

**Water Level Decision for the Rest Lake Dam (**  
**On the Manitowish River in Vilas County (**

**Docket #IP-NO-2014 64-01444**  
**Field File # 63.13 DSN 209**

**Draft Date 05 30 2014**

**ORDER**

THE DEPARTMENT THEREFORE, ORDERS:

- 1) The Rest Lake Dam shall be operated at all times to meet the following standards.
  - a. Lake level shall be measured using the Rest Lake Dam gauge. The Rest Lake Dam gauge shall be maintained so that 8'6" equates to 1601.0 National Geodetic Vertical Datum (NGVD).
  - b. United States Geological Survey (USGS) gauges on the Bear River and Trout River or alternative calibrated gauges established and approved by the Department of Natural Resources (DNR or Department) shall be maintained and used to determine inflows to the Manitowish Chain. Inflows shall be calculated using USGS Adjusted Drainage-Area Ratio Method as published in USGS Scientific Investigations Report 2012-5135.
  - c. Flow below the dam, hereafter referred to as "outflow" shall be measured by USGS gauge located at Highway 51 or an alternative calibrated method or gauge approved by the Department.
  - d. At no time shall outflow from the dam be less than 57 cubic feet per second (cfs). During drought conditions the dam operator may request an alternate minimum flow, or an alternative minimum elevation from the DNR's Northern District Water Leader. Drought conditions are defined as inflow less than or equal to 80 cfs and a reservoir elevation less than or equal to 7'6".
  - e. Outflow shall not be reduced by more than 50 cfs per 24 hour period except during emergencies when the safety of the dam is threatened.
  - f. Lake level shall be maintained within a normal operating range of 7'6" and 8'6", rainfall, runoff, and operational capacity of the dam permitting.
  - g. Reservoir drawdown rate during for the winter drawdown shall not exceed 1 inch per day without the express approval from the Department.
  - h. The dam shall be operated to meet the following standards:

Table 1. Operating Standards: Lake Levels and Drawdown Rate

Minimum Outflow	57 cfs (see sub. d., above)
Maximum Lake Level will be targeted for July 1 <sup>st</sup>	8'6" on dam gauge (see sub. f., above)
Maximum Outflow cfs Reduction	50 cfs per day (see sub. e., above)
Minimum Lake Level	7'6" on dam gauge, (see sub. f., above)
Maximum Winter Drawdown Rate	1" per day (see sub. g., above)

- 2) The dam shall be operated to meet or exceed the following outflows, except during winter operations as provided in number 4 (below).

Table 2. Minimum Outflows

<u>Inflow</u>	<u>Minimum Outflow</u>
Greater than or equal to 261 cfs	230 cfs
Between 80 cfs to 260 cfs	Target 85% of inflows*
Less than 80 cfs	57 cfs

\* The 85% should be based on available flow at the time of the daily dam check. When flows are dropping dramatically the 50 cfs ramping rate controls flow reductions.

In all other situations target flow will be achieved if the outflow is at 85% of the recorded inflow in the 18 hours before or after the dam check.

- 3) A one foot winter drawdown from full pool elevation of 8'6" to an elevation of 7'6" is permitted. The dam shall be operated to reach the winter operating level by October 15<sup>th</sup>. The draw down rate shall not exceed 1 inch per day.
- 4) From October 16<sup>th</sup> until the start of spring refill, the winter operating level shall be maintained by passing outflow equal to inflow within reasonable operation of the dam.
- 5) An over winter drawdown greater than 1 foot for aquatic plant management may occur only if done pursuant to an aquatic plant management plan which has been approved by the Department. Prior to seeking such approval from the DNR, Chippewa and Flambeau Improvement Company (CFIC) shall make good faith efforts to consult with the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and the Lake Association on the subject of the proposed drawdown.

