UNITED STATES OF AMERICA 125 FERC ¶ 62,168
FEDERAL ENERGY REGULATORY COMMISSION

Flambeau Hydro LLC Project No. 2064-048

ORDER AMENDING LICENSE TO INCLUDE REVISED WATER QUALITY CERTIFICATION

(Issued November 19, 2008)

On August 20, 2008, the Wisconsin Department of Natural Resources (WDNR) filed its notice of revised water quality certification for the Winter Hydroelectric Project (FERC Project No. 2064). The revised water quality certification was the product of a final settlement agreement[1] between and among the State of Wisconsin, Flambeau Hydro LLC (licensee), North Central Power Company, Inc., and the River Alliance of Wisconsin. The Winter Hydroelectric Project is located on the East Fork of the Chippewa River, near the town of Winter, in Sawyer County, Wisconsin.

BACKGROUND

On June 21, 2005, WDNR issued its water quality certification as part of the relicensing process for the Winter Hydroelectric Project. Paragraph E of the August 12, 2005, Order Issuing New License[2] states that the project is subject to the conditions of the certification, which were included in the license as Appendix A.

On July 18, 2005 the licensee disputed the water quality certification by requesting a contested case administrative hearing pursuant to Wisconsin Statute § 227.42. This initiated a dispute resolution process that resulted in a final settlement agreement between the licensee, State of Wisconsin, North Central Power Company, Inc., and the River Alliance of Wisconsin. In its letter revising the water quality certification, the WDNR stated that Conditions E, F, and J of the certificate were amended according to the settlement agreement. In addition, the WDNR inserted a footnote in Condition D to accommodate the licensee's proposal to revise the authorized reservoir elevation upon the Commission's approval of the licensee's formal application for license amendment.

[1] The settlement agreement was filed with the revised water quality certificate on August 20, 2008.

[2] *See* 112 FERC ¶ 62,130 (issued August 12, 2005)

AMENDED CONDITIONS

The WDNR inserted a footnote in Condition D to accommodate the licensee's proposal to revise the authorized reservoir elevation upon the Commission's approval of the licensee's formal application for license amendment. The footnote states that: In a letter dated July 22, 2008 Flambeau Hydro asked three resource agencies for their comments on its proposal to revise the authorized reservoir elevation for the Winter Hydroelectric Project from 1367.70 ± 0.3 feet mean seal level (MSL) to 1370.40 ± 0.3 feet MSL. Upon the Commission's approval of Flambeau Hydro's formal request for license amendment, the WDNR stated it would concurrently revise Condition D above.

Condition E, regarding run of river compliance monitoring, would remain the same as in the original water quality certificate except for the following four changes:

(1) The licensee shall install and maintain automatic level sensing equipment to continuously measure and record project reservoir level. In addition the licensee shall provide a continuous electronic record of project discharge flows by a continuous electronic record of power generation converted to cubic feet per second coupled with a continuous record of all bypassed reach flow changes converted to cubic feet per second. Generation shall be recorded at least hourly and generation shall be calculated from a dynamic head (reservoir elevation minus tailwater elevation in concurrent measurements), rather than from a static head (reservoir elevation minus a fixed tailwater elevation).

(2) All project log records, manually or electronically logged, including comments, should be keypunched into electronic spreadsheet format for the 3 year testing period required under condition W. All data will be permanently archived and provided to the resource agencies upon request.

(3) The phrase "or an equivalent means acceptable to the resource agencies" shall be inserted in the first sentence of the third paragraph of Condition E immediately after the phrase, "…install and maintain two USGS-type gages…".

(4) The gages shall be equipped with "telemark" type system or an equivalent means acceptable to resource agencies.

Condition F, regarding minimum flows, would remain the same as in the original water quality certificate except that the following language would be added immediately after the table: "Upon request from the resource agencies, the licensee shall adjust the starting dates of higher minimum flows without extending the 31-day duration, to accommodate fishes' behavioral response in changing environmental conditions".

Condition J, regarding fish passage, would remain the same as in the original water quality certificate except for the following changes:

(a) Within three years of the license issuance, the licensee will submit to the Department [WDNR] for approval a fish passage plan and within five years of license issuance will have completed construction of an approved fish passage plan.

The following sentence would be placed in the third paragraph of Condition J, as the second sentence: The parties acknowledge and agree that a fish passage plan may include a near nature bypass as an alternative to the open bay plan.

(b) The Department [WDNR] acknowledges and states that it holds discretion to consider extending the fish passage implementation schedule if, in the Department's judgment, circumstances so warrant.

DISCUSSION AND COMMENTS

The revised water quality certificate includes a footnote in Condition D to accommodate the licensee's proposal to revise the authorized reservoir elevation upon the Commission's approval of the licensee's formal application for license amendment. The licensee's formal application to amend the reservoir operating level was filed with the Commission on September 29, 2008, along with corresponding resource agency comments, and is being addressed in a separate Commission proceeding.

The revised water quality certificate includes a modified schedule for approval and implementation of a fish passage plan. The certificate states that, within three years of the license issuance the licensee will submit a fish passage plan to the WDNR for approval. We note that three years from the date of license issuance had passed before the revised water quality certificate was issued. In addition, on August 13, 2008, the Commission issued an Order Granting an Extension of Time for the licensee to submit, for Commission approval, a fish passage plan by January 31, 2009. Both the WDNR and the U.S. Forest Service concurred on the extension of time. The licensee is reminded that the revised water quality certificate does not change the January 31, 2009 due date for submission of the fish passage plan to the Commission.

The licensee has agreed to the conditions of the revised water quality certificate as indicated by the final settlement agreement between and among the State of Wisconsin, Flambeau Hydro LLC (licensee), North Central Power Company, Inc., and the River Alliance of Wisconsin. Accordingly, the revised water quality certificate, with the changes highlighted in this order, should replace the water quality certificate issued June

21, 2005. Appendix A of the August 12, 2005, Order Issuing License should be modified to reflect the revised water quality certificate filed with the Commission August 20, 2008.

The Director Orders:

(A) Appendix A of the August 12, 2005, Order Issuing License, is modified to reflect the Water Quality Certification filed with the Commission by the Wisconsin Department of Natural Resources on August 20, 2008. The revised Water Quality Certification is attached to this order in its entirety.

(B) This order constitutes final agency action. Request for rehearing by the Commission may be filed within 30 days from the date of the issuance of this order, pursuant to 18 CFR § 385.713.

George H. Taylor
Chief, Biological Resources Branch
Division of Hydropower Administration
and Compliance

Water Quality Certification
(P.L. 92-500, Section 401)

In the matter of: Flambeau Hydro, L.L.C.
116 State St., P.O. Box 167
Neshkoro, WI 54960

APPLICATION FOR A NEW LICENSE FOR THE WINTER HYDROELECTRIC PROJECT

On June 25, 2004 the Wisconsin Department of Natural Resources received from Flambeau Hydro, L.L.C. the most recent request3 for the water quality certification that is required to renew the federal license for the Winter Hydroelectric Project. Flambeau Hydro supported its request for water quality certification with a copy of the license application and supplemental information that various applicants and resource agencies filed with the Federal Energy Regulatory Commission (FERC).

Following a review of the application materials and other pertinent information, the Department has made the following findings:

I. Background/General Setting

1. The 600-kilowatt Winter Hydroelectric Project (FERC Project No. 2064) is located in Sawyer County, Wisconsin on the East Fork Chippewa River about 7 miles upstream from the 15,300-acre Chippewa Flowage (FERC Project No. 8286) and about 130 miles upstream from the confluence of the Chippewa and Mississippi rivers.

2. Construction of the Project was completed in 1953. The Winter Project is the only hydroelectric project and the only dam located on the East Fork Chippewa River.

