

INSPECTION, OPERATION, AND MAINTENANCE PLAN

POST LAKE DAM

Located on the Wolf River

DNR Dam Key Sequence No. 645
DNR Field File No. 34.03

POST LAKE PROTECTION & REHABILITATION DISTRICT

DAM TENDER

KEN WEST
715-275-3018

Prepared by: RUSCH ENGINEERING & SURVEYING LLC (May 8, 2012)
Updated: PLP&RD (January 2018)

INSPECTION, OPERATION, AND MAINTENANCE PLAN

POST LAKE DAM

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I. GENERAL INFORMATION

A. INTRODUCTION

This Manual describes a Plan for the Inspection, Operation, and Maintenance (IOM) of the Post Lake Dam (Dam). This manual will be periodically reviewed and updated to reflect any changes and provide the most current information.

This manual was prepared for the Post Lake Protection and Rehabilitation District (District), to conform with Chapter NR 333 *Dam Design and Construction Standards*.

This Manual, along with other important records of the Dam, will be kept on file at the District Office, located at W8684 County Hwy K, Elcho, WI 54428.

B. PURPOSE

The purpose of this IOM Plan is to provide the District, its Officials, and its Dam Operator(s) with:

- Guidelines for the operation, inspection, and maintenance of the Dam
- Forms which are used to document IOM activities
- A Consistent source of information into the future

C. DESCRIPTION OF POST LAKE DAM

Post Lake Dam is located in Section 15 in the Town of Elcho. The Dam is located under and adjacent to the Clear Lake Road Bridge over the Wolf River. The impoundment created by the Dam is called Upper and Lower Post Lake, which are located in Sections 2, 3, 10, 11, 14, 15, 22, 23, and 26 in the Town of Elcho in Langlade County, and in Sections 34 and 35 in the Town of Schoepke in Oneida County.

The Wolf River flows from the north into Upper Post (approximately 757 acres), under Langlade County Highway K, and into Lower Post Lake (approx 377 acres). The Dam is located at the northeast end of Lower Post Lake.

The Wolf River downstream of the Dam flows east and south. There are permanent and seasonal residences downstream of the Dam, on both banks of the River.

Numerous permanent residences, seasonal residences, and commercial buildings are located along and around the Wolf River upstream and Upper and Lower Post Lakes.

A dam has been at this location since the late 1800's. The current dam structure was built in 1932. The dam has been routinely maintained. In 1986, the ownership of the Dam was formally conveyed to the District, and responsibility for the Dam's operation, inspection and maintenance was assumed by the District through their Board and Employees.

The Dam is a concrete structure, with earthen embankments on the north and south ends. The dam includes a permanent spillway, and three movable steel gates.

Dams in Wisconsin are regulated by several statutes including State Statute 31, Chapter NR 330, Chapter NR 333, and Chapter NR 335.

The dam is currently classified as a Large Dam, due to its height and the amount of water impounded. The Dam is considered Low Hazard (low hazard rating approval from Bill Sturtevant (DNR) on December 6, 2017).

DNR maintains a database of dam information, a copy of the Post Lake Dam information is found in Appendix 1.

D. ORGANIZATION AND PERSONNEL

The District is the Owner and Operator of the Post Lake Dam.

The voters of the District elect a Board of Commissioners to manage the affairs of the District, including Operation, Inspection and Maintenance of the Dam.

The District employs a Dam Tender to manage the day-to-day operation of the Dam. The Dam Tender performs routine operational, inspection, and maintenance activities on a regular basis. Activities include monitoring water levels, adjusting gate settings to regulate water level, observes the overall condition of the dam and appurtenance facilities, performing routine maintenance, and communicating with the Board.

The Board is responsible for recommending the budgeting funds for dam operation, for supervising the routine operation, inspection, and maintenance of the dam, and also for coordinating non-routine maintenance requirements. The Board is also responsible for regulatory compliance, including preparation of the required plans and managing of inspections

A list of key Dam Officials is included as Appendix 2.

II. OPERATION

The key operational activities at the Dam are: Monitoring the day-to-day safety and condition of the Dam, monitoring water level, and adjusting the gate settings to regulate water level.

These activities are performed by the Dam Tender. The Dam Tender routinely observes the status at the Dam, including the water level. Unexpected conditions are addressed directly or brought to the attention of the Board.

The minimum and maximum water level of Post Lake is established by the Order of The Department of Natural Resources dated May 31, 1994 (DNR 1994 Order, a copy of which is included as Appendix 3). The water level at the dam is monitored at a gage on the concrete gateway. The gates of the Dam are adjusted as needed to keep the level within the normal operating range. The Dam Tender needs to monitor water levels and weather forecasts. The Dam Tender may at times need to adjust gates in anticipation of rain events in order to keep the operating level within the prescribed range.

