File; <b>RT</b> = Right; LT = Le	ft	3. Do when convenient	
Upstream; D/S = Downstream			
dditional Comments:			
	Dam Inspec	tion Checklist	
Name:	F.F. #:		Page of

		SPILLWA	YPRINCIPAL - FI		Acti	
Item	N		Notes/ Observa		MI	F
1 Fixed Crest A. Dimensions	N	o problem	Not applicable	Could not inspect		<b>—</b>
Top Width:						1
B. Materials						Γ
C. Shape (sharp-crested, broad-crested, ogee, chute, gated,						
overflow, morning glory,						
dropbox, labyrinth)						
D. Debris	1					
Prevention (racks, booms, etc.):						
E. Concrete Condition *						
F. Flashboards (none, number):						
Type (Metal, wood): Dimensions:						
Operability:		`				
operaomity.					··· .	
G. Abutments	1					
Condition: *						
Seepage/wetness:						·
			r			
H. Drains	No p	oroblem	Not applicable	Could not inspect		
Type; Weep holes/ Relief						_
drains/ Other: Flow Rate:						
. Other						-
					LI	-
loted; M= Monitor	Actio	on Suggestion 1. F	equires immediate action	n		=
vestigate; R= Repair		2. P	lan to do soon			
= Field File; <b>RT</b> = Right; <b>LT</b> = Lef	ì	3. D	o when convenient			
= Upstream; D/S = Downstream	Cont	rolled = Gated	Uncontrolled = Over	rflow		
tional Comments:						
				٨		
No~	15 - ·	ALL STO	PLOG BAYS	FLOCK CH	Ambor	1
·				1 0002 000	1 2010	
pe of Concrete Problems: Spalli	ng, crac	ks, exposed rebar, r	nisalignment, joints, bug	holes, efflorescence, popou	ıts,	
hon	eycomb	oing, scaling, craze/r	nap cracks, isolated crac	k, disintegration, other		
	eycomb F.F.#:	bing, scaling, craze/n Dam Inspectio	on Checklist	k, disintegration, other nte: Pag	e of	