3 The Department denied three earlier requests for water certification without prejudice because the application was incomplete. The applicant withdrew a fourth request, pending review of additional information on alternatives for fish passage. The U.S. Fish and Wildlife Service filed its *Report of Preliminary Evaluation of Fish Passage Alternatives at the Winter Hydroelectric Project* with the Federal Energy Regulatory Commission on September 21, 2004. With that submittal the Department considered the application for water quality certification as complete.

3. The East Fork Chippewa River originates in west central Iron County and flows southwest through six natural lakes and one impoundment4 to its confluence with Chippewa Flowage, a 15,300-acre storage reservoir that regulates flow to the mainstem Chippewa River. The total length of the East Fork is about 85 miles.

4. The total area of the East Fork Chippewa River watershed is 305 square miles, and the drainage area at the project dam is about 228 square miles. Vegetative cover in the watershed is mostly forest and wetland with scattered agriculture. Public land along the river corridor includes portions of the Iron and Ashland County Forests and the Chequamegon-Nicolet National Forest. Human population density is sparse, and residential development is concentrated in the community of Glidden in Ashland County and on water frontage.

5. In the headwaters 13 miles of the East Fork Chippewa River upstream from Sells Lake are listed as Class II and III brook trout waters. Downstream from Sells Lake the East Fork supports a warm water sport fish community.

6. The original license for the project was issued for a 50-year term ending November 30, 2001. On November 26, 1999, North Central Power Company filed an application with the FERC for a minor license to continue operating and maintaining the Project. On January 23, 2001 the FERC approved the transfer of the existing license from North Central Power Company, Inc. to Flambeau Hydro, an affiliate of North American Hydro, Inc. In the same order the Commission substituted Flambeau Hydro as the applicant for license renewal. By notice issued on December 12, 2001 the Commission authorized Flambeau Hydro to continue project operation under the terms and conditions of the existing license until the Commission acts on the application for subsequent license.

II. Project and Civil Works

7. The Winter Hydroelectric Project consists of a diversion dam, a reservoir, an excavated power canal 2100 feet long, a concrete intake structure, two steel penstocks, a powerhouse containing two generating units with combined capacity of 600 kW, an excavated tailrace, and appurtenant facilities. The dam diverts streamflow through the power canal to the penstock intake. Discharge from the turbines flows about 700 feet to the confluence of the bypassed channel and the tailrace. The length of the bypassed, natural channel is 2640 feet.

8. The diversion dam is 140 feet long and divided into eight bays. The elevation of the

4 These waterbodies, their surface area, and the distance from their outlet to the inlet of Chippewa Flowage are Sells Lake (16 acres, 64.3 miles), Pelican Lake (40 acres, 33.8 miles), Bear Lake (204 acres, 21.2 miles), Blaisdell Lake (356 acres, 10.8 miles), Winter Hydro Project (49.6 acres, 7.1 miles), Hunter Lake (126 acres, 4.4 miles), and Barker Lake (238 acres, 2.5 miles).

concrete sill is 1362.8 feet MSL and the top elevation of the dam is 1368.8 feet MSL. Renovations completed in 2003 included installing a spillway gate in one section and replacing the upper half of the wooden stoplogs in the remaining sections with removable steel panels.

9. The surface area of the impoundment at normal pool elevation (1367.7 feet MSL) is 49.6 acres. At normal pool elevation the reservoir has a gross storage volume of 165 acre-feet and a maximum depth of 18 feet.

10. The intake to the penstocks measures 18 feet wide by 14½ feet high. A trash rack, made of composite material with 34-millimeter clear spacing between the vertical grates, spans the entire intake area.

11. A substation is located adjacent to the powerhouse, and a transmission line crosses project land near the intake. The project proposed for licensing does not include the substation or any transmission lines.

III. Flow Regime and Reservoir Management

12. The estimated hydraulic capacity for the project is 398 cubic feet per second (cfs). Streamflow exceeds the combined hydraulic capacity of the two turbines and spills into the bypassed reach about 5% of the time.

13. The existing license requires a minimum flow of 50 cfs to the tailrace and no minimum flow to the bypassed reach.

14. Historically, the project has utilized all streamflow for power generation 95% of the time, and the only discharge to the bypassed channel originated as leakage through the stoplogs.

15. Operators introduce cinders and other materials at the upstream face of the diversion dam to seal the gaps between stoplogs. Leakage varies widely, depending on how well those gaps remain sealed. Based on 10 measurements by U.S. Forest Service staff, leakage ranged from 2.5 cfs to 56.3 cfs and averaged 24.2 cfs. Recent installation of a steel gate and steel panels as substitutes for stoplogs has reduced the potential for leakage.

16. Occasionally during floods, the stoplogs failed or operators removed enough stoplogs, so that the water level upstream and downstream of the diversion structure became equal. The renovations to the diversion dam are expected to improve the operators' ability to effectively discharge flood flows to the bypassed reach, thereby decreasing the frequency of future stoplog failure.

17. Flambeau Hydro proposes to operate the Winter Hydro Project in the run-of-river mode by maintaining a constant reservoir elevation of 1367.7 feet MSL. To demonstrate its ability to operate the project as proposed, the applicant provided concurrent measurements of headwater and tailwater elevation.5 Reservoir elevation varied between 1369.02 and 1372.35 feet MSL between May 1 and August 22, 2002. Under the proposed operation, the minimum reservoir elevation in that period was 1.3 feet greater than the proposed normal reservoir level. Daily fluctuations in pond level averaged 0.46 feet over the same period, ranging from 0.03 to 1.97 feet/day.

18. In its license application Flambeau Hydro proposed to release a minimum flow of 10 cfs to the bypassed reach. On May 14, 2004 Flambeau Hydro revised its proposal to include seasonally variable minimum flows to the bypassed reach as follows:

- March 15 to April 30 15 cfs
- May 1 to May 31 30 cfs
- June 1 to June 7 25 cfs
- June 8 to June 15 20 cfs
- June 16 to November 15 15 cfs
- November 16 to March 14 10 cfs

IV. Standards Designation

19. Chapter NR 102, Wisconsin Administrative Code establishes water quality standards to protect the public interest in the surface waters of Wisconsin. The public interest includes the protection of public health and welfare, the present and prospective uses of all waters of the state for public and private water supplies, the propagation of fish and other aquatic life and wild and domestic animals, domestic and recreational purposes, and agricultural, commercial, industrial, and other legitimate uses. In all cases where the potential uses are in conflict, water quality standards shall protect the general public interest. These water quality standards serve as a basis for developing and implementing control strategies to achieve legislative policies and goals. Water quality standards serve as a basis for decisions in other regulatory, permitting, or funding activities that impact water quality.

20. To preserve and enhance the quality of waters, standards are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all waters including the mixing zone and the effluent channel meet the following conditions at all times and under all flow conditions:

5 Records from eight days were omitted because the data did not appear to represent typical operations.

a) Substances, which will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in the waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in the waters of the state.

d) Substances in concentrations or combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant, or aquatic life.

21. It should be recognized that these standards will be revised as new information or advancing technology indicate that revisions are in the public interest. Water used for hydropower and commercial shipping depends mainly on quantity, depth, and elevation; consequently, no specific quality standards for these uses have been prepared.

22. The Department classifies all surface waters into one of five fish and aquatic life subcategories. The East Fork Chippewa River from Sells Lake downstream to Chippewa Flowage, including that portion on which Winter Hydroelectric Project is located, meets the criteria for classification as *warm water sport fish communities.* This sub-category includes surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish.