## FINDINGS OF FACT

### Description of Dam and Watershed Characteristics

1. The Rest Lake Dam (dam) is located at the outlet of Rest Lake, in the NW ¼ NW ¼ Section 9, Township 42N, Range 5E, Vilas County.
2. The dam impounds the Manitowish River to raise water levels on ten natural lakes to form the Manitowish Waters Chain of Lakes, also known as the Rest Lake Chain (Chain). The Chain includes: Rest Lake, Stone Lake, Fawn Lake, Clear Lake, Spider Lake, Island Lake, Manitowish Lake, Little Star Lake, Alder Lake, and Wild Rice Lake. The Manitowish River, Trout River, Rice Creek, Papoose Creek, and Gresham Creek contribute flow into the raised lake system. In addition, there are several unnamed streams, wetlands, and springs that contribute flow to the Chain.
3. The Manitowish River, both upstream and downstream from the Rest Lake Dam, and the lakes in the Chain are navigable water bodies of the State of Wisconsin in their natural condition and as impounded by the Rest Lake Dam.
4. In a letter to the Department dated December 19, 2012, Chippewa and Flambeau Improvement Company (CFIC) identified itself as the owner of the dam.
5. CFIC is a Wisconsin business corporation with its principal office located at 1414 West Hamilton Avenue, Eau Claire, Wisconsin, 54701, engaged in the business of operating reservoirs, primarily for the purpose of generating electrical power. CFIC is controlled and largely owned by Northern States Power Company (NSPC), a Wisconsin corporation, with its principal office also located at 1414 West Hamilton Avenue, Eau Claire, Wisconsin, 54701. NSPC is one of four operating subsidiaries owned by Xcel Energy (Xcel), a Minnesota corporation. Xcel is a registered holding company which owns four operating public utility subsidiaries that serve electric, natural gas, thermal and propane customers in eight Midwestern and Western States, including Wisconsin.
6. In 2002 concerns about possible adverse impacts on public resources expressed by a citizen to Trygve Solberg, then the Chairman of the Natural Resources Board, regarding the current operation of the Rest Lake Dam on the Manitowish River initiated a Department review and response. The Department concluded that legitimate resource concerns had been raised.
7. In fall of 2002 and again in spring of 2003 Department staff met with CFIC regarding the operation of the dam and to discuss public participation in the process of reviewing its operation.
8. In 2003 the Department solicited stakeholders to serve on a Rest Lake Dam Manitowish River work group. The Stakeholders included the Town of Manitowish Waters, River Alliance, Friends of the Manitowish River, Trude Lake/Turtle Flambeau Flowage Property Owners Association, Manitowish Waters Alliance, Manitowish Waters Lakes Association, and the Great Lakes Indian Fish and Wildlife Commission. The work group met nine times between November 19, 2003 and November 27, 2006.
9. The Manitowish Chain Defense Fund (MCDF) is an organization consisting of the Town Board of Manitowish Waters, Manitowish Waters Alliance, Manitowish Waters Lakes Association, and the Manitowish Waters Chamber of Commerce. The MCDF was formed after it became known that the Department was considering changes to the operating order

- to the dam, and as of November 27, 2006, MCDF took the position that there should be no change to the current operating order.
10. The Chain is at full design pool elevation when the Rest Lake Dam gauge is 8' 6" which corresponds to an elevation of 1601.0 NGVD (National Geodetic Vertical Datum).
  11. The Rest Lake Dam is a large dam based on the definition in Wis. Stat. § 31.19(1), and Wis. Adm. Code § NR 333.02(1). The hydraulic height of the dam is 10 feet and the structural height of the dam is 25 feet. The normal storage volume is approximately 32,000 acre feet. The maximum storage volume is approximately 68,000 acre feet.
  12. The Chain has a surface area of approximately 4,266<sup>1</sup> acres at the maximum elevation of 8' 6."
  13. There are approximately 60 miles of shoreline, including islands, on the Chain.
  14. The drainage area above the Rest Lake Dam is approximately 243 square miles. On average, the watershed area receives 34 inches of precipitation annually, which includes an annual average of 85<sup>2</sup> inches of snowfall.
  15. Downstream of the Rest Lake Dam the Manitowish River flows through three lakes: Vance, Sturgeon, and Benson. The river travels about 15 miles from the dam to a point where the Manitowish River and Bear River combine to become the North Fork of the Flambeau River which then flows into the Turtle Flambeau Flowage. The Manitowish River above the Chain is an Outstanding Resource Water (ORW). The Manitowish River below the dam is an Exceptional Resource Water (ERW).
  16. The Manitowish Chain of Lakes lies within the Townships of Manitowish Waters and Boulder Junction in Vilas County and extends into the Lac du Flambeau Indian Reservation.
  17. Information provided to the Department by the Manitowish Waters Lake Association indicates there are 1,378 privately owned riparian lake lots on the chain.
  18. There are many private structures, including wet boat houses, piers, boat lifts, riprap, and seawalls, located on lakebed lands in the Chain, i.e., lying on lands below the elevation of the Ordinary High Water Mark (OHWM). Based on comments provided by MCDF to the Department, there are more than 100 wet boathouses and over 1,000 piers placed on the lakebeds in front of the privately owned riparian properties.
  19. Based on a survey it conducted, the Manitowish Chain Defense Fund (MCDF) has estimated that 790 riparian lake shore properties have shore protection structures such as riprap or seawalls.
  20. The Manitowish River downstream of the dam has year-round and seasonally used developments on the river, around Vance, Benson, and Sturgeon lakes, along the State Highway 51 corridor, and near the intersection of State Highway 51 and State Highway 47 (STH 47). There are also a number of resorts, restaurants, and business located in this downstream area.
  21. The Manitowish River from Benson Lake to STH 47 is designated as a scenic management area in the Northern Highland –American Legion State Forest Master plan.
  22. The Manitowish River wilderness area, consisting of 6,265 acres of publicly owned lands, is located downstream of STH 47. Within this wilderness area are the Frog Lake and Pines, and the Turtle Flambeau Pattern Bog State Natural Areas.