An existing staff gauge located on the north pier with numbers shown on gauge corresponding to the local datum. A range from 95 to 96, being a 12' range, has been established by the DNR as the minimum to maximum water levels the lakes shall be kept at. An additional gauge will be placed along side of the existing gauge that will portray these numbers as sea level elevations (95=1519.37 and 96=1520.37).

The Dam is located downstream of the Little Rice Dam; contact Jeremy Holtz with the DNR (jJeremy.holtz@wisconsin.gov or 715-365-8999) with questions about the operation of the Little Rice Dam.

The Dam Tender completes a Monthly Log Sheet (see Appendix 4), noting on a daily basis the water level and positioning of the three gates. The Monthly Log Sheet is filed with the other important records of the Dam and filed at the PLP&RD office.

III. INSPECTION

Inspections are an important part of dam safety in that early detection of potential problems can prevent large maintenance expenses, and can prevent small issues from growing into serious or emergency events.

Inspections at the Post Lake Dam can be categorized into four types:

1. Daily inspection by Dam Tender - As part of his routine responsibilities, the Dam Tender is in position to observe conditions and detect any unusual or suspicious events. Should the Dam Tender observe any such

non-routine situation, and after significant high-water or flooding events, a Dam Inspection Report (Appendix 5) should be filled out. This will be a communication tool to Dam Officials and will provide a record of actions taken, maintenance performed, and planning needed. Once any required action is completed, the Dam Inspection Report should be filed with the other important records of the Dam at the PLP&RD office.

2. Regular Monthly Inspection - Every month the Dam Tender and possibly other officials should perform a routine inspection using the "Dam Inspection Report" checklist to aide in the process. The report again will serve as a communication tool and may trigger planned maintenance activity. The Dam Inspection Report should be filed with the other important records of the Dam.
3. Inspection - Since the Dam is classified as a Large, Low-Hazard dam, Chapter NR 333 requires an inspection by a Licensed Engineer at ten year intervals. The inspection was last performed in 2015 by Ayres & Associates. DNR has prepared an inspection checklist (<http://dnr.wi.gov/topic/Dams/InspectionOwner.html>) which may be used as the basis for this inspection. This in-depth inspection should take place mid-year, after winter conditions and the traditional high water levels and flows associated with spring runoff. This inspection evaluates if/how the dam has changed. In addition to visual observation, it includes photos and measurements which will document the dam's condition over longer periods of time. This inspection also verifies that any required drawings or other records are kept up-to-date. This inspection will provide documentation that will be useful in evaluating long-term maintenance requirements. This inspection will be filed by the District with the other important operating files of the Dam. State code requires that copies of this inspection report be submitted to DNR. The DNR will issue a concurrence letter that will include action items and deadlines.
4. DNR Ten-Year inspection - A Water Management Engineer from the DNR performs a thorough inspection every 10 years. The report which is provided to the District Board, points out condition-based maintenance needs in addition to identifying compliance issues related to IOM Plan and EAP. This report will possibly specify actions which the District needs to accomplish along with a specified deadline. In addition to performing those action items, the District should fill the 10-year Inspection Report with other important records of the Dam. DNR Ten-Year inspections were most recently performed in 1986, 1997, 2007 and 2017.

IV MAINTENANCE

The Dam is constructed of concrete, steel, earth, rock, and other materials all of which may be subject to wear and tear, deterioration, and occasional failure.

Results of the various Inspections performed (Daily, Non-routine, Monthly, Annual, and DNR Ten-Year) will dictate the extent and frequency of maintenance required.

Routine Maintenance activities will generally be performed by the Dam Tender or other trained Dam Officials, and will be documented through use of the Dam Inspection Report forms. The following items, at a minimum, need to be completed annually:

- Mowing and brushing of embankments
- Monitor concrete
- Operate gates

Larger, non-routine maintenance activities may be performed by Dam Officials or by qualified contractors and will be funded through the regular budgeting process of the District.

The District works under an annual budget which is approved by the voters at its Annual Meeting. Routine, on-going maintenance needs are covered by the regular operating budget. Larger, non-routine expenses need to be specifically planned and included as line items in the budget. The Board of Commissioners has authority to expend funds from reserves in the event of an emergency expense not budgeted.

Budget records should be filed with the important records of the Dam. Maintenance records should also be filed with the important records of the Dam at the PLP&RD office.