A. Types (IIIIdia, taitor(radia), inables, teal, roller, number and Size:       4 STOPLOG BAYS MA OPERATOR'S DECK.         B. Stoplogs       Dimensions: Condition:       OPERATOR'S DECK.         C. Abutments       Condition:       GOOD, MONITOR SEPARATION Seepage/vetness:         D. Piers (number, shape)       3 PIERSMINOR CRACKS/EN         D. Piers (number, shape)       3 PIERSMINOR CRACKS/EN         D. Piers (number, shape)       3 PIERSMINOR CRACKS/EN         E. Operability       Type of Operator: Condition: *       PLACE         E. Operability       Backup Operator: Backup Operator:       PLACE         F. Access       FROM SPERATOR'S DECK         G. Condition Rust: Searity(locked)?:       NOT SPERATOR'S DECK         G. Condition Rust: Searity(locked)?:       NOT SPERATOR'S DECK         G. Condition Rust: Searity(locked)?:       NOT SPERATOR'S DECK         J. Condition of Plowway       NOT SPERATOR'S DECK         J. Condition of Plowway       NONE APPR.		Ac	
A. Types (ithinks, tainer(radia), templogs, teaf, roller, number and Size;       H. STOPLOGE BAYS MARKED Structure, number and Size;         B. Stoplogs       Dimensions: Condition:       OPERATOR'S DECK         C. Abutments       Condition:       Sepage/wetness:       JOHNSTOR SEPARATION         D. Piers (number, shape)       3 PIEPESMINOR-CRACKEY (EPR         E. Operability       TOHNSTOR SEPARATION         Security(coked):       BOARDS IN SPERATOR'S DECK         Security(coked):       BOARDS IN SPERATOR'S DECK         Backup Operator:       MANUACLY FROM OPERATOR'S DECK         G. Condition:       Endowney         Backup Operator:       PLACE         F. Access       FROM SPERATOR'S DECK         G. Condition       Rust:         Scalis (takage):       Not SECONGRA         I. Lee protection       Nows AppR.         J. Condition of Flowway       None AppR.         J. Condition of Flow appring Controlled = Gated       Uncontrolled ection         Type (Weep holes/ Relief mins/ Other):		M	1
stoplags, leaf, roller, flashboards, acedies, other): Number and Size:       OFERATOR'S DECK         B. Stoplags       Dimensions: Condition:       OFERATOR'S DECK         C. Abutments       Condition:       GOOD, MONITOR SEPARATION Condition:         C. Abutments       GOOD, MONITOR SEPARATION Condition:       Seepage/wetness:         D. Piers (number, shape)       Z PIEPSMINOL-CRACK [EPA Condition:       E. Operability         D. Piers (number, shape)       Z PIEPSMINOL-CRACK [EPA Condition:       E. BOARDS IN SPERATOR'S DEC PLACE         E. Operability       MANUALY FROM OPERATOR'S DEC PLACE       Seetartor's DECK         F. Access       FROM SPERATOR'S DECK         Backup Operator:       NOT SESTENCED         K. Condition       Rust Seetals (leakage):       NOT SESTENCED         H. Ice protection       NOT SESTENCED         Type (Heaters, Bubblers, Barriers, Other)       Nonto APPR.         J. Condition of Flowway       Nonto APPR.         J. Condition of Flowway       Nonto APPR.         Flow rate:       Location:       Nonto Section         I. Other       Nonto APPR.         Settion Suggestion       I. Requires immediate action         Flow rate:       Location:         Location:       Settion Suggestion         I. Nother       Settion S	d not inspect thoroughly		
Instructional reading other):       Instructional reading other):       Instructional reading other):         Instructional reading other):       Not or or serves underse         Dimensions:       Condition:       Image: Condition:         C. Abutments       Good p. Monitor Serves underse         D. Piers (number, shape)       Image: Condition:       Image: Condition:         Condition:       Image: Condition:       Image: Condition:       Image: Condition:         Condition:       Image: Condition:       Image: Condition:       Image: Condition:         Security(Locked?):       Image: Condition:       Image: Condition:       Image: Condition:         Security(Locked?):       Image: Condition:       Image: Condition:       Image: Condition:       Image: Condition:         Security(Locked?):       Image: Condition:       Image: Condition:       Image: Condition:       Image: Condition:         Security(Locked?):       Image: Condition:       Image: Condition:       Image: Condition:       Image: Condition:         I. Debrity:       Image: Condition:	NOUTR THE		
Number and Size:       NOT OBSERVED VNBER         B. Stoplags       Dimensions:         Condition:       GOOD, MONITOK SEPARATION         C. Abutments       JOINTS         D. Piers (number, shape)       3 PIERSMINOR-CRACKS[EN]         Condition: *       Seepage/wetness:         D. Piers (number, shape)       3 PIERSMINOR-CRACKS[EN]         Condition(chain, ableshaps)       3 PIERSMINOR-CRACKS[EN]         E. Operability       MANUALLY FROM OPBEATORS         Security(locked?):       BACKUP Operator:         Backup Operator:       PLACE         F. Access       FROM OPBEATORS DEC         Backup Operator:       PLACE         Seals (seage):       No T         H. Ice protection       Norg         Type (Heater, Slubblers,       Norg         Barriers, Other)       Norg         I. Debris       Norg         Prevention (Rack, boom, etc.)       Norg         J. Condition of Flowway       Worg         K. Drains       Uncorf         Type (Weep holes/ Relief dnind/ Other):       Norg         J. Condition of Flowway       Above         K. Drains       Dimention         Type (Weep holes/ Relief dnind/ Other):       Dowe         Flow			
Dimensions:       Condition:       Condition: </td <td>T</td> <td></td> <td></td>	T		
C. Abutments       Condition: *       GOOD, MONITOR SEPARATION         Seepage/wetness:       JOINTS         D. Piers (number, shape)       2       PIEPSMINOR CRACK [/ EPI         Condition: *       3       PIEPSMINOR CRACK [/ EPI         E. Operability       MANUALY       FROM OF BEATOR.         Condition: ebbes, boisty:       Security(locked):       EBSARDS IN OFERATOR'S DEC         Backup Operator:       PLACE       PLACE         F. Access       FROM ORDERATOR'S DEC         G. Condition       Rust:       Not OBSERVED         Seals (leakage):       H. Ice protection       Not OBSERVED         H. Ice protection       Not OBSERVED       Not OBSERVED         Prevention (Rack, boom, etc.)       Not OBSERVED       Not OBSERVED         K. Drains       Type (Weep bales/ Relief drains/ Other):       None APPR.         J. Condition of Flowway       None APPR.       Location:         Location:       I. Other       Sone APPR.         Type (Weep bales/ Relief drains/ Other):       None APPR.       Sone APPR.         Second:       None APPR.       Sone APPR.         Location:       I. Other       Sone APPR.         Second:       None APPR.       Sone APPR.         J. Condition of Floww	er water		
Condition: *       Seepage/wetness:       Jowrs         D. Piers (number, shape)       J (EESS - M (Not-CRACKS) (EW)         Condition: *       Seepage/wetness:         E. Operability       MANUALY         Type of Operator:       MANUALY         Condition: *       E. SARDS : M OPERATOR'S DESC         Backup Operator:       PCACE         F. Access       FROM OPERATOR'S DESC         G. Condition       Rust:         Seals (leakape):       Not ORSERVERS         H. Ice protection       Nort ORSERVERS         Type (Heaters, Bubblers,       Jowe APPR.         J. Condition of Flowway       Not ORSERVERS         K. Drains       Nort OBSEAWED         K. Drains       Nore APPR.         J. Condition of Flowway       Nore APPR.         Flow rate:       Location:         Location:       Nore APPR.         S. Condition of Flowway       Nore APPR.         Flow rate:       Nore OBSEAWED         K. Drains       Nore OBSEAWED         K. Drains       Nore APPR.         F. Field File; RT = Right; LT = Left       3. Dowhen convenient         Se Optrawn; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         dditional Comments and/or Ske			
Condition:       Jowrs         D. Piers (number, shape)       3       PLEPLSMINOL CLARCKS/EPN         Condition:       3       PLEPLSMINOL CLARCKS/EPN         E. Operability       Type of Operator:       MANUALLY FROM OF BEATORS:         Condition:       Backup Operator:       MANUALLY FROM OF BEATORS:         Condition:       Backup Operator:       PLACE         F. Access       FROM OPBEATOR'S DESC         G. Condition       Rust:       Not OBSERVED         Seals (leakage):       Not OBSERVED         H. Ice protection       Nove APPR.         Barriers, Other)       Nove APPR.         J. Condition of Flowway       Not OBSERVED         K. Drains       Nove APPR.         Type (Veep holes/Relief drains/       Other):         Flow rate:       Location:         L. Other       Nove APPR.         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Investigate; R= Repair       2. Plan to do soon       3. Do when convenient         /S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         dditional Comments and/or Sketch:       Const 106M UPDATING TP       DIFFERMENT TY	VATCOR	K	
D. Piers (number, shape) Condition: *       3       PIERSMINOL CHARCES/EPH         E. Operability Type of Operator: Condition(chain, cables, hoist): Security(locked?): Backup Operator: Backup Operator: Backup Operator: PLACE       MANNALLY FROM OPERATOR'S DEC PLACE         F. Access       FROM OPERATOR'S DEC Backup Operator: Backup Operator: PLACE       PLACE         F. Access       FROM OPERATOR'S DEC PLACE       DEC FLACE         G. Condition       Rust: Seals (relaters): Prevention (Rack, boom, etc.)       Nort OBSERVED         J. Condition of Flowway       Nort OBSERVED         K. Drains       Nort OBSERVED         Type (Weep holes/Relief drains/ Other): Flow rate: Location:       Nort OBSERVED         E. Noted; M= Monitor       Action Suggestion       1. Requires immediate action         F. Field Thick T = Right LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream Controlled = Gated       Uncontrolled = Overflow         dditional Comments and/or Sketch:       Consister Controlled = Gated       Different Ty	11 0000		
E. Operability       Type of Operator:       MANUALLY FROM OPERATOR:         Condition(chain, cables, hoist):       Bookels, hoist):       Bookels, hoist):         Backup Operator:       PLACE         F. Access       FROM ORGENTIC'S DEC.         G. Condition       Rust:       Not OBSERVERS         Scals (leakage):       Not OBSERVERS         H. Ice protection       Nove APPR.         Barriers, Other)       Nove APPR.         J. Debris       Nove APPR.         Prevention (Rack, boom, etc.)       Nove APPR.         J. Condition of Flowway       Nove APPR.         Flow rate:       Nove APPR.         J. Condition of Flowway       Nove APPR.         Prevention (Rack, boom, etc.)       Nove APPR.         J. Condition of Flowway       Nove APPR.         I. Debris       Nove APPR.         Type (Weep holes/ Relief drains/ Other):       Nove APPR.         Flow rate:       Location:         L. Other       2         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         Investigate; R= Repair       2. Plan to do soon       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditiona	FLORDS	X	Ι
Type of Operator:       MANUALLY FROM OFBEATOR'.         Condition(claim, cables, bist):       Backup Operator:         Backup Operator:       PLACE         F. Access       FROM ORDEATOR'S DECK         G. Condition       Rust:         Seals (leakage):       NOT         H. Ice protection       NOT         Type (Heaters, Bubblers, Barriers, Other)       NOT         I. Debris       NOT         Prevention (Rack, boom, etc.)       NOT         Note       APPR.         J. Condition of Flowway       NOT         K. Drains       Nowe         Type (Weep holes/ Relief drains/ Other):       Nowe         Flow rate:       Location:         Location:       Location         I. Other       State Controlled = Gated         Investigate; R = Repair       State Controlled = Overflow         Hitional Comments and/or Sketch:       CONSIDER UP DATING TP SIFERTORY TY		5	
Condition(chain, cables, hoists): Security(locked?): Backup Operator:       Ear BookRDS IN OPERATOR'S DEC PLACE         F. Access       FROM OREGATION'S DECK         G. Condition       NoT         Rust: Seals (leakage):       NoT         H. Ice protection       Jones         Type (Heaters, Bubblers, Barriers, Other)       Jones         I. Debris       NoNS         Prevention (Rack, boom, etc.)       NoNS         J. Condition of Flowway       Kons         K. Drains       NoNS         Type (Weep holes/ Relief drains/ Other): Flow rate: Location:       NoNS         J. Other       Action Suggestion         I. Nothing:       Somes         Proventigate; R= Repair       Somes         Prestigate; R= Repair       Somes         Public Size       Controlled = Gated         Uncontrolled = Overflow       Controlled = Gated         Upstream; D/S = Downstream       Controlled = Gated         Consci Deb UPSATING       To       Differtant Ty	L in		L
Security(locked?):       Backup Operator:       PLACE         PLACE       PLACE         F. Access       FROM ORDEATOR'S DEC.         G. Condition       Rust:       NOT         Seals (leakage):       NOT       DESCRIPTION         H. Ice protection       NONE       APPR.         Barriers, Other)       NONE       APPR.         J. Condition of Flowway       NONE       APPR.         I. Other       None       None       None         Investigate; R= Repair       Seconon       Seconon       Seconon </td <td></td> <td></td> <td></td>			
Backup Operator:       PCACE         F. Access       FRON OPERATOR'S DECK         G. Condition       Rust:       Not OBSERVERS         Barriers, Other)       Jores       APPR.         Barriers, Other)       Jores       APPR.         J. Condition of Flowway       Not OBSERVERS         K. Drains       Note       Note         Type (Weep holes/ Relief drains/ Other):       Note       APPR.         I. Other       Note       APPR.         E. Other):       Note       APPR.         I. Other       Other):       Note       APPR.         I. Other       Incontrolled action       2. Plan to do soon       2. Plan to do soon         FField File; RT = Right; LT = Left       3. Do when convenient       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         dditional Comments and/or Sketch:       Consider UPDATING       70       Difference Try	5Chr CHAM2	51.	·
F. Access       FRON PREATOR'S DECK         G. Condition       No T       No T       SEEWGD         H. Ice protection       No T       Prevention       No T       SEEWGD         H. Ice protection       No T       Prevention (Rack, boom, etc.)       No NO T       APAR.         J. Condition of Flowway       No NO T       OB SEAWED       K. Drains         Type (Weep holes/ Relief drains/ Other):       No NE       APAR.         J. Condition of Flowway       No NE       APAR.         I. Debris       No NE       APAR.         J. Condition of Flowway       No NE       APAR.         J. Condition of Flowway       No NE       APAR.         I. Debris       No NE       APAR.         J. Condition of Flowway       No NE       APAR.         I. Condition of Flowway       No NE       APAR.         I. Condition of Flowway       No NE       APAR.         E. Controlled Trains       Other):       No NE       APAR.         E. Object Relief drains       Other):       No NE       APAR.         E. Other       I. Other       I. Requires immediate action       Prevention         S. Upstemail D'S = Downstream       Controlled = Gated       Uncontrolled = Overflow		, 0 ,	~
Rust:       Not CRSERVED         Seals (leakage):       Nove Appr         Barriers, Other)       Nove Appr         I. Debris       Nove Appr         Prevention (Rack, boom, etc.)       Nove Appr         J. Condition of Flowway       Nove Appr         K. Drains       Nove Appr         Type (Weep holes/ Relief drains/ Other):       Nove Appr         Plow rate:       Location:         L. Other       Nove Appr         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         e. Investigate; R= Repair       2. Plan to do soon       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       Cons 105%       DIFFERENCE TY         Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, effect	L		Ι
H. Ice protection         Type (Heaters, Bubblers, Barriers, Other)         I. Debris         Prevention (Rack, boom, etc.)         Nows         J. Condition of Flowway         Wows         Wows         Mows         J. Condition of Flowway         Wows         Wows         Mows         Mows         J. Condition of Flowway         Wows         Plow rate:         Location:         L. Other         =         Note:         Repair         Pilot do soon         S = Upstream; D/S = D		Τ	Т
H. Ice protection         Type (Heaters, Bubblers, Barriers, Other)         I. Debris         Prevention (Rack, boom, etc.)         Nows         J. Condition of Flowway         Wows         Wows         Mows         J. Condition of Flowway         Wows         Wows         Mows         Mows         J. Condition of Flowway         Wows         Plow rate:         Location:         L. Other         =         Note:         Repair         Pilot do soon         S = Upstream; D/S = D			
Type (Heaters, Bubblers, Barriers, Other)       Nowe Appen.         I. Debris       Prevention (Rack, boom, etc.)       Nowe Appen.         J. Condition of Flowway       Nowe Appen.         K. Drains       Nowe Appen.         Type (Weep holes/ Relief drains/ Other):       Nowe Appen.         I. Other       Interview Appen.         Location:       Nowe Appen.         I. Other       Interview Appen.         I.			
Barriers, Other)       I. Debris         Prevention (Rack, boom, etc.)       Nows Apple.         J. Condition of Flowway       Rows Apple.         J. Condition of Flowway       Rows Apple.         K. Drains	· · L		L
I. Debris       Nows APPR.         J. Condition of Flowway       Nows APPR.         J. Condition of Flowway       Nows APPR.         J. Condition of Flowway       Nows APPR.         K. Drains			
Prevention (Rack, boom, etc.)       Nows APPA.         J. Condition of Flowway       Nows APPA.         J. Condition of Flowway       Nows APPA.         K. Drains       Image: Constraints of the constrant of the constraints of the constraints of the constraints of th			-
J. Condition of Flowway       The Not observed         K. Drains       Image: Constraint of the con	L		L
K. Drains       Mone Addr.         Type (Weep holes/ Relief drains/ Other):       None Addr.         Flow rate:       None Addr.         Location:       Location:         L. Other       .         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         /S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         dditional Comments and/or Sketch:       Conscient UPDATING       TD       Difference Try         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, effect			•
Type (Weep holes/ Relief drains/ Other): Flow rate: Location:       Nowe APAR.         I. Other       I. Conter         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         /S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Idditional Comments and/or Sketch:       Consider UPDATING TO DIFFERENT TY         Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflor	L	Ι	
Type (Weep holes/ Relief drains/ Other): Flow rate: Location:       Nowe APAR.         I. Other       I. Conter         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         /S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Idditional Comments and/or Sketch:       Consider UPDATING TO DIFFERENT TY         Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflor			
Other): Flow rate: Location:       None AAAR.         I. Other       I. Requires immediate action         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         = Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       DIFFERMENT TY         Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			i
Flow rate:       NONE       HHR.         Location:       Location:         L. Other       Incontrol and the second			
Location:         L. Other         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UPDATING       TP       DIFFERMENT TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			
L. Other         = Noted; M= Monitor       Action Suggestion       1. Requires immediate action         Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UP (DATING 70)       DIFFERENT TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			
Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UP (IATING       TV       DIFFERENT TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored	T		
Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UP (IATING TO DIFFERENT TY         CONSIDER       UP (IATING TO DIFFERENT TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			
Investigate; R= Repair       2. Plan to do soon         F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UP DATING       TO       DIFFERENT TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			_
F.= Field File; RT = Right; LT = Left       3. Do when convenient         S = Upstream; D/S = Downstream       Controlled = Gated       Uncontrolled = Overflow         Iditional Comments and/or Sketch:       CONSIDER       UP (IATING       TV       DIFFERENT       TY         Type of Concrete Problems:       Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored       Spalling       Concrete Problems:       Spalling			
Iditional Comments and/or Sketch:         CONSIDER UPDATING TO DIFFERENT TY         Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflored			
Iditional Comments and/or Sketch: CONSIDER UPDATING TO DIFFERENT TY Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflo			
Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflo			
Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflo			
Type of Concrete Problems: Spalling, cracks, exposed rebar, misalignment, joints, bug holes, efflo	YPE OF GAT	ÐS	
	- 0.1		
honeycombing, scaling, craze/map cracks, isolated crack, disintegr			
Dam Inspection Checklist			
m Name: F.F.#: Date:	Page	of	