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<sup>1</sup> FERC Document #UL96-16-006 and UL96-17-006

<sup>2</sup> Soil Survey of Vilas County WI, NRCS, June 1988

23. As part of its effort to review the operation of the dam, the Department contracted with United States Geological Society (USGS) to conduct a study to improve estimates of natural flows in the Manitowish River at the Rest Lake Dam. The resulting USGS report, "Estimation of Natural Historical Flows for the Manitowish River near Manitowish Waters," was published in 2012.
24. The natural flow pattern for the Manitowish River as determined by USGS resembles the flow patterns of other northern rivers with a high spring flow followed by a gradual decrease of flow through the summer and the lowest flow occurring in late summer and early fall.
25. USGS calculated an annual low flow for the Manitowish River downstream of the dam of 57 cubic feet per second (cfs), using the adjusted drainage-area ratio method<sup>3</sup>. This number equates to the lowest natural low flow on an annual basis (Flow Duration (FD) 99.6). Flows are greater than 57 cfs 99.6% of the time on an annual basis. USGS evaluated two methods of estimating inflows and opined to Department staff that the drainage area methodology is more accurate especially at lower flows and is therefore likely the preferred method for basing future dam operations.
26. The Department has determined that inflows (daily natural flow) to the Manitowish Chain measured at the dam can be accurately estimated based formulas generated in the USGS Report, utilizing stream gauging information from the Bear and Trout Rivers.
27. The authorized minimum flow of 57 cfs in this order complies with Wis. Stat. § 31.34.

#### Environmental Assessment

28. Pursuant to Wis. Admin. Code § NR 150.03(8) (f) 8, the department prepared an Environmental Assessment (EA) for a proposed new operating order for the Rest Lake Dam. A draft EA was public noticed on September 14, 2012. After an extended public comment period, and the issuance of Department responses to comments received, the EA was certified by the Department on May 10, 2013. The information provided in the EA and received through the EA public comment period was considered in the drafting of this order.

#### Regulatory Background

29. The Rest Lake Dam was originally constructed in the late 1800s for the purpose of supplementing spring flow for log drives to downstream mills. In 1911, the Wisconsin Legislature granted CFIC the authority to construct, maintain and operate a system of water reservoirs on the tributaries to the Flambeau and other rivers under Chapter 640, laws of 1911 (subsequently amended and renumbered as Wis. Stat. 182.71). That legislation provided: *"The said authority is granted for the purpose of producing as nearly a uniform flow of water as practicable in the Chippewa and Flambeau rivers, through all seasons, by holding back and storing up in said reservoirs the surplus water in times of great supply, and discharging the same in times of drought and a scarcity of water...."*
30. On July 8, 1937, the Rest Lake Dam operating order was modified by the Wisconsin Public Service Commission (Commission) to establish an 8' 6" maximum and 5' 0" minimum water level. The Commission required the water to be raised each year from the

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<sup>3</sup> USGS Estimation of Natural Historical Flows for the Manitowish River near Manitowish Waters, Wisconsin, Scientific Investigations Report 2012-5135

time of the spring ice break-up to April 15th to a minimum level of 7' 3" gauge height, providing the minimum discharge required by law and runoff permitting; required the water to be raised to 8' 6" by July 1<sup>st</sup> of each year, rainfall and runoff permitting; permitted the water to be drawn off from July 1<sup>st</sup> to September 1<sup>st</sup> of each year to a minimum level of 7' 3" and from September 1st to November 1<sup>st</sup> to a minimum of 5' 0", but at no time at a rate exceeding 2" per day; and prohibited any lowering of the water level after the ice sheet forms until the time of spring ice break up.