V. ATTACHMENTS

1. DNR Dam Summary Sheet
2. List of Key Dam Officials
3. DNR Order 1994
4. Monthly Log Sheet
5. Dam Tender's Inspection Report
6. Location Map

Detailed Information for Dam Upper Post Lake

Dam Key Seq No	645	Field File No	34.03
Size	LARGE	NID	698
Popular Name	Post Lake	Former Name	

Location

County	Langlade	Longitude	-89.086499
Latitude	45.437265	Located TRS	
Permitted TRS		Located TRS	
QQQ:SE QQ:SW Q:SW - Sec:11 T:34N R:11		QQ:SE Q:SW - Sec:11 T:34N R:11	

Contacts

Owner		Alternate	
Organization	Post Lake Protection & Rehabilitation District	Organization	
Name	John Stebers	Name	Ken West

Waterbody

Drainage Basin (sq mi)	122.00		
Stream		Impoundment	
Local Name	WOLF RIVER	Local Name	UPPER AND LOWER POST LAKES
Row and Official Name		Row and Official Name	
Navigable?	navigable	Size (acres)	1,134.00
When was navigability determined?	1,932.00	Maximum Depth (ft)	14.00

Regulatory/Inspection

NR 333 Years	EAP:2017 IOM:2012 HYD:2016 STAB: ZONE:2016		
Auth. Approval Desc	1866C35	Regulatory Agency	WIDNR
Hazard Rating	Low	Estimated Hazard Rating	Low
Ferc. No		Exempt Issue Date	
Ferc. Inspection Year		License Expiration Year	

Construction Characteristics

Normal Storage (acre-ft)	4,000.00	Max Storage (acre-ft)	13,000.00
Structural Height (ft)	10.00	Hydraulic Height (ft)	3.00
Crest Length (ft)	200.00	Spillway Type	Controlled
Discharge Through Principal Spillway (cfs)	1,820.00	Width/Diameter of Principal Spillway (ft)	30.00
Total Discharge Through All Spillways (cfs)	1,820.00	Total Width/Diameter of All Spillways (ft)	
Core Type		Position	
Foundation Type		Foundation Certainty	
Purposes	RECREATION	Structural Types	GRAVITY EARTH

Detailed Information for Dam Upper Post Lake

Water Levels

	Normal		Winter	
	MSL	Datum	MSL	Datum
Minimum	1,519.37	NAVD 88		
Normal				
Maximum	1,520.37	NAVD 88		

Construction History

Designer	Construction Firm	Complete Year
HENRY OLK		1932

Outlet Gates

No data found.

Inspection History

Inspection Date	Inspection Report Date	DNR Engineer Initials	Inspection Type
10/19/2017	12/18/2017	JLJ	31.19
11/20/2015	1/28/2016	MAW	CNSLT
11/20/2015		MAW	CNSLT
9/15/2011	10/25/2011	TMC	CNSLT
4/25/2007	5/4/2007	TMC	31.19
11/20/2003		TMC	LEVEL
3/31/2000		TMC	CHECK
10/8/1997	3/24/1999	DP	31.19
5/9/1977		XXX	LEVEL
8/2/1976		XXX	LEVEL
9/7/1966	9/13/1966	XXX	LEVEL
8/15/1966	8/23/1966	XXX	LEVEL
8/15/1966		XXX	GEN
8/19/1965	8/26/1965	XXX	LEVEL
8/10/1961		XXX	GEN
8/10/1961	8/16/1961	XXX	LEVEL
11/16/1954	11/29/1954	XXX	LEVEL
8/4/1954	8/12/1954	XXX	LEVEL
6/27/1950		XXX	LEVEL
5/17/1950		XXX	GEN
6/23/1939	1/13/1940	XXX	LEVEL
8/30/1932	8/30/1932	XXX	LEVEL
4/10/1924		XXX	CHECK
8/18/1922	12/29/1922	XXX	LEVEL

Followups

Type of Followup	Due Date	Extension Date	Completion Date
INSPECTION, OPERATION & MAINTENANCE MANUAL	3/31/2012	12/31/2018	
GATE(S)	6/30/2018		
FENCING/RAILING	6/30/2017		9/30/2016
CONCRETE REPAIRS	9/30/2013	6/30/2017	
EMERGENCY ACTION PLAN	3/31/2013	12/31/2016	12/5/2017
SUBMIT DOCUMENTATION	12/31/2016		8/29/2017
GAGES	12/31/2016		12/18/2017
EMBANKMENT REPAIRS	7/31/2012	12/31/2016	8/29/2017
BENCHMARKS	12/31/2016		1/17/2017
ADOPT DOWNSTREAM ZONING (NR 116.08)	12/31/2016		7/26/2016
DAM FAILURE ANALYSIS	9/30/2012	12/31/2015	1/6/2016