23. Except for natural conditions, all waters classified for fish and aquatic life, subcategory *warm water fish communities* shall meet the following criteria (Chapter NR 102.04, Wisconsin Administrative Code):

a) *Dissolved oxygen* - The dissolved oxygen content in surface waters may not be lowered to less than 5 milligrams per liter (mg/l) at any time.

b) *Temperature* -
   i) There shall be no temperature changes that may adversely affect aquatic life.
   ii) Natural daily and seasonal temperature fluctuations shall be maintained.
   iii) The temperature shall not exceed 89^0 F for warm water fish.

c) *pH* - The pH shall be within the range of 6.0 to 9.0, with no change greater than 0.5

units outside the estimated natural seasonal maximum and minimum.

24. Barker Lake, Blaisdell Lake, and Lake Chippewa on the East Fork Chippewa River are designated as Outstanding Resource Waters under Chapter NR 102.10 of Wisconsin's Administrative Code. The state's highest quality lakes and streams were designated as Outstanding Resources Waters and granted additional protection against degradation from existing and proposed point source discharges. The Upper Chippewa River Basin Water Quality Management Plan (1996) includes a specific recommendation that WDNR should evaluate the East Fork Chippewa River for potential classification at Outstanding Resource Water.

25. The East Fork Chippewa River has been nominated as a candidate eligible for designation as a wild and scenic riverway under the National Wild and Scenic Rivers Act (16 USC 1271 to 1287). The USDA Forest Service currently manages portions of the river within the Chequamegon-Nicolet National Forest boundary under various scenic and recreational eligibility classifications.

V. Water Quality

Chemical

26. White Water Associates, Inc. collected physical and chemical water quality data for the Winter Hydroelectric Project impoundment in 1998-1999. Those results indicated that all temperature, dissolved oxygen, and pH measurements met Wisconsin's water quality standards. Maximum temperature in the reservoir was at least 5°C below the standard of 89°F, dissolved oxygen concentration was always greater than 5 mg/l, and no pH readings were recorded below 6.0 or above 9.0 units.

27. Surface water temperature monitoring in the impoundment found a maximum temperature of 28.4°C (83.1°F). Temperature during July and August averaged about 23°C (73.4°F). The stained water promotes warming of the surface water. Temperature profiles showed temperature declines of 3°C below a depth of 1 meter in mid-summer. Other than this, no significant thermal stratification occurred.

28. Dissolved oxygen profiles showed slight declines in dissolved oxygen concentrations with depth, but concentrations exceeded 5.0 mg/l on all dates and at all depths.

29. Water clarity as measured by Secchi disk ranged from 3.3 to 6.6 feet and averaged 4.2 feet. The water was moderately stained with color values ranging from 34 to 69 platinum-cobalt units.

30. Alkalinity varied from 34 to 70 milligrams per liter (as $CaCO_3$) probably due to changes in surface runoff contributions. The pH ranged from 6.9 to 7.6. The magnesium concentration was higher than the calcium concentration in the sample collected from the impoundment on November 4, 1998.6

31. Nutrient concentrations were low for a riverine impoundment. Total phosphorus concentration ranged from 20 to 30 micrograms per liter. Ammonia concentration ranged from 0.16 to 0.49 mg/l (as N), nitrate plus nitrite concentrations ranged from 0.27 to 0.56 mg/l (as N), and reliable values for total Kjeldahl nitrogen concentration7 ranged from 0.34 to 0.36 mg/l (as N).

32. On September 2, 1998 Department staff probed the substrate near shore and at the deepest point of six transects across the channel. The impoundment had an abundance of coarse substrates. Cobble or rubble was present at half of the near shore transect sites. No significant deposits of fine sediment had accumulated. Occasional reservoir drawdown and continuous leakage through the diversion dam may have contributed to the downstream transport of fine sediments. Sediment input to the impoundment is likely to be low because most of the watershed is forested and has a low rate of sediment export. Blaisdell Lake, located about ½ mile upstream from the project reservoir may capture much of the sediment from upstream sources.

33. White Water Associates found two sites with active erosion on the banks of the tailrace immediately downstream from the powerhouse. On the north shore people accessing the tailrace have eroded a trail down the steep bank. On the south shore discharge from the powerhouse has scoured the bank.

Aquatic Biota

34. From 1998 through 2000, staff in the Department's Fisheries Management and Habitat Protection program sampled fish populations in the project reservoir and adjacent waters. Frank Pratt, Senior Fishery Biologist, compiled the objectives, results, and recommendations of the study in a report.8

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6 Calcium concentration generally always exceeds magnesium concentration in Wisconsin waters, and consequently these trace metal results are considered unreliable.

7Total Kjeldahl nitrogen (TKN) is the combination of ammonia and organic nitrogen. Consequently, TKN concentration must be greater than or equal to the ammonia concentration. Since all ammonia concentrations were greater than the reporting limit of 0.1 mg/l for TKN, the reported results for either TKN or ammonia were unreliable in samples from several dates and locations.

8 Pratt, Frank B., 2000. Wisconsin Department of Natural Resources. *Fish Community and*

35. Pratt found 36 fish species,9 which he described as a moderately diverse fish community reflective of the dual habitat characteristics (lake/river) of this narrow, riverine impoundment. Although he did not compute a score using the Index of Biotic Integrity,10 Pratt noted that fish community attributes generally showed characteristics of health and integrity on both sides of the dam. Most species found in the tailwaters were also found in the impoundment. The notable exception was the migratory species index. Pratt captured channel catfish and observed lake sturgeon below, but not above the project.

36. Greater redhorse and longear sunfish occurred upstream and downstream of the project. Both species are currently listed as "threatened" under Wisconsin's Endangered Species Act. Lake sturgeon are listed as a "species of concern" under Wisconsin's Endangered Species Act and as a "species of greatest conservation need" in the Comprehensive Wildlife Conservation Plan.

37. Smallmouth bass was the predominant gamefish in the impoundment. The walleye population was characterized by poor recruitment, truncated size distribution, slow growth, and low adult density. Northern pike and muskellunge coexist at average density and occasionally interbreed in the reservoir.

38. The reservoir supported a panfish community, consisting of bluegills, pumpkinseeds, longear sunfish, rock bass, black crappies, and yellow perch. All panfish populations had poor recruitment, average growth rate, and low adult density compared to regional norms.

39. Pratt concluded that population characteristics for walleye, black crappies, other panfish, channel catfish, lake sturgeon, and smallmouth bass during periods of low recruitment, as well as characteristics of the recreational fishery, provided evidence to support the one-way valve hypothesis and the recommendation for fish passage.

40. Minnows, particularly rosyface shiners, were the predominant small forage in the project impoundment. Other forage included riverine habitat specialists such as creek chub, central

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Fishery Near the Winter Hydroelectric Project on the East Fork Chippewa River, FERC Project No. 2064, Sawyer County, Wisconsin.

9 The occurrence of river redhorse (*Moxostoma carinatum*) in the East Fork Chippewa River has been questioned. No voucher specimens were retained for verification.

10 Lyons, J., 1992. *Using the index of biological integrity (IBI) to measure environmental quality in warmwater streams of Wisconsin*. U.S. Forest Service, North Central Forest Experimental Station, Gen. Tech. Report 149.

stoneroller, and hornyhead chub; habitat generalists like the common and blacknose shiners; and obligate lake species like the golden shiner, fathead minnow, and bluntnose minnow. Larger forage included northern hogsuckers, white suckers, and several redhorse species.

41. The impoundment was lightly fished and anglers' catch rates were poor for all species except smallmouth bass. Conversely, there was heavy fishing pressure in the tailwaters. Catch rates for all species were higher in the tailwaters than in the impoundment, but still lower than regional averages.

