Saxon Falls Hydroelectric Project
FERC Project No. 2610

Superior Falls Hydroelectric Project
FERC Project No. 2587

Applications for a Subsequent License for a Minor Water Power Project Less than 1.5 Megawatts
and
A New License for a Major Water Power Project Less than 5 Megawatts

Prepared for

Northern States Power Company
a Wisconsin Corporation

Prepared by

Mead & Hunt

meadhunt.com

Volume 1 of 4
Initial Statement and
Exhibits A, E, and H

July 2022

Volume 1 of 4
Initial Statement and Exhibits A, E, and H

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Before the
Federal Energy Regulatory Commission
Application for a Subsequent License
For a Minor Water Power Project
Less than 1.5 Megawatts

Initial Statement as required under 18 CFR §4.61

1. Northern States Power Company, a Wisconsin Corporation (NSPW) *applies to the Federal Energy Regulatory Commission (FERC) for a subsequent license for the* Saxon Falls *Water Power Project, as described hereinafter* (FERC Project No. 2610).

2. *The location of the project is:*

State or territory:	Michigan and Wisconsin
County:	Gogebic County, MI and Iron County, WI
Township or nearby town:	Ironwood Township, Gogebic County, MI; Town of Saxon, Iron County, WI
Stream:	Montreal River
Other:	Located in northwest Gogebic County, Michigan and Northeast Iron County, Wisconsin, approximately 11 miles northwest of the neighboring cities of Hurley, Wisconsin and Ironwood, Michigan.

Project location maps are included in Appendix A-5.

3. *The exact name, address, and telephone number of the applicant is:*

Northern States Power Company, a Wisconsin Corporation
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1428

4. *The exact name, address, and telephone number of each person authorized to act as agent for the applicant in this application are:*

Scott A. Crotty
Senior Hydro Operations Manager
NSPW
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1428

Matt Miller
Hydro License Consultant
NSPW
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1353

5. *Applicant is a* domestic corporation *and* is not *claiming preference under Section 7(a) of the Federal Power Act.*

6. *The statutory or regulatory requirements of the state(s) in which the project would be located and that affect the project as proposed, with respect to bed and banks and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power and in any other business necessary to accomplish the purposes of the license under the Federal Power Act, and*

a. The Applicant must be in accordance with the following state requirements:

In accordance with Section 401 of the Federal Water Pollution Control Act, 33 U.S.C. §1341, the applicant must obtain water quality certification, or a waiver thereof, from the State of Michigan. In Michigan, the Certification Program is administered by the Michigan Department of Environment, Great Lakes, and Environment (EGLE).

EGLE established water quality standards in Michigan. The State of Michigan's Part 4 Rules, Water Quality Standards (of Part 31, Water Resources Protection, of Act 451 of 1994), specify water quality standards which shall be met in all waters of the state. It requires that all designated uses of the receiving water be protected. The State of Michigan’s Part 8 Rules, Water Quality-Based Effluent Limit Development for Toxic Substances, is used to establish toxic substance water quality-based effluent limits for point source discharges that are protective of the designated uses of the surface waters of the state.

The Applicant is a corporation duly organized and existing under the laws of the State of Wisconsin and is duly authorized by its Articles of Incorporation to engage in the business of generating, transmitting, and distributing power.

Chapter 31 Wisconsin Statutes Regulation of Dams and Bridges Affecting Navigable Waters.

The Applicant must comply with the provisions of the Coastal Zone Management Act (CZMA) of 1972.

b. *The steps the applicant has taken or plans to take to comply with each of the laws cited above are outlined below:*

The Applicant will apply to the MDEQ for the Section 401 water quality certificate pursuant to Section 401 of the Clean Water Act for continued operation of the Project.

NSPW has complied with all state laws necessary for its corporate existence, for engaging in the business of a wholesale power generation and for ownership, operation, and maintenance of the Saxon Falls Hydroelectric Project.

Electric utilities are governed by various statutes and regulated by the Public Service Commission of Wisconsin and the Michigan Public Service Commission.

The Wisconsin Coastal Resources Management Program (WCMP) is responsible for implementing the State of Wisconsin's coastal zone management program. The State of Wisconsin Coastal Zone Management Program is limited to only the 15 counties that have frontage on Lake Superior and Lake Michigan. Iron County is located within Wisconsin's Lake Superior coastal zone. The Licensee requested a formal written determination of consistency with the WCMP on April 25, 2022. No response has been received from WCMP as of the date of this filing.

EGLE is responsible for implementing the Michigan Coastal Management Program (MCMP). Portions of Ironwood Township in Gogebic County, including the Superior Falls Project, are located within Michigan's coastal zone. The Licensee requested a formal written determination of consistency with the MCMP on April 15, 2021. MCMP responded on April 18, 2022 indicating that the request had been forwarded on to the appropriate contact for further review. On April 29, 2022, EGLE responded via email indicating the Saxon Falls Project is located outside of Michigan's coastal zone and the Superior Falls Project is located within Michigan's coastal zone. A CZMA consistency certification letter is only necessary for the Superior Falls Project.

7. *Brief Project Description*

The Project operates as a run-of-river facility with a normal head of 137 feet. It consists of a 46-foot-high dam with five sections, a 65.5-acre reservoir, a 1,607-foot-long conduit, a 59.5-foot-high surge tank, two, 156-foot-long penstocks, a powerhouse containing 2 generating units, and a short transmission line. The five sections of the dam consist of a spillway, a non-overflow concrete gravity dam, an intake structure, a non-overflow mass concrete dam, and a left earthen dam. The minimum hydraulic capacity of the Project is 48 cfs (one unit) and the maximum hydraulic capacity of the powerhouse is 170 cfs. A minimum flow of 5 cfs is required to be released into the bypass reach. The power generated by the facility is distributed to the Licensee's customers through its local distribution system.

a. The Project has an installed generating capacity of 1.5 MW.
b. The Project is an existing dam.

8. *Lands of the United States affected (Shown in Exhibit G)*

The Project does not occupy any lands of the United States.

9. *Construction of the Project*

No construction is proposed.

The information provided below complies with Section 4.32 of 18 CFR.

1. *For a preliminary permit or a license, identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the project*.

NSPW is the sole entity that intends to maintain any proprietary right necessary to construct, operate, or maintain the Project.

2. *For a license, identify (providing names and mailing addresses):*

Every county in which any part of the project and any federal facilities that would be used by the project would be located:

Gerry Pelissero, Clerk
Gogebic County
200 North Moore St
Bessemer, MI 49911

Michael Saari
Iron County
300 Taconite St, Suite 101
Hurley, WI 54534

No federal facilities are used by the Project.

Every city, town, or similar local political subdivision in which any part of the project, and any Federal facilities that is used by the project is located:

Ms. Kathryn Brauer, Town Clerk
Town of Saxon
P.O. Box 37
Saxon, WI 54559

Mr. LeRoy Johnson, Deputy Supervisor
Township of Ironwood
10892 Lake Road
Ironwood, MI 49938

No federal facilities are used by the Project.

Every city, town, Indian Tribe, or similar local political subdivision that has a population of 5,000 or more people and is located within 15 miles of the project dam:

The following cities and towns each have a population of 5,000 or more people (2010 U.S. Census data), and are located within 15 miles of the Project powerhouse:

Karen Gullan, City Clerk
City of Ironwood
213 S. Marquette Street
Ironwood, Michigan 49938

Every irrigation district, drainage district, or similar special purpose political subdivision which any part of the project is located, and any federal facility used by the project is located:

Northwest Regional Planning Commission
1400 S. River Street
Spooner, WI 54801-8692

No federal facilities are used by the Project.

Every other political subdivision in the general area of the project that there is reason to believe would be likely to be interested in or affected by the notification:

There is no other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, this notification.

All Indian tribes that may be affected by the project:

Ms. Edith Leoso, THPO
Bad River Band of Lake Superior Tribe of Chippewa Indians
P.O. Box 39
Odanah, WI 54862

Mr. Bryan Newland, Chairman
Bay Mills Indian Community of Michigan
12140 W. Lakeshore Drive
Brimley, MI 49715-9319

Ms. Jill Hoppe, THPO
Fond du Lac Band of Lake Superior Chippewa
1720 Big Lake Road
Cloquet, MN 55720

Mr. Benjamin Rhodd, THPO
Forest County Potawatomi Community of Wisconsin
5320 Wensaut Lane
P.O. Box 340
Crandon, WI 54520

Mr. Michael Blackwolf, THPO
Fort Belknap Indian Community
656 Agency Main Street
Harlem, MT 59526-9455

Ms. Mary Ann Gagnon, THPO
Grand Portage Band of Chippewa Indians
PO Box 428
Grand Portage, MN 55605

Mr. Earl Meshigaud, Cultural Director
Hannahville Potawatomi Indian Community
M-14911 Hannahville B1 Road
Wilson, MI 49896

Mr. William Quackenbush, THPO
Ho-Chunk Nation
Executive Offices
P.O. Box 667
Black River Falls, WI 54615

Iowa Tribe of Oklahoma
Cultural Preservation Office
RR 1, Box 721
Perkins, OK 74059

Mr. Warren Swartz, President
Keweenaw Bay Indian Community
16430 Beartown Road
Baraga, MI 49908-9210

Mr. Brian Bisonette, THPO
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
13394 West Trepania Road
Hayward, WI 54843

Ms. Melinda Young, THPO
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin
P.O. Box 67
Lac du Flambeau, WI 54538

Ms. Alina Shively, THPO
Lac Vieux Desert Band of Lake Superior Chippewa Indians
P.O. Box 249, E23857 Poplar Circle
Watersmeet, MI 49969

Mr. James Williams, Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
E23968 Pow Wow Trail
Watersmeet, MI 49969

Ms. Amy Burnette, THPO
Leech Lake Band of Minnesota
Chippewa Tribe
190 Sailstar Drive NE
Cass Lake, MN 56633

Mr. David Grignon, THPO
Menominee Indian Tribe of WI
W3426 Cty VV
P.O. Box 910
Keshena, WI 54135-0910

Ms. Diane Hunter, THPO
Miami Tribe of Oklahoma
PO Box 1326
Miami, OK 74355

Ms. Natalie Weyaus, THPO
Mille Lacs Band of Ojibwe
43408 Oodena Drive
Onamia, MN 56359

Ms. Stacy Cutbank, THPO
Oneida Nation of Wisconsin
P.O. Box 365
Oneida, WI 54155-0365

Mr. Ryan Howell, THPO
Prairie Island Indian Community
5636 Sturgeon Lake Road
Welch, MN 55089

Ms. Hattie Mitchell, THPO
Prairie Band Potawatomi Nation
162Q Road
Mayetta, KS 66509

Mr. Marvin Defoe, THPO
Red Cliff Band of Lake Superior
Chippewa Indians of Wisconsin
88385 Pike Road HWY 13
Bayfield, WI 54814

Mr. Jonathan Buffalo, NAGPRA Rep.
Sac and Fox of the Mississippi in Iowa
349 Meskwaki Road
Tama, IA 52339-9629

Mr. Gary Bahr
Sac and Fox Nation of Missouri in Kansas and Nebraska
305 N. Main
Reserve, KS 66434

Ms. Sandra Massey, NAGPRA Rep.
Sac and Fox Nation of Oklahoma
920883 S. Hwy 99 Bldg. A
Stroud, OK 74079

Mr. Cecil E. Pavlat Sr., Cultural Repatriation Specialist
Sault Ste. Marie Tribe of Chippewa Indians
523 Ashmun Street
Sault Ste. Marie, MI 49783

Mr. Chris McGeshick, Chairman
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Webster, WI 54893

Mr. Michael LaRonge, THPO
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Crandon, WI 54520

Mr. Lewis Taylor, President
St. Croix Chippewa Indians of WI
24663 Angeline Ave.
Webster, WI 54893

Ms. Wanda McFaggen, THPO
St. Croix Chippewa Indians of Wisconsin
Tribal Historic Preservation Office
24663 Angeline Avenue
Webster, WI 54893

Mr. Nathan Allison, THPO
Stockbridge-Munsee Community
86 Spring Street
Williamstown, MA 01267

Ms. Sherry White, THPO
Stockbridge Munsee Community of Wisconsin
PO Box 70
Bowler, WI 54416

Ms. Jamie Arsenault, THPO
White Earth Band of the Minnesota Chippewa Tribe
P.O. Box 418
White Earth, MN 56591

As to any facts alleged in the application or other materials filed, be subscribed and verified under oath in the form set forth in paragraph (2)(3)(ii) of Section 9.32 by the person filing, an officer thereof, or other person having knowledge of the matters set forth.

This application is executed in the:

State of Wisconsin

County of Eau Claire

By Scott Crotty

Being duly sworn, deposes and says the contents of this application are true to the best of his knowledge. The undersigned applicant this _____ day of _____, 2022.

_____

Scott Crotty
Senior Hydro Operations Manager
Northern States Power Company, a Wisconsin corporation

Subscribed and sworn before me, a Notary Public, of the State of Wisconsin this _____ day of _____, 2022.

_____

SEAL Notary Public

Before the
Federal Energy Regulatory Commission
Application for a Subsequent License
For a Major Water Power Project
Less than 10 Megawatts

Initial Statement as required under 18 CFR §4.61

1. Northern States Power Company, a Wisconsin Corporation (NSPW) *applies to the Federal Energy Regulatory Commission (FERC) for a new license for the* Superior Falls *Water Power Project, as described hereinafter* (FERC Project No. 2587).

2. *The location of the project is:*

State or territory:	Michigan and Wisconsin
County:	Gogebic County, MI and Iron County, WI
Township or nearby town:	Ironwood Township in Gogebic County, MI; Town of Saxon in Iron County, WI
Stream:	Montreal River
Other:	Located in northwest Gogebic County, Michigan and Northeast Iron County, Wisconsin, approximately 14 miles northeast of the neighboring cities of Hurley, Wisconsin and Ironwood, Michigan

A Project location map is included in Appendix A-1.

3. *The exact name, address, and telephone number of the applicant are:*

Northern States Power Company, a Wisconsin corporation
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1428

4. *The exact name, address, and telephone number of each person authorized to act as agent for the applicant in this application are:*

Scott Crotty
Senior Hydro Operations Supervisor
NSPW
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1428

Matthew Miller
Hydro License Consultant
NSPW
1414 W Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702-0008
715-737-1353

5. *Applicant is a* domestic corporation *and* is not *claiming preference under Section 7(a) of the Federal Power Act.*

6. *The statutory or regulatory requirements of the state(s) in which the project would be located and that affect the project as proposed, with respect to bed and banks and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power and in any other business necessary to accomplish the purposes of the license under the Federal Power Act, and*

a. The Applicant must be in accordance with the following state requirements:

In accordance with Section 401 of the Federal Water Pollution Control Act, 33 U.S.C. §1341, the applicant must obtain water quality certification, or a waiver thereof, from the State of Michigan. In Michigan, the Certification Program is administered by the Michigan Department of Environment, Great Lakes, and Environment (EGLE).

EGLE established water quality standards in Michigan. The State of Michigan's Part 4 Rules, Water Quality Standards (of Part 31, Water Resources Protection, of Act 451 of 1994), specify water quality standards which shall be met in all waters of the state. It requires that all designated uses of the receiving water be protected. The State of Michigan’s Part 8 Rules, Water Quality-Based Effluent Limit Development for Toxic Substances, is used to establish toxic substance water quality-based effluent limits for point source discharges that are protective of the designated uses of the surface waters of the state.

The Applicant is a corporation duly organized and existing under the laws of the State of Wisconsin and is duly authorized by its Articles of Incorporation to engage in the business of generating, transmitting, and distributing power.

Chapter 31 Wisconsin Statutes Regulation of Dams and Bridges Affecting Navigable Waters.

The Applicant must comply with the provisions of the Coastal Zone Management Act (CZMA) of 1972.

b. *The steps the applicant has taken or plans to take to comply with each of the laws cited above are outlined below*:

The Applicant will apply to the MDEQ for the Section 401 water quality certificate pursuant to Section 401 of the Clean Water Act for continued operation of the Project.

NSPW has complied with all state laws necessary for its corporate existence, for engaging in the business of a wholesale power generation and for ownership, operation, and maintenance of the Superior Falls Hydroelectric Project.

Electric utilities are governed by various statutes and regulated by the Public Service Commission of Wisconsin and the Michigan Public Service Commission.

The Wisconsin Coastal Resources Management Program (WCMP) is responsible for implementing the State of Wisconsin's coastal zone management program. The State of Wisconsin Coastal Zone Management Program is limited to only the 15 counties that have frontage on Lake Superior and Lake Michigan. Iron County is located within Wisconsin's Lake Superior coastal zone. The Licensee requested a formal written determination of consistency with the WCMP on April 25, 2022. No response has been received from WCMP as of the date of this filing.

EGLE is responsible for implementing the Michigan Coastal Management Program (MCMP). Portions of Ironwood Township in Gogebic County, including the Superior Falls Project, are located within Michigan's coastal zone. The Licensee requested a formal written determination of consistency with the MCMP on April 15, 2021. MCMP responded on April 18, 2022 indicating that the request had been forwarded on to the appropriate contact for further review. On April 29, 2022, EGLE responded via email indicating the Saxon Falls Project is located outside of Michigan's coastal zone and the Superior Falls Project is located within Michigan's coastal zone. A CZMA consistency certification letter is only necessary for the Superior Falls Project.

7. *Brief Project Description*

The Project operates as a run-of-river facility with a normal head of 127 feet. It consists of a 28.5-foot-high dam with five sections, a 3-foot-high right earthen embankment, a 16.3-acre reservoir, a 1,697-foot-long conduit, a 28-foot-high surge tank, two, 207-foot-long penstocks, a powerhouse containing 2 generating units, and a short transmission line. The five sections of the dam consist of a right gate section, a middle overflow section, a left gate section, and a left overflow weir section. The minimum hydraulic capacity of the Project is 25 cfs (one unit) and the maximum hydraulic capacity of the powerhouse is 220 cfs. A minimum flow ranging from 8 cfs to 20 cfs is required to be released into the bypass reach. The power generated by the facility is distributed to the Licensee's customers through its local distribution system.

a. The Project has an installed generating capacity of 1.65 MW.
b. The Project is an existing dam.

8. *Lands of the United States affected (Shown in Exhibit G)*

The Project does not occupy any lands of the United States.

9. *Construction of the Project*

No construction is proposed.

The information provided below complies with Section 4.32 of 18 CFR.

1. *For a preliminary permit or a license, identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the project*.

NSPW is the sole entity that intends to maintain any proprietary right necessary to construct, operate, or maintain the Project.

2. *For a license, identify (providing names and mailing addresses):*

Every county in which any part of the project and any federal facilities that would be used by the project would be located:

Gerry Pelissero, Clerk
Gogebic County
200 North Moore St
Bessemer, MI 49911

Michael Saari
Iron County
300 Taconite St, Suite 101
Hurley, WI 54534

No federal facilities are used by the Project.

Every city, town, or similar local political subdivision in which any part of the project, and any Federal facilities that is used by the project is located:

Ms. Kathryn Brauer, Town Clerk
Town of Saxon
P.O. Box 37
Saxon, WI 54559

Mr. LeRoy Johnson, Deputy Supervisor
Township of Ironwood
10892 Lake Road
Ironwood, MI 49938

No federal facilities are used by the Project.

Every city, town, Indian Tribe, or similar local political subdivision that has a population of 5,000 or more people and is located within 15 miles of the project dam:

The following cities and towns each have a population of 5,000 or more people (2010 U.S. Census data), and are located within 15 miles of the Project powerhouse:

Karen Gullan, City Clerk
City of Ironwood
213 S. Marquette Street
Ironwood, Michigan 49938

Every irrigation district, drainage district, or similar special purpose political subdivision which any part of the project is located, and any federal facility used by the project is located:

Northwest Regional Planning Commission
1400 S. River Street
Spooner, WI 54801-8692

No federal facilities are used by the Project.

Every other political subdivision in the general area of the project that there is reason to believe would be likely to be interested in or affected by the notification:

There is no other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, this notification.

All Indian tribes that may be affected by the project:

Ms. Edith Leoso, THPO
Bad River Band of Lake Superior Tribe of Chippewa Indians
P.O. Box 39
Odanah, WI 54862

Mr. Bryan Newland, Chairman
Bay Mills Indian Community of Michigan
12140 W. Lakeshore Drive
Brimley, MI 49715-9319

Ms. Jill Hoppe, THPO
Fond du Lac Band of Lake Superior Chippewa
1720 Big Lake Road
Cloquet, MN 55720

Mr. Benjamin Rhodd, THPO
Forest County Potawatomi Community of Wisconsin
5320 Wensaut Lane
P.O. Box 340
Crandon, WI 54520

Mr. Michael Blackwolf, THPO
Fort Belknap Indian Community
656 Agency Main Street
Harlem, MT 59526-9455

Ms. Mary Ann Gagnon, THPO
Grand Portage Band of Chippewa Indians
PO Box 428
Grand Portage, MN 55605

Mr. Earl Meshigaud, Cultural Director
Hannahville Potawatomi Indian Community
M-14911 Hannahville B1 Road
Wilson, MI 49896

Mr. William Quackenbush, THPO
Ho-Chunk Nation
Executive Offices
P.O. Box 667
Black River Falls, WI 54615

Iowa Tribe of Oklahoma
Cultural Preservation Office
RR 1, Box 721
Perkins, OK 74059

Mr. Warren Swartz, President
Keweenaw Bay Indian Community
16430 Beartown Road
Baraga, MI 49908-9210

Mr. Brian Bisonette, THPO
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
13394 West Trepania Road
Hayward, WI 54843

Ms. Melinda Young, THPO
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin
P.O. Box 67
Lac du Flambeau, WI 54538

Ms. Alina Shively, THPO
Lac Vieux Desert Band of Lake Superior Chippewa Indians
P.O. Box 249, E23857 Poplar Circle
Watersmeet, MI 49969

Mr. James Williams, Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
E23968 Pow Wow Trail
Watersmeet, MI 49969

Ms. Amy Burnette, THPO
Leech Lake Band of Minnesota
Chippewa Tribe
190 Sailstar Drive NE
Cass Lake, MN 56633

Mr. David Grignon, THPO
Menominee Indian Tribe of WI
W3426 Cty VV
P.O. Box 910
Keshena, WI 54135-0910

Ms. Diane Hunter, THPO
Miami Tribe of Oklahoma
PO Box 1326
Miami, OK 74355

Ms. Natalie Weyaus, THPO
Mille Lacs Band of Ojibwe
43408 Oodena Drive
Onamia, MN 56359

Ms. Stacy Cutbank, THPO
Oneida Nation of Wisconsin
P.O. Box 365
Oneida, WI 54155-0365

Mr. Ryan Howell, THPO
Prairie Island Indian Community
5636 Sturgeon Lake Road
Welch, MN 55089

Ms. Hattie Mitchell, THPO
Prairie Band Potawatomi Nation
162Q Road
Mayetta, KS 66509

Mr. Marvin Defoe, THPO
Red Cliff Band of Lake Superior
Chippewa Indians of Wisconsin
88385 Pike Road HWY 13
Bayfield, WI 54814

Mr. Jonathan Buffalo, NAGPRA Rep.
Sac and Fox of the Mississippi in Iowa
349 Meskwaki Road
Tama, IA 52339-9629

Mr. Gary Bahr
Sac and Fox Nation of Missouri in Kansas and Nebraska
305 N. Main
Reserve, KS 66434

Ms. Sandra Massey, NAGPRA Rep.
Sac and Fox Nation of Oklahoma
920883 S. Hwy 99 Bldg. A
Stroud, OK 74079

Mr. Cecil E. Pavlat Sr., Cultural Repatriation Specialist
Sault Ste. Marie Tribe of Chippewa Indians
523 Ashmun Street
Sault Ste. Marie, MI 49783

Mr. Chris McGeshick, Chairman
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Webster, WI 54893

Mr. Michael LaRonge, THPO
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Crandon, WI 54520

Mr. Lewis Taylor, President
St. Croix Chippewa Indians of WI
24663 Angeline Ave.
Webster, WI 54893

Ms. Wanda McFaggen, THPO
St. Croix Chippewa Indians of Wisconsin
Tribal Historic Preservation Office
24663 Angeline Avenue
Webster, WI 54893

Mr. Nathan Allison, THPO
Stockbridge-Munsee Community
86 Spring Street
Williamstown, MA 01267

Ms. Sherry White, THPO
Stockbridge Munsee Community of Wisconsin
PO Box 70
Bowler, WI 54416

Ms. Jamie Arsenault, THPO
White Earth Band of the Minnesota Chippewa Tribe
P.O. Box 418
White Earth, MN 56591

As to any facts alleged in the application or other materials filed, be subscribed and verified under oath in the form set forth in paragraph (2)(3)(ii) of Section 9.32 by the person filing, an officer thereof, or other person having knowledge of the matters set forth.