31. On July 28, 1937, A.E Meyer and 73 other persons petitioned the Commission for rehearing and review of the 1937 order. The petitioners were requesting to narrow the water level range between an 8' 0" maximum and a 6' 6" minimum establishing an operating range of 1' 6."
32. The Commission held a public hearing on the petition on October 14, 1938. Commission records of that hearing indicate that testimony was presented describing how the 3' 6" water level fluctuations in the 1937 order adversely affected the fish and wildlife habitat values of the reservoir. Sid W. Gordon, Aquatic Biologist, with the Wisconsin State Conservation Commission testified that the operation of the dam as permitted in the 1937 order would have a bad effect on the availability of fish food (forage) in the reservoir and limit fish habitat, and that a 3 ½' drawdown would create an "aquatic desert" of sand around the margin of the flowage in which nothing would grow. Additional testimony by Otis Bersing, Supervisor of Lake and Stream Improvement with the Wisconsin State Conservation Commission, described how the sudden fluctuations in waters levels would have a disastrous effect on aquatic plants (macrophytes). Lyman O. Williamson, an Area Biologist with the Conservation Department, testified that the lack of natural wall-eyed pike spawning beds in the chain was due to the recession of the water and the action of the waves in bringing silt and other material down into the bed, coating the eggs with silt which caused the eggs to soon die. Other witnesses testified to facts addressed in testimony at previous hearings concerning riparian property damage caused by the 3' 6" fluctuation in the water level.
33. By order dated February 15, 1939, the Public Service Commission reaffirmed its 1937 order. In its 1939 order the Commission recognized that the primary purpose of the dam was for "evening out of the flow of water in the stream in order to improve the generation of hydraulic power." The Commission further clarified that the waters in the reservoir are not the headwaters described in Chapter 640, Laws of 1911, Section 2.2, which are to be given preference during low water conditions, but instead determined that the statute required preference be given to the waters below the dam. In its 1939 decision the Commission described the competing interests (hydraulic power, recreation, fish and wildlife, flood control, and navigation) it considered and balanced regarding the operation of the Rest Lake Dam "in order to obtain its greatest possible usefulness for all public rights and interests in the waters affected". The Commission recognized that ideally the interests of fishing and fish and wildlife habitat would be best protected by the maintenance of a water level as uniform as rainfall and runoff would permit. The Commission concluded, however, that to produce a reasonably uniform flow of water for hydraulic power the dam should be operated as described in the 1937 order, and that order best balanced all of the public interests as they currently exist.
34. In the late 1990s CFIC petitioned the Federal Energy Regulatory Commission (FERC) to remove the Rest Lake Dam from FERC regulation. After its evaluation of the Rest Lake

- reservoir, FERC concluded in its June 1, 2001 Order Denying Rehearing that the Rest Lake dam by itself increases power generation by only 0.06 percent of total downstream [electric power] generation. FERC stated “We therefore concluded that Rest Lake is neither used and useful nor necessary or appropriate to maintain or operate the downstream projects” and for that reason removed the Rest Lake Dam from its regulation.
35. Based on information provided by CFIC, it currently operates the dam to maintain the reservoir in a narrow range of elevations between 8’ 2” and 8’ 6” during the summer months and through late September by adjusting outflows to the Manitowish River. When reservoir levels fall below 8’ 2”, the records indicate that CFIC reduces dam outflows to minimum low flows of 40 to 50 cubic feet per second (cfs) to maintain reservoir levels. The records also show that CFIC draws water levels down to 5’0” starting in late September through early November every year and then begins reservoir refill only after 75% of the ice is off the Chain. This information also indicates that CFIC’s average start of refill has been approximately April 20<sup>th</sup>, but in some years it has delayed the start of refill into May.
  36. CFIC has not operated the dam in compliance with the 1937/1939 operating order’s requirements: a. To refill the reservoir to 7’ 3” by April 15<sup>th</sup> (FOF 30). Refill has not started, on average, until April 20<sup>th</sup>. As a result spring runoff is not captured and outflow is dropped dramatically when the chain is refilled; b. To permit the water to be drawn off from July 1<sup>st</sup> to September 1<sup>st</sup> of each year to a minimum of 7’3,” with the intent of this augmenting flow downstream during low flow conditions. Instead, CFIC reduces flow to a minimum of 40 cfs to 50 cfs during this period to keep the Chain as full as possible (8’2”-8’6”); and c. The order’s 5’ winter minimum is not achieved by November 1<sup>st</sup>. Draw down does not begin until September 28<sup>th</sup> -29<sup>th</sup> and is not completed until approximately November 8<sup>th</sup>.
  37. Records of the Wisconsin Valley Improvement Company (WVIC) indicate that the average date of runoff in Northern Wisconsin begins March 25<sup>th</sup> and that 75% or more of spring runoff occurs by April 15<sup>th</sup>. WVIC owns and operates dams in Northern Wisconsin, including dams that influence the Minocqua, Eagle River, and Three Lakes Chains, all of which are within 50 miles of the Rest Lake Chain. DNR staff reviews of hydrograph information for northern Wisconsin rivers have confirmed this observation.