42. Staff from four state, federal, and tribal resource agencies and a community college participated in a cooperative study to evaluate the movements of lake sturgeon (*Acipenser fulvescens*) in the East Fork Chippewa River. They attached an external radio transmitter with a unique frequency to 28 adult sturgeon captured in gillnets in May 2002 and 2003. All radio-tagged sturgeon and 7 others also received a Passive Integrated Transponder tag injected into the pectoral fin muscle and a numbered Monel or Floy tag attached at the dorsal fin. Four sturgeon, captured and radio-tagged downstream from the only dam on the river, were released immediately upstream of that dam. They released all other tagged fish near their capture location. Pilots located each radio-tagged sturgeon weekly during daylight hours from a fixed wing aircraft and recorded coordinates in a GPS unit. Locations recorded from the water from May to July 2003 were unreliable. Based on 1306 locations recorded from the air between June 12, 2002 and December 4, 2003, they confirmed that five sturgeon moved substantial distances. None of the subjects moved outside the study area. Three of four sturgeon released above the dam moved 13.7 miles upstream to a natural lake within 36 days of release in 2002. One sturgeon moved 7.6 miles downstream from a suspected spawning area to a natural lake in 2003 within 13 days of tagging and release. Another sturgeon moved about 2½ miles between two natural lakes downstream of the dam at least twice. Locations recorded from the air for six other sturgeon indicated apparent movements upstream and downstream from their release site; however, we had less confidence in data indicating apparent movement than we had in data supporting confirmed movement. Most radio-tagged sturgeon remained in the natural lakes where they were captured. Of 3 sturgeon tagged in 2002 and recaptured in 2003, all were mature males, and one lost its transmitter. We suspect that other sturgeon lost tags.

43. In July 1998 White Water Associates characterized vegetation on riparian land in the project area into five categories in descending order of predominance as follows: mesic northern hardwoods, lowland hardwoods/alders, emergent/wet meadow, lowland conifers, and open upland. Eighty-three aquatic and terrestrial plant species were recorded.

44. In July 1998 White Water Associates found several patches of purple loosestrife (*Lythrum salicaria*), an invasive competitor of native wetland vegetation, at two locations on the project impoundment. The upstream site was located near a mowed lawn at a residence,

and the downstream site was within an extensive wet meadow where conditions provide opportunity for spreading.

45. Department staff conducted an aquatic macrophyte survey for the impoundment in September 1998 and found twenty-five species of aquatic macrophytes. Wild celery (*Vallisneria americana*), coontail (*Ceratophyllum demersum*), and water marigold (*Megalodonta beckii*) were the 3 most abundant species. Aquatic macrophytes were not widespread. Limitations to growth probably include abundance of coarse substrate (cobble, rubble), possible nutrient limitations in some finer substrates, limited water clarity, and periodic drawdowns. No wild rice (*Zizania palustris)* was found in project waters in two vegetative surveys conducted in 1998.

46. In June 1998 staff from the Department and the U. S. Forest Service conducted a freshwater mussel survey at three sites to evaluate the potential effects of the project on mussel distribution and habitat fragmentation in the East Fork Chippewa River. Eleven mussel taxa were recorded, including round pigtoe (*Pleurobema coccineum*), a species of special concern under Wisconsin's Endangered Species Act. No endangered or threatened mussels were found. Species richness was similar upstream and downstream from the project, and community fragmentation was not evident. We found eleven species upstream of the project and ten species downstream. When sample size was adequate, visual observations of mussel size distribution suggested that recruitment does occur. We visually estimated density at about 2, 1½, and 20 mussels per square meter, respectively, at the downstream, upstream, and power canal sites. In most river systems population densities are higher in tailwaters and substantially lower in impounded waters. The power canal contained little fine sediment, moderate current, and stable substrate—all conditions that favor high mussel density. We did not look for mussels in the bypassed channel. Few, if any mussels would be expected to inhabit the bypassed channel due to its unreliable water quality and hostile environmental conditions. Mussels, which are long-lived and largely sedentary, require nearly constant wet conditions, and they will not survive long under shallow, low flow, dry, or frozen conditions.

47. Twelve dragonfly taxa were identified from exuviae (i.e. epidermal layers shed during emergence) collected from the shoreline of the impoundment and two free-flowing river segments above and below the Winter Project in June 1998. *Gomphurus ventricosus*, *Gomphus viridifrons*, and *Stylgomphus albistylus* are listed as dragonfly species of special concern. No endangered or threatened dragonflies were found. Due to small sample size, we were unable to discern any community or habitat fragmentation.

Water Quantity and Aquatic Habitat

48. The bypassed channel, locally known as Snaptail Rapids, drops 18 vertical feet over a distance of 2640 feet, making it one of the longest and steepest rapids on the East Fork

Chippewa River. To place Snaptail Rapids in the context of the broader river ecosystem, the U.S. Forest Service classified 32.9 miles of the stream channel from the National Forest boundary above Pelican Lake downstream to the Chippewa Flowage into 5 broad geomorphic categories. Slightly entrenched run/pool was the most common channel type (32.8%), followed by lacustrine (28.5%), upland run/pool (22.1%), gentle rapids (10.4%), and steep rapids (6.2%). Steep rapids have slopes greater than 0.5%, are moderately entrenched, have greater turbulence, water velocity, and coarse substrate composed mostly of cobbles and boulders. Steep rapids are relatively rare on the East Fork Chippewa River. Snaptail Rapids was one of four separate rapids in the steep category, comprising 25% of the total length of all steep rapids combined. Velocity and depth in steep rapids provide suitable habitat for riffle-dwelling fish and macroinvertebrates, including logperch, slenderhead darter, blackside darters, stoneflies, mayflies, and caddisflies. Rapids are important food producing areas for predatory fish, and they serve as spawning habitat for lake sturgeon and various sucker and redhorse species.

49. In 1998 staff from Great Lakes Environmental Center, U.S. Forest Service, and Wisconsin DNR evaluated average depth and velocity at four permanent transects when discharge to the bypassed channel was 3.7, 6.9, 15.8, and 31.5 cfs. Photographs and videotape taken at each transect provide a visual record of habitat conditions in the bypassed reach at each flow increment. Habitat Suitability Indices for six species and lifestages were selected to represent the shallow-fast and shallow-slow habitat guilds. Habitat was considered suitable if the suitability index was greater than zero for all habitat criteria. Emphasis was placed on depth, velocity, and substrate across each transect, while cover was used as an indicator of habitat quality. The analysis focused on the change in wetted-width and wetted-area under various flow increments. Based on the 1998 instream flow study results and professional judgment, the applicant's consultant recommended that a minimum flow of 10 cfs would provide adequate aquatic habitat within the bypassed channel, cautioning that minimum flows may be difficult to maintain in winter due to icing at the diversion dam and decreased streamflow.

50. In 2000 and 2001 at discharges of 6.5 and 49.9 cfs, respectively, U.S. Forest Service staff collected additional velocity and substrate data at the same four transects used in the 1998 flow evaluation. Following the Instream Flow Incremental Methodology (IFIM), they modeled physical habitat in the bypassed channel, using PHABSIM software and habitat suitability indices for various lifestages of seven fish species known to occur in the East Fork Chippewa River and expected to use Snaptail Rapids. PHABSIM provided an estimate of weighted usable area (WUA) for each species and lifestage at simulated flows ranging from 3.7 to 350 cfs.

51. The simulation revealed that Snaptail Rapids had excellent potential habitat for spawning lake sturgeon which require cobble and boulder substrate, moderate to high velocity, and a

variety of depths. WUA for spawning lake sturgeon increased as flows increased, and the proportion of total usable area that is suitable for sturgeon spawning is maximized at 120 cfs. Despite the projected availability of suitable spawning habitat, shallow depth at low flow may limit or preclude lake sturgeon's access to spawning habitat in the bypassed channel. Based on the predicted water surface elevations at the two riffle transects, 50 cfs would provide some areas greater than one foot deep through which sturgeon should be able to swim to reach suitable spawning habitat.