This application is executed in the:

State of Wisconsin

County of Eau Claire

By Scott Crotty

Being duly sworn, deposes and says the contents of this application are true to the best of his knowledge. The undersigned applicant this _____ day of _____, 2022.

_____

Scott Crotty
Senior Hydro Operations Supervisor
Northern States Power Company, a Wisconsin Corporation

Subscribed and sworn before me, a Notary Public, of the State of Wisconsin this _____ day of _____, 2022.

_____

SEAL Notary Public

Saxon Falls Hydroelectric Project
FERC No. 2610

Exhibit A
Description of Project

Draft License Application

Prepared for

Northern States Power Company
a Wisconsin Corporation

Prepared by

Mead & Hunt
meadhunt.com

July 2022

TABLE OF CONTENTS

APPENDICES[1]

[1] All Appendices are located in *Volume 3 of 4, Appendices.*

LIST OF ABBREVIATIONS

AC	Alternating Current
cfs	cubic feet per second
d/b/a	doing business as
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
hp	Horsepower
kV	Kilovolt
kW	Kilowatt
NGVD	National Geodetic Vertical Datum 1929
NSPW	Northern States Power Company, a Wisconsin corporation
O&M	Operation and management
Project	Saxon Falls Hydroelectric Project
rpm	Revolutions per minute
USGS	United States Geological Survey
WDNR	Wisconsin Department of Natural Resources

1. Project Description

The Saxon Falls Hydroelectric Project (Project) is located on the Montreal River, 4.3 miles upstream of its confluence with Lake Superior. It is located within the town of Saxon, Iron County, Wisconsin and Ironwood Township, Gogebic County, Michigan. **Appendix A-1** of this application includes a map showing the general location of the Project. **Appendix A-2** presents an aerial photograph showing the Project facilities. The Project includes the Saxon Falls Dam, powerhouse, reservoir, conveyance systems, transmission equipment, and appurtenant equipment. These features are described in the following paragraphs.[2]

2. Description of Dam Structures

The dam is 440 feet long[3] and 40 feet high. From right to left looking downstream[4], the main structures of the dam consist of a spillway section, a non-overflow concrete gravity dam section, an intake structure, a non-overflow mass concrete dam section, and an earth embankment dam section.

2.1 Spillway

The spillway is divided into three components: the right spillway abutment, the overflow spillway section, and the gated spillway section.

2.1.1 Right Spillway Abutment

The right spillway abutment consists of a concrete training wall founded on bedrock that is 50.6 feet long and 3.5 feet wide. A concrete core wall extends 20 feet into the earth fill to the right of the spillway. The purpose of the right spillway abutment is to direct flow on the right side of the spillway toward the river channel downstream

2.1.2 Overflow Spillway Section

The overflow spillway is a reinforced concrete Ambursen-type structure that is 127 feet long, 62 feet wide at its base, and 32.9 feet high at the crest. The elevation of the crest is 997.0 feet National Geodetic Vertical Datum (NGVD) and 964.1 feet (NGVD) at the downstream apron.[5] It is founded on bedrock and the right end is keyed into the near vertical bedrock riverbank. The interior chamber of the overflow spillway is separated into bays by 2.5-foot-thick concrete buttresses spaced 16 feet on center. Each bay, except the last two bays on the right side, have vents and a drain on the downstream face of the structure. The left side of the leftmost bay is supported by one of the concrete piers located on either end of the gated spillway.

2.1.3 Gated Spillway Section

The gated spillway section is 30-feet-long, 65.6-feet wide at the base, and 40-feet-high. It is a mass concrete structure with an ogee-shaped crest and downstream face. The elevation of the gate sill is 984.1 feet. The gated spillway has an access tunnel that extends from the non-overflow concrete gravity dam section to the interior chamber of the overflow spillway section. Concrete

[2] Unless otherwise cited, all facility description attributes are from the Supporting Technical Information Document filed with the FERC on March 13, 2014 (Northern States Power Company, 2014).
[3] Dam length 190 feet, earthen embankment 250 feet in Exhibit F-2 plan view.
[4] Direction of left or right, when describing facilities, is given looking downstream.
[5] All elevations in this document are referenced in the 1929 National Geodetic Vertical datum (NGVD).

piers are located on both ends of the gated spillway and support the steel radial-type gate, the concrete operator's deck, and gate hoist equipment. The radial-type gate is 13-feet-high by 26-feet-wide.[6] The gate hoist has an electric motor-driven lift mechanism that is manually operated.

2.2 Non-Overflow Concrete Gravity Dam

The non-overflow concrete gravity dam is 12 feet long, 29.2-feet-wide at its base, and 46.1-feet-high, with a crest elevation of 1,004.1 feet.[7] It was modified as part of a 1990 reconstruction of the intake structure. The structure sill still includes the remains of the 1990 concrete. There is a low-flow orifice outlet located on the downstream face between the dam and powerhouse that provides minimum flows to the river channel. The downstream face of the concrete gravity dam slopes from the intake section to the gated spillway section.

2.3 Intake Structure

The intake structure was reconstructed in 1990. It consists of a mass concrete structure that is 19 feet long, 45.2 feet wide at its base, 36.6-feet-high and is located between the non-overflow concrete gravity dam and the non-overflow mass concrete dam. The elevation of the top of the intake structure is 1,004.1 feet. The intake structure controls flow into the steel conduit that extends downstream to the powerhouse. Trash racks, a flap gate for conduit dewatering, and a hoist for the flap gate are located on the upstream end of the intake structure. The trash racks are 20-feet-high by 15-feet-wide with 1-inch clear spacing. A steel frame gatehouse, located over the intake structure, houses the gate hoist and operations and maintenance equipment.

2.4 Non-Overflow Mass Concrete Dam

The non-overflow mass concrete dam is 57 feet long, 53 feet wide at the base, and varies in height from 19.1 feet to 29.1 feet. It has a crest elevation ranging from 1,004.1 feet to 1,005.2 feet. It serves as a transition between the intake structure and the left earthen dam.

2.5 Left Earthen Dam

The left earthen dam is 250 feet long, 119.6 feet wide at its base, and 15 to 17.6 feet high.[8] It extends southeast from the non-overflow mass concrete dam. It has crest elevations ranging from 1,005.0 feet to 1,007.6 feet. It is an embankment dam constructed of a homogenous earth fill that includes a sheet pile cutoff wall driven into bedrock. Rip-rap has been placed on the upstream face to protect against wave action and a drain filter is located on the downstream side.

3. Description of Reservoir

The reservoir encompasses approximately 65.5 acres with a storage capacity of approximately 524 acre-feet at the maximum reservoir elevation of 997.0 feet. It has a maximum depth of 12 feet and an estimated average depth of 8 feet. The substrate consists of 70% sand, 0% gravel, 0% rock, and 30% muck (WDNR, 2019).

[6] Height measured from Exhibit F-2, Section BB.
[7] Height measured from Exhibit F-2, Section CC.
[8] Length from plan note in Exhibit F-2.

4. Description of Conveyance Systems

Conveyance systems at the Project consist of a steel conduit, a steel surge tank, and two steel penstocks.

4.1 Conduit

The conduit is a 5/16-inch-thick steel pipe with an inside diameter of 6 feet. It extends 1,607 feet downstream from the intake structure to the surge tank. The conduit crosses the Montreal River from the Wisconsin side to the Michigan side approximately 700 feet downstream of the dam. It is supported by six concrete piers and 29 ring anchor supports. Thrust blocks are located at each horizontal curve and expansion joints are located regularly along the length of the conduit.

4.2 Surge Tank

The surge tank is constructed on a reinforced concrete base and is located at the edge of the high riverbank on the Michigan side of the Montreal River overlooking the powerhouse. The surge tank is situated between the conduit and the steel penstocks which connect to the powerhouse. It is a 3/8-inch-thick steel-walled tank that is 23.5 feet in diameter and 59.5 feet high.

4.3 Penstocks

The penstocks consist of two steel pipes that extend 156 feet downward from the surge tank to the powerhouse. Each pipe is 1/2 inch in thickness and 54 inches in diameter. Each one has a butterfly valve located in a masonry gate house immediately downstream of the surge tank.

5. Description of Powerhouse

The reinforced concrete powerhouse is 52 feet long by 30 feet wide and is 16 feet high from the generator floor to the ceiling. The powerhouse is located in Michigan.

5.1 Turbines

The powerhouse contains two horizontal-type units manufactured by the James A. Leffel Company and are rated at 1,000 horsepower (hp) each. The minimum flow to operate one turbine is 48 cfs. The maximum hydraulic capacity with both turbines operating is 170 cfs.

5.2 Generators

The Project features two General Electric 2300-volt, 600 rpm, 0.8 power factor AC generators with an original nameplate capacity of 625 kW each. The generators were rewound in 1957 and are now rated at 750 kW each. The combined plant capacity is 1,500 kW.

6. Tailrace

Water is released from the powerhouse directly to the Montreal River. The Project boundary extends downstream on the Wisconsin side of the river for approximately 675 feet and on the Michigan side of the river for approximately 1,350 feet.

7. Transmission Equipment

There is a 0.25-mile-long, three phase overhead 2/0 wire 2.4 kV transmission line extending from the powerhouse to the non-project distribution substation. The 2.4 kV transmission line is isolated from the generators by 400 A generator breakers. The equipment required to transmit the electrical generation to the non-project, 34.5 kV electrical grid and the non-project distribution system contains a three phase, 2,000 kVA, 2.4/34.5 kV step-up transformer.

8. Appurtenant Equipment

Appurtenant equipment includes, but is not limited to, bearing lubrication systems, generator ventilation systems, switchboards, additional gate hoist equipment, switchgear, protective devices, and metering devices.

9. Project Operation

The Project currently operates in a run-of-river mode where discharge measured immediately downstream of the Project tailrace approximates the sum of inflows into the Project reservoir. This operation mode protects water quality, fish, and wildlife resources in the Montreal River. A minimum flow of 5 cfs or inflow, whichever is less, is released from the minimum flow outlet into the bypass reach of the Montreal River immediately below the Saxon Falls Dam during the ice-free season (i.e., ice-out to October 31).

In order to minimize reservoir fluctuations, a minimum reservoir elevation of 997.0 feet (NGVD)[9] is required to be maintained from ice-out to June 1.[10] Between June 1 and ice-out, the reservoir is required to be maintained between elevations 996.5 feet and 997.0 feet.

The Project is operated in conjunction with the Superior Falls Project located a short distance downstream. Two operators are assigned to oversee the daily operation and routine maintenance of both Projects. Eight-hour coverage is provided five days a week, Monday-Friday. An operator for the facility is on call 24 hours per day, seven days per week. The plant is manually operated with controls installed for automatic shutdown in case of operational emergencies. Whenever a plant shutdown occurs or if high or low water occurs, the continually staffed control center at the Licensee's Wissota Hydroelectric Project is automatically notified.

For emergency operation of the facility, an operator is available 24 hours a day and can also be supported by the operator from White River Hydro, local line crews, the Ashland Bay Front Plant maintenance staff, and personnel from NSPW's Hydro Maintenance Department in Chippewa Falls, Wisconsin.

10. Safe Management, Operation, and Maintenance

NSPW has a robust Owners Dam Safety Program that incorporates all dam safety inspection components, monitoring responsibilities, and communications required for this dam classification. It also

[9] The current license lists the elevations in mean sea level, which is not a true survey datum. NGVD 1929 was created to approximate mean sea level. Therefore, for the purposes of listing the elevations in a true survey datum, all elevations are listed in NGVD 1929.
[10] Prior to ice-out, the operation requires water to be spilled over the top of the radial gates to remove ice that has formed on the downstream side of the gates to prepare them for operation during spring runoff. The top of the gates is 997.1 feet and water is spilled over the gates for no more than a 14 day period each year prior to spring runoff.

assures adequate resources are allocated for fulfillment of FERC dam safety requirements. The current Owners Dam Safety Program was revised and submitted to FERC on June 28, 2019 (NSPW, 2019).

NSPW developed a public safety plan in consultation with the FERC. The plan is reviewed on an annual basis to determine if changes are necessary. The plan was last updated in 2015 (NSPW, 2015).

11. Average Annual Generation

Average annual generation for the Saxon Falls Project averaged approximately 10,017.3 Megawatt-hours (MWh) for the five-year period ending in 2021.

12. River Flow Characteristics

Streamflow information from the United States Geological Survey (USGS) Gaging Station No. 04029990 was used to develop flow duration curves for the Montreal River. According to the National Water Information System Web Interface, daily discharge values are provided by NSPW from the gage location (Saxon Falls powerhouse) listed as Latitude 46.53689°N, Longitude -90.37990°W (USGS, nd).[11] The gage location has a drainage area of 262 square miles. Based on the data for the analyzed period of January 1986 to December 2017, the average annual calendar year flow at the Project was 310 cfs; the maximum annual calendar year flow at the Project was 579 cfs in 2016; and the minimum annual calendar year flow was 154 cfs in 1987.

Streamflow duration data show the percentage of time a given flow is equaled or exceeded. Monthly flow duration curves and the annual exceedance table are based on data collected for the period of record from January 1986 to December 2017 and are included in **Appendix A-4**.

Other than an increase in the minimum flow being released into the bypass reach for aesthetic purposes, NSPW is not proposing any changes in Project operations.

13. Purpose of the Project

The purpose of the Project is to generate renewable hydroelectric energy. NSPW is a public utility that produces, purchases, transmits, and distributes power to retail customers. The power generated by the Saxon Falls Project is delivered to NSPW's system for sale to customers.

14. Estimated Project Cost

The Project is an existing, FERC licensed facility. The estimated Project cost will be provided in the FLA. These figures will include the land and land rights, structures and improvements, waterway improvements, generating equipment, accessories, and miscellaneous equipment.

[11] Since flow data is provided by NSPW, there is no physical gage in this location.

15. Estimated Costs of Proposed Environmental Measures

NSPW is still in the process of evaluating the need for environmental measures. Capital and estimated annual operation and management (O&M) costs for proposed environmental measures will be provided in the Final License Application (FLA).

16. License Application Development Costs

The costs for NSPW to relicense under the Traditional Licensing Process will be provided in the FLA.

17. Estimated Value of On-Peak and Off-Peak Power

The Project operates in a run-of-river mode of operation; therefore, this section is not applicable.

18. Average Annual Increase or Decrease in Project Generation and Value of Power Due to Changes in Project Operations

NSPW is proposing to increase the 5 cfs minimum flow currently released into the bypass reach to 10 cfs. It is estimated the change will require an additional 248 acre-feet of storage to be released from the upstream Gile Flowage Storage Reservoir (currently undergoing licensing). If the additional storage is not incorporated into the pending license for the Gile Flowage, the generation potential at the Saxon Falls Project will be reduced as that reservoir does not have storage capability. Therefore, the Licensee recommends the average annual decrease in Project generation and value of lost power due to the proposed change in minimum flow be evaluated as part of the Gile Flowage licensing proceedings.

Since the Gile Flowage is currently not licensed, the Licensee can release additional water from the reservoir to compensate for the proposed increase in the minimum flow at Saxon Falls without incurring an actual decrease in generation. The average annual amount and value of project power for the term of the new license is projected to remain the same.

19. Remaining Undepreciated Net Investment, or Book Value, of the Project

The undepreciated net investment of the Project is $85, 561 (book cost of $1,768,688 less accumulated depreciation of $1,685,127).

20. Annual Operation and Management Costs

The annual O&M expenses for the Project including administrative costs, insurance, taxes, depreciation, and general operations and maintenance costs will be provided in the FLA.

21. One-Line Diagram of Electrical Circuits

The One-line Diagram of Electrical Circuits is shown in **Appendix A-4**.

22. Lands of the United States

There are no federal lands located within the Project boundary.

23. Public Utilities Regulatory Policy Act

The Licensee reserves any future rights it may have under the Public Utility Regulatory Policies Act (PURPA) as it pertains to the Project.

24. Supporting Design Report

The supporting design report is considered Critical Energy Infrastructure Information and will be filed accordingly as a separate document with the FLA.

25. List of References

Listed below are the publications, reports, and other literature that were consulted in the preparation of this Exhibit A.

(NSPW, 1988) Northern State Power Company-Wisconsin. 1988. Application for a Minor Water Power Project Pursuant to Section 4(e) of the Federal Power Act for the Saxon Falls Hydro Project, FERC No. 2610. December 16, 1988.

(NSPW, 2014) Northern States Power Company-Wisconsin. 2014. Saxon Falls Hydroelectric Project FERC No. 2610 Supporting Technical Information Document. March 13, 2014.

(NSPW, 2015) Northern States Power Company-Wisconsin. 2015. Revised Public Safety Plans NSP-Wisconsin, NSP-Minnesota. August 31, 2015.

(NSPW, 2019) Northern States Power Company-Wisconsin. 2019. Revisions to Owners Dam Safety Program. June 28, 2019.

(USGS, nd) United States Geological Survey. Nd. USGS 0429990 Montreal River at Saxon WI. National Water System Information System: Web Interface. Retrieved on April 26, 2022 from https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=04029990.

(WDNR, 2019) Wisconsin Department of Natural Resources. 2019. WDNR Lakes Pages-Saxon Falls Flowage. Retrieved on September 19, 2019 from https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2941100&page=facts.

Superior Falls Hydroelectric Project
FERC No. 2587

Exhibit A
Description of Project

Draft License Application

Prepared for

Northern States Power Company
a Wisconsin Corporation

Prepared by

Mead & Hunt
meadhunt.com

July 2022

TABLE OF CONTENTS

APPENDICES[1]

[1] All Appendices are located in *Volume 3 of 4, Appendices*.

LIST OF ABBREVIATIONS

AC	alternating current
cfs	cubic feet per second
d/b/a	doing business as
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
hp	horsepower
kV	kilovolt
kVA	kilovolt-amperes
kW	kilowatt
NGVD	National Geodetic Vertical Datum 1929
NSPW	Northern States Power Company, a Wisconsin corporation
O&M	Operation and management
Project	Superior Falls Hydroelectric Project
RCP	reinforced concrete pipe
rpm	revolutions per minute
USGS	United States Geological Survey
WDNR	Wisconsin Department of Natural Resources

1. Introduction

Northern States Power Company, a Wisconsin corporation (NSPW), is the Licensee for the Superior Falls Hydroelectric Project (FERC No. 2587). The Superior Falls Dam is located approximately 0.4 miles upstream of the Montreal River's confluence with Lake Superior in the town of Saxon, Iron County, Wisconsin and Ironwood Township, Gogebic County, Michigan. The Project is located approximately 14 miles northwest of the neighboring cities of Hurley, Wisconsin and Ironwood, Michigan and roughly 23 miles east of the city of Ashland, Wisconsin. **Appendix A-5** of this application includes a map showing the general location of the Superior Falls Project. **Appendix A-6** presents an aerial photograph showing the Project's primary facilities. The Project includes a reservoir, dam, conduit, surge tank, penstocks, powerhouse, tailrace, transmission equipment, and appurtenant equipment. These features are described in the following paragraphs.[2]

2. Description of Dam Structures

The dam is 240 feet long, 30 feet wide at its base, and 28.5 feet high. From right to left looking downstream[3], the main structures of the dam consist of a non-overflow section with intake, right gate section, middle overflow section, left gate section, and left overflow weir section. In addition to the main dam structures, a right earthen embankment is located on the right side of the dam that extends upstream of the non-overflow section for 213.1 feet.

2.1 Non-Overflow Section and Intake Structure

The non-overflow section of the dam is approximately 70 feet long, 17.6 feet wide at its base, and 25.2 feet high. It is a concrete wall with buttresses on the downstream end.[4] The intake structure for the reinforced concrete pipe (RCP) conduit is 29.25 feet high, 30 feet wide at its base, and 23 feet long and included in the non-overflow section. The intake includes a 15-foot wide by 22-foot high (measured on incline) metal trash rack with one-inch spaced vertical bars; a mechanical trash rake for maintenance; a mechanically operated timber headgate; an air shaft, which also acts as an accessway; and a concrete collar connecting the intake to the 84-inch-diameter RCP conduit. A walkway with handrails is located on the upstream and downstream sides along the length of the non-overflow section.

2.2 Spillway

The spillway is divided into four components: the right gate section, the middle overflow section, the left gate section, and the left overflow weir section.

2.2.1 Right Gate Section

The right gate section consists of two 16-foot-wide by 18-foot-high radial-type steel gates with a crest elevation of 722.2 National Geodetic Vertical Datum (NGVD).[5] These two tainter gates replaced the original wooden radial-type gates as part of the 1999 rehabilitation. A hydraulic

[2] Unless otherwise cited, all Superior Falls Project facility description attributes are from the Supporting Technical Information Document dated March 22, 2014 (NSPW, 2014).
[3] Direction of left or right, when describing facilities, is given looking downstream.
[4] In the Pre-Application Document, the Right Non-overflow Section was further described as having three sections. In order to be consistent across documents, in this exhibit the Right Non-overflow Section is described as it is described in the STID and shown in the Exhibit F drawings.
[5] All elevations in this document are referenced in the 1929 National Geodetic Vertical Datum (NGVD).

cylinder hoist system is used to raise the radial-type gates. The hoist is located on a steel frame with wheels and is moved along a concrete bridge with steel tracks between the two large bays. This section is approximately 40.5 feet long, 35 feet wide at its base, and 27 feet high when measuring from top of bedrock to the operator's bridge.

2.2.2 Middle Overflow Section

The middle overflow section was added as part of the 1999 spillway rehabilitation and replaced a portion of the original wooden radial-type gates. This section is approximately 18.6 feet long, 30 feet wide at its base, and 27.1 feet high when measuring from top of bedrock to the operator's bridge. It was constructed by filling the old Ambursen-type dam with mass concrete and extending the crest to the normal pool elevation of 740.2 feet. Piers were added on each side, with the remaining overflow section having a width of 11.5 feet. The crest is an ogee shape and has two small trash gates. The right trash gate is a vertical slide gate with a hand-winch operator. The left trash gate is also used to release the minimum flow. It is a sluice-type gate with a handwheel and threaded stem operator.