#### Description of Natural Resources Upstream of Dam

38. Currently there are approximately 934 acres of mapped wetlands on the Wisconsin Wetland Inventory maps (WWI) that are in the drawdown zone or connected to the Chain. This estimate only includes mapped wetlands 5 acres or greater in size.
39. Baseline water quality data (chlorophyll a, nutrients and water clarity) of the lakes within the Chain are considered good and similar to other lakes in northern Wisconsin.
40. The Department has documented 35 species of fish in the Chain, including muskellunge and walleye. The Chain has a low density but quality muskellunge fishery. The Walleye population is average for natural walleye waters in the area.<sup>4</sup>
41. The Longear Sunfish is a state threatened species which was found in Stone Lake in 1984 and 2004, and has a well-established population in the Trout River between Trout Lake and Wild Rice Lake.

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<sup>4</sup> Gilbert, Fisheries Biologist for Vilas County, Reference P. 29, 2nd ¶ of EA.

42. The Manitowish River System is located in the Chippewa Ceded Territory of Wisconsin, and Tribal hunting, fishing, and gathering rights are accorded as a matter of federal law.
43. The Rest Lake Chain contains stands of wild rice, a plant which has long been harvested by Native Americans. The estimated acreage of wild rice during peak years upstream of the Rest Lake Dam is as follows: Island Lake (at Rice Creek) ~80 acres, Island Lake (at Manitowish River) ~60 acres, Rest Lake (at Papoose Creek) ~12 acres, and Wild Rice Lake and Trout River ~15 acres.
44. Lake Superior Chippewa use the Chain for traditional harvest of fish and wild rice.
45. Cranberry producers use water from the chain and its contributing waters to irrigate cranberries during the growing season, to flood beds for harvest in August, to flood beds in winter to protect them from freezing/drying, and to either flood beds or irrigate to protect the plants from frost in the spring. The Department has no authority to regulate the removal of water from public waterways for cranberry operations, however, cranberry producers have informed the Department that they rarely divert water during the spring

#### Effects of Dam Operation on Public Interest Upstream of the Dam

46. Based on USGS estimates, approximately 656 acres of aquatic resources are dewatered when the elevation of water in the chain is lowered 3 feet from 8'6" to 5'6". At a 3'6" drawdown additional acres of aquatic resources are dewatered annually with current CFIC operation.
47. A drawdown of 3' 6" requires 660<sup>5</sup> million cubic feet of water to refill the chain. A one foot drawdown reduces volume of water required to refill the chain to approximately 189 million cubic feet. With a 1 foot winter drawdown, there is a reduced dependency on snow pack runoff or spring rainfall to refill the Chain.
48. Reducing the winter drawdown from 3'6" to 1' as provided by this order, will reduce winter kill of aquatic plants in the littoral zone improving near shore vegetated habitat.
49. A drawdown of 3' 6" on the chain between late September and early November, as CFIC currently operates the dam, increases the risk of winter mortality for herptiles which seek winter refuge in debris and soft sediment in the near shore area.
50. Northern pike, muskellunge, and grass pickerel require flooded vegetated-type habitat for spawning. These habitats are also valuable as nursery waters for fish and wildlife species. Depending on the timing of refill, these areas, due to low water levels from current dam operations, may not be available for those purposes.
51. There is abundant walleye habitat available through a wide range of water levels and thus likely no significant change in habitat with this order.
52. Waterfowl prefer quiet backwater areas to for nesting and brooding young. A refill that causes a large fluctuation of water levels in late spring can flood such habitat, causing displacement of wildlife.
53. Reducing water level fluctuations from 3'6" to 1' will likely improve the natural function of aquatic bed wetlands and shallow water habitat in the Chain. This habitat is critical to the life cycles of mammals, waterfowl, amphibians, reptiles, and aquatic insects above the dam.
54. The annual draw down creates unstable shoreline conditions due to the lack of shoreline vegetation in the 0 to 3'6" depth. This is evidenced by the fact that more than half of the lakeshore properties use shoreline protection structures such as riprap or seawalls (See

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<sup>5</sup> 1939 Order



FOF 17 and 19, above: there are approximately 790 shoreline protection structures adjacent to approximately 1378 developed parcels).

55. Raising the minimum water level of the Chain to 7' 6", will likely improve access and increase navigation days by larger vessels throughout the open water season, including the opening of fishing season in May.
56. It is difficult to predict precisely how the proposed change in dam operation will impact wild rice productivity. Wild rice is negatively impacted by rising water levels during the floating leaf stage in May or June; however it is also adapted to disturbance caused by occasional low water levels.
57. DNR owns/manages recreational facilities on all 10 lakes on the Chain. Usability of these DNR facilities is greatest at water levels close to full pool but some use exists at all water levels. At low water levels the largest impacts are difficulty launching trailered boats at the boat launches and navigating from the launch at Clear Lake to the rest of the Chain.