,		SPILLWAYPRIM	NCIPAL - WHIST	LE TUBES	A	Act
Item	N		Notes/ Observat		M	]
1 Whistle Tubes		Full circle/ Whistle tube	Half circle riser	Glory hole (Drop Inlet)		
A. Inlet Riser Diameter						
D. O. H. L. i *						
<b>B. Outlet pipe *</b> Dia: Type:						
Dia: Type:						
C. Low level draw /Inlet Pipe						
What kind & Size:						
D. Debris/Trash Rack						
E. Antivortex						
F. Material					TT	
F					L	
C. Alignment						
G. Alignment						
Noted; M= Monitor nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments and/or Sketc	Co	2. Plan 3. Do w ontrolled = Gated	to do soon hen convenient Uncontrolled = Ove	rflow		_
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
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vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
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vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow .		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream	Left Co	2. Plan 3. Do w ontrolled = Gated	hen convenient	rflow		
nvestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments and/or Sketc	Left ch:	2. Plan 3. Do w controlled = Gated	hen convenient Uncontrolled = Ove	· · · · · · · · · · · · · · · · · · ·		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments and/or Sketc	Left Ch:	2. Plan 3. Do w controlled = Gated	hen convenient Uncontrolled = Ove	holes, efflorescence, popouts,		
vestigate; R= Repair = Field File; RT = Right; LT = I = Upstream; D/S = Downstream itional Comments and/or Sketc	Left Ch:	2. Plan 3. Do w controlled = Gated	hen convenient Uncontrolled = Over ignment, joints, bug cracks, isolated cracl	holes, efflorescence, popouts,		