2.2.3 Left Gate Section

The left gate section consists of an 18-foot-wide by 15-foot-high radial-type steel gate with a crest elevation of 726.2 feet. It was installed in 1999 between the new middle overflow section and the existing left overflow weir section. This section is approximately 22 feet long, 30 feet wide at its base, and 27.1 feet high when measuring from top of bedrock to the operator's bridge.

2.2.4 Left Overflow Weir Section

The left overflow weir section consists of three concrete bulkhead overflow weir bays which are referenced as Bay 6, Bay, 7, and Bay 8. Each bay is 12 feet wide with a crest elevation of 740.7 feet. A steel beam and grafting walkway with handrails spans Bays 6 and 7. There is a concrete walkway with handrails spanning Bay 8. The section is approximately 41.4 feet long, 9 feet wide at its base, and 28.5 feet high when measuring from top of bedrock to the concrete walkway.

2.3 Right Earthen Embankment

The right earthen embankment was installed in 2019 to replace the existing jersey barriers that were temporarily used to prevent water from overflowing through the operations and maintenance buildings and the relatively flat wooded area to the right of the dam. The right earthen embankment is 213 feet long, 3 feet tall, and 23.6 feet wide at the base.[6]

3. Description of Reservoir

The reservoir encompasses an area approximately 16.3 acres with a gross storage capacity of 78.2 acre-feet at a reservoir elevation of 740.2 feet. It has a maximum depth of 18 feet near the dam and average depth of 4.8 feet (NSPW, 1991). The substrate consists of 70% sand and 30% muck (WDNR, 2019).

4. Description of Conveyance Systems

Conveyance systems at the Project consist of a conduit, surge tank, and penstocks.

[6] Height and width from typical north south profile (along the reservoir).

4.1 Conduit

The conduit conveys water from the intake structure to the surge tank along and above the steep riverbank for hydropower use. The conduit is a buried 84-inch-diameter RCP and is approximately 1,697 feet long. The conduit makes three small 7.5-degree bends near the intake and one large 45-degree bend just upstream of the surge tank. The conduit was installed in 1972 and replaced the original wood-stave structure.

4.2 Surge Tank

The surge tank is a 28-foot-diameter steel tank with a concrete base, a 13-foot-high concrete lower section and a steel upper section that extends 28 feet above the concrete section. It reduces pressure variation (including water hammer) by storing or releasing water at a location near the turbine during changing or transient flow conditions. The 84-inch-diameter concrete conduit enters the surge tank on the upstream end and two 54-inch-diameter steel penstocks exit the surge tank on the downstream end and extend to the powerhouse. The conduit and penstocks are anchored to the surge tank structure with reinforced concrete collars. The surge tank was installed in 1972 and the interior and exterior were painted in 1987.

4.3 Penstocks

Two 54-inch steel penstocks extend down the steep, 100-foot-high riverbank from the surge tank to the powerhouse. Each penstock is 207 feet long from the surge tank to the concrete thrust block located adjacent to the upstream wall of the powerhouse.[7] Each penstock has a concrete collar at the surge tank and an expansion joint located a short distance downstream of the surge tank. The penstocks are suspended approximately 3 feet above the ground from a series of steel frames. Each frame is oriented perpendicular to the pipe axis and consists of steel wide-flange columns, double channel beams, and a 1.25-inch-diameter U-shaped hoop around a flat ring girder on each penstock. The steel columns are founded on concrete footings keyed into the exposed bedrock. The penstocks were installed in 1964 and their exteriors were painted in 1987. The embedded steel liners and surrounding concrete thrust blocks were replaced in 1987.

5. Description of Powerhouse

The powerhouse is located approximately 207 feet downstream of the surge tank and 1,800 feet downstream of the dam. It is 32 feet long, 62 feet wide, and 43 feet high. It is a reinforced concrete building and includes a generating room, a lower level, two tailpits and tailraces below the powerhouse, and conical steel draft tubes.

The tailpits and tailraces are located below the powerhouse and are rectangular in shape with an upstream wall, side piers, and a base slab. They direct the vertical flow from the draft tube downstream. In 1987, the pier walls were armored with steel plates near the waterline in conjunction with concrete repairs to the piers.

[7] Length from Exhibit F4.

5.1 Turbines

The powerhouse contains two horizontal shaft, Francis-type turbines. Each turbine has a rated capacity of 1,250 horsepower (hp) at an operating head of 127 feet and a speed of 600 revolutions per minute (rpm). The turbines have a minimum hydraulic capacity (one unit) of 25 cfs, and a combined maximum hydraulic capacity of 220 cfs.

5.2 Generators

The Project contains two generator units with original capacities of 660 kilowatts (kW) each. They were both rewound in 1954 and 1957 and each now has the capability to produce 825 kW at unity power factor for a maximum plant capacity of 1,650 kW at unity power factor.

6. Tailrace

The tailrace is approximately 55 feet wide at the powerhouse and extends downstream from the dam for approximately 80 feet to its confluence with the Montreal River.[8]

7. Transmission Equipment

There is a 200 foot-long, three phase overhead 2/0 wire 2.4 kV transmission line extending from the powerhouse to the non-project distribution substation, which serves as the point of interconnection. The 2.4 kV transmission line is isolated from the generators by 400A generator breakers. The equipment required to transmit the electrical generation to the non-project, 34.5 kV electrical grid and the non-project distribution system contains a three phase, 2,000 kVA, 2.4/34.5 kV step-up transformer.

8. Appurtenant Equipment

Appurtenant equipment includes, but is not limited to, a log boom upstream of the intake, bearing lubrication systems, generator ventilation systems, switchboards, additional gate hoist equipment, switchgear, protective devices, and metering devices.

9. Project Operation

The Project operates in a run-of-river mode where discharge measured immediately downstream of the Project tailrace approximates the sum of inflows to the Project reservoir. This operation mode protects fish spawning in the Project impoundment, riparian vegetation above and below the Project, and recreation opportunities.

To ensure run-of-river operation, the Licensee maintains a reservoir water surface elevation at a minimum of 739.7 feet (NGVD)[9] as measured immediately upstream from the dam. A minimum flow of 8 cfs is required to be released into the bypass reach of the Montreal River from the Saturday before Memorial Day through October 15 for enhancement of scenic resources. A minimum flow of 20 cfs is required to be released into the bypass reach from 8 am to 8 pm on weekends and holidays during the same timeframe, also for the enhancement of aesthetic resources.

[8] Length and width of tailrace measured via Google Earth.
[9] The current license lists the elevations in mean sea level, which is not a true survey datum. NGVD 1929 was created to approximate mean sea level. Therefore, for the purposes of listing the elevations in a true survey datum, all elevations are listed in NGVD 1929.

The Project is operated in conjunction with the Saxon Falls Project located approximately 3.5 miles upstream. Two operators are assigned to oversee the daily operation and routine maintenance of both Projects. Eight-hour coverage is provided five days a week, Monday-Friday. An operator for the facility is on call 24 hours per day, seven days per week. The plant is manually operated with controls installed for automatic shutdown in case of operational emergencies. Whenever a plant shutdown occurs or if high or low water alarms are activated, the continually staffed control center at the Licensee's Wissota Hydro Project is automatically notified.

For emergency operation of the facility, an operator is available 24 hours a day and can be supported by the Licensee's White River Hydro operator, local line crews, the Ashland Bay Front Plant maintenance staff, and personnel from the NSPW's Hydro Maintenance Department in Chippewa Falls, Wisconsin.

NSPW is not proposing any changes to Project operations.

10. Safe Management, Operation, and Maintenance

NSPW has a robust Owners Dam Safety Program that incorporates all dam safety inspection components, monitoring responsibilities, and communications required for this dam classification. It also assures adequate resources are allocated for fulfillment of Federal Energy Regulatory Commission (FERC) dam safety requirements. The current Owners Dam Safety Program was revised and submitted to FERC on June 28, 2019 (NSPW, 2019).

NSPW developed a public safety plan in consultation with the FERC. The plan is reviewed on an annual basis to determine if changes are necessary. The plan was last updated in 2015 (NSPW, 2015).

11. Average Annual Generation

Annual generation for the Superior Falls Project averaged approximately 11,436.4 Megawatt-hours (MWh) for the five-year period ending in 2021.

12. River Flow Characteristics

Streamflow information from the United States Geological Survey (USGS) gaging station No. 04029990 (Saxon Falls powerhouse) was used to develop flow duration curves for the Montreal River. According to the National Water Information System Web Interface, daily discharge values were provided by NSPW from the gage location at Latitude 46.53689°N, Longitude -90.37990°W (USGS, nd).[10] The gage location has a drainage area of 262 square miles. The drainage basin for the Project is 264 square miles. Based on the data for the analyzed period of January 1986 to December 2017, the average annual calendar year flow at the Project is 312 cfs; the maximum annual calendar year flow was 584 cfs in 2016; and the minimum annual calendar year flow was 156 cfs in 1987.

Streamflow duration data shows the percentage of time a given flow is equaled or exceeded. Monthly flow duration curves and the annual exceedance table are based on data collected for the period of record from January 1986 to December 2021 and are included in **Appendix A-8.**

[10] Since flow data is provided by NSPW, there is no physical gage in this location.

13. Estimated Project Cost

The Project is an existing, FERC licensed facility. The estimated Project cost will be included in the FLA. This figure includes land and land rights, structures and improvements, waterway improvements, generating equipment, accessories, and miscellaneous equipment.

14. Estimated Costs of Proposed Environmental Measures

NSPW is still in the process of conducting studies and evaluating the need for environmental measures. Capital and estimated annual operation and management (O&M) costs for proposed environmental measures will be provided in the Final License Application (FLA).

15. Purpose of the Project

The purpose of the Project is to generate renewable hydroelectric energy. NSPW is a public utility that produces, purchases, transmits, and distributes power to retail customers. The power generated by the Superior Falls Project is delivered to NSPW's system for sale to customers.

16. License Application Development Costs

The costs for NSPW to relicense under the Traditional Licensing Process will be provided in the FLA.

17. Estimated Value of On-Peak Power and Off-Peak Power

The Project operates in a run-of-river mode of operation; therefore, this section is not applicable.

18. Average Annual Increase or Decrease in Project Generation and Value of Power Due to Changes in Project Operations

NSPW is not proposing any changes that will affect power generation at the Superior Falls Project. The average annual amount and value of project power for the term of the new license is projected to remain the same.

19. Remaining Undepreciated Net Investment, or Book Value of the Project

The undepreciated net investment of the Project is $294,773 (book cost of $2,561,284 less accumulated depreciation of $2,266,511).

20. Annual Operation and Management Costs

The annual O&M expenses for the Project including administrative costs, insurance, taxes, depreciation, and general operations and maintenance costs will be included in the FLA.

21. One-Line Diagram of Electric Circuits

The One-line Diagram of Electrical Circuits is shown in **Appendix A-8**.

22. Lands of the United States

There are no federally owned lands within the Project boundary.

23. Public Utilities Regulatory Policy Act

The Licensee reserves any future rights it may have under the Public Utility Regulatory Policies Act (PURPA) as it pertains to the Project.

24. Supporting Design Report

The supporting design report is considered Critical Energy Infrastructure Information and will be filed accordingly as a separate document with the FLA.

25. List of References

Listed below are the publications, reports, and other literature that were consulted in the preparation of this Exhibit A.

(NSPW, 1991) Northern States Power Company-Wisconsin. 1991. Application for a License for a Minor Water Power Project, Superior Falls Hydroelectric Project, FERC Project No. 2587. December 17, 1991.

(NSPW, 2014) Northern States Power Company-Wisconsin. 2014. Superior Falls Hydroelectric Project FERC No. 2587 Supporting Technical Information Document. March 22, 2014.

(NSPW, 2015) Northern States Power Company-Wisconsin. 2015. Revised Public Safety Plans NSP-Wisconsin, NSP-Minnesota. August 31, 2015.

(NSPW, 2019) Northern States Power Company-Wisconsin. 2019. Revisions to Owners Dam Safety Program. June 28, 2019.

(USGS, nd) United States Geological Survey. Nd. USGS 0429990 Montreal River at Saxon WI. National Water System Information System: Web Interface. Retrieved on April 26, 2022 from https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=04029990.

(WDNR, 2019) Wisconsin Department of Natural Resources. 2019. WDNR Lakes Pages-Superior Falls Flowage. Retrieved on September 19, 2019 from https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2940600&page=facts.

Saxon Falls Hydroelectric Project
FERC Project No. 2610

Superior Falls Hydroelectric Project
FERC Project No. 2587

Exhibit E
Environmental Report

Draft License Application

Prepared for

Northern States Power Company
a Wisconsin Corporation

Eau Claire, WI

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July 2022

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LIST OF ABBREVIATIONS AND TERMS

§ ..... Section
°F ..... degrees Fahrenheit
AIS ..... Aquatic Invasive Species
Applicant ..... Northern States Power Company, a Wisconsin Corporation
APE ..... Area of Potential Effect
ATIS ..... Aquatic and Terrestrial Invasive Species
AW ..... American Whitewater
BITA ..... Broad Incidental Take Authorization
BZE ..... BZ Engineering
CFR ..... Code of Federal Regulations
cfs ..... cubic feet per second
CZMA ..... Coastal Zone Management Act
Commission ..... Federal Energy Regulatory Commission
CPUE ..... catch per unit effort
CWA ..... Clean Water Act
Dam ..... Superior Falls or Saxon Falls Dam
DLA ..... Draft License Application
DO ..... Dissolved oxygen
DSC ..... Demographic Services Center
EA ..... Environmental Analysis
Eagle Act ..... Bald and Golden Eagle Protection Act
EFH ..... Essential Fish Habitat
EGLE ..... Michigan Department of Environment, Great Lakes, and Energy
ESA ..... Endangered Species Act
FERC ..... Federal Energy Regulatory Commission
FAL ..... Fish and Aquatic Life
FLA ..... Final License Application
FOG ..... Friends of the Gile Flowage
Gile Flowage ..... Gile Flowage Storage Reservoir Project
GPS ..... Global Positioning System
HPMP ..... Historic Properties Management Plan
HRMP ..... Historic Resources Management Plan
Hwy 122 ..... Wisconsin Highway 122
IPaC ..... Information for Planning and Consultation
IT ..... Ironwood Township
JAM ..... Joint Agency Meeting
kW ..... Kilowatts
Licensee ..... Northern States Power Company, a Wisconsin Corporation
m ..... meter
µg/L ..... micrograms per liter
MDC ..... maximum depth of colonization
MDNR ..... Michigan Department of Natural Resources
mg/L ..... milligrams per liter
MH ..... Mead & Hunt, Inc.
MIBI ..... Macroinvertebrate Index of Biological Integrity
ml ..... milliliter

MNFI ..... Michigan Natural Features Inventory
MiSWIMS ..... Michigan Surface Water Information System
nd ..... no date
NGVD ..... National Geodetic Vertical Datum 1929
NHI ..... Natural Heritage Inventory
NLEB ..... northern long-eared bat
NOI ..... Notice of Intent
NPS ..... National Park Service
NOAA ..... National Oceanic and Atmospheric Administration
NREPA ..... Natural Resources and Environmental Protection Act
NRHP ..... National Register of Historic Places
NR 40 ..... Chapter NR 40 of Wisconsin Administrative Code
NR 102 ..... Chapter NR 102 of Wisconsin Administrative Code
NSPW ..... Northern States Power Company, a Wisconsin Corporation
PAD ..... Pre-Application Document Project
Part 4 ..... State of Michigan's Part 4 Rules, Water Quality Standards
Programmatic Agreement ..... see definition in Section 7.2
Project ..... Superior Falls or Saxon Falls
RAW ..... River Alliance of Wisconsin
Saxon Falls Project ..... Saxon Falls Hydroelectric Project (FERC Project No. 2610)
SCORP ..... Statewide Comprehensive Outdoor Recreation Plan
SHPO ..... State Historic Preservation Officer
Superior Falls Project .... Superior Falls Hydroelectric Project (FERC Project No. 2587)
TLP ..... Traditional Licensing Process
USC ..... United States Code
USFWS ..... United States Fish and Wildlife Service
USGS ..... United States Geologic Survey
WCMP ..... Wisconsin Coastal Management Program
WDNR ..... Wisconsin Department of Natural Resources
WisCALM ..... Wisconsin Consolidated Assessment and Listing Methodology

1. Introduction

Northern States Power Company, a Wisconsin Corporation (Applicant, Licensee, or NSPW), is applying to the Federal Energy Regulatory Commission (FERC or Commission) for a subsequent license to operate the Saxon Falls Hydroelectric Project (FERC Project No. 2610) (Saxon Falls Project) and a new license to operate the Superior Falls Hydroelectric Project (FERC Project No. 2587) (Superior Falls Project). Throughout this document, the hydroelectric projects will be known collectively as Projects or individually as Project. The purpose of this Exhibit E is to provide a description of the environmental setting in the vicinity of the Projects. The Licensee prepared this Exhibit to conform to the Commission's regulations under 18 Code of Federal Regulations (CFR) § 4.38 and § 4.61, as required under the Traditional Licensing Process (TLP). The Licensee's request to use the TLP was approved by the FERC via letter dated February 13, 2020.

2. Project Descriptions

A brief description of each Project is provided below as a basis for subsequent discussions. Detailed descriptions for each Project are provided in Exhibit A of the Draft License Application (DLA).

2.1 Project Facilities

2.1.1 Saxon Falls Project

The Project is located on the Montreal River 4.3 miles upstream of the river's confluence with Lake Superior in Iron County, Wisconsin and Gogebic County, Michigan. The Project operates as a run-of-river facility for the purpose of generating hydroelectric power. The reservoir is operated above elevation 997.0 feet National Geodetic Vertical Datum 1929 (NGVD) from ice-out to June 1 and between the elevations of 996.5 feet NGVD and 997.0 feet NGVD the remainder of the year.[2]

Project works include a dam, downstream conduit, surge tank, penstocks, powerhouse, tailrace, transmission equipment, reservoir, and appurtenant equipment. The dam consists of a right spillway abutment section, overflow spillway section, gated spillway section, non-overflow concrete gravity dam section, minimum flow release outlet, intake structure section, non-overflow mass concrete dam section, and left earthen dam section. A minimum flow of 5 cubic feet per second (cfs) or inflow, whichever is less, is released into the bypass reach of the Montreal River immediately below the Saxon Falls Dam during the ice-free season (i.e., ice-out to October 31) to protect aesthetic resources. The Project has a combined total rated capacity of 1,500 kilowatts (kW).

The Licensee is not proposing any changes to Project facilities. Minor changes to minimum flow releases are further discussed in Section 9.2.3. No other operational changes are proposed.

2.1.2 Superior Falls Project

The Project is located on the Montreal River approximately 0.4 miles upstream from Lake Superior in Iron County, Wisconsin and Gogebic County, Michigan. The Project operates as a run-of-river facility for the purpose of generating hydroelectric power. The reservoir's minimum elevation requirement is 739.7 feet.

Project works include a dam, conduit, surge tank, penstocks, powerhouse, tailrace, transmission equipment, reservoir, and appurtenant equipment. The main structures of the dam consist of a right non-overflow dam section and intake structure; spillway with four sections, right radial gate section, middle overflow section, left radial gate, and left overflow weir section. A minimum flow of 8 cfs is required to be released into the bypass reach of the Montreal River from the Saturday before Memorial Day to October 15 for the enhancement of aesthetic resources. A minimum flow of 20 cfs is required to be released into the bypass reach from 8 am to 8 pm on weekends and holidays during the same timeframe. The Project has a total rated capacity of 1,650 kW.

The Licensee is not proposing any changes to Project facilities or operations.

[2] All elevations in this Exhibit E are reference in National Geodetic Vertical Datum 1929 (NGVD), unless stated otherwise.

2.2 Project Lands and Waters and Federal Lands

The FERC Project boundary for each Project is depicted on drawings included in Exhibit G of this application. No federal lands are contained within either Project boundary.

3. Pre-Filing Consultation Process

The FERC issued the Licensee a subsequent license for the Saxon Falls Project on December 22, 1989, and a new license for the Superior Falls Project on January 19, 1995. Both Projects' licenses expire on December 31, 2024. On December 30, 2019, the Licensee filed a Notice of Intent (NOI) to relicense the Projects, a Pre-Application Document (PAD) containing information for both Projects, and a request to use the TLP. After due consideration and the opportunity for public comment, the FERC granted the Licensee's request to use the TLP via their February 13, 2020 letter. Each stage of consultation is further discussed in the following sections.

3.1 First-Stage Consultation

The Licensee distributed the NOI, PAD, and request to use the TLP to the various stakeholders on December 30, 2019 concurrent with the FERC filing. The Licensee also published a public notice for said documents on December 26, 2019, in The Daily Globe, a daily newspaper of general circulation in Gogebic County, MI where the Projects are located. Comments on Licensee's request to use the TLP were due to the FERC within 30 days of the December 30, 2019 PAD filing, i.e., on or before January 29, 2019. The FERC approved Licensee's TLP request via their February 13, 2020 letter.

In accordance with the deadlines set by the FERC, the Licensee held a virtual Joint Agency Meeting (JAM) on April 9, 2020, due to the COVID-19 Centers for Disease Control and corporate guidelines to avoid public gatherings and discretionary travel in place at the time. A public notice of the JAM was published in the Daily Globe on March 17, 2020. The FERC was also notified of this meeting on March 10, 2020. An updated public notice of the JAM was published in the Daily Globe on March 24, 2020 to announce that the format of the meeting was changed from an in-person meeting to a virtual meeting due to the on-going COVID-19 pandemic. The FERC was also notified of the meeting format change on March 18, 2020. The virtual JAM was attended by a total of fourteen individuals from resource agencies and interested members of the public, and ten individuals from NSPW and their licensing consultant. The site visit was held on October 1, 2020. A total of five members of the public and four individuals from NSPW and their licensing consultant participated in the site visit. A public notice of the site visit was published in the Daily Globe on September 16, 2020. The FERC was also notified of the meeting on September 4, 2020.

Comments and study requests were received after the JAM from the following entities: American Whitewater (AW), Friends of the Gile Flowage (FOG), Michigan Department of Natural Resources (MDNR), National Park Service (NPS), and River Alliance of Wisconsin (RAW). Comments and study requests are discussed within each respective resource section and are summarized in *Volume 4, Documentation of Consultation*.

3.2 Second-Stage Consultation

3.2.1 Study Summary

Based upon the study requests submitted during the first stage of consultation, the Licensee developed a study summary identifying which studies to complete and the general study protocols.

In the study summary, the Licensee proposed to complete the following:

- Aesthetic Flow Documentation
- Aquatic and Terrestrial Invasive Species (ATIS) Study (including an aquatic plant study, development of bathymetric maps, and assessment of riverine and reservoir habitat)
- Project Boundary Modification (provide additional information in DLA)
- Fishery Study
- Mussel Study
- Phase I Archaeological Survey and Shoreline Monitoring
- Recreation Use Study
- Recreation Flow (Whitewater) Study
- Threatened and Endangered Species (provide additional information in DLA)
- Water Quality Study
- Wildlife Habitat (provide additional information in DLA)

On September 1, 2020, the Licensee filed the study summary with the FERC, AW, FOG, MDNR, Michigan Hydro Relicensing Coalition (MHRC), NPS, RAW, and WDNR. Comments were received from WDNR regarding the ATIS and Mussel Studies. Comments were received from AW and NPS on the Recreation Flow (Whitewater) Study. The full listing of stakeholder comments on the study plans, and the Licensee's follow-up responses, are included in *Volume 4, Documentation of Consultation*.