52. The habitat modeling results for other species and lifestages are summarized in the December 2004 report, entitled *Instream Flow Evaluation for the Winter Hydroelectric Project, PHABSIM Modeling11*. The authors recommended that a two-stage minimum flow to the bypassed channel was warranted considering the spawning requirements of lake sturgeon in spring and the requirements of other fish and aquatic life throughout the rest of the year. A 50 cfs minimum flow from May 1 to May 31 would provide spawning habitat for lake sturgeon and sufficient depth for sturgeon to access that habitat. Considering the combined needs of the other species and lifestages modeled in this study, a minimum flow of 30 cfs would provide adequate habitat for the riffle-dwelling community through the remaining time.

53. Adjusting the wicket gates of the turbines to ensure that enough water spills over the crest of the diversion dam would not guarantee compliance with minimum flow requirements. Consistent discharge over a broad-crested weir is highly dependent on stable water levels.12 Based on the wide variation in reservoir elevation measured in spring and summer 2002, adjusting discharge through the powerhouse and removing stoplogs to spill over the top of the diversion dam will not provide a reliable method to ensure a constant minimum flow to the bypassed channel.

Fish Passage

54. The diversion dam at the Winter Hydroelectric Project is the only physical barrier to fish movements on East Fork Chippewa River. Providing safe upstream and downstream fish passage at this dam would restore connectivity and functionality of the river ecosystem in 295 stream miles throughout the watershed, including 85 miles on the mainstem.

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11 Fedora, Mark, D. Higgins, S. Reinecke, and J. Scheirer, 2004. *Instream Flow Evaluation for the Winter Hydroelectric Project, FERC No. 2064. PHABSIM Modeling.* Chequamegon-Nicolet National Forests and Wisconsin Department of Natural Resources, Park Falls, WI. Dated December 17, 2004.

12 Higgins, Dale, 2005. *Evaluation of Methods for Minimum flow Compliance, Winter Hydroelectric Project, FERC No.2064.* Chequamegon-Nicolet National Forests. Park Falls, WI. Dated January 13, 2005.

55. Based on a site visit in June 2004, a fish passage engineer from the U. S. Fish and Wildlife Service evaluated the feasibility and estimated costs for several structural and operational alternatives for upstream and downstream fish passage at the Winter Hydro Project.13

56. Bidirectional fish passage can be provided by removing flashboards and opening the bays to the concrete sill of the diversion dam. The majority of flow would run through the natural channel. This measure has been referred to as the open bay alternative for fish passage.

57. Providing continuous upstream and downstream fish passage year round would yield maximum resource benefits for the aquatic ecosystem. Using the open bay alternative to provide fish passage annually in spring and fall represents a reasonable balance among multiple uses of the waterway. The Department and the U. S. Forest Service considered the open bay alternative as the minimum cost alternative because it carries no infrastructure cost and requires no capital investment.

58. Spring passage would occur from April 15th to May 31st, and fall passage would occur between September 15 and October 1. Providing fish passage in spring is intended to allow adult and newly hatched lake sturgeon, walleyes, and other fish species to pass upstream and downstream during their spawning and early developmental period. Passage in fall is intended to allow downstream movement of adult and juvenile fish to their winter habitat.

59. U. S. Forest Service staff used hydraulic modeling of flows for a range of gate openings to determine associated water depths and velocities.14 Modeled depths and velocities under several combinations of flow and gate openings were then compared to fish swimming speeds and depth requirements to determine which fish species, if any, would pass upstream through the diversion dam.

VI. State Comprehensive Plans

60. *The Upper Chippewa River Basin Water Quality Management Plan*
The goal of this plan is to identify areas of water quality concerns and identify management objectives for the water resources of the Upper Chippewa River Basin. The plan focuses on

13 Orvis, C., 2004. *Site Inspection Report for Consultation Meeting at the Winter Hydroelectric Project (FERC No. 2064) on the East Fork Chippewa River, Sawyer County, Wisconsin, held on June 23, 2004.* Unpublished report, U.S. Fish and Wildlife Service.

14 Higgins, D., M. Fedora and J. Mineau, 2005. *Evaluation of Fish Passage Via the Open Gate Alternative, Winter Hydroelectric Project, FERC No. 2064*. Chequamegon-Nicolet National Forest, Park Falls, WI. Filed with the Commission on January 18, 2005.

issues that require a comprehensive approach both within the Department and with other agencies and public and private groups. The plan identifies impacts of beaver dams on trout streams in the East Fork Chippewa River watershed and high potential for endangered resource occurrences in the mainstem. In the watershed narrative of the plan, the Department's Fishery Biologist suggested that the dam at the Winter Hydroelectric Project may be degrading the fishery in the East Fork Chippewa River.

61. *Wisconsin's Biodiversity as a Management Issue*

This report presents the Department's strategy for the conservation of biological diversity. In the aquatic community section of this report, past and present dam construction is considered the number one impact on our state's large rivers. Impacts on rivers caused by dams include fragmentation of river habitats, elimination of higher gradient riffle and rapids habitat, increased temperatures and reduced dissolved oxygen levels in waters discharged below dams, interference with natural flooding and sedimentation, interference with the natural downstream transport of woody debris. Hydroelectric dams also pose mortality threats to downstream migrating fish species, block natural upstream movements of fish, and interfere with the colonization of macroinvertebrates and mussel species. Hydroelectric facilities that operate in the peaking mode or with fluctuating discharge decrease the availability and suitability of habitat for fish and other aquatic species. Changes in discharge affect the suitability of substrate, velocity, and depth. This translates into changing habitat conditions for aquatic species.

The report lists possible actions that would be consistent with ecosystem management and would correct some of the negative impacts that dams have on rivers. These include providing both up and downstream fish passage at dams when and where it is appropriate and providing stable discharge to protect recreation, water quality, fish, and other aquatic life.

- Identify critical seasonal habitats and improvement opportunities (high).
- Ensure the impacts of dams and habitat needs of species are considered during the FERC relicensing process (high).
- Work with dam owners to effectively manage or improve habitat in fragmented river systems. Consider dam removal, if warranted, to reconnect fragmented populations. Educate public on the impacts of dams and benefits of dam removal (high).
- Use proper flow management at dams to benefit species (high).
- Provide passage at dams where feasible and where passage would benefit sturgeon populations (high).

62. *A Fisheries, Wildlife, and Habitat Management Plan for Wisconsin, 2001 – 2007*

This plan addresses the DNR Mission, implements the four goals of the Department's Strategic Plan, and provides specific information and objectives relevant to fish, wildlife, and habitat management for the six year period from July 1, 2001 through June 30, 2007.

The Department's authority to manage fish and wildlife populations is found in State Statute 29.011 and 29.014. There are additional specific authorizations in Chapters 29 and 23. Administrative rules affecting Fish and Wildlife are found in NR 10 (game) and NR 20 - 26 (fishing). Additional authorizations are found in NR 10 through NR 27 and NR 45. Chapters 30 and 31 of the statutes protect aquatic habitat.

Habitat continues to be degraded, simplified, fragmented or destroyed by some land and water use practices, policies, and development decisions. Wisconsin's fish and wildlife, our continued enjoyment of hunting and fishing, our tourism industry and our quality of life depend on high quality natural habitat. Wisconsin's more than 30,000 miles of warm water rivers and streams are among the most biologically diverse aquatic ecosystems and among the most threatened nationwide. These systems harbor over 150 fish and 53 mussel species. About one third of the state’s mussel species are endangered or threatened. Modification of rivers and streams, including the construction of more than 3,700 dams, has changed the character and function of these riverine ecosystems.