οΓΙΔΔΨΑΥΡΚ	INCL	PAL - OUTLET EROSION CONTROL & UNDERMINING		cti
Item	N	Notes/ Observations	M	
1 Outlet Erosion Control	1.	No problem Not applicable Could not inspect thoroughly	1.1.1	
A. Type (none, endwall, plunge				
pool, energy dissipation structure				
rock lined channel, apron)				
		· · · · ·		
B. Scour				
C. Material				
a. Riprap: Avg Diameter:				
Condition (adequate, sparse,				
displaced, weathered):				
Bedding fabric- (Yes/ No):				
b. Concrete *				
Dimensions/Location:				
D. Sidewall/Headwall				
Misalignment:				
Location:				
Description:				
E. Separated Joint / Loss of			T	
Joint Material:		_		
Location:		· · · ·		
Description:		$\epsilon$		
F. Natural				
				_
Undermining	N	o problem Not applicable Could not inspect thoroughly		
Location:				
Description:				
Noted; M = Monitor	AC	tion Suggestion 1. Requires immediate action		
vestigate; R= Repair	- <b>A</b>	2. Plan to do soon		
= Field File; $\mathbf{RT}$ = Right; $\mathbf{LT}$ = L		3. Do when convenient		
= Upstream; D/S = Downstream tional Comments:	C0	ntrolled = Gated Uncontrolled = Overflow		
Nor O	101	PUEN		
Not 0	62e			
11. 3				
		χ.		
		racks, exposed rebar, misalignment, joints, bug holes, efflorescence, popouts,		
hc	oneyco	mbing, scaling, craze/map cracks, isolated crack, disintegration, other		
		Dam Inspection Checklist		
		Date: Page	of	