3.2.1.1 Aquatic and Terrestrial Invasive Species Study

On January 19, 2021, WDNR provided point intercept grids for the ATIS Study at both Projects.

3.2.1.2 Mussel Study

The Mussel Study was developed in consultation with WDNR. At the request of WDNR, the Licensee provided a copy of the study scope and responded to several inquiries from WDNR staff. WDNR concurred with the Mussel Study Plan on January 7, 2021.

3.2.1.3 Whitewater Recreation Flow Study

AW and NPS requested additional information regarding the study protocol. In response, the Licensee provided a copy of the proposed study plan and invited both entities to observe the Recreation Flow (Whitewater) Study.

3.2.2 Study Results

The studies were performed in 2021. Results for each of the studies are presented in this DLA. The Licensee will respond to all stakeholder comments regarding the study results, and any other comments on the DLA, in the Final License Application (FLA). A full listing of stakeholder comments on the study results and the Licensee's follow-up responses will be included in the FLA in *Volume 4, Documentation of Consultation*.

3.2.3 Draft License Application

This DLA was submitted for review to the consulting parties included in the distribution list outlined in the corresponding cover letter. Written comments received and the Licensee's follow-up responses will be included in *Volume 4, Documentation of Consultation* of the FLA.

3.3 Third-Stage Consultation

The FLA will address comments received on the DLA. A letter with a link to the electronic version of the FLA will be sent via certified mail to the consulting parties included on the distribution list. The FLA will also be posted on the relicensing website at: http://hydrorelicensing.com/. The FLA distribution list will be included in *Volume 4, Documentation of Consultation* of the FLA.

3.4 Consistency with Statutory and Regulatory Requirements

3.4.1 Section 401 of the Clean Water Act

Under Section 401 of the Clean Water Act (CWA) (33 United States Code (USC) § 1341), any federal license or permit to conduct any activity that may result in discharge into navigable waters requires a certification from the state in which the discharge originates that it will comply with the applicable provisions of the CWA, unless the certification is waived. Therefore, a Section 401 Water Quality Certification or waiver is required prior to the FERC's issuance of a new license for the Projects. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) is the state agency designated to conduct the certification requirements prescribed in Section 401 of the CWA since both the Saxon Falls Project and Superior Falls Project powerhouses are located within the State of Michigan. Pursuant to 18 CFR § 5.23(b), the Licensee will request a Section 401 Water Quality Certification from EGLE.

3.4.2 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure any action they authorize, fund, or conduct is not likely to jeopardize the continued existence of any federal-listed endangered or threatened species or result in the destruction or adverse modification of the species' critical habitat.

The Licensee was granted designation as the FERC non-federal representative for ESA consultation on February 13, 2020. The Licensee consulted with the USFWS and concluded that four federal-listed species may occur in the vicinity of both Projects. These species include the Canada lynx (*Lynx canadensis),* Northern long-eared bat (*Myotis septentrionalis)*, red knot (*Calidris canutus rufa)*, and monarch butterfly (*Danaus plexippus)* (USFWS, nda; USFWS, ndb). The Licensee's analyses of the Projects' impacts on threatened and endangered species are presented in Section 6.1.10.

3.4.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) fisheries on all actions that may adversely affect Essential Fish Habitat (EFH). EFH is only applicable to federally managed commercial fish species which live at least one component of their lifecycle in marine waters. All fish in the Montreal River are freshwater species and are not managed commercially; therefore, there is no designated EFH in either Project vicinity.

3.4.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (Public Law 89-665) requires every federal agency to consider how each of its undertakings could affect historic properties. Historic properties are any prehistoric or historic districts, sites, building structures, Traditional Cultural Property, or objects significant in American history architecture, engineering, and culture which are eligible for inclusion in the National Register of Historic Places (NRHP or Register). The Saxon Falls Hydroelectric Dam Historic District and Superior Falls Hydroelectric Plant Historic District were both evaluated for inclusion in the NRHP and both were determined ineligible (MH, 2019).

3.4.5 Coastal Zone Management Act

Under Section 307 (c)(3)(a) of the Coastal Zone Management Act (CZMA), the FERC cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

The Wisconsin Coastal Management Program (WCMP) is responsible for implementing Wisconsin's coastal management program, which includes 15 counties with frontage on Lake Superior or Lake Michigan. Both Projects are located within the designated coastal zone for Wisconsin; therefore, the Projects are subject to coastal zone management review and consistency certifications are needed for the Commission's relicensing of the Projects. The Licensee requested a formal written determination of consistency with WCMP on April 15, 2022. No response from WCMP has been received as of the filing of the DLA.

Michigan Department of Environment, Great Lakes, and Energy (EGLE) is responsible for implementing Michigan's Coastal Management Program. The Projects are located within both the Wisconsin and Michigan coastal zones and therefore require consistency certifications from both states. The Licensee requested a formal written determination of consistency with EGLE on April 15, 2022. EGLE responded on April 18, 2022 indicating that they had forwarded the request to the appropriate contact in their department. On April 29, 2022, EGLE responded via email indicating the Saxon Falls Project is located outside of Michigan's coastal zone and the Superior Falls Project is located within Michigan's coastal zone. Therefore, a CZMA consistency certification letter from EGLE is only necessary for the Superior Falls Project. EGLE issued a letter on June 15, 2022 confirming that Saxon Falls is outside and Superior Falls is inside Michigan's coastal management boundary. The letter further concluded that the relicensing of the Superior Falls Project would not have an adverse impact to coastal resources.

Communications with WCMP and EGLE are included in *Volume 4, Documentation of Consultation* of the DLA.

3.4.6 Wild and Scenic Rivers and Wilderness Acts

Section 7(a) of the Wild and Scenic Rivers Act (Public Law 90-542) requires federal agencies to make a determination as to whether the operation of a project under a new license would unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated area. The Montreal River is not a designated Wild and Scenic River (NWSRS, nda; NWSRS, ndb; NWSRS, ndc).

The Wilderness Act (Public Law 88-577) was enacted to establish a National Wilderness Preservation System. There are no nationally designated wilderness areas within the vicinity of either Project.

3.4.7 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC § 668-668c) (Eagle Act) was enacted to protect eagles from human-induced alterations and human interactions. The act prohibits the take; possession; sale; purchase; barter; offer to sell, purchase, or barter; transport; export; or import of any bald or golden eagle whether alive or dead, including any eagle, part, nest, or egg. A take is defined as pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, collecting, molesting, or disturbing eagles (USFWS, ndc).

There are no recorded occurrences of bald eagle (*Haliaeetus leucocephalus*) nests within the boundaries of either Project. However, bald eagles were identified as potentially present at both Projects in their respective Information for Planning and Consultation (IPaC) Resource Lists. The Licensee's analysis of the Projects' impacts on the protected eagle is presented in Section 6.1.10.

4. General Location and Project Locale

4.1 Location

Three of the four regulated dams within the Montreal River watershed are located on the main branch of the Montreal River. From upstream to downstream they include: the Pine Lake Dam, Saxon Falls (Dam) Hydroelectric Project (P-2610), and Superior Falls (Dam) Hydroelectric Project (P-2587). The Gile Flowage Storage Reservoir Project (Gile Flowage, P-15055) is the only dam located on the West Fork of the Montreal River.

The Saxon Falls, Superior Falls and Gile dams are owned and operated by NSPW and are currently undergoing federal licensing as described in this application. The Gile Flowage is a storage reservoir that releases water during periods of low streamflow for electric generation at the downstream Saxon Falls and Superior Falls Projects. The Gile Flowage is currently in the process of obtaining an initial FERC license under a separate proceeding. The Pine Lake Dam is a state-regulated dam that is not affiliated with NSPW. A figure showing the locations of the dams is included in **Appendix E-9**.

4.1.1 Saxon Falls Project

The Saxon Falls Project is located approximately 4.3 miles upstream of the Montreal River's confluence with Lake Superior in Iron County, Wisconsin and Gogebic County, Michigan. The Saxon Falls Dam impounds the Montreal River creating a 69.8-acre reservoir known as Saxon Falls Flowage.[3] Municipalities within the current Project boundary include the Town of Saxon, Wisconsin, and Ironwood Township, Michigan.

From right to left looking downstream,[4] project structures include: a dam with seven sections, a steel conduit downstream of the dam which conveys water from the intake to the surge tank, and two penstocks which extend from the surge tank to the powerhouse. The facilities and property within the Project boundary are located within the Town of Saxon, Wisconsin and Ironwood Township, Michigan. The Saxon Falls Project and surrounding area are shown on an orthophotograph included in **Appendix E-10**. The proposed Project boundary is further described in Section 9.3 and Exhibit G of this application.

4.1.2 Superior Falls Project

The Superior Falls Project is located approximately 0.4 miles upstream of the Montreal River's confluence with Lake Superior in Iron County, Wisconsin and Gogebic County, Michigan. The Superior Falls Dam impounds the Montreal River creating a 16.3-acre reservoir known as Superior Falls Flowage.[5] Municipalities within the current Project boundary include the Town of Saxon, Wisconsin and Ironwood Township, Michigan.

From right to left looking downstream, the Project structures include: a dam with a right non-overflow section, intake section, a spillway with four sections, and left overflow weir section. Downstream of the dam on the Michigan side of the Montreal River is a concrete conduit that conveys water from the intake to the

[3] GIS derived acreage.
[4] Direction of left or right, when describing facilities, is given looking downstream.
[5] GIS derived acreage.

surge tank. Two penstocks extend from the surge tank to the powerhouse. The facilities and property within the Project boundary are located within the Town of Saxon, Wisconsin and Ironwood Township, Michigan.

The Superior Falls Project and surrounding area are shown on an orthophotograph included in **Appendix E-11**. The proposed Project boundary is further described in Section 9.3 and Exhibit G of this application.

4.2 Climate

Both Projects are located within the continental climate region, which includes Iron County, Wisconsin and Gogebic County, Michigan. The region is characterized by cold winters and warm summers (UW-M, 2003). Weather records indicate an annual temperature range typical of this climate type. January is the coldest month with an average low temperature of 3 degrees Fahrenheit (°F) and an average high of 21°F. July is the warmest month with an average low temperature of 56°F and an average high of 77°F. The annual average low temperature is 30°F and annual average high is 50°F (USCD, 2022).

The regional climate is moderately moist with an average annual precipitation of approximately 36 inches, with about half of the precipitation falling during the growing season from May through September. The area is located within the Lake Superior snowbelt and has an average annual winter snowfall of 166 inches. January experiences the largest snowfall with an average of 43 inches (USCD, 2022).

4.3 Topography, Geology, and Soils

4.3.1 Topography

The Montreal River water surface profile drops an estimated 883 feet in the roughly 27.3 miles between the City of Hurley and the Superior Falls tailrace. The profile drop is approximately 32.3 feet per mile (USGS, 2019; USGS, 2022). The Licensee operates two hydroelectric projects in this stretch.

4.3.1.1 Saxon Falls Topography

The Project is located in the North Central Forest Ecological Landscape, which is characterized by end and ground moraines with pitted outwash and bedrock-controlled areas. Other glacial landforms include kettle depressions and steep ridges which are found in the northern portion of the North Central Forest (WDNR, 2015). The surrounding topography can vary up to 300 feet in elevation with the highest land surface at about 1,180 feet descending to the Montreal River surface elevation of 880 feet downstream of the powerhouse (USGS, nda). The topography in the Saxon Falls Project and surrounding areas is shown in **Appendix E-12**.

4.3.1.2 Superior Falls Topography

The Project is located in the Superior Coastal Plain Ecological Landscape, which is characterized by level plains that slope towards Lake Superior. These plains are dissected by deeply incised streams and rivers. Sandspits enclosing lagoons and wetlands are often well-developed at river mouths (WDNR, 2015). The surrounding topography can vary up to 300 feet in elevation with the highest land surface at about 900 feet descending to the Lake Superior surface elevation of 603 feet (USGS, 2022). The topography in the Superior Falls Project and surrounding areas is shown in **Appendix E-13**.

4.3.2 Geology

The Saxon Falls Dam and Superior Falls Dam are both located on the Middle Keweenawan Portage Lake Volcanic Group, which is composed of numerous basalts flows with a few sedimentary rock units of sandstone and shale deposited between the flow events. Geologic maps of the area place the contact between the Portage Lake Volcanic Group and the Upper Keweenawan Oronto Group less than a mile north of the dams. Although the thickness of the Volcanic Group is unknown, it is estimated at greater than 20,000 feet and both dams rest on its entire thickness (NSPW, 2014a; NSPW, 2014b).

The geologic units observed at the dams are presumed to represent the interflow sedimentary units; no basalt is observed. These sedimentary units are moderately to highly metamorphosed due to their deposition between lava flow events and to the Late Keweenawan regional metamorphism that resulted from the emplacement of the Mellen Intrusive, located approximately five miles to the south of the dams. Mafic dikes visible at the dams were intruded at this time. The southern portion of the Keweenawan fault cuts through the Montreal River about three miles southeast of the Saxon Falls Dam and about four miles southeast of the Superior Falls Dam. This fault is a northwest to southeast trending, nearly vertical, reverse dip-slip fault with the majority of displacement occurring during middle to late Keweenawan time. Displacement north of the dams in Gogebic County, Michigan is estimated at 10,000 feet. There is evidence that small movement took place within this fault system during the early Ordovician period. The faulting resulted in displacement and jointing of the rocks near the dam (NSPW, 2014a; NSPW, 2014b).

4.3.2.1 Saxon Falls Dam

Glacial deposits are 50 to 100 feet thick in the area of the Saxon Falls Dam. Ground moraine of reddish-brown silty to sandy clay till containing gravel and cobbles is overlain by end moraine deposits of red sandy to clay till with stratified sand and gravel, which in turn is overlain by reddish-brown glacial lake clay. The red clay region has a remarkably high rate of erosion and yields an overage of 500 tons per square mile per year of clay and silt sediment (NSPW, 2014a).

4.3.2.2 Superior Falls Dam

The Superior Falls Dam was constructed in the Montreal River Canyon at the head of a series of rapids that lead to the Superior Falls waterfall. The bedrock is exposed in several locations at the Project site. Upstream of the dam, bedrock is visible along the banks of both shores. Downstream of the dam, bedrock is exposed across the base of the dam and downstream beyond the waterfall. Glacial drift is thin to absent at the dam. It thickens away from the Montreal River to a maximum of 100 feet of reddish-brown lake clay (NSPW, 1991).

Geologic maps of the area identify the bedrock as a Precambrian sedimentary unit composed of shale and conglomerate. The bedrock outcropping immediately above and below the dam is shale and the bedding strikes east-northeast to west-southwest and an angle of approximately 35 degrees from the centerline of the dam. Due to the impermeable nature of shale, the porosity and permeability in the immediate vicinity of the dam is estimated to occur along joint and bedding planes (NSPW, 2014b).

4.3.3 Soils

The soil types identified in the vicinity of each Project are grouped into major soil associations. The major soil associations each have distinctive soil patterns, relief, and drainage factors. A custom soil resource report from the Natural Resource Conservation Service (NRCS) is provided for the Saxon Falls Project vicinity in **Appendix E-14**, which includes 15 soil types grouped into 13 major soil associations, and the Superior Falls Project vicinity in **Appendix E-15**, which includes 10 soil types grouped into nine major soil associations.

4.3.3.1 Saxon Falls Project Soils

The most prevalent soil series include the Michigamme-Schweitzer-Peshekee rock outcrop complex, Gichigami-Oronto complex, and Fence soils, as listed in **Table 4.3.3.1-1**. The most common soil classifications are the Michigamme-Schweitzer-Peshekee-Rock outcrop complex soils with 55-75% slopes (369F), Gichigami-Oronto complex soils with 0-6% slopes (444B), and Fence very fine sandy loam soils with 0-6% slopes (625B) (NRCS, nda).

Table 4.3.3.1-1 Prevalent Soil Characteristics in the Saxon Falls Project Vicinity

Soil Series	Drainage Classification	Formation	Water Transmittal Capacity	Runoff Class
Michigamme-Schweitzer-Peshekee-Rock Outcrop	Well-drained	Hill, backslope, and sideslope	Very low to low	High
Gichigami-Oronto	Moderately well-drained to somewhat poorly drained	Till plain	Moderately high to high	Moderate
Fence	Moderately well-drained	Lake plain slopes	Moderately High	Moderate

4.3.3.2 Superior Falls Project Soils

The most prevalent soil series include the Moquah-Anheim complex, Flintsteel loam, and Rockland-Anheim complex soils, as listed in **Table 4.3.3.2-1**. The most common soil classifications are the Moquah-Anheim complex with 0-3% slopes frequently flooded (230B), Flintsteel loam with 1-8% slopes (280B), and Rockland-Anheim frequently flooded complex with 0-70% slopes (5285F) (NRCS, ndb).

Table 4.3.3.2-1 Prevalent Soil Characteristics in the Superior Falls Project Vicinity

Soil Series	Drainage Classification	Formation	Water Transmittal Capacity	Runoff Class
Moquah-Anheim	Moderately well-drained to poorly drained	Floodplain	Moderately high to high	Low to negligible
Flintsteel Loam	Moderately well-drained	Till plain	Very low to moderately low	High
Rockland-Anheim	Well-drained to poorly drained	Slump and floodplain	Moderately high to high	Very high to negligible

4.3.4 Impoundment Shoreline Conditions

The Projects' shorelines are entirely undeveloped with the exception of the Project dams, generation facilities, and recreational facilities. The majority of the reservoir shoreline at Saxon Falls Project and the entire shoreline of the Superior Falls Project are owned by the Licensee. Both reservoir shorelines vary from regular and steep to irregular and low banked areas. The shorelines are heavily vegetated with second growth forest up to the water's edge, at which point they are heavily vegetated with aquatic plants (BZE, 1991a; BZE, 1991b).

4.3.4.1 Saxon Falls Shoreline Conditions

In 2021, the Licensee conducted an archaeological/shoreline erosion survey of the entire Saxon Falls reservoir shoreline. All known archaeological sites and eroding sites were visited. One erosion site (ER1) was identified during this survey. ER1 was caused by a major flood event in 2016 (not from Project operations) when a severe storm with 90 mile per hour winds and torrential rains washed out roads and culverts. The shoreline at ER1 has since re-vegetated and is stable. No other areas of active erosion were noted along the Saxon Falls reservoir shoreline. The survey recommended the reservoir shoreline be monitored again in five years (TRC, 2021). The survey report is included in **Appendix E-16**.

4.3.4.2 Superior Falls Shoreline Conditions

A survey conducted in 1991 noted bank erosion along the upper portion of the reservoir. Many abandoned river channels were also apparent. Water flow in the lower portion of the flowage includes several marshy area and showed less erosion (BZE, 1991b).

In 2021, the Licensee conducted an archaeological/shoreline erosion survey of the entire Superior Falls reservoir shoreline as part of the relicensing effort. The survey included an inspection of the entire shoreline for actively eroding sites; no actively eroding sites were identified, and shorelines were well vegetated with some areas of emergent and submergent vegetation. The relicensing survey recommended the reservoir shoreline be monitored again in five years (TRC, 2021). The relicensing survey report is included in **Appendix E-16**.

The Licensee conducted an independent shoreline erosion survey in 2021 along with its annual wood duck nest box inspection as required under license Articles 407 and 410, respectively. No active erosion was noted during this separate annual survey. The three historic erosion sites that were originally the result of significant run-off events (rather than from Project operations) were inspected during the survey. No discernable changes in the extent of the erosion at any of these sites has been identified within the last five years. Site 1 and Site 2 have gradual slopes and are well vegetated above the toe, which should preclude further significant erosion. The shoreline of Site 3 is steeper, exhibits pioneering vegetation, and has a stable toe. The only active soil movement at Site 3 is due to burrowing animals. The 2021 Annual Erosion Survey Report is included in **Appendix E-17**.

4.4 Vegetative Cover

The shoreline upstream and downstream of both Project dams is primarily forested and entirely undeveloped except for the dams, generation facilities, and recreation facilities. Forested areas consist of northern hardwoods, swamp hardwoods, aspen, red pine plantations, and coniferous forest.

There are approximately 69 acres of wetland in the proposed Saxon Falls Project boundary and 15.3 acres in the proposed Superior Falls Project boundary.[6] These wetlands support various sedges, grasses, and water-tolerant trees and shrubs including northern white cedar, eastern white pine, black ash, willow, dogwood, and alder. Emergent wetland species include cattails, sedges, grasses, and rushes (WDNR, 2015).

The vegetation along the shoreline of both Project reservoirs was evaluated in conjunction with the ATIS Study. Observations were conducted from a boat while moving slowly along the shoreline, or on foot where the use of a boat was not feasible (i.e., the Saxon Falls Project bypass reach). To provide an overall characterization of the terrestrial plant composition, the shoreline was divided into sections based on plant community type. The overall community type within a 10-meter riparian zone visible from the open water was recorded for each section. A full description of the botanical species identified during the surveys is included in Section 6.1.8. The Saxon Falls and Superior Falls ATIS Study Report is included in **Appendix E-18**.

4.5 Land Development

Major land uses within the vicinity of both Projects include deciduous forest, evergreen forest, mixed forest, and wooded wetlands (MH, 2019). A map depicting the major land uses in the Saxon Falls Project vicinity and the Superior Falls Project vicinity is included in **Appendix E-19** and **Appendix E-20**, respectively.

The Saxon Falls and Superior Falls Projects are located within the Town of Saxon in Iron County, Wisconsin and Ironwood Township in Gogebic County, Michigan. According to the Town of Saxon Comprehensive Plan, major land use consists of 89.6% woodlands or other natural areas, 8% agriculture, 1.9% open space, 0.3% residential, and less than 0.1% each for parks and recreation, industrial, communications and utilities, government and institutional, and commercial (TS, 2003).

The Ironwood Township Master Plan does not detail the percentages of individual land classifications within the township. However, a review of the current land use map shows lands in the vicinity of both Projects, in order of abundance, consist of county lands (county forest), Commercial Forest Act Lands, and recreational lands (IT, 2012).

4.6 Population Size and Density

The two largest cities in the counties where both Projects reside are Hurley in Iron County, Wisconsin and Ironwood in Gogebic County, Michigan. Data from the 2020 census indicated the population of the City of Hurley was 1,430, a decrease of 7.4% over the 2010 census figure of 1,544. The population of the City of Ironwood was 5,045, a decrease of 6.3% from the 2010 census figure of 5,387 (USCB, nda; WPR, 2021). This data suggests an average population density of 839.0 persons per square mile for the City of

[6] Existing and proposed acreages are fully analyzed in Section 9.4.

Ironwood. From 2016 to 2020, there were an estimated 2,589 households in the City of Ironwood with an average of 1.86 persons per household (Quickfacts, 2022).[7]

The 2020 population of Iron County was 6,137, an increase of 3.7% over the 2010 figure of 5,916. This results in an average population density of 7.8 persons per square mile. From 2016 to 2020, there were an estimated 2,856 households in Iron County with an average of 1.94 persons per household (Quickfacts, 2022).

The 2020 population of Gogebic County was 14,380, a decrease of 12.5% over the 2010 figure of 16,427. This results in an average population density of 14.9 persons per square mile. From 2016 to 2020, there were an estimated 6,896 households in Gogebic County with an average of 1.99 persons per household (Quickfacts, 2022).

Table 4.6-1 depicts the City of Hurley, City of Ironwood, Iron County, and Gogebic County population changes from 1970 to 2020. Between 1970 and 2020, the population of the City of Hurley decreased 40.9%, City of Ironwood decreased 42.1%, Iron County decreased 6.1%, and Gogebic County decreased 30.5% (Brinkhoff, 2021; Quickfacts, 2022).