Some of the specific goals and objectives for sustaining ecosystems and providing outdoor recreation opportunities include:

- Improve sport fishing by protecting, maintaining, and restoring critical habitat for natural sportfish stocks and their associated aquatic communities.
- Manage for a biologically diverse, balanced, and healthy ecosystem that meets fishable and swimmable standards and the DNR's strategic objectives for biodiversity.
- Identify and investigate the causes of habitat loss or impairment and take corrective actions in each Geographic Management Unit.
- Screen proposed management actions for impact on state and federally listed species; develop improved tools for screening and for managing rare species and natural communities.
- Assess the impact of 10 dams or hydro facilities per year statewide.
- Gain approval and begin implementing Wisconsin’s Sturgeon Management Plan by 2002. Preserve and enhance existing naturally reproducing sturgeon populations. Re-establish populations in waters within their original range consistent with their genetic origins. Allow for sport harvest opportunities where a limited harvest can be sustained.

63. *Comprehensive Wildlife Conservation Plan (CWCP)*

The main goal of the program, as defined by Congress, is to keep species off the state and federal endangered and threatened species lists. To accomplish this goal and remain eligible to receive funding for conservation projects, the states must:

- Develop a CWCP that sets forth a strategic, holistic, and proactive approach to fish and wildlife conservation.
- Consider all native wildlife, game and nongame, large and small, as long as the focus

is on those species of greatest conservation need;
- Take proactive action for the species of greatest conservation need and their habitats;
- Create partnerships, build on past efforts, and implement the plan through local actions; and
- Implement the plan without introducing new regulations or constraints

Species of greatest conservation need have low and/or declining populations that are in need of conservation action. They include various birds, fish, mammals, reptiles, amphibians, and invertebrates (e.g. dragonflies, butterflies, and freshwater mussels) that are:
- Already listed as threatened or endangered;
- At risk because of threats to their life history needs or their habitats;
- Stable in number in Wisconsin, but declining in adjacent states or nationally.
- Of unknown status in Wisconsin and suspected to be vulnerable.

Lake sturgeon, greater redhorse, and longear sunfish are among the species of greatest conservation need known to occur in the East Fork Chippewa River system.

64. *Wisconsin Endangered Species Strategic Plan*
Chapter 29.415 of the Wisconsin Statutes mandates that the preservation of endangered and threatened plant and animal communities is of highest importance, and the legislature urges all persons and agencies to fully consider all decisions in this light. Species are listed as endangered, threatened, or special concern primarily because of human activities that have jeopardized their continued existence in the state or globally. The Department's Endangered Resources Strategic Plan provides direction or preserving and fostering the recovery of endangered resources throughout the state.

Continued operation of the Winter Hydroelectric Project would comply with the objectives outlined in these plans if all state water quality standards were met, and if the project is operated in a run-of-river mode with seasonally variable minimum flows to the bypassed channel and adequate provisions for upstream and downstream fish passage.

ACTION OF THE DEPARTMENT

The Department has the authority to issue Water Quality Certification under Chapter NR 299 of the Wisconsin Administrative Code. Water quality certification procedures have been adopted pursuant to Section 401 of the Clean Water Act (33 USC 1341) and Sections 144.025 and 147.0, Wis. Stats. It is the policy of the Department to review, all activities which require a federal license or permit which may result in any discharge to waters of the state and to:

1. Deny certification for any activity where the Department does not have reasonable assurance

that any discharge will comply with effluent limitations, water quality related concerns or any other appropriate requirements of state law as outlined in NR 299.04;

2. Grant or grant conditionally certification for any activity where the Department has reasonable assurance that any discharge will comply with effluent limitations, water quality related concerns, or any other appropriate requirements of state law as outlined in NR 299.04; or

3. Waive certification for any activity which the Department finds will result in no discharge, any wastewater discharge associated with an activity which will be regulated by the permit authority under ch. 283, Wis. Stats., or any activity that does not fall within the purview of the Department's authority.

The Department shall determine whether it has reasonable assurance that the proposed activity complies with the following water quality standards:

1. Effluent limitations adopted under s. 283.13, Wis. Stats. and 33 USC 1311 for categories of discharges;

2. Water based related effluent limitations adopted under s. 283.13 (5), Wis. Stats. and 33 USC 1312;

3. Water quality standards adopted under s. 281.15, Wis. Stats. and 33 USC 1313;

4. Standards of performance adopted under s. 283.19, Wis. Stats. and 33 USC 1316;

5. Toxic and pretreatment effluent standards adopted under s. 283.21, Wis. Stats. and 33 USC 1317;

6. Public interest and public rights standards, related to water quality, set forth in ss. 30.03, 30.10, 30.11, 30.12, 30.123, 30.13, 30.15, 30.18, 30.19, 30.195, 30.196, 30.20, 30.202, 30.206, 30.21, 31.02, 31.05, 31.06, 31.07, 31.08, 31.12, 31.13, 31.18, 31.23, 88.31 and 281.15, Wis, Stats. and made applicable by 33 USC 1341 (d);

7. Any other appropriate requirements of state law as provided in 33 USC 1341 (d).

VII. Conclusions and conditional certification

Based on its review of the applicant's proposal and the above findings, the Department concludes that there is reasonable assurance that operation and maintenance of the Winter Hydroelectric Project as proposed by the applicant in the November 26, 1999 license application and modified by the following conditions will not cause a violation of Wisconsin Water Quality Standards and

will be in compliance with sections 301, 302, 303, 306, and 307 of the Federal Clean Water Act, P.L 92-500, as amended, and other appropriate requirements of state law:

For the protection of water quality, fish, and wildlife resources in the East Fork Chippewa River…

A. The licensee shall comply with all federal, state, and local permit requirements.

B. The licensee shall meet the most current water quality standards adopted under s. 281.15, Wis. Stats. and 33 USC 1313, as well as any revised water quality standards that may be adopted over the term of the license.

C. The licensee shall operate the Winter Hydroelectric Project in a run-of-river mode. The licensee shall act at all times to minimize fluctuation of the reservoir surface elevation by maintaining a discharge from the Project so that, at any point in time, flows, as measured immediately downstream from the confluence of the tailrace and the bypassed channel, approximate the sum of inflows to the project reservoir. Project operation may be temporarily modified if required by operating emergencies beyond the licensee's control or for short periods with the Department's approval. If project operation is temporarily modified due to circumstances beyond the licensee's control, the licensee must make all reasonable attempts to return to authorized operation as soon as possible.

D. The licensee shall maintain a target reservoir elevation of 1367.7 ± 0.3 feet mean sea level (MSL)15 at all times, except as authorized in Paragraph J below. The licensee shall act at all times to minimize fluctuations in headwater elevation, and the allowable range of reservoir level should not be used on a daily basis. If the reservoir elevation is temporarily modified due to uncontrollable circumstances, the licensee shall notify the Department's office in Park Falls, Wisconsin as soon as possible, but no later than 5 days after each incident.

E. The licensee shall demonstrate compliance with the requirements in Paragraphs C and D in the following manner. The licensee shall install and maintain automatic level sensing equipment to continuously measure and record project reservoir elevation. In addition, the licensee shall provide a continuous electronic record of project discharge by a continuous electronic record of power generation converted to cubic feet per second coupled with a continuous record of all bypassed reach flow changes converted to cubic feet per second. Generation shall be recorded at least hourly, and generation shall be calculated from a dynamic head (reservoir elevation minus tailwater elevation in concurrent measurements), rather than from a static head (reservoir elevation minus a fixed tailwater elevation).