#### Effects of Dam Operation on Public Interest Downstream of the Dam

58. The operation of the Rest Lake Dam has a major influence on water levels and flows in the Manitowish River downstream to the Turtle Flambeau Flowage.
59. Current CFIC dam operation results in an inverse of natural seasonal flow patterns in the Manitowish River by releasing lower outflows in spring and higher outflows in fall.
60. This order is expected to significantly reduce the frequency of downstream low flow conditions in the spring and to significantly reduce the frequency of flooding in the fall.
61. The Department has documented 42 species of fish between the Rest Lake Dam and the Turtle Flambeau Flowage. Populations of resident game fish such as smallmouth bass, walleye, muskellunge, and northern pike are believed to be relatively low in density based on catch rate statistics from past WDNR surveys.
62. The Wisconsin statewide sturgeon management plan recommends restoration of Lake Sturgeon in the Manitowish River through stocking and efforts to improve natural reproduction.
63. The Pugnose Shiner is a state threatened species found in the Manitowish and Trout Rivers and the Chain. Pugnose Shiners spawn between May and July in densely vegetated areas.
64. Rocky substrate habitat with moderate to swift current is limited between the dam and the Turtle-Flambeau Flowage. An 800 foot reach of high quality spawning habitat for a number of fish species below Highway 51 has been identified as critical habitat for Lake Sturgeon and Greater Redhorse. Rocky habitat can also be found above Sturgeon Lake and at the confluence of the Manitowish and Bear rivers.
65. Natural reproduction of Lake Sturgeon and Greater Redhorse is dependent on sufficient water levels and flows during the spring. Flows of 125 and 200 cfs or more between the dam and the Turtle-Flambeau Flowage will provide sufficient habitat with suitable depth, velocity, and rocky riffle substrate for sturgeon spawning. Optimum water temperatures for sturgeon spawning (53-59 degrees F) typically occur between May 1<sup>st</sup> and June 6<sup>th</sup> in the Manitowish River. Sturgeon eggs take approximately 5 to 8 days after spawning to hatch and young fish to begin to drift downstream. Greater Redhorse spawn after Lake Sturgeon (62-66 degrees F) when spring flows in the river begin to stabilize at 75 to 133 cfs. The larval fish stage of this species occupies shallow vegetated areas near shore with slow water velocities.

66. The new order increases the frequency of flows necessary for successful spawning by Lake Sturgeon and Greater Redhorse. The Current CFIC dam operations, which reduce spring outflows to 50 cfs or less in the Manitowish River, limits the available spawning habitat downstream of the dam for Lake Sturgeon and Greater Redhorse.
67. The Department has been monitoring Lake Sturgeon in the Turtle Flambeau Flowage (TFF) and its tributaries since 1990. Lake Sturgeon are present in the Manitowish River and Benson Lake and have been found near Wisconsin State Highway 51 in the spring. Telemetry studies have shown that Lake Sturgeon move from the TFF into Benson Lake in the fall.
68. Sturgeon aging data suggest that there have been six years of successful Lake Sturgeon spawning reproduction and recruitment in the TFF System. These years corresponded to years of high precipitation when the chain filled quickly and adequate flows were passed downstream of the dam.
69. DNR facilities, i.e. boat landings and camp sites are usable at a wide range of flows but can be somewhat limited due to impacts to navigation at river flows less than 80 cfs (due to long travel times and shallow areas in certain areas on the river).
70. The approximately 12 mile stretch of diverse riparian wetlands downstream of the dam includes oxbows, meander scars and backwater sloughs the majority of which are functionally connected to the main river during natural spring and summer flow above 120 cfs. These habitats provide spawning, feeding, protection, and nursery areas for a wide range of fish and wildlife species.
71. Spring flood flows in excess of 200 cfs are the minimum flow needed to inundate the flood plain of the Manitowish River, including its wet meadow and shrub wetland areas.
72. Current dam operations create unseasonal flow patterns and extreme water level fluctuations. Rapid changes in water levels displace, entrap and cause mortality of many species of fish and wildlife, and disrupt or eliminate life cycles of wetland plants associated with these habitats.
73. Navigation of the Manitowish River downstream of the dam becomes difficult when flows are less than 80cfs.
74. This order is expected to increase recreation activity both on the Rest Lake Chain and Manitowish River. These activities include but are not limited to recreational boating, fishing, hunting, camping, swimming wildlife observation, and wild rice gathering.