Table 4.6-1 City of Hurley, City of Ironwood, Iron County, and Gogebic County Historic Population

Municipality	1970	1980	1990	2000	2010	2020
City of Hurley	2,418	2,015	1,843	1,833	1,547	1,430
City of Ironwood	8,711	7,741	6,849	6,293	5,387	5,045
Iron County	6,533	6,730	6,153	6,861	5,916	6,137
Gogebic County	20,676	19,686	18,052	17,370	16,427	14,380

Source: Brinkhoff, 2021; Quickfacts, 2022

Population projections from the Demographic Services Center (DSC) of the State of Wisconsin's Department of Administration for the City of Hurley and Iron County from 2025 through 2040, as well as population projections from the Michigan Bureau of Labor Market Information and Strategic Initiatives for the City of Ironwood and Gogebic County, are shown in **Table 4.6-2**. From 2020 to 2040, the projected population decrease for the City of Hurley, City of Ironwood, Iron County, and Gogebic County is 13.3%, 11.4%, 11.7%, and 11.3%, respectively (DSC, 2013a; DTMB, nd).

Table 4.6-2 City of Hurley, City of Ironwood, Iron County, and Gogebic County Population Projections

Municipality	Population					
	2020 Census	2025	2030	2035	2040	Decrease
City of Hurley	2,418	2,015	1,843	1,833	1,547	13.3%
City of Ironwood	8,711	7,741	6,849	6,293	5,387	11.4%
Iron County	6,533	6,730	6,153	6,861	5,916	11.7%
Gogebic County	20,676	19,686	18,052	17,370	16,427	11.3%

Source: DSC, 2013a; DSC, 2013b; DTMB, nd; Quickfacts, 2022; USCB, nda; USCB, ndb
**Calculated based on the same rate of change as Gogebic County*

[7] This metric is not available for the City of Hurley because the population is too small to be conducted by the census.

4.7 Labor Force and Employment

The largest employment sectors for the City of Hurley include the following categories in order of prevalence: educational services, health care, and social assistance; construction; manufacturing; and public administration, as shown in **Table 4.7-1**.

The largest employment sectors for the City of Ironwood include the following categories in order of prevalence: manufacturing; education services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and retail trade, as shown in **Table 4.7-2**.

The largest employment sectors for Iron County include the following categories in order of prevalence: educational services, health care, and social assistance; manufacturing; arts, entertainment, recreation, accommodation, and food services; and construction, as shown in **Table 4.7-3**.

The largest employment sectors for Gogebic County include the following categories in order of prevalence: educational services, health care, and social assistance; manufacturing; retail trade; and arts, entertainment, recreation, accommodation, and food services, as shown in **Table 4.7-4**.

Table 4.7-1 Employment Status, City of Hurley

Industry	Estimate	% Jobs*
Civilian employed population 16 years and over	625	100%
Agriculture, forestry, fishing, hunting, and mining	5	0.8%
Construction	106	17.0%
Manufacturing	83	13.3%
Wholesale trade	23	3.7%
Retail trade	51	8.2%
Transportation, warehousing, and utilities	12	1.9%
Information	26	4.2%
Finance and insurance, real estate, rental, and leasing	38	6.1%
Professional, scientific, and management; administrative; and waste management services	22	3.5%
Educational services, health care, and social assistance	113	18.1%
Arts, entertainment, recreation, accommodation, and food services	38	6.1%
Other services, except public administration	38	6.1%
Public administration	70	11.2%

Source: USCB, 2020
**Does not add to 100% due to rounding*

Table 4.7-2 Employment Status, City of Ironwood

Industry	Estimate	% Jobs*
Civilian employed population 16 years and over	2,130	100%
Agriculture, forestry, fishing, hunting, and mining	70	3.3%
Construction	119	5.6%
Manufacturing	389	18.3%
Wholesale trade	59	2.8%
Retail trade	276	13.0%
Transportation, warehousing, and utilities	115	5.4%
Information	37	1.7%
Finance and insurance, real estate, rental, and leasing	74	3.5%
Professional, scientific, and management; administrative; and waste management services	103	4.8%
Educational services, health care, and social assistance	372	17.5%
Arts, entertainment, recreation, accommodation, and food services	287	13.5%
Other services, except public administration	92	4.3%
Public administration	137	6.4%

Source: USCB, 2020
**Does not add to 100% due to rounding*

Table 4.7-3 Employment Status, Iron County

Industry	Estimate	% Jobs*
Civilian employed population 16 years and over	2,478	100%
Agriculture, forestry, fishing, hunting, and mining	94	3.8%
Construction	252	10.2%
Manufacturing	271	10.9%
Wholesale trade	76	3.1%
Retail trade	209	8.4%
Transportation, warehousing, and utilities	103	4.2%
Information	52	2.1%
Finance and insurance, real estate, rental, and leasing	111	4.5%
Professional, scientific, and management; administrative; and waste management services	156	6.3%
Educational services, health care, and social assistance	577	23.3%
Arts, entertainment, recreation, accommodation, and food services	260	10.5%
Other services, except public administration	101	4.1%
Public administration	216	8.7%

Source: USCB, 2020
**Does not add to 100% due to rounding*

Table 4.7-4 Employment Status, Gogebic County

Industry	Estimate	% Jobs*
Civilian employed population 16 years and over	5,978	100%
Agriculture, forestry, fishing, hunting, and mining	268	4.4%
Construction	463	7.6%
Manufacturing	810	13.3%
Wholesale trade	82	1.3%
Retail trade	761	12.5%
Transportation, warehousing, and utilities	301	4.9%
Information	84	1.4%
Finance and insurance, real estate, rental, and leasing	348	5.7%
Professional, scientific, and management; administrative; and waste management services	336	5.5%
Educational services, health care, and social assistance	1,246	20.5%
Arts, entertainment, recreation, accommodation, and food services	675	11.1%
Other services, except public administration	297	4.9%
Public administration	412	6.8%

Source: USCB, 2020
**Does not add to 100% due to rounding*

4.8 Tribal Resources

There are 11 federally recognized Tribes in Wisconsin and 5 in the Upper Peninsula of Michigan. The tribes in Wisconsin include: Forest County Potawatomi, Ho-Chunk Nation, Menominee Indian Tribe of Wisconsin, Oneida Nation of Wisconsin, Stockbridge-Munsee Band of Mohican Indians, and six Ojibwe (Chippewa) tribes. The Ojibwe tribes include the Bad River Band of Lake Superior Chippewa, Lac Courte Oreilles Band of Lake Superior Chippewa, Lac du Flambeau Band of Lake Superior Chippewa, Red Cliff Band of Lake Superior Chippewa, St. Croix Band of Chippewa Indians of Wisconsin, and Sokaogon Chippewa (Mole Lake) Community (WDPI, nd). The tribes in Michigan include the Bay Mills Indian Community, Hannahville Indian Community, Keweenaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa Indians, and Sault Ste. Marie Tribe of Chippewa Indians (MB, nd). Native American Reservations (Tribal lands) have been established by the federal government for each of these Tribes. There are no Tribal lands within either Project.

The Licensee is not proposing changes to the current operations of the Superior Falls Project. The only operational change proposed for Saxon Falls is an increase in the minimum flow in the bypass reach, as described in Section 9.2.3. Since the proposed operational change is expected to improve aesthetics, continued operation of both Projects is not expected to adversely impact Tribal resources in the area.

The Commission initiated Tribal consultation on October 9, 2018 via letter and followed up by telephone on December 10, 2018, and again by telephone and email on January 30, 2019. The Commission reached out to the Keweenaw Bay Indian Community, Miami Tribe of Oklahoma, Mille Lacs Band of Ojibwe, Bad River Band of Lake Superior Indians, Fond Du Lac Band of Minnesota Chippewa Tribe, Fort

Belknap Indian Community of the Fort Belknap Reservation of Montana, Grand Portage Band of Chippewa Indians, Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan, Leech Lake Band of the Minnesota Chippewa Tribe, Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin, Sokaogon Chippewa Community, Menominee Indian Tribe of Wisconsin, St. Croix Chippewa Indians of Wisconsin, White Earth Band of the Minnesota Chippewa Tribe, and Lac du Flambeau Band of Lake Superior Chippewa Indians.

4.8.1 Forest County Potawatomi

Potawatomi oral tradition speaks of three brothers, the Ojibwe (kept the faith), Odawa (handled trade), and Bodewadmi (kept the fires lit). Today, the three brothers are known as Ojibwe, Ottawa, and Potawatomi. Within a century of their migration back to the Great Lakes region, the three brothers had evolved into separate, but closely aligned nations. The Potawatomi still refer to themselves as the "keepers of the Fire" and arrived in Wisconsin in the mid-17th century from Canada and the western United States. In the early 1800s, the government took away Potawatomi land rights. In 1913, the Forest County Potawatomi bought back approximately 12,000 acres located in northern Wisconsin (Loew, 2001).

4.8.2 Ho-chuck Nation

The Ho-Chunk people, who were driven from Wisconsin to the West, have gradually returned to reclaim their ancestral lands. No treaty lands have been reserved, so present Ho-Chunk lands are tribal lands that have been re-purchased. Today, 4,700 members of the Wisconsin Ho-Chunk hold title to 2,000 acres of land in Wisconsin (Loew, 2001).

4.8.3 Menominee Indian Tribe of Wisconsin

The Menominee people are believed to have occupied Wisconsin for more than 5,000 years. As Europeans arrived, the Menominee lost most of their lands, but maintained a significant presence in the state. Menominee County was created from part of Shawano County in 1959 in anticipation of the Menominee Indian Reservation termination in 1961. Reservation status was restored in 1973. Today, most land within Menominee County is designated as tribal trust lands by the U.S. Bureau of Indian Affairs; non-tribal regulations do not apply. The Menominee also holds a small amount of land within the Town of Red Springs, Shawano County (Loew, 2001).

4.8.4 Oneida Nation of Wisconsin

The Oneida people were part of the New York Iroquois League prior to the Revolutionary War. In 1822, the Oneida purchased land in a territory that would later become the state of Wisconsin. Much of these lands were taken away by the 1900s, but 1,270 acres were repurchased in 1937 (Loew, 2001).

4.8.5 Stockbridge-Munsee Band of Mohican Indians

The Stockbridge-Munsee are a blend of Mohican Tribes from Massachusetts and Delaware who moved west, settling near Lake Winnebago. In 1856, they obtained their present treaty lands from neighboring Menominee Native Americans. Tribal fee lands are owned by the Stockbridge-Munsee and remain subject to non-tribal regulations. As such, lands held in fee title are subject to County zoning and subdivision regulation. The Stockbridge-Munsee population was estimated at 1,527 in 2000, which represents a 163% increase from 1990 (Loew, 2001).

4.8.6 Ojibwe (Chippewa) Tribes

The Ojibwe (Chippewa) people originally from the Great Lakes had moved east near the Atlantic Ocean. Over 1,000 years ago, the Tribe returned to the Great Lakes Region, settling amidst fertile wild rice beds. Their final resting stop was Madeline Island in Wisconsin. The Ojibwe had a close relationship with the French, but the effort to convert the Ojibwe people to Christianity divided their belief systems into various bands of Ojibwe who established themselves in other locations.

As the pursuit of furs for trade progressed inland, conflicts with other Tribes, including the Dakotas, culminated with a Treaty assembled by the U.S. Government in 1825. The Treaty forced the Ojibwe to cede their territory to the U.S. under negotiations in 1837 and 1842. The Saxon Falls and Superior Falls Projects are located within the territory ceded in 1842 (Loew, 2001).

Certain areas within the ceded territory have cultural significance; however, these areas are not publicly documented or recorded. If these areas are expected to be impacted by Project operation, this information will need to be disclosed through consultation with the individual Tribal representatives who consider the lands contained within the Project home territories.

4.8.7 Bay Mills Indian Community of Anishinaabe Indians

The Bay Mills Indian Community is located twenty-five miles west of Sault Ste. Marie in Brimley, Michigan, in Chippewa County, Michigan. The traditional name given to the area by local Ojibwe is “Gnoozhekaaning,” meaning “The Place of Pike” (ITCM, 2012a). This Community is part of the original Ojibwe described in Section 4.8.6 and Section 4.8.11.

The Bay Mills people are Ojibwa or Chippewa who have lived for hundreds of years on Lake Superior in the areas around Whitefish Bay, falls of the St. Mary River, and bluffs overlooking Tahquamenon Bay (BMIC, nd). The Bay Mills Indian Community was officially established by an Act of Congress on June 19, 1860 (ITCM, 2012a).

Under the Indian Reorganization Act of 1934, the Bay Mills Indian Community was established from five of the six original Sault Ste. Marie Bands and adopted a constitution and bylaws on November 4, 1936. The five Bands agreed to abandon their traditional clan forms of government when the constitution and bylaws were enacted (BMIC, nd).

4.8.8 Hannahville Indian Community of Potawatomi Indians

The Hannahville Indian Community of Potawatomi Indians are part of the original Potawatomi described in Section 4.8.7. The Community descends from those who refused to leave Michigan in 1834 during the great Indian Removal. Instead of leaving Michigan, they lived with the Menominee in Northern Wisconsin and the Ojibwe and Ottawa people in Canada. In 1853, some of the Hannahville Indian Community returned to Michigan and settled along the Big Cedar River where sustainable fishing occurred in the Cedar River and the bay of Green Bay. This location was also home to Methodists of the Cedar River Mission. The Hannahville Indian Community was established as a reservation in 1884 under the direction of Methodist Missionary, Peter Marksman. In 1913, Congress acknowledged the Hannahville Indian Community of Potawatomi Indians and purchased 3,400 acres of land in scattered parcels and added another 39 acres in 1942. The Hannahville Indian Community has been federally recognized since 1936 (HIC, 2013).

4.8.9 Keweenaw Bay Indian Community of Lake Superior Chippewa Indians

The Keweenaw Bay Indian Community of the Lake Superior Band of Chippewa Indians are part of the original Ojibwe described in Section 4.8.6 and Section 4.8.11. The Community is located approximately 65 miles north of Marquette, Michigan in the L'Anse/Baraga area. The L'Anse Reservation is both the oldest and largest reservation in Michigan and was established under the treaty of 1854. The Community's constitution, by-laws, and corporate charter were adopted on November 7, 1836, pursuant to the terms of the 1934 Indian Reorganization Act (ITCM, 2012b). The Keweenaw Bay Indian Community holds rights in the 1842 ceded territories where the Projects are located.

4.8.10 Lac Vieux Desert Band of Lake Superior Chippewa Indians

The Ojibwe people divided into two and expanded westward from the Sault Ste. Marie region. The Ojibwe southern branch established in the area of Lac Vieux Desert on South Island and later moved to the south shore of the lake around 1880 (LVD, nd; GLITC, nd). Lac Vieux Desert is known as Gete-gitigaani-zaaga'igan ("Lake of the Old Garden") in the Anishinaabe language and is ideally located near several major watershed boundaries. It was a hub of trade and travel that had connections to Lake Superior, Lake Michigan, and the Wisconsin River. Of the original twelve bands in historic times, the Lac Vieux Desert Band is one of three bands located in Michigan. The other nine bands resided in what became Wisconsin and Minnesota. The Lac Vieux Desert Band lost their independent federal recognition and were combined with the L'Anse and Ontonagon Bands under the federal Indian Reorganization Act of 1934 into the Keeweenaw Bay Indian Community. However, the Lac Vieux Desert Band continued to live independent from the other two bands in the Watersmeet area until they achieved independent federal recognition as a separate tribe under the "Lac Vieux Desert Band of Lake Superior Chippewa Indians Act" of 1988 (LVD, nd). The Lac Vieux Desert Band holds rights in the 1842 ceded territories where the Projects are located.

4.8.11 Sault Ste. Marie Tribe of Chippewa Indians

As part of the original Ojibwe described in Section 4.8.6, the Sault Ste. Marie Tribe of Chippewa are also known as Anishinaabeg ("Original People" or "Spontaneous Beings"). Tribal ancestors hunted, fished, and gathered food in settlements dotting the upper Great Lakes around Lake Superior, Lake Michigan, and Lake Huron throughout the St. Mary's River system and the Straits of Mackinac. Upon the arrival of European settlers in the 1600s, Tribal descendants greeted the French from Montreal to the Sault to obtain beaver pelts for the emerging fur trade.

Beginning in 1820, the Anishinaabeg at Sault Ste. Marie ceded 16 square miles of land along the St. Mary's River to build Fort Brady. In 1836, a second treaty, ceded northern lower Michigan and the eastern portion of the Upper Peninsula to the United States for cash payments and ownership to about 250,000 acres of land. As terms of the treaties were violated over the next 20 years, a Treaty with the Ottawa in 1855 allotted lands to Michigan Indian families. Although the Treaty granted large land tracks to the federal government, the Ojibwe sovereignty continued, as did their ancestral right to hunt and fish on the ceded lands and waters. The tribe was granted federal status in 1972 and members adopted their constitution in 1975 (SSM, 2022).

4.9 Floodplains

The Montreal River is subject to periodic flooding and the corresponding floodplain areas are defined in terms of a floodway and flood fringe. The floodway is the river channel and adjacent areas where water continues to flow downstream under flood conditions. The flood fringe is the portion of the floodplain outside the floodway where water will collect and remain lentic during a flood. A flood occurs when water flows outside the river bank and activates the floodplain. A floodplain typically includes the area of land covered by water during a 100-year flood event, which is a flood defined as having a 1% recurrence interval in any given year. The Federal Emergency Management Agency flood zone maps for the vicinity of the Saxon Falls and Superior Falls Projects are included in **Appendix E-21**. The floodplains within the vicinity of both Projects are entirely undeveloped with the exception of Project facilities including the dams, electric generation facilities, and recreation facilities.

Streamflow information from the United States Geologic Survey (USGS) gage No. 04029990, Montreal River at Saxon Falls, was to develop flow duration curves. According to the National Water Information System Web Interface, daily discharge values were provided by NSPW from the location listed at Latitude 46.53689°N, Longitude -90.37990°W (Saxon Falls powerhouse).[8] The location has a drainage area of 262 square miles. The USGS data, adjusted for the drainage areas at the Saxon Falls and Superior Falls Dams, were analyzed from January 1986 to December 2017. Based on the data, the average calendar year flow at the Saxon Falls Project is 310 cfs, the minimum annual calendar year flow was 154 cfs in 1987, and the maximum annual calendar year flow was 579 cfs in 2016. The average calendar year flow at the Superior Falls Project is 312 cfs, the minimum annual calendar year flow was 156 cfs in 1987, and the maximum annual calendar year flow was 584 cfs in 2016.

The water discharge records for the Saxon Falls and Superior Falls Projects are presented in **Appendix A-3** and **Appendix A-7**, respectively. The Saxon Falls Dam and Superior Falls Dam flow statistics are presented in **Table 4.9-1** (MH, 2022a; MH, 2022b).

Table 4.9-1 Saxon Falls Dam and Superior Falls Dam Flow Statistics

Flow Statistic	Saxon Falls Dam		Superior Falls Dam	
	Value (cfs)	Date	Value (cfs)	Date
Annual Mean	451	2013-2017	454	2013-2017
Highest Annual Mean	579	2016	584	2016
Lowest Annual Mean	154	1987	156	1987
Highest Daily Mean	9,880	July 3, 1992	9,955	July 3, 1992
Lowest Daily Mean	17	September 11, 1998	17	September 11, 1998
10% Exceedance	587.5	-	592.0	-
50% Exceedance	205.8	-	207.4	-
90% Exceedance	100.4	-	101.2	-
100-year flood flow	8,960	-	9,550	-

[8] No physical USGS gage exists at this location; flow data is provided through calculations completed by NSPW.

5. Report on Water Use and Quality

5.1 Existing Uses of Project Waters

Prior to European settlement, the Montreal River was not used as a transportation route due to the presence of waterfalls and steep canyons along the lower portion of the river. However, the Flambeau Trail, which began at the mouth of the Montreal River, was used as one of the few routes from the south shore of Lake Superior to the interior of northern Wisconsin. The Flambeau Trail was the only practical way to reach the interior and was used by travelers from prehistoric times into the 19th century (NSPW, 1988).

5.1.1 Saxon Falls Project

The Saxon Falls Project powerhouse operates with 135 feet of head at a normal surface water elevation of 997.0 feet and has an estimated maximum hydraulic capacity of 170 cfs. The powerhouse contains two generators (Unit 1 and Unit 2) with an original nameplate capacity of 625 kW each. The generators were rewound in 1957 and are now rated at 750 kW each with a combined plant capacity of 1,500 kW. The generators are connected to two horizontal shaft, Leffel turbines rated at 1,000 horsepower each at an operating speed of 600 revolutions per minute (NSPW, 1988; NSPW, 2014a).

The Saxon Falls Flowage encompasses 69.8 acres with a gross storage capacity of 564 acre-feet at elevation of 997.0 feet (MH, 2022c). The Project is operated in a run-of-river mode where discharge measured immediately downstream of the tailrace approximates the sum of inflows into the reservoir. A minimum flow of 5 cfs, or inflow, whichever is less, is released into the bypass reach during the ice-free season between ice-out and October 31 to maintain aesthetic flows and protect downstream aquatic resources. In order to minimize reservoir fluctuations, a minimum reservoir elevation of 997.0 feet is required to be maintained between ice-out and June 1 and between the elevations of 996.5 feet and 997.0 feet the remainder of the year (FERC,1989a).

5.1.2 Superior Falls Project

The Superior Project powerhouse operates with 127 feet of head at the minimum reservoir elevation of 739.7 feet and has an estimated combined maximum hydraulic capacity of 220 cfs. The powerhouse contains two generator units with original nameplate capacities of 660 kW each. The generators were rewound in 1954 and 1957 and are now rated at 825 kW each with a combined plant capacity of 1,650 kW. The generators are connected to two horizontal shaft, Francis-type turbines rated at 1,250 horsepower each at an operating speed of 600 revolutions per minute (NSPW, 2014b).

The Superior Falls Flowage encompasses 16.3 acres with a gross storage capacity of 78.2 acre-feet at a reservoir elevation of 740.2 feet (MH, 2022d). The Project is operated in a run-of-river mode where discharge measured immediately downstream of the Project tailrace approximates the sum of inflows to the Project reservoir with a minimum reservoir elevation of 739.7 feet as measured immediately upstream from the Project dam (FERC, 1997). A minimum flow of 8 cfs must be released from the Saturday before Memorial Day to October 15. A minimum flow of 20 cfs must be released between 8 am and 8 pm on weekends and holiday during the same timeframe (FERC, 1995a).

5.2 Proposed Uses of Project Waters

Both Projects will continue to be operated in a run-of-river mode whereby discharge measured immediately downstream of each Project tailrace approximates the sum of inflows into each Project reservoir. The Licensee is not proposing to change the current reservoir elevation requirements at either Project, nor is it proposing to change to the current minimum flow requirement at Superior Falls. However, licensee is proposing an increase in the minimum flow requirement in the bypass channel at Saxon Falls to improve aesthetics (refer to Section 9.2.3). The impacts to available water for downstream uses due to the proposed minimum flow increase at Saxon Falls is discussed in Section 6.4.2.6.

5.3 Existing Water Quality - Wisconsin Regulations

The State of Wisconsin established water quality standards under Chapter NR 102 of the Wisconsin Administrative Code (NR 102) to protect, maintain, and enhance surface waters for a variety of designated uses. The standards set limits for each designated use described below for which water quality cannot be artificially lowered unless a variance has been provided. NR 102 standards are consistent with CWA § 303(c). A copy of NR 102 is included in **Appendix E-22**.