		SPILLWAYAUXILIARY		
Description:	· · ·	* :		Acti
Item	N	Notes/ Observations	M	I
1 Dimensions				
Length/ Width:				
Outfall Slope:				
2 Type (turf, reinforced turf,				
riprap, block, concrete):		· · · · ·		
3 Signs of usage	1			
(debris, bent grass, etc.):				
		·		
4 Vegetation:	No problem	·		
A. Trees				
Quantity (<5, sparse, dense):				
Diameter:		·		
Location:				
B. Brush	·			
Quantity (sparse, dense):				
Diameter:				,
Location:				
C. Ground cover:				
Type (grass, crown vetch, other)				
Quantity (bare, sparse, adequate		· ** ,		
dense):				
Appearance (tall, short, good):				
5 Slope protection	Not applicable			
A. Type (none, riprap, wave				Τ
berm, concrete slabs, other):		·		
Condition:				
6 Erosion	No problem	Not applicable Could not inspect		
A. Wave erosion (beaching):				1
Scarp: Length/ Width:				
Location:		,		
B. Runoff erosion (Gullies)				T
Quantity:		·		
Length/ Width/ Depth:				
Location:				
Instabilities	No problem	Not applicable Could not inspect		
A. Slides				T
Transverse Length:		L	I	
Longitudinal Length:				
Scarp: Length/ Width:				
Location:				
Crack Length/ Width:				
Location:				
	Action Comment'	n 1 Dequires immediate action		· ·
Noted; M= Monitor	Action Suggestio	n 1. Requires immediate action		
nvestigate; R= Repair		2. Plan to do soon		
= Field File; <b>RT</b> = Right; <b>LT</b> = Left		3. Do when convenient		
= Upstream; D/S = Downstream				
itional Comments:		2		
- //	ONE	POSSIRIN LOCK CHAMBER CONCH	D	
<i>V</i> 3		POSSIBLY LOCK CHAMBER COUL BE CONSIDERED AVX. SPILLWAY	-	
		BE CONSIDERED AVX. SPILLWAY		
Type of Concrete Problems: Spall	ing, cracks, exposed	d rebar, misalignment, joints bug holes, efflorescence, popouts	5,	
		g, craze/map cracks, isolated crack, disintegration, other	····· ·	
		spection Checklist		
Name: F.F.#:		Date: Page:	of	