#### Economic Considerations

75. This order reduces the winter drawdown from 3'6" to 1,' which is expected to expose more structures left below the OHWM to ice action.
76. The Department does not track the occurrence of frost or ice impacts to shoreline structures around the state since permits or notification are not required for repair if the structure is exempt from permits or if the structure has been previously permitted and no physical changes are made to the shape or configuration of the structure.
77. Statewide, many property owners remove piers from waterways prior to ice cover. On the Manitowish Chain however, many property owners do not remove piers, due to the past practice of drawing down water levels 3'6" before winter. The proposed order would allow a lesser winter drawdown of 1 foot. Frost action can damage shoreline structures even if they are above the elevation with ice contact. Above the water, frost action can heave or distort support structures for piers. Those piers left in the water over winter

under the reduced drawdown level would be exposed to ice, possibly resulting in damage from ice expansion or movement. Owners of permanent piers may expect to incur costs to replace them with removable piers or to repair them if ice damage occurs. Repair due to ice damage may exceed current costs for maintenance and repair due to frost action.

78. Wet boat houses constructed on pilings will likely be exposed to additional damage from ice action with the reduced winter drawdown specified in this order. The one year implementation delay of this order will allow the owners of such structures sufficient time to obtain permits and to install support structures (or other devices such as aerators) that will enable the wet boathouse to withstand ice action in the manner such structures and devices are frequently deployed by owners of wet boat houses on other lakes in Wisconsin. Installation of such structures and devices will incur costs to owners.
79. Testimony at the October 14, 1938 hearing discussed the need to stabilize water levels to prevent property damage. Ongoing property damage due to erosion is evidenced by 790 shoreland protection structures, many of which are in areas of low wind wave energy, and not typically subject to wind wave caused erosion. A more stable water level will allow formation of shallow water vegetation, which buffers much of the effects of wind wave action
80. Information provided by the Manitowish Chain Defense Fund includes pictures of numerous boat hoists remaining on the lakebed over winter. Boat hoists left on the lakebed below the one foot drawdown elevation and exposed to ice may be damaged by ice expansion. State law requires that boat lifts be removed from the lakebed annually during winter (Wis. Admin. Code ch. NR 326)
81. Riparian owners on the Chain have the same right to protect and maintain their structures as afforded to riparian owners on the thousands of other Wisconsin lakes.
82. The Department expects ice action under this proposed order to be similar to what occurs on other waterbodies in the region, including the Eagle River Chain and the Minocqua Chain of Lakes. The Department expects that any damage to shoreline structures under this order may be reasonably mitigated or avoided as it is on similar waterbodies.
83. The Department has considered information submitted by the Manitowish Chain Defense Fund regarding their survey of shoreline structure and their survey of property owners regarding investment in those structures. The DNR also considered the information it developed in 2004 to identify elevations of shore structures.
84. A cost estimate for the maintenance, repair, or replacement of a structure due to ice damage is difficult to determine. Comments submitted by riparian property owners to the Department estimated the additional costs to maintain structures at the new water level would range from a few thousand dollars for an individual structure to tens of millions of dollars across the Chain.
85. The Department concludes that maintenance and repair costs associated with implementation of the new order are expected to be similar to maintenance costs of individual structures on other Wisconsin Lakes.
86. A winter drawdown of 1 foot, as authorized by this order, will continue to allow ice to form away from the shoreline reducing shoreline damage from ice expansion.
87. The Department has considered and expects the value of property and improvements to remain relatively stable, other factors being equal, as a result of this order. Property boundaries will remain the same: no additional lands will be flooded and the Ordinary High Water Mark (OHWM) will not change as a result of this order.

88. The Department has considered and expects that businesses in the vicinity of the Chain that provide services related to pier maintenance, shore structure maintenance, installation of protective measures, and winter management of structures may experience an increase in business as a result of the issuance of this order.
89. Many local businesses rely on visitors and seasonal residents who are interested in the many recreational opportunities provided by local waters and natural resources. There are approximately 56 lodging facilities serving the local area providing 342 rooms. One marina is located directly on the Chain. One canoe livery is located on the Manitowish River below the dam. This order is expected to benefit these businesses by increasing recreational opportunities by improving navigation throughout the chain and in the river below the dam, and fish and wildlife habitat.

<b>Local Businesses Manitowish Chain &amp; Manitowish River Area</b>	
Lodging & Resorts	56
Restaurants	11
Services	9
Construction	3
Real Estate	4