The portion of the Montreal River flowing through the Projects is defined as a surface water and no variances are provided. The waters within the Montreal River upstream of the Saxon Falls reservoir are a Class II trout stream and have a designated use for Fish and Aquatic Life-Coldwater (FAL-Coldwater). The waters within the Montreal River downstream of the Saxon Falls Dam are not designated as a Wisconsin trout stream and have a designated use for Default-Fish and Aquatic Life (Default-FAL). Both Project reservoirs consist of warm water fisheries and each use is designated for Default-FAL.

5.3.1 Wisconsin Fish and Aquatic Life Standards

Fish and aquatic life standards in Wisconsin are as follows:

- pH shall be between 6.0 and 9.0, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum.
- Surface water dissolved oxygen (DO) shall never be lowered below 5 milligrams per liter (mg/L)
- Total phosphorus shall be less than 100 micrograms per liter (µg/L) or 0.1 mg/L
- Water bodies classified as trout waters by WDNR or as Great Lakes or coldwater communities may not be altered from natural background DO levels to such an extent that trout populations are adversely affected. Additionally, all of the following conditions shall be met:
    - DO in classified trout streams shall not be artificially lowered to less than 6.0 mg/L at any time, nor shall the DO be lowered to less than 7.0 mg/L during the spawning season.
    - DO in Great Lakes tributaries used by stocked salmonids for spawning runs shall not be lowered below natural background during the period of habitation.

5.3.2 Wisconsin Temperature Standards

The Montreal River upstream of the Saxon Falls reservoir is classified as a coldwater stream (Class II trout stream). The Montreal River downstream of the Saxon Falls Dam to Lake Superior is classified as a warm water stream. Waters within each Project reservoir are subject to the temperature standards for northern inland lakes and reservoirs. Details of the maximum acute water temperatures allowed within the vicinity of the Projects are shown in **Table 5.3.2-1**.

Table 5.3.2-1 Wisconsin Maximum Acute Water Temperature Standards

Month	Montreal River Upstream of Saxon Falls Reservoir (FAL-Coldwater)	Montreal River Lake Superior to Saxon Falls Dam (Default-FAL)	Reservoirs Saxon Falls and Superior Falls
	Maximum Acute Temperatures (ºF)		
	Table 2 Cold	Table 2 Warm-Small	Table 4 Northern
January	68	76	76
February	68	76	76
March	69	77	76
April	70	79	78
May	72	82	81
June	72	84	85
July	73	85	86
August	73	84	86
September	72	82	84
October	70	80	80
November	69	77	78
December	69	76	76

Source: NR 102 Table 2, NR 102 Table 4

5.3.3 Wisconsin Recreational Use Standards

NR 102.04(6) indicates that a recreation use classification requires the geometric mean of bacterial counts of E. coli (*Escherichia coli*) to not exceed a most probable number of 200 counts per 100 milliliters (ml), based on five or more water samples per month. Under the WDNR Beach Advisory Program, a beach advisory is issued when the bacterial counts reach an action value of 235 per 100 ml and a beach closure is issued at 1,000 per 100 ml.

5.3.4 Wisconsin Public Health Standards

NR 102.14 establishes taste and odor criteria standards for public health and welfare, which are outlined by specific substance, and will not be summarized here.

5.3.5 Wisconsin Fish Consumption Standards

NR 105.07 establishes wildlife use standards, which are outlined based upon specific substance concentrations, and will not be summarized here.

5.3.6 Wisconsin Reservoir Total Phosphorus Water Quality Standards

Under NR 102.06, a waterbody is considered a reservoir if there is a dam that raises water depth more than two times the conditions prior to dam construction, and that has a mean water residence time of 14 days or more under summer mean flow conditions. Under this definition, the Saxon Falls and Superior Falls reservoirs are both considered impounded flowing waters with less than a 14-day residence period and are subject to the stream total phosphorus criterion of less than 100 micrograms per liter.

5.4 Existing Water Quality - Michigan Regulations

The State of Michigan established water quality standards under the State of Michigan's Part 4 Rules, Water Quality Standards (of Part 31, Water Resources Protection, of Act 451 of 1994). Michigan's Part 4 Water Quality Standards (Part 4) require all designated uses of the receiving water be protected. Designated uses are defined in Part 4, R323.1100 and include at a minimum: agriculture, navigation, industrial water supply, warmwater fishery, other indigenous aquatic life and wildlife, fish consumption, and partial body contact for recreation. Between May 1 to October 31, all surface waters are designated for total body contact recreation. Additional designated uses (i.e., trout stream, public water supply) may be applied to specific waters (EGLE, 2006). Michigan's Part 4 Water Quality Standards are provided in **Appendix E-23**.

5.4.1 Michigan pH Standards

Part 4, R323.1053, Rule 53 states pH shall be maintained within the range of 6.5 to 9.0 in all surface waters.

5.4.2 Michigan Dissolved Oxygen Standards

Part 4, R323.1064, Rule 64 (1) indicates a minimum of 7 mg/L of DO shall be maintained at all times in all inland waters designated to be protected for coldwater fish. In all other waters, except for inland lakes as prescribed by Part 4, R323.1065, a minimum of 5 mg/L of DO shall be maintained (EGLE, 2006).[9]

5.4.3 Michigan Temperature Standards

Part 4, R323.1075, Rule 75 (1) indicates rivers, streams, and impoundments naturally capable of supporting coldwater fish may not receive a heat load which would warm the receiving water at the edge of the mixing zone (a) more than 2°F above the existing natural water temperature or (b) greater than the monthly maximum temperatures shown in **Table 5.4.3-1**.

Part 4, R323.1075, Rule 75 (2) indicates rivers, streams, and impoundments naturally capable of supporting warmwater fish shall not receive a heat load which would warm the receiving water at the edge of the mixing zone more than 5°F above the existing natural water temperature.

Part 4, R323.1075, Rule 75 (3) (a) indicates rivers, streams, and impoundments naturally capable of supporting warmwater fish shall not receive a heat load which would warm the receiving water at the edge of the mixing zone greater than the monthly maximum temperatures shown in **Table 5.4.3-1**.

The Montreal River is classified by MDNR as a trout stream capable of supporting coldwater fish (MDNR, 2014). Both reservoirs support warmwater fish as evidenced by the 2021 fisheries surveys conducted within the Saxon Falls and Superior Falls reservoirs and described in Section 6.1.2 of this application.

[9] Both the Saxon Falls and Superior Falls reservoirs are subject to the 5.0 mg/L standard and the Montreal River upstream and downstream of both reservoirs is subject to the 7.0 mg/L standard.

Table 5.4.3-1 Michigan Water Quality Standards for the Montreal River

Month	Montreal River Maximum Acute Temperatures		Impoundments Capable of Supporting Warmwater Fish	
	(ºF)	(ºC)	(ºF)	(ºC)
January	38	3.3	38	3.3
February	38	3.3	38	3.3
March	43	6.1	41	5.0
April	54	12.2	56	13.3
May	65	18.3	70	21.1
June	68	20.0	80	26.7
July	68	20.0	83	28.3
August	68	20.0	81	27.2
September	63	17.2	74	23.3
October	56	13.3	64	17.8
November	48	8.9	49	9.4
December	40	4.4	39	3.9

Source: EGLE, nd

5.4.4 Michigan Recreational Use Standards

Part 4, R323.1062, Rule 62 states all surface waters of the state protected for total body contact recreation shall not contain more than 130 E. coli (*Escherichia coli*) per 100 ml, as a 30-day geometric mean. At no time shall the surface waters of the state protected for total body contact recreation contain more than a maximum of 300 E. coli per 100 ml (EGLE, 2006). All surface waters of the state protected for partial body contact recreation shall not contain more than a maximum of 1,000 E. coli per 100 ml. Discharges containing treated or untreated human sewage shall not contain more than 200 fecal coliform bacteria per 100 ml, based on the geometric mean of all of 5 or more samples taken over a 30-day period, nor more than 400 fecal coliform bacteria per 100 ml, based on the geometric mean of all of 3 or more samples taken during any period of discharge not to exceed 7 days.

5.4.5 Michigan Public Health and Welfare Standards

5.4.5.1 Taste and Odor

Part 4, R323.1055, Rule 55 states the surface waters of the state shall contain no taste-producing or odor-producing substances in concentrations which impair or may impair their use for a public, industrial, or agricultural water supply source or which impair the palatability of fish as measured by test procedures approved by the department.

5.4.5.2 Toxic substances

Part 4, R323.1057, Rule 55 indicates toxic substances are prohibited in surface waters at levels that may become injurious to public health, safety or welfare, plant and animal life, or designated uses of the waters and identifies those levels (EGLE, 2006).

5.5 Historic Water Quality

In both Wisconsin and Michigan, the Montreal River, which flows through both Project reservoirs, is not currently listed as an impaired water under § 303(d) of the Clean Water Act (WDNR, nda; EGLE, 2020).

5.5.1 Saxon Falls Project

A search of WDNR Surface Water Data Viewer and Michigan Surface Water Information System (MiSWIMS) did not identify water quality data within the Saxon Falls Project boundary (MH, 2019). The Environmental Analysis (EA) issued on October 13, 1989, indicated DO concentrations are high, seldom dropping below 8.5 mg/L and 87% saturation. Water temperature follows normal seasonal patterns of a coldwater stream with a summer maximum of less than 80°F. Hardness, nitrogen, and phosphorus are low to moderate in concentration and pH is slightly alkaline. The only water quality concern identified in the EA was a historical contamination with fecal coliform bacteria (likely as a result of untreated waste from upstream cities), which appeared to be corrected at the time of license issuance (FERC, 1989a).

5.5.2 Superior Falls Project

WDNR maintains historic water quality monitoring data for two locations within the Superior Falls Project boundary. Both stations are located within Superior Falls Flowage. Monitoring Station 263001 is located at the intersection of the Montreal River and the Wisconsin Highway 122 (Hwy 122) bridge and includes water monitoring data from 1988, 1989, 1990, 1997, 1998, 2008, and 2009. Monitoring Station 10022264, also located within the Superior Falls Flowage, approximately 575 feet downstream of the Hwy 122 bridge includes monitoring data from 2010. WDNR water quality monitoring data from these two stations was included in the PAD. The monitoring data indicated the Superior Falls Flowage meets Wisconsin's water quality standards for all monitoring events, meets Michigan's water quality standards for pH and DO for all monitoring events, and meets Michigan's water quality standards for temperature for all but 5 of the 31 monitoring events.

One monitoring station within the Superior Falls Project vicinity was identified in a review of MiSWIMS. Monitoring Station 270004, Montreal River at Lake Superior Road, is located upstream of the Superior Falls Dam and within the Project reservoir. Monitoring at this station began in the late 1960s. The most recent monitoring data for this station is from May through September of 1991. During the 1991 monitoring, all samples met Michigan's water quality standards for pH and DO. However, 2 of the 7 samples exceeded the temperature standards for waters capable of supporting a coldwater fishery. The MiSWIMS water quality monitoring data was provided in the PAD.

The FERC License issued January 19, 1995 stated:
"Evidence to date shows that the project operations do not affect water quality adversely. The project is compliant with state standards except temperature variance during some spring and summer months. The variance occurs upstream and downstream of the Project. The Project meets temperature standards during critical periods such as the fall spawning season. Due to the small size and shallowness of the Project reservoir, Northern States has no ability to modify its operations to enhance water quality conditions." (FERC, 1995a).

In order to further monitor water quality downstream of the Superior Falls Project, License Article 415 required NSPW to monitor DO levels and temperatures in the Project tailrace during the months of September to November for at least three years (FERC, 1995a).

Water quality data from 1990 to 1991 indicated upstream and downstream DO and water temperatures remained within state standards throughout the duration of the fall spawning period. Downstream DO levels ranged from 7.8 to 12.8 mg/L, with an average of 9.9 mg/L. Since the Project was shown to meet state water quality standards, the FERC approved deletion of Article 415 in its March 13, 1998 order (FERC, 1998).

5.6 Current Water Quality

The Licensee conducted water quality monitoring studies at each Project in 2021 to characterize current water quality conditions and determine compliance with Wisconsin and Michigan water quality standards. The study results are described in the following sections.

5.6.1 Saxon Falls Project

5.6.1.1 Saxon Falls Project Current Water Quality

Surface water quality monitoring of the Saxon Falls Project was conducted on one day each in mid-July, mid-August, and mid-September. Monitoring was conducted at three sites: the deep hole upstream of the Saxon Falls Dam boat barrier (reservoir), the bypass reach upstream of the waterfall, and downstream of the powerhouse (GAI, 2021a). The monitoring locations are identified in the Water Quality Monitoring Study Report, which is included in **Appendix E-24**. To ensure consistency, the sites were visited in the same order on each of the three days, starting at approximately the same time each day.

The following parameters were monitored:

- Ammonia
- Bacteria
- Chlorophyll a
- Color
- Conductivity
- Cyanobacteria
- Dissolved Oxygen
- Dissolved Phosphorus
- Iron, Manganese, and/or Sulfide
- Nitrate (plus Nitrite)
- pH
- Secchi depth
- Sulfate
- Total Mercury
- Temperature
- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids

Results for all monitoring parameters listed above are located within Attachment E of the Water Quality Monitoring Study Report included in **Appendix E-24**. Surface water monitoring results for pH, DO, total phosphorus, E. coli, and temperature are discussed in the following paragraphs and summarized in **Table 5.6.1.1-1**.

Table 5.6.1.1-1 Saxon Falls Surface Water Quality Monitoring Study Results

Monitoring Site	Date	pH	DO (mg/L)	Total P (mg/L)	E. coli (MPN/100 ml)	Temperature	
						(°F)	(°C)
Deep Hole (Reservoir)	7/20/2021	7.11	6.7	0.0426	20	74.7	23.7
	8/18/2021	4.35*	8.4	0.0363	12	77.7	25.4
	9/14/2021	7.74	8.6	0.0329	19	63.9	17.7
Bypass Reach	7/20/2021	7.13	6.5	0.0439	18	74.5	23.6
	8/18/2021	5.88*	7.5	0.0384	12	73.8	23.2
	9/14/2021	8.02	10.3	0.0360	47	63.9	17.7
Downstream	7/20/2021	7.13	6.5	0.0443	10	74.5	23.6
	8/18/2021	12.11*	8.0	0.0407	21	74.5	23.6
	9/14/2021	8.12	9.8	0.0356	32	63.5	17.5

Source: GAI, 2021a

**The YSI pH meter was presumed out of calibration on this date*

Monitoring Results for pH

It is believed that the pH meter was out of calibration during the August 18, 2021 sampling event and the readings taken on that date are not valid (GAI, 2021a). The remaining pH readings met both Wisconsin and Michigan standards.

Monitoring Results for DO

All DO readings met Wisconsin standards.

The Michigan minimum DO standard for coldwater streams of 7.0 mg/l, which is applicable in the entire Montreal River outside of the Project reservoir, was not met at all times. The DO readings taken on July 20 in the bypass reach and downstream of the powerhouse were 6.5 mg/l.

The Michigan minimum standard for DO in a reservoir suitable for warmwater fish is 5.0 mg/l. The July 20 reading taken in the deep hole upstream of the Saxon Falls Dam boat barrier (reservoir) was 6.7 mg/l. While the DO reading meets the reservoir standard, it does not meet the coldwater stream standard. This indicates that water coming into the Saxon Falls Flowage for release does not meet the Michigan coldwater stream standards before any influence from Project Operations.

Monitoring Results for Total Phosphorus

All total phosphorus readings met both Wisconsin and Michigan standards.

Monitoring Results for E. Coli

All E. coli readings met both Wisconsin and Michigan standards.

Monitoring Results for Temperature

All water temperature readings met Wisconsin standards; however, not all temperature readings met Michigan standards. The reservoir readings taken in July, August, and September were 74.7°F, 77.7°F, and 63.9°F, respectively, meeting the Michigan water temperature standards of 83°F, 81°F, and 74°F, respectively. All readings taken in July, August, and September within the bypass reach upstream of

the waterfall and downstream of the powerhouse exceeded Michigan water temperature standards. Michigan standards for July, August, and September are 68°F, 68°F, and 63°F, respectively. The readings within the bypass reach for July, August, and September were 74.5°F, 73.8°F, and 63.9°F, respectively; and the readings downstream of the powerhouse were 74.5°F, 74.5°F, and 63.5°F, respectively. These readings indicate that water coming into the Saxon Falls Dam and powerhouse do not meet Michigan water temperature standards.

5.6.1.2 Saxon Falls Reservoir Hydrographic Profile

A hydrographic profile was collected using a YSI Professional Plus meter at the deep hole upstream of the Saxon Falls boat barrier during each sampling event. The meter was placed at the surface and descended to the bottom at one-meter intervals while readings were taken for pH, DO, and temperature. A hydrographic profile including pH, DO, and water temperature is included in **Table 5.6.1.2-1**.

A Secchi disk was used to determine water clarity by lowering the disk into the water until it was no longer visible, raising it to the surface and lowering it once more until it disappeared. The length of rope was then measured as Secchi depth. The results for all monitoring parameters are located in Attachment E of the Water Quality Study Monitoring Report included in **Appendix E-24**.
It is presumed the YSI pH meter was out of calibration during the August 18, 2021 sampling and readings taken on that date are not valid. The remaining pH readings met water quality standards for both Wisconsin and Michigan.

The hydrographic profiles did not indicate stratification or the formation of a hypolimnion. Temperature and DO decrease as depth increases; however, no thermocline was encountered (GAI, 2021a).

Table 5.6.1.2-1 Saxon Falls Deep Hole Hydrographic Profile Results

Depth	Date	pH	DO (mg/L)	Temp. (°F)	Temp (°C)
Surface (0 m) Upstream	7/20/2021	7.11	6.7	74.7	23.7
1 m	7/20/2021	7.09	6.9	74.7	23.7
2 m	7/20/2021	7.13	6.5	74.5	23.6
Bottom (2.5 m)	7/20/2021	6.68	5.4	73.6	23.1
Surface (0 m)	8/18/2021	4.35*	8.4	77.7	25.4
1 m	8/18/2021	4.27*	8.2	73.9	23.3
2 m	8/18/2021	4.02*	6.4	72.5	22.5
Bottom 2.5 m	8/18/2021	4.60*	6.2	72.0	22.2
Surface (0 m)	9/14/2021	7.74	8.6	63.9	17.7
1 m	9/14/2021	7.73	8.5	63.9	17.7
2 m	9/14/2021	7.73	8.1	63.5	17.5
Bottom (2.5 m)	9/14/2021	7.70	8.1	63.5	17.5

Source: GAI, 2021a

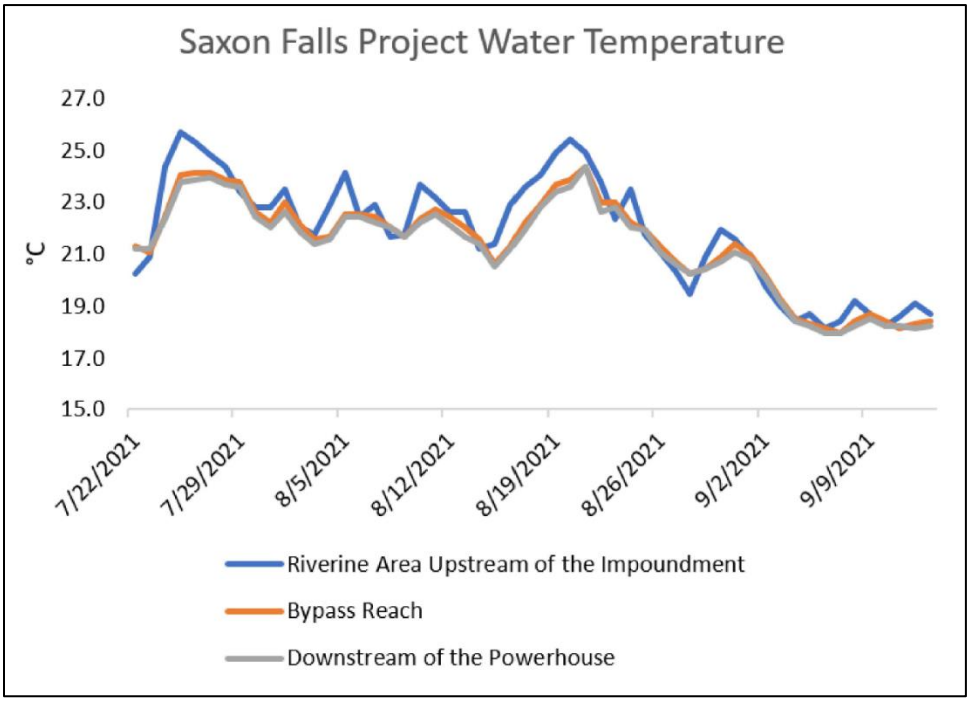
**The YSI pH meter was presumed out of calibration on this date*

5.6.1.3 Saxon Falls Water Temperature Loggers

HOBO pendant data loggers were deployed on July 20 in three locations to monitor daily variation in the water temperature of the Montreal River. The locations included a riverine area upstream of the reservoir, the bypass reach, and downstream of the powerhouse. The loggers began recording temperature data on July 22, 2021 and automatically recorded temperature data every 24 hours until the loggers were removed on September 13, 2021. A graph showing water temperatures recorded by the data loggers is shown in **Figure 5.6.1.3-1**.

All water temperatures recorded during the survey period met Wisconsin temperature standards. However, water temperatures recorded within the bypass reach and downstream of the powerhouse exceeded Michigan standards. A review of the data indicated that on most days water temperatures downstream of the Project were lower than those measured upstream of the reservoir. As stated previously, water coming into Saxon Falls Flowage does not meet Michigan standards when temperatures within the bypass reach and downstream do not meet the Michigan standards. Therefore, the increased temperatures are not due to Project operations particularly because the Project operates in a run-of-river mode, has a small reservoir, and has a short water retention time.

Figure 5.6.1.3-1 Saxon Falls Water Temperature Logger Graph



5.6.2 Superior Falls Project

5.6.2.1 Superior Falls Project Current Water Quality

Surface water quality monitoring of the Superior Falls Project was conducted one day each in mid-July, mid-August, and mid-September. Monitoring was conducted at three sites that included the deep hole upstream boat barrier (reservoir), the bypass reach upstream of the waterfall, and downstream of the powerhouse (GAI, 2021a). The monitoring locations are identified in the Water Quality Monitoring Study

Report, which is included in **Appendix E-24**. To ensure consistency, the sites were sampled in the same order on each of the three days, starting at approximately the same time each day.

The following parameters were monitored:

- Ammonia
- Bacteria
- Chlorophyll a
- Color
- Conductivity
- Cyanobacteria
- Dissolved Oxygen
- Dissolved Phosphorus
- Iron, Manganese, and/or Sulfide
- Nitrate (plus Nitrite)
- pH
- Secchi depth
- Sulfate
- Total Mercury
- Temperature
- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids

The results for the parameters listed above are found in Attachment E of the Water Quality Monitoring Study Report included in **Appendix E-24**. Surface water monitoring results for pH, DO, total phosphorus, E. coli, and temperature are explained in the following paragraphs and summarized below in **Table 5.6.2.1-1**.