15 In a letter dated July 22, 2008 Flambeau Hydro asked three resource agencies for their comments on the licensee's proposal to revise the authorized reservoir elevation for the Winter Hydroelectric Project from 1367.70 ± 0.3 feet MSL to 1370.40 ± 0.3 feet MSL. Upon the Commission's approval of Flambeau Hydro's formal request for license amendment, the Department will concurrently revise Condition D above.

The licensee shall also maintain staff gauges that are visible to the public in the impoundment and tailwaters along with a daily log record of project operation. Operators should record in the project log daily staff gauge readings, generation, flow releases through the powerhouse and spillway updated whenever changes are made, the daily minimum and maximum discharge through the project as calculated from accurate measurements of gate openings and the ratings curves for all outlets, comments to explain circumstances for equipment adjustments (e.g. snow melt, heavy precipitation, etc.), and a detailed description of the duration and circumstances of unexpected outages that interrupt flow through the turbines. All project log records, manually or electronically logged, including comments, should be keypunched into electronic spreadsheet format for the 3-year test period required under Condition W. All data will be permanently archived and provided to the resource agencies upon request.

Performance standards to demonstrate compliance with run-of-river operation will follow a phased approach, first by using operational data (i.e. headwater elevation, tailwater elevation, generation, tailrace discharge, spillway discharge) and descriptive definitions, then if necessary, by comparing inflow and discharge measurements from gage stations. The objective of run-of-river operation is to maintain a stable reservoir elevation and to match discharge as closely as possible to inflow at each project. In managing reservoir levels operators should strive to minimize variations from the target elevation within the allowable range. The allowable band of ±0.3 feet around the target reservoir levels should not be used on a daily basis. Similarly, under run-of-river operation, changes in discharge through the turbines and spillway should follow the rate of changing inflow. Operators should adjust turbine and gate settings to achieve smooth transitions when inflow increases and decreases. For manually operated projects like this one, small adjustments made more often are generally preferred over larger adjustments made less frequently. Minimizing the percent change in discharge during periods of stable inflow is also important. Cycling a turbine on and off in response to changing reservoir level would not meet the Department's expectations for run-of-river operation at these projects. Because individual turbines can pass a substantial proportion of the streamflow in the system, cycling a unit on and off would cause unacceptable fluctuations in discharge. Run-of-river operation that closely mimics the natural hydrograph will minimize adverse impacts of project operations on aquatic resources and recreation.

If the Department determines, at the end of the 3-year test period required by Condition W below, that the licensee has not documented its ability to meet the descriptive compliance standard outlined in the preceding paragraph, and that the licensee has not proposed acceptable alternatives to achieve the compliance standard, then the licensee shall consult with the U. S. Geological Survey (USGS) to install and maintain two USGS-type gages, or an equivalent means acceptable to the resource agencies, in the East Fork Chippewa River, one

upstream of the project reservoir and one in the riverine tailwaters immediately downstream from the confluence of the tailrace and bypassed channel. The gages must be operational within one year from the end of the 3-year test period. The gages shall be equipped with the "telemark" type system, or an equivalent means acceptable to the resource agencies, with sufficient memory to allow instantaneous and short-term data retrieval via phone lines or the Internet. Discharge from the Winter Hydro Project shall differ no more than ±10% from inflow to the Project reservoir in concurrent measurements after appropriate corrections for travel time, gains and losses between the gages, and measurement error. Appropriate corrections shall be determined in consultation with the Department and USGS within one year following activation of the new gages.

F. The licensee shall discharge to the bypassed channel the following instantaneous minimum flows, or inflow, whichever is less. Minimum flows shall be released through an orifice near the sill of the diversion dam, and the dimensions of the orifice shall calculated from an accepted hydraulic formula, based on the lowest reservoir elevation in the authorized range. The licensee shall inspect and maintain the orifice daily to ensure that it remains unobstructed and free of debris.

Period	Discharge (cfs)
May 1 to May 31	50
June 1	40
June 2 to April 30	30

These ramping rates may be modified upon implementation of the fish passage plan as required in Condition J. Upon request from the resource agencies, the licensee shall adjust the starting dates of higher minimum flows without extending the 31-day duration to accommodate fishes' behavioral response in changing environmental conditions.

The licensee shall discharge from the powerhouse to the tailrace an instantaneous minimum flow of 5 cfs. If inflow to the project reservoir is less than 35 cfs, then ten percent of inflow shall be discharged to the tailrace and the remainder to the bypassed channel below the diversion dam.

G. The licensee shall demonstrate compliance with the requirements in Paragraph F in the following manner. Minimum flow to the tailrace, as determined from wicket gate opening and rating curve, or from the dimensions of a debris-free orifice and reservoir elevation, shall be documented in the project log daily. The licensee shall demonstrate compliance with discharge requirements to the bypassed channel by one of the following options, depending on whether the licensee opts to include leakage and spillage as part of the minimum flow.

Option 1—If the licensee elects to include leakage and spillage as part of the minimum flow, then within one year of license issuance the licensee shall install and operate a streamflow gauging station in the bypass channel. The station shall include a staff gage, a stilling well, and a water level recorder capable of recording stage data at hourly or shorter intervals. The design and location of the gauging station will be subject to Department approval. The licensee shall develop an accurate stage-discharge relationship for the gauging station and provide an annual record of discharge in the bypassed channel to the Department by December 31 each year or within two weeks upon request.

Option 2—If the licensee opts to exclude leakage and spillage from the minimum flow, the licensee shall record the opening of the orifice(s) at the diversion dam at least daily and calculate discharge to the bypassed channel, based on hourly reservoir elevation measurements and an accurate rating curve. The licensee shall develop an accurate rating curve for the orifice(s) and provide an annual record of discharge to the Department by December 31 each year or within two weeks upon request. The licensee shall obtain Department approval for the design, placement, and dimensions of the orifice(s) prior to construction and operation.

H. Within six months of license issuance, the licensee shall prepare an Outage Response Plan in consultation with the Department to ensure that discharge is promptly restored following unexpected outages that interrupt flow through the turbines.

I. The licensee shall maintain all operational monitoring equipment in serviceable condition and calibrate, repair, or replace it as necessary. The licensee shall retain all electronic and paper records of project operations for the life of the project. The licensee shall allow the Department to access the project and its operational records at any time to monitor compliance with certification conditions.

J. The licensee shall provide safe and effective upstream and downstream passage for aquatic life annually in spring and fall. The goal is to pass as many aquatic organisms as possible. Target fish species include lake sturgeon, walleyes, native redhorse species, smallmouth bass, and channel catfish. Passage will be provided at the diversion dam by temporarily raising gates and removing stoplogs down to the sill to allow the majority of flow to run through the natural channel. Passage will occur in spring from April 15th to May 31st. Passage in fall will occur from September 15th to Oct 1st.

Within three years of license issuance, the licensee shall submit to the Department for approval a fish passage plan prepared in consultation with the Department and other resource agencies, including the USDA Forest Service and the U.S. Fish and Wildlife Service. Within five years of license issuance the licensee shall have completed construction of an approved fish passage plan. The plan shall describe the details for providing fish passage by the open

bay alternative, including an implementation schedule, reservoir drawdown notification, ramping rates for reservoir level and discharge, gate and stoplog management, and minimum flows during reservoir refill. To determine how many bays should be opened for optimal passage under various flow conditions, the plan shall incorporate information from the report *Evaluation of Fish Passage via the Open Bay Alternative, Winter Hydroelectric Project, FERC No. 2064*. The plan shall include a monitoring component to evaluate the effectiveness of this condition in providing passage for target species. The licensee shall cooperate in monitoring activities by providing reasonable assistance and participation, such as visual observations, equipment maintenance, and in-kind services. The plan shall also include provisions for reasonable modifications that are necessary to achieve objectives for passage. Based on monitoring results, necessary measures for adaptive management shall be developed by consensus among the licensee, the Department, and other resource agencies.