90. CFIC has indicated that while the direct economic benefit from the reservoir is relatively small, the revenue from the increased electric generation does help pay for the maintenance and operation of the dam.<sup>6</sup>
91. CFIC has indicated that if the permissible drawdown of reservoir was reduced, it would likely examine transfer of dam ownership. The Department concludes CFIC's continued ownership of the dam is not assured whether the dam is operated at a 3' 6" winter drawdown or a 1' 0" winter drawdown.
92. The Department has considered information indicating that tourism and seasonal residents are the most significant source of local revenue contributing estimated annual revenue of \$12.2 million and \$7.5 million to the local economy respectively.<sup>7</sup>
93. The Department has considered information indicating that tourism related industries including art, entertainment, recreation, accommodations and food service employ the largest percent of people in the area at 19.1%, followed by retail trade at 18.4%, and construction at 12.8%. Finance, Real Estate, and Leasing combined employ 5.7%.<sup>7</sup>
94. The Department is advised that property taxes are an important source of revenue for local townships and county government. According to information submitted to the Department by the Manitowish Waters Lake Association, the total assessed value of waterfront properties on the Chain is \$418,695,300. The estimated property tax revenue from the Chain is \$2.9 million. Local property tax revenue to Vilas County, Manitowish Waters and Boulder Junction is estimated at \$2.8 million.
95. The Department has seen and considered other information indicating that the 2013 total assessed value of the 1187 privately owned waterfront properties on the Chain was \$596,122,000, generating approximately \$4 million in property tax revenue. There are 13 tribally owned and 50 publicly owned parcels located on the Chain.

<sup>6</sup> CFIC letter dated 12-19-2012 commenting on EA

<sup>7</sup> TMW Comprehensive Plan 2022

96. The Department has seen and considered information indicating that the 2013 total assessed value of the 72 privately owned waterfront properties on the Manitowish River below Rest Lake Dam was \$13,119,542, generating approximately \$93,000 in property tax revenue. There are 115 publicly owned parcels located on the Manitowish River below the dam. In addition there are State-managed lands as part of the Northern Highland American Legion State Forest, Town-owned properties, and Tribally-owned properties.
97. The Department believes this order supports economic interest in the area by improving functions of the Chain and Manitowish River which are the major attractions for visitors and recreational users. The number of days the Chain would be navigable by larger watercraft would be increased. The number of navigable days on the Manitowish River below the dam would also be increased. This order improves the functionality of wildlife and fisheries habitat that support opportunities for hunting, fishing and wildlife observation. This order reduces the risk that drought conditions will negatively impact recreational opportunities above and below the dam. Considering these factors, DNR does not believe this order will negatively affect local public revenue in a significant degree and may even operate to enhance property values and local public revenues.
98. In drafting this order the Department has considered all economic information assembled by staff and submitted to the Department during the evaluation of the dam operation, including the Environmental Assessment process during which approximately 167 individual parties provided comments on the EA either by phone, in person, or in writing via email or hard copy letter. Many of the comments related to economic impacts of revising the dam's operating order. Beginning in 2006 and extending through the final drafting of this order, the Department also sought and received input on economic and other matters from public workgroups, stakeholder meetings, and public information meetings.
99. The issuance of this order regulating and controlling the level and flow of water in the Chain and from the dam, when balanced against impacts on wildlife, water quality, wetlands, and recreation, adequately protects riparian lands as well as improvements to such lands, the community's interest in such lands, and investments in and capital derived from such lands.

#### Evaluation of Public Interests Summary

100. Wisconsin lakes and rivers are public resources, owned in common by all Wisconsin citizens under the state's Public Trust Doctrine. The public interest includes public rights to water quality and quantity, recreational activities, fish and wildlife habitat, and natural scenic beauty. All Wisconsin citizens have the right to boat, fish, hunt, and swim on navigable waters, as well as enjoy the scenic beauty of navigable waters, and enjoy the quality and quantity of water that supports those uses. This order supports these interests.
101. Wisconsin law recognizes that riparian property owners hold rights in the public water adjacent to their property, including use of the shoreline, reasonable use of the water, and a right to access the water. This order preserves these riparian rights.
102. The issuance of this order regulating and controlling the level and flow of water in the Chain and from the dam is in the interest of public rights in these navigable waters.

Implementation of Order

103. The implementation of this order will be delayed one year from the date this order is signed to provide the dam owner and riparian property owners sufficient time to prepare for the operational changes.

CONCLUSIONS OF LAW

1. The Department has authority under Wis. Stat. § 31.02, and the foregoing findings of fact to issue this order for water levels and flow on the Rest Lake Flowage.
2. Prior to this order the legal authorization for Rest Lake Dam operation was the 1939 order issued by the Public Service Commission, the Department's statutory predecessor in such matters.
3. The Department has complied with Wis.stat. § 1.11, and Wis. Admin. Code ch. NR 150.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to Wis. Stat. § § 227.52 and 227.53, you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. 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. All requests for contested case hearings must be made in accordance with section Wis. Admin. Code § NR 2.05(5), and served on the Secretary in accordance with section Wis. Admin. Code § NR 2.03. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

Reasonable accommodation, including the provision of informational material in an alternative format will be provided for qualified individuals with disabilities upon request.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By \_\_\_\_\_  
Nancy Larson  
Northern Region Water Leader

Dated: \_\_\_\_\_