EMERGENCY ACTION PLAN	3/31/2012		6/25/2012
DAM FAILURE ANALYSIS	12/31/2009		7/6/2011
EMERGENCY ACTION PLAN	3/31/2009		9/25/2010
INSPECTION, OPERATION & MAINTENANCE MANUAL	3/31/2009		9/25/2010
CONCRETE REPAIRS	9/30/2008		10/25/2011
	5/5/1987		7/6/1987
	5/5/1987		7/6/1987
	5/5/1987		7/6/1987
	2/18/1987		10/8/1997
	2/18/1987		10/8/1997
	2/18/1987		10/8/1997

Approvals

Approval Date	Docket ID	Approval Type	DNR Engineer Initials
12/6/2017		ASSIGN HAZARD RATING	WDS
12/5/2017		EMERGENCY ACTION PLAN	JLJ
9/23/2016		ASSIGN HAZARD RATING	JLJ
1/6/2016		DAM FAILURE ANALYSIS	KEM
9/1/1986	3-NC-86-010	TRANSFER; STAT 31.185B	XXX
9/1/1955	2-WP-1010	LEVELS; STAT 31.02	XXX
8/1/1939	2-WP-440	LEVELS; STAT 31.02	XXX
6/1/1923	WP-169	LEVELS; STAT 31.02	XXX

Orders

No data found.

Inspection Schedule

Inspection Year	Inspection Type
2027	OWNER

KEY DAM OFFICIALS AND CONTACT INFORMATION

POST LAKE PROTECTION AND REHABILITATION DISTRICT

**P O BOX 248
ELCHO, WI 54428**

CHAIRMAN-	JOHN STEBER 920-390-0405
SECRETARY-	PHIL MCGRATH 773-450-5096
COMMISSIONER-	JEFF MCKINNEY 715-216-2530

DISTRICT EMPLOYEES:

DAM TENDER	KEN WEST 715-275-3018
RELIEF DAM TENDER	JERRY BURNS 715-275-4070

APPENDIX 3

BEFORE THE
DEPARTMENT OF NATURAL RESOURCES

In the Matter of the Establishment of)
maximum water elevations to be maintained) 2-WP-1010B
by the Post Lake Dam, on the Wolf River) 34.3
Town of Elcho, Langlade County)

FINDINGS OF FACT AND ORDER

The Post Lake Protection and Rehabilitation District on August 19, 1992, requested the Department to establish a maximum water level pursuant to Section 31.02, Statutes, for the Post Lake Dam in the Town of Elcho, Langlade County. Order issued.

FINDINGS OF FACT

1. The Post Lake Protection and Rehabilitation District, on August 19, 1992, requested the Department to establish a maximum water level pursuant to Section 31.02, Statutes, for the Post Lake Dam in the Town of Elcho, Langlade County. The Department and the petitioner have complied with all procedural requirements of Section 31.02, Wisconsin Statutes.
2. Upper and Lower Post Lakes are maintained by the Post Lake Dam, located on the Wolf River in the SW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 11, T34N, R11E, Langlade County. The dam is owned by the Post Lake Protection and Rehabilitation District.
3. Public Service Commission Order 2-WP-1010, dated September 29, 1955, established a maximum level of Post Lake at 95.5 feet and a minimum level at 95.0 feet.
4. The Post Lake Dam is structurally capable of maintaining a maximum water level of 96.00 feet, DNR datum. There is sufficient storage capacity above this elevation to prevent excessive flooding of the shoreline or failure of the dam.
5. The ordinary high-water mark of Post Lake has been determined to be at elevation 96.50 feet, DNR datum. Establishing and maintaining water levels at or above this elevation would infringe on private property rights unless flowage easements have been purchased.
6. Historically, levels recorded by the Department have averaged 96.00 feet over the last 20 years and have ranged from 94.44 feet to 96.72 feet, DNR datum.
7. All elevations herein are in reference to a benchmark described as Benchmark 565-E, a bronze tablet marked Public Service Commission of Wisconsin, set in the left upstream abutment of the bridge over the lake outlet, elevation 104.70 feet, DNR datum.