Table 5.6.2.1-1 Superior Falls Surface Water Quality Monitoring Study Results

Monitoring Site	Date	pH	DO (mg/L)	Total P (mg/L)	E. coli (MPN/100 ml)	Temperature	
						(°F)	(°C)
Deep Hole (Reservoir)	7/20/2021	7.22	7.0	0.0369	125	73.6	23.1
	8/18/2021	8.80*	7.6	0.0322	15	76.8	24.9
	9/14/2021	7.98	8.5	0.0303	115	64.4	18
Bypass Reach	7/20/2021	6.88	6.1	0.0389	73	71.1	21.7
	8/18/2021	8.10	8.3	0.0334	31	79.9	26.6
	9/14/2021	8.18	10.8	0.0300	236	61.0	16.1
Downstream	7/20/2021	7.49	7.7	0.0569	50	71.6	22.0
	8/18/2021	6.67*	7.5	0.0324	17	71.4	21.9
	9/14/2021	8.16	8.7	0.0341	146	64.2	17.9

Source: GAI, 2021a

**The YSI pH meter was presumed out of calibration on this date*

Monitoring Results for pH

It is believed that the pH meter was out of calibration during the August 18, 2021 sampling and readings taken on that date are not valid (GAI, 2021a). The remaining pH readings met both Wisconsin and Michigan standards.

Monitoring Results for DO

All DO readings met Wisconsin standards.

The Michigan minimum DO standard for coldwater streams of 7.0 mg/l, which is applicable in the entire Montreal River outside of the Project reservoir, was not met at all times. The DO reading taken on July 20 within the bypass reach was 6.1 mg/l.

The Michigan minimum standard for DO in a reservoir suitable for warmwater fish is 5.0 mg/L. The profile readings taken on July 20 upstream of the dam in the deep hole exceeded 7.0 mg/L near the surface only. At depths of 1 meter, 2 meters, and 2.5 meters, the DO readings were 6.8 mg/L, 6.1 mg/L, and 6.1 mg/L, respectively. This indicates that water coming into Superior Falls Flowage does not meet the 7.0 mg/L Michigan standard for coldwater streams before any influence from Project operations.

Monitoring Results for Total Phosphorus

All total phosphorus readings met both Wisconsin and Michigan standards.

Monitoring Results for E. Coli

One E. coli reading of 236 MPN/100 ml taken on September 14, 2021 in the bypass reach exceeded the Wisconsin beach action level of 235 MPN/100 ml and was slightly below the 300 MPN/100 ml Michigan standard.

Monitoring Results for Temperature

All water temperature readings met Wisconsin standards. However, two readings taken in the bypass reach on July 20 and August 18, and all water temperature readings downstream of the powerhouse, did not meet Michigan temperature standards. The reservoir temperature readings of 73.6°F, 76.8°F, and 64.4°F, taken in July, August, and September, respectively, met Michigan standards.

All readings taken in July, August, and September within the bypass reach and downstream of the powerhouse exceeded the Michigan water temperature standards. Standards for July, August, and September are 68°F, 68°F, and 63°F, respectively. The readings within the bypass reach were 71.1°F, 79.9°F, and 61.0°F, respectively and the readings downstream of the powerhouse were 71.6°F, 71.4°F, and 64.2°F, respectively. The readings indicate that the water coming into Superior Falls Flowage does not meet Michigan temperature standards. Water temperatures downstream of the Superior Falls Dam were lower than those entering the Project reservoir.

5.6.2.2 Superior Falls Reservoir Hydrographic Profile

A hydrographic profile was developed for each monthly sampling event for the deep hole upstream of the Superior Falls Dam boat barrier using a YSI Professional Plus meter. The meter was placed at the surface and lowered to the bottom at one-meter intervals while readings were taken for pH, DO, and temperature. A hydrographic profile of the pH, DO, and water temperatures is included in **Table 5.6.2.2-1**.

A Secchi disk was used to determine water clarity. The disk was lowered into the water until it was no longer visible, raised to the surface, and lowered once again until it disappeared. The length of the rope was then recorded as the Secchi depth. The results for all monitoring parameters are located in Attachment E of the Water Quality Study Monitoring Report included in **Appendix E-24**.

It is presumed the YSI pH meter was out of calibration during the August 18, 2021 sampling and readings taken on that date are not valid. The remaining pH readings met water quality standards for both Wisconsin and Michigan.

The hydrographic profiles did not indicate stratification or the formation of a hypolimnion. Although temperature and DO decreased as depth increased, no thermocline was encountered (GAI, 2021a).

Table 5.6.2.2-1 Superior Falls Deep Hole Hydrographic Profile Results

Depth	Date	pH	DO (mg/L)	Temp. (°F)	Temp (°C)
Surface (0 m)	7/20/2021	7.22	7.0	71.2	21.8
1 m	7/20/2021	6.88	6.8	72.5	22.5
2 m	7/20/2021	6.88	6.1	71.2	21.8
Bottom (2.6 m)	7/20/2021	6.84	6.1	71.2	21.8
Surface (0 m)	8/18/2021	8.80	7.6	76.8	24.9
1 m	8/18/2021	8.81*	7.2	73.6	23.1
2 m	8/18/2021	8.72	6.6	71.6	22.0
Bottom (2.6 m)	8/18/2021	7.7	6.5	70.9	21.6
Surface (0 m)	9/14/2021	7.70	8.5	64.4	18.0
1 m	9/14/2021	7.98	8.0	63.9	17.7
2 m	9/14/2021	7.81	7 .8	63.1	17.3
Bottom (2.5 m)	9/14/2021	7.71	7.7	62.8	17.1

Source: GAI, 2021a

** The YSI pH meter was presumed out of calibration on this date*

5.6.2.3 Superior Falls Water Temperature Loggers

HOBO pendant data loggers were deployed on July 20 in three locations to monitor daily variation in the water temperature of the Montreal River. The locations included a riverine area upstream of the reservoir, the bypass reach, and downstream of the powerhouse. The loggers began recording temperature data on July 22, 2021 and automatically recorded temperature data every 24 hours until the loggers were removed on September 13, 2021. A graph showing water temperatures recorded by the data is shown in **Figure 5.6.2.3-1**.

All water temperatures recorded during the survey period met Wisconsin temperature standards. However, all water temperatures recorded within the bypass reach and downstream of the powerhouse exceeded Michigan water temperature standards. A review of the data indicated that on most days water temperatures downstream of the Project were 1-3 degrees warmer than the water entering the Project reservoir. As discussed in the Water Quality Study Monitoring Report included in **Appendix E-24**, this water temperature increase is likely due to warmer than normal air temperatures, lower than normal precipitation, and the resulting low flow conditions in 2021 which ultimately led to the placement of the monitoring device in an area that is not completely representative of downstream conditions. As illustrated in **Figure 5.6.2.3-2**, the monitoring device could not be placed in a representative location because the flows below the powerhouse split into two channels. Placement in the west channel would have been more representative but would cause difficulty with security and retrieval of the monitoring device. Therefore, the east channel was chosen to assure data could be retrieved. If the monitor were

moved further downstream of the location where the channels merge, Lake Superior could have significantly influenced the results.

As stated earlier, the water coming into Superior Falls Flowage does not meet Michigan standards when measurements within the bypass reach and downstream do not meet the Michigan standards. Therefore, the increased temperatures are not due to Project operations because the Project operates in a run-of-river mode.

Figure 5.6.2.3-1 Superior Falls Water Temperature Logger Graph

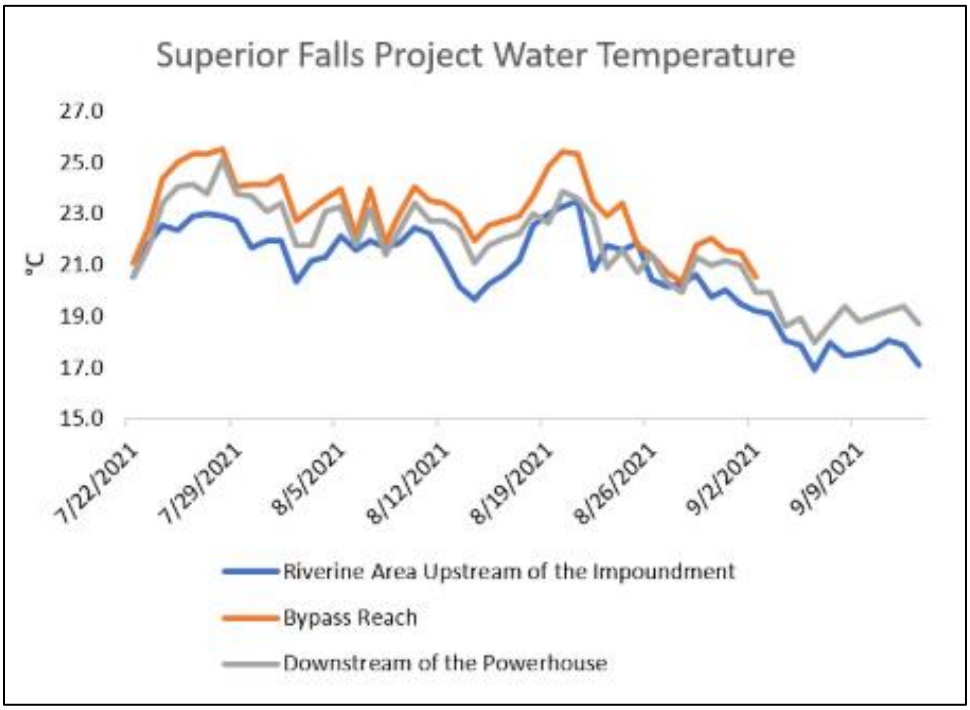


Figure 5.6.2.3-2 Location of Superior Falls Temperature Logger

5.7 Future Water Quality Monitoring

As described in Section 5.6, water coming into the dam and powerhouse for release at both Projects does not meet Michigan surface water quality standards for temperature, nor do the measurements within the bypass reach and downstream at both Projects. The increased temperatures are not due to Project operations particularly because the Project operates in a run-of-river mode, has a small reservoir, and has a short water retention time. Therefore, the Licensee is not proposing any future water quality monitoring.

The WDNR conducted a macroinvertebrate sampling below the Superior Falls Project in 2010 and identified an excellent Macroinvertebrate Index of Biological Integrity (MIBI), as explained in Section 6.1.4, and "G*iven the evidence of recruitment and the presence of state endangered species, a small portion of the Montreal River* (downstream of Superior Falls) *appears to remain relatively healthy for mussel populations*", as explained in Section 6.1.3.2. Based on this macroinvertebrate and mussel information, the Licensee is not proposing any future water quality monitoring.

With the exception of a proposed increase in minimum flows in the Saxon Falls bypass reach for aesthetic purposes, the Licensee is not proposing any new facilities or changes to the current operation of either Project. As such, continued Project operation is not expected to adversely impact water quality and the Licensee therefore is not proposing any future water quality monitoring.

5.8 Project Operation (Minimum Flow and Reservoir Fluctuation)

5.8.1 Saxon Falls Project

Under the terms of the existing license, the Project is operated in a run-of-river mode. In order to minimize reservoir fluctuations, a minimum reservoir elevation of 997.0 feet is required to be maintained from ice-

out to June 1.[10] Between June 1 and ice-out, the reservoir is required to be maintained between elevations 996.5 feet and 997.0 feet. A minimum flow of 5 cfs or inflow, whichever is less, is released into the bypass reach of the Montreal River immediately below the Saxon Falls Dam during the ice-free season (i.e., ice-out to October 31) to protect aquatic and aesthetic resources (FERC, 1989b).

The Licensee proposes to continue to operate the Project under the terms of the existing license except for a proposed increase in minimum flow in the bypass reach. Licensee is proposing to increase the current minimum flow of 5 cfs to 10 cfs or inflow, whichever is less, from 8 am to 8 pm on weekends and holidays during the time period beginning the Saturday before Memorial Day to October 15 for enhancement of aesthetic resources.[11]

5.8.2 Superior Falls Project

Under the terms of the existing license, the Project is operated in a run-of-river mode with a minimum reservoir surface elevation of 739.7 feet as measured immediately upstream from the Project dam per FERC's March 31, 1997 Order on Rehearing (FERC, 1997). A minimum flow of 8 cfs is required to be released into the bypass reach of the Montreal River between the Saturday before Memorial Day to October 15 for enhancement of aesthetic resources. A minimum flow of 20 cfs is required to be released into the bypass reach from 8 am to 8 pm on weekends and holidays during the same timeframe (FERC, 1995a). The Licensee proposes to continue to operate the Project as it is currently operated under the existing license.

5.9 Operational Deviations

In an effort to protect water quality, the Licensee will notify the FERC, USFWS, and WDNR of planned deviations with a duration of less than 3 weeks. This advanced notification will allow the Licensee to consult with the USFWS and/or WNDR and implement agency-recommended measures to minimize adverse environmental impacts.

An after-the-fact notification procedure for an unplanned deviation will allow the FERC, USFWS, and WDNR to respond to any stakeholder questions or concerns regarding the deviation. The process will also allow the Licensee to keep a record of deviations. Should a deviation result in unanticipated adverse environmental impacts as identified by the operator(s), the Licensee can use the knowledge gained from the incident to avoid future deviations caused by similar circumstances.

The Licensee recommends the following deviation requirements be incorporated into any issued license:

> *Planned Deviations*
> *Project operation may be temporarily modified for short periods, of up to 3 weeks, after mutual agreement among the Licensee, U.S. Fish and Wildlife Service, and Wisconsin Department of Natural Resources (collectively, resource agencies). After concurrence from the agencies, the Licensee must file a report with the Secretary of the Commission as soon as possible, but no later than 14 calendar*

[10] Prior to ice-out, Project operation requires water to be spilled over the top of the gated spillway to remove ice on the downstream side to prepare the gates for operation during spring runoff. The top of the gates is at elevation 997.1 feet; water is spilled over the gates for no more than a 14 day period each year prior to spring runoff.
[11] This time-period corresponds with the current aesthetic flow requirement at the Superior Falls Project.

days after the onset of the planned deviation. Each report must include: (1) reasons for the deviation and how project operations were modified, (2) duration and magnitude of the deviation, (3) any observed or reported environmental effects and how the observations were made, and (4) documentation of consultation with the agencies. For planned deviations exceeding 3 weeks, the Licensee shall file for Commission approval, an application for a temporary amendment of license.

Unplanned Deviations
Operations may be temporarily modified if required by operating emergencies beyond the control of the Licensee (i.e., unplanned deviations). For any unplanned deviation that lasts longer than 3 hours ***or*** *results in visible adverse environmental effects such as a fish kill, turbidity plume, bank erosion, or downstream flooding, the Licensee shall file a report with the Secretary of the Commission as soon as possible, but no later than 14 days after each such incident. The report must include: (1) cause of the deviation, (2) duration and magnitude of the deviation, (3) any pertinent operational and/or monitoring data, (4) a timeline of the incident and the Licensee's response, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, (6) documentation of any observed or reported environmental effects, and (7) a description of measures implemented to prevent similar deviations in the future.*

For unplanned deviations lasting 3 hours or less that do not result in visible adverse environmental effects, the Licensee must file an annual report, by March 1, describing each incident that occurred during the prior calendar year. The report must include: (1) cause of the deviation, (2) duration and magnitude of the deviation, (3) any pertinent operational and/or monitoring data, (4) a timeline of the incident and the Licensee's response to each deviation, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, and (6) a description of measures implemented to prevent similar deviations in the future.

The Licensee will develop an operations monitoring plan for each Project to document how it will comply with the operational requirements of the license, including reservoir elevation and minimum flow requirements. This plan will include the locations of headwater monitoring gages, frequency of monitoring, procedures for maintaining and calibrating monitoring equipment, standard operating procedures to be implemented outside of normal operating conditions such as scheduled or emergency facility shutdowns or maintenance activities, and a schedule for installing and operating the monitoring equipment. The cost to develop each Project's operations monitoring plan is estimated at $25,000, with an additional estimated annual cost of $5,000 for deviation reporting.

5.10 Water Quality Impacts During Project Operation

Water quality monitoring programs conducted in and near the Project areas are described in Section 5.2.

The Licensee is not proposing any planned ground-disturbing activities at either Project. However, it is possible that future maintenance or construction projects could result in ground-disturbance. Should ground-disturbing activities be anticipated, the Licensee will implement either temporary or permanent erosion and siltation controls designed to keep sedimentation from entering surface waters. During ongoing ground-disturbing activities, the Licensee will implement erosion and siltation controls designed

to keep sedimentation from entering surface waters, such as silt fences, straw waddles, or temporary settling basins. These temporary measures would help minimize potential impacts to water quality.

Should permanent ground-disturbance result from maintenance or construction activities, the Licensee will implement erosion and siltation controls designed to stabilize bare soil as quickly as possible, such as mulching and seeding or stabilizing with rock. These types of measures would provide permanent erosion control to help mitigate impacts to water quality that may result from future construction activities.

The Licensee has not identified any proposed operational changes that would adversely impact minimum flows or run-of-river operations. Therefore, continued operation of the Project is not expected to adversely impact water quality.

5.11 Water Quality Certification

The Licensee will request a water quality certification from WDNR, pursuant to Section 401 of the Clean Water Act, no later than 60 days following the FERC issuance of the Notice of Application Ready for Environmental Assessment.

6. Report on Fishery, Terrestrial, and Endangered Resources

6.1 Existing Resources

6.1.1 Aquatic Habitat Resources

6.1.1.1 Saxon Project Aquatic Habitat Resources

The Saxon Falls Project consists of a dam, powerhouse, and 69.8-acre reservoir at elevation of 997.0 feet (MH, 2022c). Much of the reservoir is less than six feet deep (NSPW, 1988). A bathymetric map developed in conjunction with the 2021 ATIS Study is included in **Appendix E-25**. The Saxon Falls Dam includes a right spillway abutment section, overflow spillway section, gated spillway section, non-overflow concrete gravity dam section, minimum flow release structure, intake structure section, non-overflow mass concrete dam section, and left earthen dam section. A minimum flow of 5 cfs or inflow, whichever is less, is released into the bypass reach of the Montreal River immediately below the Saxon Falls Dam during the ice-free season (i.e., ice-out to October 31) to protect aquatic and aesthetic resources.

As part of the ATIS study, the Licensee conducted a point-intercept aquatic vegetation survey of Saxon Falls Flowage. To account for both early and late season species, two surveys were completed, one in mid-June and one in early August. WDNR provided a point intercept plan with 167 sampling grid points distributed evenly throughout the flowage. Per WDNR guidelines, grid points to be sampled included those located in water depths of less than 15 feet or to the maximum depth of rooted vegetation if less than 15 feet (WDNR, 2010).

The vegetation survey was conducted from a boat using a global positioning system (GPS) with submeter accuracy to navigate to grid point locations. Points were sampled using a double-sided rake mounted on a pole. The rake was lowered until it rested gently on the river bottom, twisted twice, and then raised straight up out of the water. The density for each rake sample was recorded based on rake fullness. Plants not collected on the rake sample but visible within six feet of the sample point were recorded as visual sightings. A meander survey was also conducted of the near shore/littoral zone, which is defined as the area less than five feet in depth, but only to the maximum depth of plant colonization. Additionally, sediment composition at each grid point was described. Maps showing the substrate types identified at each grid point are shown in Figure 6 of the ATIS Study Report included in **Appendix E-18**.

During the June survey, 110 of the 167 grid points were sampled. The remaining grid points were not sampled for the following reasons:

- grid point was in an area where the water depth was greater than the maximum depth of colonization or MDC (11)
- grid point was terrestrial (30)
- grid point was too shallow (13)
- grid point was inside the boat barrier (3)

All 110 of the sampled points were shallower than the maximum plant rooting depth of 7.5 feet and 73 of the points had vegetation. Eighteen species were found during the survey, four of which were observed visually, but not present on the rake. The visually observed species included: spatterdock (*Nuphar variegata*), reed canary grass (*Phalaris arundinacea*), common arrowhead (*Sagittaria latifolia*),

and bur-reeds (*Sparganium* spp.). Predominant species identified during the survey were fern pondweed (*Potamogeton robbinsii*), sweet flag (*Acorus americanus*), common waterweed (*Elodea canadensis*), and coontail (*Ceratophyllum demersum*). The average rake fullness across the Study was 1.69 (GAI, 2021b).[12]

During the August survey, 83 of the 167 grid points were sampled. The remaining grid points were not sampled for the following reasons:

- grid point was too shallow (55)
- grid point was in an area where the water depth was greater than the MDC (14)
- grid point was terrestrial (12)
- grid point was inside the boat barrier (3)

Seventy-eight of the 83 sampled points were shallower than the MDC of 7.5 feet and 56 had vegetation. Sixteen species were found during the survey. Two species, leafy pondweed (*Potamogeton foliosus*) and spatterdock, were visually observed but not present in the rake sampling. The predominant species sampled overall was fern pondweed, while common waterweed, coontail, and various pondweeds were predominant in several of the rake samples. The average rake fullness across the Study was 2.29. No aquatic invasive species were observed during the August Study. Any purple loosestrife (*Lythrum salicaria*) observed along the shoreline was captured in the terrestrial survey (GAI, 2021b).

Table 6.1.1.1-1 lists all the submerged aquatic plant species identified at the Saxon Falls Project during the June and August surveys. **Table 6.1.1.1-2** provides an overall summary of the point-intercept vegetation survey. The ATIS Study Report, including maps and datasheets, is included in **Appendix E-18**.

Table 6.1.1.1-1 Species of Aquatic Vegetation Observed during Saxon Falls ATIS Surveys

Common Name	Scientific Name
Alpine pondweed	*Potamogeton alpinus*
Blunt-leaf pondweed	*Potamogeton obtusifolius*
Bur-reeds	*Sparganium* spp.
Cattail	*Typha spp.*
Common arrowhead	*Sagittaria latifolia*
Common waterweed	*Elodea canadensis*
Coontail	*Ceratophyllum demersum*
Fern pondweed	*Potamogeton robbinsii*
Large-leaf pondweed	*Potamogeton amplifolius*
Leafy pondweed	*Potamogeton foliosus*
Muskgrass	*Chara sp.*
Reed canary grass	*Phalaris arundinacea*

[12] Rake fullness is measured on a scale of 1 to 3, with (1) having only a few plants that do not cover the length of the rake in a single layer; (2) having enough plants to cover the head of the rake in a single layer, but not enough to fully cover the tines; and (3) the rake is completely covered, and the tines are not visible.

Common Name	Scientific Name
Ribbon-leaf pondweed	*Potamogeton epihydrus*
Slender naiad	*Najas flexilis*
Small duckweek	*Lemna minor*
Spatterdock	*Nuphar variegata*
Sweet Flag	*Acorus americanus*
Various-leaved milfoil	*Myriophyllum hererophyllum*
Vasey's pondweed	*Potamogeton vaseyi*
White water crowfoot	*Ranunculus aquatilis*
Yellow water crowfoot	*Ranunculus aqualtilis*

Table 6.1.1.1-2 Overall Saxon Project Point-Intercept Vegetation Survey Summary

Statistic	June 2021	August 2021
Frequency of Occurrence	66.36	71.79
Maximum Rooting Depth	7.5 feet	7.5 feet
Species Richness	18	16
Floristic Quality Index	23.8	26.7

6.1.1.2 Superior Falls Project Aquatic Habitat Resources

The Superior Falls Project consists of a dam, powerhouse, and 16.3-acre reservoir at elevation of 740.2 feet (MH, 2022d). Approximately 42% of the reservoir has a depth of less than three feet; the average depth is 4.8 feet (NSPW, 1991). A bathymetric map developed in conjunction with the 2021 ATIS study is included in **Appendix E-26**. The dam includes seven sections: a right spillway abutment section, overflow spillway section, gated spillway section, non-overflow concrete gravity dam section, intake structure section, non-overflow mass concrete dam section, and earthen dam section. A minimum flow of 8 cfs is required to be released into the bypass reach of the Montreal River between the Saturday before Memorial Day to October 15 for enhancement of aesthetic resources. A minimum flow of 20 cfs is required to be released into the bypass reach from 8 am to 8 pm on weekends and holidays during the same timeframe.