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			SP	ILLWAYAUXILL	ARY (Conf	)	Ti	Acti
	Item	N			servations	/	M	I
	B. Bulges: (Depressions,						1	
	Hummocky):	·	-				have	
	Size	:						
	Height/ Depth	:						
	Other		No problem	Not applicable	Could	not inspect		
	A. Rodent burrows (few, many)	the second se						
	Location:		·····					
	B. Ruts							
	Location:							
	Length/ Width/ Depth:							
	C. Other (debris):							
4					1-1			
	Outlet erosion control		No problem	Not applicable	Could r	ot inspect thoroughly		
4	A. Type (none, endwall, plunge							
	pool, energy, dissipation structure							
	rock-lined channel, apron):			,				
L	Condition (Scour?):							
I	3. Material					L		
	Riprap: Avg. diameter:							
	Condition (adequate, sparse,							
	displaced, weathered):							
	Bedding fabric (Yes/No):							
C	C. Concrete *	N	lot applicable					
	a. Condition *							T
	b. Cracking *					Γ		
	Dimensions/Location:							
	c. Sidewall/ Headwall*					Γ		Т
	Misalignment:					L		
	Location:							
	Description:							
	d. Joints					Г	T	Т
	Separated:							
	Loss of material:						·	
	Location:							
	Description:			χ.				
D.	Natural						T	Т
Un	dermining	No	problem	Could not inspect	horoughly			T
	Location:							
	Description:							
lote	ed; M= Monitor	Act	ion Suggestion	1. Requires immediat	e action			
	tigate; <b>R</b> = Repair			2. Plan to do soon				
	eld File; RT = Right; LT = Left	1		3. Do when convenies	nt			
	pstream; <b>D/S</b> = Downstream							
tior	nal Comments:							
			NONE					
			1.00.					
ype	e of Concrete Problems: Spa							
	h	oneyco	and the second	craze/map cracks, isola	ted crack, dis	integration, other		
LT.			Dam Insp	ection Checklist		~	_	
Nar	ne: F.F.a	#:		Date		Page:	_ of	