8. The following water levels are in the interest of public rights in navigable waters and will promote safety and protect life, health, and property:

Maximum water level of 96.00 feet, DNR datum
Minimum water level of 95.00 feet, DNR datum

9. The Department has evaluated the proposed order in light of the Wisconsin Environmental Policy Act (Section 1.11, Wisconsin Stats.) and has determined that the issuance of the order would not be a major state action significantly affecting the quality of the human environment.

10. The proposed order will not adversely impact wetlands as defined in Chapter NR 103, Wisconsin Administrative Code.

CONCLUSIONS OF LAW

1. The Department has authority under subsections 31.02(1) and (2), Wisconsin Statutes, and in accordance with the foregoing Findings of Fact, to issue an order establishing water levels for Post Lake.

2. The Department has complied with Section 1.11, Wisconsin Statutes.

3. The proposed order is in conformance with Chapter NR 103, Wisconsin Administrative Code.

ORDER

THE DEPARTMENT THEREFORE ORDERS:

1. Public Service Commission Order Number 2 of docket 2-WP-1010 is hereby rescinded.

2. The maximum level of Post Lake is hereby established at 96.00 feet, DNR datum.

3. The minimal level of Post Lake established in Order 2-WP-1010 at 95.00 feet, DNR datum, remains in effect.

4. The above established levels must be adhered to as closely as possible by reasonable and proper operation of the Post Lake Dam. At all times when Post Lake is above its maximum level of 96.00 feet, all gates must be opened until the maximum level is restored.

If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

To request a contested case hearing pursuant to Section 227.42, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources.

This notice is provided pursuant to Section 227.48(2), Stats.

Dated at Rhinelander, Wisconsin May 31, 1994

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By


Dale J. Lang, Water Regulation & Zoning Supervisor
North Central District Headquarters
P. O. Box 818
Rhinelander, Wisconsin 54501

APPENDIX 4

SAMPLE

Dam Report.x12-2007.xls

	A	B	C	D	E	F
1	Days	Water Height	Gate 1	Gate 2	Gate 3	Time
2		96	Closed	Closed	Closed	9:00am
3	2	96	Closed	Closed	Closed	9:00am
4	3	96	Closed	Closed	Closed	9:00am
5	4	96	Closed	Closed	Closed	9:00am
6	5	96	Closed	Closed	Closed	9:00am
7	6	96	Closed	Closed	Closed	9:00am
8	7	96	Closed	Closed	Closed	9:00am
9	8	96	Closed	Closed	Closed	9:00am
10	9	96	Closed	Closed	Closed	9:00am
11	10	96	Closed	Closed	Closed	9:00am
12	11	96	Closed	Closed	Closed	9:00am
13	12	96	Closed	Closed	Closed	9:00am
14	13	96	Closed	Closed	Closed	9:00am
15	14	96	Closed	Closed	Closed	9:00am
16	15	96	Closed	Closed	Closed	9:00am
17	16	96	Closed	Closed	Closed	9:00am
18	17	96	Closed	Closed	Closed	9:00am
19	18	96	Closed	Closed	Closed	9:00am
20	19	96	Closed	Closed	Closed	9:00am
21	20	96	Closed	Closed	Closed	9:00am
22	21	96	Closed	Closed	Closed	9:00am
23	22	96	Closed	Closed	Closed	9:00am
24	23	96	Closed	Closed	Closed	9:00am
25	24	96	Closed	Closed	Closed	9:00am
26	25	96	Closed	Closed	Closed	9:00am
27	26	96	Closed	Closed	Closed	9:00am
28	27	96	Closed	Closed	Closed	9:00am
29	28	96	Closed	Closed	Closed	9:00am
30	29	96	Closed	Closed	Closed	9:00am
31	30	96	Closed	Closed	Closed	9:00am
32	31	96	Closed	Closed	Closed	9:00am

ATTACHMENT 5

POST LAKE DAM

DAM TENDER'S INSPECTION REPORT

DATE

_____ ROUTINE MONTHLY INSPECTION

_____ NON-ROUTINE EVENT _____ FLOOD/ HIGH WATER

_____ OTHER (DESCRIBE)

<u>INSPECTION AREA</u>	<u>OK?</u>	<u>ITEM OF CONCERN</u>	<u>ACTION TAKEN</u>
SPILLWAYS BLOCKED?	_____		
RIPRAP	_____		
GATES/ OPERATORS	_____		
CONCRETE- CRACKING?	_____		
JOINT SPREADING?	_____		
EMBANKMENT EROSION	_____		
CLUMPING	_____		
SEEPAGE	_____		
TREES, VEGETATION	_____		
SAFETY SIGNS	_____		
SECURITY FENCE	_____		
OTHER:			

Attachment 6