At any time during the term of the license, the licensee may submit to the Department for approval, detailed plans and design drawings for practical alternatives that provide fish passage. The Parties acknowledge and agree that a fish passage plan may include a near-nature bypass as an alternative to the open bay plan. Preferred alternatives include those which promote multiple objectives, including power generation, year round fish passage, and reliable delivery of minimum flow to the bypassed channel. Alternative plans for fish passage must be at least as effective as the open bay concept. Alternative plans should be developed in consultation with the Department, and the plan should include a monitoring component to evaluate the effectiveness of the alternative design with cooperation from the licensee as describe above. Until the Department approves and the licensee implements an alternative plan, the licensee shall continue to provide fish passage by temporarily opening the dam.

K. The Licensee shall collect detailed information on all aquatic species (fish, reptiles, amphibians, waterfowl, furbearers, etc.) found on the trash rack and in the tailrace pool immediately below the powerhouse. Records should include species, size (length), date, time, and general condition of the organism (i.e. alive, injured, freshly dead, or decomposed). The trash rack and tailrace pool should be visually inspected at least three times weekly from April 15 to June 15 and September 15 to November 15 and at least weekly in the remaining time. The licensee shall compile all records in a summary report submitted to the Department by December 31 each year.

L. To the extent practicable the licensee shall pass downstream all woody and organic debris that accumulates near the diversion dam, canal, and trash racks. Large woody debris found near the diversion dam shall be conveyed through or over the diversion dam to the bypassed channel. To prevent navigational obstruction at the canoe portage landing, large wood should not be conveyed to the tailrace. For the purposes of this condition, large wood is defined as any natural woody material greater than 3 feet long by 4 inches in diameter. Smaller wood

and other organic material can be deposited either in the tailrace or in the bypassed channel at the bridge. Wood and organic debris should be conveyed downstream on a regular basis similar to the rate of accumulation to avoid depositing large volumes at one time. All trash and other synthetic materials shall be removed before organic material is transported downstream, and all trash shall be disposed by approved methods.

M. The licensee shall submit to the Department a reservoir drawdown management plan at least 60 days in advance of all non-emergency reservoir drawdowns scheduled for any activity which requires that the reservoir elevation is lowered below 1367.0 feet MSL, including maintenance, inspection, renovation, resource management, etc. Excluded from this requirement are reservoir drawdowns resulting from the requirements in Paragraph J to facilitate fish passage. The drawdown management plan shall include detailed information on the objectives of the drawdown, seasonal timing, scheduled dates for drawdown and refill, drawdown and refill rates, minimum pool elevation, duration at drawdown level, minimum discharge during reservoir refill, agency and public notification procedures, and a discussion of the alternatives that the licensee evaluated to avoid a reservoir drawdown.

N. The licensee shall monitor water quality of the reservoir three times annually within 3 weeks of ice-out and in July and August. A profile of dissolved oxygen concentration and temperature shall be recorded at one-meter intervals from surface to bottom in the deepest portion of the reservoir. Water samples should be collected at a depth of 1.0 meter at the same site. Secchi disk depth should be measured with each sample collection, and water samples should be analyzed for total phosphorus, chlorophyll a, and true color (Pt-Co units) using procedures approved by the U.S. Environmental Protection Agency. The limit of detection for the total phosphorus analysis should not exceed 7 micrograms per liter.

O. The licensee shall establish a shoreline buffer extending at least 200 feet landward from the ordinary high water elevation on all licensee-owned lands adjacent to the reservoir, tailrace, and bypassed channel at the Winter Hydroelectric Project. The primary objective of the shoreland buffer is to protect water quality, aesthetics, and ecological functions of the river corridor. The recommended and preferred management approach is to maintain the buffer zones in a natural state, leave the land wild, and allow natural vegetative succession to determine the composition of the plant community. Limited management activity can take place for control of invasive species. No timber harvest should occur within the buffer zone, and any trees that fall into project waters should be anchored to shore and left in the water, unless they conflict with project or recreational uses. Recreational activities, which do not conflict with those objectives, should be permitted within the buffer zone.

P. The licensee shall annually inspect the entire shoreline of the project waters for purple loosestrife (*Lythrum salicaria)* and map its distribution and relative abundance. Inspections should be scheduled in August while plants are flowering so purple loosestrife can be readily

identified. The licensee should submit a report of the monitoring results to the Department by December 31 each year. If the Department deems it necessary to initiate or expand efforts to control purple loosestrife in the East Fork Chippewa River, the licensee shall provide reasonable cooperation in those efforts.

Q. The licensee shall monitor the shoreline of the project reservoir, power canal, tailrace, and bypassed channel for erosion, and if necessary, prepare an erosion control plan in consultation with the Department. Inspections should be conducted at three-year intervals in spring before vegetation develops, so eroded areas can be readily identified. The licensee shall submit to the Department a report of monitoring results by December 31 in the year of each inspection.

R. Before engaging in any activity that may introduce zebra mussels into project waters, the licensee shall provide or demand (through contract clause or other binding agreement) evidence of effective decontamination of barges, tools, boats, construction equipment, or other items capable of transferring water containing larval or adult zebra mussels. Effective decontamination may include steam-cleaning, chemical treatment, physical treatment, or other suitable procedures.

S. To continue the current practice of introducing cinders to seal leakage at project structures, the licensee must request and obtain a conditional grant of exemption to permit beneficial use of low hazard substances under Section 289.43(8) of Wisconsin Statutes. Within six months of license issuance, the licensee should initiate consultations with staff in the Waste Management Program at the Department's Service Center in Superior, Wisconsin on procedures to request an exemption from regulation. The licensee shall not deposit into the East Fork Chippewa River any deleterious substances and materials, such as plastic sheeting, carpeting, carpet padding, weighted feed sacks, and manure, for sealing leakage or for any other purpose.

T. Within one year of license issuance, the licensee shall prepare a Hazardous Substance Spill Prevention, Control, and Countermeasures Plan for the Winter Hydroelectric Station.

U. The licensee shall cooperate with the Department to implement reasonable resource management practices, including but not limited to measures for controlling exotic populations, restoring endangered or threatened populations, and protecting or enhancing water quality, fish and wildlife populations, and their habitat.

V. The licensee shall notify the Department and the public at least two weeks in advance of any scheduled activity that will substantially change reservoir elevation or discharge from normal project operations, including the full-range gate tests that FERC requires and the provisions in Paragraph J to facilitate fish passage.

W. A three-year test period shall be used to determine the licensee's ability to maintain compliance with the above conditions. The licensee shall prepare and submit annual reports to the Department documenting its ability to maintain operational compliance standards and, if necessary, its proposals to achieve the compliance standards.

X. At least 60 days before undertaking any proposed change to the project or its operation, which would have a significant or material effect on the findings, conclusions, or conditions of this certification, the licensee shall submit the proposal to the Department for review and written approval.

Y. The Department may request, at any time, that FERC consider modifications to the license to assure compliance with Wisconsin Water Quality Standards.

Z. On the date of submittal to the Commission, the licensee shall provide to the Department a complete copy of any application to transfer this license, including all attachments and schedules.

Dated at Park Falls, WI: August 19, 2008

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By _____
Tom Aartila
Upper Chippewa Watershed Supervisor

NOTICE OF APPEAL RIGHTS

If you believe 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. For judicial review of a decision pursuant to ss. 227.52 and 227.53, Stats., 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 shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to s. 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. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review. Unless a written request for a hearing is filed with the Department within 30 days after mailing of the notice, the Department's decision will become final without public hearing at the end of the 30-day period.

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