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A B. 2 Liz A. devii No Ben C. V a. M	Item General Type of lake drain (isolated control/intake tower, valve vault with outlet conduit valve in riser/drop inlet siphon): Size: Operated (Yes/ No) ake drain components Concrete structure Location: Description *	N	None found		lotes/ Observat es not have one	ions				M	I
A B. 2 Liz A. devii No Ben C. V a. M	Type of lake drain (isolated control/intake tower, valve vault with outlet conduit valve in riser/drop inlet siphon): Size: Operated (Yes/ No) ake drain components Concrete structure Location:		None found	Do	es not have one	-	**				
B. 2 Lz A. devii No Ben C. V a. M	(isolated control/intake tower, valve vault with outlet conduit valve in riser/drop inlet siphon): Size: Operated (Yes/ No) ake drain components Concrete structure Location:										
2 La A. B. devii No Ben C. V a. M	valve vault with outlet conduit valve in riser/drop inlet siphon): Size: Operated (Yes/ No) ake drain components Concrete structure Location:				·						
2 Lzz A.d B. devii No Ben C. V a. M	valve in riser/drop inlet siphon): Size: Operated (Yes/ No) ake drain components Concrete structure Location:	]					• · ·				
2 La A. B. devii No Ben C. V a. M	Size: Operated (Yes/ No) ake drain components Concrete structure Location:	]									
2 La A. B. devii No Ben C. V a. M	Operated (Yes/ No) ake drain components Concrete structure Location:										
2 La A. B. devii No Ben C. V a. M	ake drain components Concrete structure Location:										
A. B. devia No Ben C. V a. M	Concrete structure Location:								L		
A. B. deviu No Ben C. V	Concrete structure Location:					- 1998					
devia No Ben C. V a. M											
devia No Ben C. V a. M	Descriptions								L		_
devia No Ben C. V a. M	Description:*										
devia No Ben C. V a. M	Condition:*										
No Ben C. V a. M	Valve control (operating									T	
Ben C. V a. M								5.1	<b>L</b>		
С. V а. М	operating device; No stem										
a. M	nt/Broken Stem; Access										
a. M	Other:										
a. M	Operability:	•									
	/alve/Sluice gate										
	Quantity:										
	1etal deterioration (surface										
	rust, minor, moderate, extensive,										
	other):										
	Location:										
	Flow rate:										
	lisalignment										
	akage - Flow rate										
0.0	utlet conduit										Ι
	Size:										
	Material:										•
	Condition:			nt							
E. En	ergy dissipater										
	Type (endwall, plunge pool										
	impact basin, stilling basin,										
	rock-lined channel, none):										
	Condition:*										
			•								
nted	M= Monitor	Acti	ion Suggestion	1. Requires	immediate action						
	gate; $\mathbf{R}$ = Repair			2. Plan to de							
	d File; RT = Right; LT = Left		•	3. Do when							
	tream; $D/S = Downstream$ .			2.20 1101							
_	Comments:										
	NONE	-	APPR.								
	/ 10/ 40										
	f Concrete Problems: Spal				nment, joints bug						

	Powerhouse/ Mill Building			
Item	N Notes/ Observations	M	Actio	on T
1 Est. Capacity (Kw):	IN INDES/ ODSERVATIONS			+
Date last used:		L	- <b>I</b>	
Current Use:				_
2 Item:			1	
A. Headrace general				
Gates/ Trashracks:				
Vegetation/ Erosion: Sloughs/Slides/Cracks:				
Stoughts/Studes/Clacks. Seepage Wetness:				
Rodent Burrows:				
Concrete:				
B. Tailrace				Γ
Scour:				
Vegetation/Erosion:				
Sloughs/Slides/Cracks:				
Seepage wetness:				
Rodent burrows:				
Concrete: C. Foundation: general		TT		-
C. Foundation: general Concrete:		L1		
Seepage:				
Integrity:				
D. Superstructure				
Condition:				
loted; M= Monitor	Action Suggestion 1. Requires immediate action			-
vestigate; R= Repair = Field File; RT = Right; LT = Left = Upstream; D/S = Downstream	<ol> <li>Plan to do soon</li> <li>Do when convenient</li> </ol>			
tional Comments:				

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				FIELI	) BOOK		
Profile Level	ing For:	NAUBESA	T ANA	Instrun	nent Perso	n: 5J	
Original Note		the second s	1 Prove	]	Rod Perso	n:	
						KJ	
Instrument U	sed:				Note Take	r: ST	
Weather Con	ditions:	$\overline{\Omega}$					
		1		Y. WINDY			(L) D V O
STATION	B.S. +	H.I.	F.S	ELEV.	DIST.	REN	ARKS
BM 691-B /1	0.98	860.80		849.8Z	-	•	
SIDE			11.00	849,80			
A SIDE OF LOCK VIS SIDE			11.02	849,78			
ock sill			22,23	838.57			
DS SIL			22.23	838.57			
TENO PILLWAY SILL			22.41	838.39			
F CENTER PILLWAY SILL			20.90	839.90			
T CENTER PILLWAT SILL			21.14	839.66			
T SPILLMAY SILL			20.86	839.94			
ERATOR 21 SEE C - ABUT			10,99	849.81			•
CHATOR CHAGGE			11.02	849.78			
15			14.83	845.97			
4065 3m		1	.82	858.98		BRIDGE BM	B-13-385-92
M			10.98	849.82		CLOSE	
tch Mank Info	ormation	: /	9.82	850.98			
lone	DEP-	THE	0/s =	6.5'			
			•				
ments:							
		at : wat a.					
ested Survey	_		lo:	11	Ir	ow Embankment	
	HW TW		Si	nest		. Groin	
		Channel		outments		. Groin	
		. Crest LT		ix. Crest RT		utlet Pipe Invert	

STATION	B.S. +	H.I.	F.S	ELEV.	DIST.	REM	ARKS
					· · · · · · · · · · · · · · · · · · ·		
							,
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iments:							
ested Survey	y points:						
	HW		Sill			ow Embankment	
	TW		Cre			t. Groin	
		Channel		itments		t. Groin	
	Aux.	Crest LT		. Crest RT		utlet Pipe Invert	
			Dam 1	Inspection	Checklis	t	
Name:		<b>F.F.</b> #:			Date:		Pageof_

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rec 1-4-08



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# State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor Matthew J. Frank, Secretary Lloyd L. Eagan, Regional Director South Central Region Headquarters 3911 Fish Hatchery Road Fitchburg, Wisconsin 53711-5397 Telephone 608-275-3266 FAX 608-275-3338 TTY Access via relay - 711

January 2, 2008

IN REPLY REFER TO: 13.19

Dane County Department of Land and Water Resources Mr. Kevin Connors, Director 1 Fen Oak Court, Room 208 Madison, WI 53718

SUBJECT: Assignment of the Hazard Rating for the Lake Waubesa Dam, Field File No. 13.19, Dane County

Dear Mr. Connors:

I am sending you this letter to notify you that we are setting the hazard rating for the Lake Waubesa Dam. The hazard rating is being set as Low Hazard. The dam, as currently configured, is submerged by less than the 10-year flood according to the detailed study of the Yahara River done for the Dane County FIS. The dam was witnessed to be submerged by Department staff during our inspection of the dam on September 21, 2007.

Dane County has floodplain zoning in place below the dam that incorporates the required dam failure floodplain (hydraulic shadow). This will provide adequate floodplain zoning downstream to prevent future, unprotected development in the floodplain and allow this assignment of a low hazard rating.

If you have questions, please give me a call or e-mail me. Thank you for your continued cooperation.

Sincerely,

Robert R. Davis, P.E. Water Management Engineer Robert.Davis@Wisconsin.gov 608-275-3316

cc: Bill Sturtevant, P.E. - WT/3