As part of the ATIS study, the Licensee conducted a point-intercept aquatic vegetation survey of the Superior Falls Flowage. To account for both early season and late season species, two surveys were completed, one in mid-June and one in early August. WDNR provided a point intercept plan with 167 sampling grid points distributed evenly throughout the waterway. Per WDNR guidelines, grid points to be sampled included those sites located in water depths of less than 15 feet or to the maximum depth of rooted vegetation if less than 15 feet (WDNR, 2010).

The survey was conducted from a boat using a GPS with submeter accuracy to navigate to grid point locations. Points were sampled using a double-sided rake mounted on a pole. The rake was lowered until it rested gently on the river bottom, twisted twice, and then raised straight up out of the water. The density for each sample was recorded based on rake fullness. Plants not collected on the rake sample,

but visible within six feet of the sample point, were recorded as visual sightings. A meander survey was also conducted of the near shore/littoral zone, which is defined as the area less than five feet in water depth, but only to the maximum depth of plant colonization. Additionally, sediment composition at each grid point was recorded. Maps showing the substrate types identified at each grid point are shown in Figure 6 of the ATIS Study Report which is included in **Appendix E-18**.

During the June survey, 108 of the 162 grid points were sampled. The remaining grid points were not sampled for the following reasons:

- grid point was inside the boat barrier or downstream of the dam in the rocky rapids of the bypass reach (31)
- grid point was terrestrial (19)
- grid point unnavigable (4)

Of the 108 points sampled, all were shallower than the maximum rooting depth of 8.8 feet and 21 sample points had vegetation. Ten species were found during the survey. Three species were visually observed (not present on rake) and included large-leaf pondweed (*Potamogeton amplifolius*), white water crowfoot (*Ranunculus aquatilis*), and hardstem bulrush (*Schoenoplectus acutus*). Predominant species were fern pondweed, water star-grass (*Heteranthera dubia*), common bur-reed (*Sparganium eurycarpum*), and common arrowhead (*Sagitoria latifolia*). The average rake fullness during the Study was 1.38 (GAI, 2021b).

During the August survey, 96 of the 162 grid points were sampled. The remaining grid points were not sampled for the following reasons:

- grid point was inside the boat barrier or downstream of the dam in the rocky rapids of the bypass reach (31)
- grid point was terrestrial (18)
- grid point was in an area where the water depth was greater than the MDC (12)
- grid point was unnavigable (2)
- grid point was too shallow (2)
- grid point missed (1)

Of the 96 sampled points, 91 were shallower than the MDC of 5.0 feet and 20 had vegetation. Nine species were found during the survey. Three were observed visually (not present on rake) and included large-leaf pondweed and floating-leaf pondweed (*Potamogeton natans*). Predominant species were fern pondweed, common waterweed, flat-stem pondweed (*Potamogeton zosteriformis*), and one grid point of predominantly bur-reed. The average rake fullness across the study was 1.47. Solitary purple loosestrife plants were observed and locations were recorded, but no widespread populations were encountered (GAI, 2021b).

Table 6.1.1.2-1 lists all submerged aquatic plant species identified at the Superior Falls Project during the June and August surveys. **Table 6.1.1.2-2** provides an overall summary of the point-intercept vegetation survey. The ATIS Study Report, including all maps and datasheets, is included in **Appendix E-18**.

Table 6.1.1.2-1 Species of Aquatic Vegetation Observed during Superior Falls ATIS Surveys

Common Name	Scientific Name
Alpine pondweed	*Potamogeton alpinus*
Blunt-leaf pondweed	*Potamogeton obtusifolius*
Bur-reeds	*Sparganium* spp.
Common arrowhead	*Sagittaria latifolia*
Common bur-reed	*Sparganium eurycarpum*
Common waterweed	*Elodea canadensis*
Coontail	*Ceratophyllum demersum*
Fern pondweed	*Potamogeton robbinsii*
Flat-stem pondweed	*Potamogeton zosteriformis*
Floating-leaf pondweed	*Potamogeton natans*
Hardstem bulrush	*Schoenoplectus acutus*
Large-leaf pondweed	*Potamogeton amplifolius*
Long-leaf pondweed	*Potamogeton nodosus*
Purple loosestrife	*Lythrum salicara*
Water star grass	*Heteranthera dubia*
White water crowfoot	*Ranunculus aquatilis*

Table 6.1.1.2-2 Overall Superior Falls Project Point-Intercept Vegetation Survey Summary

Statistic	June 2021	August 2021
Frequency of Occurrence	19.44	21.98
Maximum Rooting Depth	8.8 feet	5.0 feet
Species Richness	10	9
Floristic Quality Index	13.2	13.5

6.1.2 Fish

6.1.2.1 Summary of Historic Fisheries Data

WDNR Fish Mapping Application

When preparing the PAD, the Licensee obtained public fisheries information via the WDNR Fish Mapping Application, which provided geographic data on the distribution and relative abundance of Wisconsin fishes. Fisheries information from the Fish Mapping Application is included in **Appendix E-27**. WDNR has discontinued the Fish Mapping Application since the PAD was developed.

Fish Stocking Information

WDNR routinely stocked the Montreal River from 1972 through 2021. During that timeframe, 14,733 brook trout (*Salvelinus fontinalis*) and 16,896 brown trout *(Salmo trutta*) were stocked (WDNR, ndb). A review of the MDNR website did not identify any fish survey data but did reveal fish stocking data for

the Montreal River. MDNR stocked 19,745 brown trout in the Montreal River between 1979 and 2018 (MDNR, nd). Fish stocking data for the Montreal River are included in **Appendix E-28**.

6.1.2.2 Current Fisheries Data

Since there was no recent fisheries data for either Project, the Licensee conducted fisheries surveys on both reservoirs. Seasonal nighttime electrofishing surveys were conducted in late May (spring), late July (summer), and mid-October (fall) when water temperatures were between 55-70°F. One night of shoreline electrofishing was conducted per season at each reservoir. Electrofishing was conducted via a 16-foot boat with a pulsed DC output set up. The boat was controlled by a Smith Root 5.0 GPP running to a boom-mounted shocking array and powered by a 5,000-watt generator. Output was set at each site according to conditions but was generally at 60 pulses per second and power limited to 4-5 Amps. Time fished was recorded in seconds and distance of shoreline sampled was measured in meters for catch per unit effort (CPUE) calculation. CPUE was calculated as individuals captured per kilometer of shoreline (GLEC, 2021).

Saxon Falls Fish Survey Results

A total of 1,604 fish representing 19 species were collected during the three survey days. Black bullhead (*Ameiurus melas*), pumpkinseed (*Lepomis gibbosus*), white sucker (*Catostomus commersonii*), and yellow perch (*Perca flavescens*) were the most abundant species collected and represented approximately 72% of all individuals captured during the surveys. Game fish potentially available to recreational anglers include black crappie (*Poxomis nigromaculatus*), bluegill (*Lepomis macrochirus*), muskellunge (*Esox masquinongy*), northern pike (*Esox lucius*), pumpkinseed, rock bass (*Ambloplites rupestris*), smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), and yellow perch. Black crappie, pumpkinseed, and rock bass were the most abundant gamefish within the Saxon Falls Flowage. A summary of fish species collected, their relative abundance, and CPUE are shown in **Table 6.1.2.2-1**. The Saxon Falls and Superior Falls Fisheries Study Report is included in **Appendix E-29**.

Table 6.1.2.2-1 Summary of Fish Species Collected from the Saxon Falls Project in 2021

Fish Species	Scientific Name	Relative Abundance (%)	CPUE Distance (kilometer)
Black bullhead	*Ameiurus melas*	25.12	17.24
Black crappie	*Pomoxis nigromaculatus*	3.87	2.65
Bluegill	*Lepomis macrochirus*	0.06	0.04
Brook stickleback	*Culaea inconstans*	0.06	0.04
Central mudminnow	*Umbra limi*	0.06	0.04
Common shiner	*Luxilus cornutus*	9.54	6.55
Golden shiner	*Notemigonus crysoleucas*	3.55	2.44
Hornyhead chub	*Nocomis biguttatus*	0.31	0.21
Johnny darter	*Etheostoma nigrum*	0.56	0.39
Logperch	*Percina caprodes*	1.00	0.68
Mottled sculpin	*Cottus bairdii*	0.06	0.04

Muskellunge	*Esox masquinongy*	0.81	0.56
Northern pike	*Esox lucius*	1.87	1.28
Pumpkinseed	*Lepomis gibbosus*	19.64	13.48
Rock bass	*Ambloplites rupestris*	4.61	3.17
Smallmouth bass	*Micropterus dolomieu*	0.19	0.13
Walleye	*Sander vitreus*	1.37	0.94
White sucker	*Catostomus commersonii*	9.73	6.67
Yellow perch	*Perca flavescens*	17.58	12.07

Superior Falls Fish Survey Results

A total of 1,954 fish representing 20 species were collected during the three survey days. White sucker and common shiner (*Luxilus cornutus)* were the most abundant species collected and represented approximately 74% of all individuals captured at Superior Falls. Gamefish potentially available to recreational anglers include black crappie, muskellunge, pumpkinseed, rock bass, smallmouth bass, walleye, and yellow perch. Pumpkinseed and rock bass were the most abundant gamefish.

The redside dace (*Clinostomus elongatus*) is a Michigan endangered fish species and three specimens were collected upstream of the Hwy 122 bridge during the July sampling event. All three were successfully released after recording their length and weight (GLEC, 2021). A summary of the fish species collected, their relative abundance, and CPUE are shown in **Table 6.1.2.2-2**. The Saxon Falls and Superior Falls Fisheries Study Report is included in **Appendix E-29**.

Table 6.1.2.2-2 Summary of Fish Species Collected from the Superior Falls Project in 2021

Fish Species	Scientific Name	Relative Abundance (%)	CPUE Distance (kilometer)
Black bullhead	Ameiurus melas	25.12	17.24
Black crappie	Pomoxis nigromaculatus	3.87	2.65
Blacknose shiner	Notropis heterolepis	0.26	0.85
Central mudminnow	Umbra limi	0.77	2.55
Common shiner	Luxilus cornutus	34.39	114.21
Creek chub	Semotilus atromaculatus	3.63	12.07
Hornyhead chub	Nocomis biguttatus	7.63	25.32
Johnny darter	Etheostoma nigrum	1.23	4.08
Logperch	Percina caprodes	0.87	2.89
Longnose dace	Rhinichthys cataractae	0.41	1.36
Mottled sculpin	Cottus bairdii	0.16	0.51
Muskellunge	Esox masquinongy	0.05	0.17
Pumpkinseed	Lepomis gibbosus	2.00	6.63
Redside dace	Clinostomus elongatus	0.15	0.51
Rock bass	Ambloplites rupestris	4.96	16.49

Smallmouth bass	Micropterus dolomieu	0.20	0.68
Walleye	Sander vitreus	0.05	0.17
Western blacknose dace	Rhinichthys obtusus	0.51	1.7
White sucker	Catostomus commersonii	39.2	130.18
Yellow perch	*Perca flavescens*	0.51	1.70

6.1.3 Fish Entrainment and Mortality

6.1.3.1 Historic Fish Entrainment and Mortality Information

A search of available literature during development of the PAD did not identify any historic entrainment or mortality information regarding the Saxon Falls Project. However, the Final EA issued on January 19, 1995, for the Superior Falls Project indicated the narrow trash rack spacing precludes the passage of larger fish and allows mostly young-of-year fish to pass through. Young-of-year fishes are more susceptible to entrainment but are less prone to mortality due to their small size. Natural mortality in the first year for most resident fish species is very high, therefore an additional small increment of mortality due to turbine passage at the early life stage should not significantly affect the overall fishery. The FERC concluded that “entrainment mortality is not likely to be biologically significant, i.e., would not adversely affect fish populations either in the reservoir or down-stream in Lake Superior” (FERC, 1995b).

6.1.3.2 Current Saxon Falls Fish Entrainment and Mortality

The Saxon Falls Project intake is comprised of a 15-foot high by 20-foot wide trashrack with one-inch clear spacing. Mead & Hunt calculated the intake velocity at the trashracks in 2020. According to the calculations, the intake velocity at Saxon Falls is estimated at 0.71 feet per second. Intake velocity calculations for both projects are included in **Appendix E-30**. In 2016, NSPW retained the services of Kleinschmidt to conduct the Chippewa River Fish Protection Study. In their report, Kleinschmidt included a table using USFWS criteria showing the sustained and burst swim speeds for fish by length. Sustained swim speed is the velocity that a fish can be expected to sustain indefinitely and burst swim speed is a velocity that a fish could sustain briefly to ambush prey, escape predation, or maneuver in current (KG, 2016). **Table 6.1.3.2-1** in the following section presents the swim speeds of fish for each length-frequency group. According to the table, fish exceeding three inches in length have sustained swim speeds greater than 0.71 feet per second. Similarly, fish exceeding two inches in length have burst speeds greater than 0.71 feet per second. Therefore, fish in these length classes would be able to avoid entrainment or impingement. The Chippewa River Fish Protection Report is included in **Appendix E-31**.

6.1.3.3 Current Superior Falls Fish Entrainment and Mortality

The Superior Falls Project features a 15-foot-high by 23-foot-wide main trashrack with one-inch clear spacing. In 2020, Mead & Hunt completed calculations to determine the intake velocity at the trashracks. According to the calculations, the intake velocity was estimated at 0.83 feet per second. Based on the swim speeds presented in **Table 6.1.3.2-1**, fish exceeding four inches in length have sustained swim speeds exceeding the intake velocity. Similarly, fish longer than two inches have burst swim speeds exceeding the intake velocity. Therefore, both of these size class fish would be able to avoid impingement or entrainment.

Table 6.1.3.2-1 Swimming Speeds of Fish for Each Length Frequency Group

Swim Speed (Body Length/s)	Fish Length																			
	1-inch	2-inch	3-inch	4-inch	5-inch	6-inch	7-inch	8-inch	9-inch	10-inch	11-inch	12-inch	13-inch	14-inch	15-inch	16-inch	17-inch	18-inch	19-inch	20-inch
Sustained Swim Speeds	Swimming Speeds (fps)																			
3	0.24	0.48	0.75	0.99	1.26	1.5	1.8	2.1	2.25	2.49	2.76	3.0	3.3	3.27	3.75	3.99	4.23	4.5	4.74	4.98
4	0.32	0.64	1.0	1.32	1.68	2.0	2.4	2.8	3	3.32	3.68	4.0	4.4	4.36	5	5.32	5.64	6.0	6.32	6.64
5	0.4	0.8	1.25	1.65	2.1	2.5	3.0	3.5	3.75	4.15	4.6	5.0	5.5	5.45	6.25	6.65	7.05	7.5	7.9	8.3
Burst Swim Speeds																				
6	0.48	0.96	1.5	1.98	2.52	3.0	3.6	4.2	4.5	4.98	5.52	6.0	6.6	6.54	7.5	7.98	8.46	9.0	9.48	9.96
7	0.56	1.12	1.75	2.31	2.94	3.5	4.2	4.9	5.25	5.81	6.44	7.0	7.7	7.63	8.75	9.31	9.87	10.5	11.06	11.62

Source: KG, 2016 (Table 19)

6.1.4 Freshwater Mussels

6.1.4.1 Historic Mussel Information

Historic information from WDNR identified two mussel species within the Montreal River, the Cylindrical papershell (*Anodontoides ferussacianus*) and Eastern elliptio (*Elliptio complanata*) (MH, 2019).

The Michigan Natural Features Inventory maintains a web application called the Michigan Mussels Web App for tracking the presence of mussels throughout the state. A review of the web application did not identify any mussel data for the Montreal River (MNFI, nda).

6.1.4.2 Current Mussel Information

Mussel surveys were completed in 2021 at both Projects. Mussel survey efforts were conducted in three survey reaches within each Project. The objectives of the survey were to provide baseline data on mussel species occurrence, diversity, and abundance within each Project area, to denote the presence or absence of rare and sensitive mussel species, and to characterize mussel habitats within each Project boundary.

The mussel surveys were performed according to the 2015 WDNR *Guidelines for Sampling Freshwater Mussel in Wadable Streams* and other standard protocols. Three survey reaches were sampled for each Project. Reach 1 was a riverine portion of the reservoir, Reach 2 was in the reservoir, and Reach 3 was located downstream of the powerhouse. Within Reach 1 and Reach 2 for each Project, five randomly selected transects extending from bank to bank were surveyed. Within Reach 3 for each Project, two transects were surveyed. Transects were further subdivided into 10-meter intervals. Each 10-meter interval was searched for a minimum of 0.2 minutes/meter^2 (2 minutes total if no mussels were present). If mussels were located along a 10-meter interval, search effort increased to ≥1.0 minutes/meter^2 (≥10 minutes total). Depth and substrate composition were also recorded for each 10-meter interval.

For each 10-meter interval, surveyors used visual and tactile methods to inspect the river bottom, collecting all mussels within one meter of the transect line. Surveyors used their hands and fingertips to fan the top level of substrate, rake loose sediments, and overturn cobbles and boulders to enhance mussel detection. All live mussels were identified to species, counted, and sexed by a malacologist.

Mussels were kept submersed in ambient river water, kept cool and moist during processing, and released upon completion of the survey (EDGE, 2021).

Saxon Falls

Reach 1 was 1,000-meters long beginning approximately 1,975 meters upstream of the Saxon Falls Dam. Reach 2 was 1,000-meter long beginning approximately 460 meters upstream of the Saxon Falls Dam and extended upstream for 1,000 meters. Reach 3 began at the powerhouse and extended approximately 200 meters downstream.

The survey identified two live mussels representing the giant floater (Pyganodon grandis) species. Both individuals were collected near the bank in water less than 10 meters deep. No live state or federal-listed mussels were identified. No additional species were recovered as deadshell (EDGE, 2021).

The mussel study report concluded the following:
"*Two live Giant Floaters were recovered in the Saxon Falls Reservoir. A plethora of suitable, silty habitat with only a few mussel present may suggest that the Giant Floater is a recent addition to the riverine mussel community above Saxon and Superior Falls"* (EDGE, 2021).

A summary of the mussel species identified during the Saxon Falls study is found in **Table 6.1.4.2-1**. The complete mussel study report is included in **Appendix E-32**.

Superior Falls

Reach 1 was a 1,000-meters long beginning approximately 1,125 meters upstream of the Superior Falls Dam. Reach 2 was 800-meters long beginning approximately 350 meters upstream of the Superior Falls Dam and extended upstream for 800 meters. Reach 3 began at the powerhouse and extended approximately 200 meters downstream.

The survey identified a total of 36 live mussels representing 6 species, including black sandshell (*Ligumia recta*), creeper (*Strophitus undulatus*), eastern elliptio (*Elliptio complanata*), fatmucket (*Lampsilis siliquoidea*), flutedshell (*Lasmigona costata*), and giant floater. All individuals were collected within ten meters of the bank. No live federal-listed mussels were identified. No additional species were recovered as deadshell. Black sandshell is listed as state endangered in Michigan and was the only state-listed mussel species encountered. One black sandshell individual was represented as a juvenile (23.7 mm length) and the other was an adult (109.9 mm length) (EDGE, 2021).

The mussel study report concluded the following:
"Significant mussel resources were encountered below Superior Falls which serves as the first cataract of the Montreal River that impedes upstream fish migration. The Falls serve as a natural barrier for fish hosts and may inhibit the upstream colonization of mussels from a source population (i.e., Lake Superior). Presumably, fish hosts are capable of migrating into the lower section of the Montreal River, become infected with glochidia, and help promulgate resident mussel populations. The life cycles of several species are actively being completed for numerous mussel species. This portion of the Montreal River supports a relatively healthy freshwater mussel population, with at least 6 extant species. Survey efforts within this Reach only covered a fraction (3.75%) of the potentially available mussel habitat (i.e., >20,000 m2) between Superior Falls and Lake Superior; therefore, represents only a small proportion

of the mussel assemblage and population. Live mussels were represented by many different size classes and age structures. The presence of sub-adult mussels (e.g., <5 years old, <40 mm) in the Project area indicates successful recruitment for multiple species including Black Sandshell. Given the evidence of recruitment and the presence of state endangered species, a small portion of the Montreal River appears to remain relatively healthy for mussel populations" (EDGE, 2021).

A summary of the mussel species identified during the Superior Falls Project study is located in **Table 6.1.4.2-1**. The complete mussel study report is included in **Appendix E-32**.

Table 6.1.4.2-1 Mussels Identified in 2021 Survey

Mussel Species Name		Federal Status	State Status	Total Number	Relative Abundance
Common	**Scientific**				
Saxon Falls					
Giant floater	*Pyganodon grandis*	-	-	2	100%
Superior Falls					
Black Sandshell	*Ligumia recta*		MI Endangered	2	5.6%
Creeper	*Strophitus undulatus*	-	-	1	2.8%
Eastern elliptio	*Elliptio complanate*	-	-	20	55.6%
Fatmucket	*Lampsilis siliquoidea*	-	-	9	25.0%
Fluted shell	*Lasmigona costata*	-	-	1	2.8%
Giant floater	*Pyganodon grandis*	-	-	3	8.3%

6.1.5 Benthic Community

6.1.5.1 Saxon Falls

Qualitative samples of macroinvertebrates were collected at the Saxon Falls Project during the last relicensing effort. Three stations were monitored for macroinvertebrates (Stations 1, 2, and 4). Station 1 was located within the Saxon Falls flowage. Station 2 was located within the bypass reach below the Saxon Falls Dam. Station 4 was located one-half mile downstream from the Saxon Falls powerhouse (NSPW, 1988).

A total of 22 different taxa of macroinvertebrates were identified among the three stations sampled and included 17 insects, one isopod, one crayfish, two snails, and one clam. The highest diversity was found in Station 4 where 21 taxa were identified. The abundance of stoneflies, mayflies, and alderflies was reflective of the clean, cool waters of the river. Station 2 had few invertebrate taxa. This was not only a function of the periodic low flows, but also the poor habitat and steep gradient. Four taxa, all insects, were identified in this location. Station 1 within the reservoir, produced 13 taxa. The difference in invertebrate diversity between the flowage and the downstream reach was attributable to the presence of rheophilic species in the free-flowing river segment. The assemblage of invertebrates in the flowage was indicative of a clean water, well oxygenated environment (NSPW, 1988). A table showing the macroinvertebrate taxa sampled and their relative abundance is included in **Appendix E-33**.

6.1.5.2 Superior Falls

WDNR conducts standardized macroinvertebrate surveys to assess the health of certain wadable streams within the state. In 2010, WDNR conducted macroinvertebrate sampling at monitoring station #10031229 Montreal River Below Superior Falls Flowage, located near the powerhouse. The Wisconsin Consolidated Assessment and Listing Methodology (WisCALM) identifies wadable MIBI values of greater than 7.5 as being in "excellent" condition (WDNR, ndc). WDNR sampling at #10031229 identified a MIBI wadable value of 7.65169 (WDNR, ndd). This MIBI value suggests the benthic community in the Superior Falls Project vicinity is in excellent condition. Macroinvertebrate sampling information collected by WDNR for the monitoring station is included in **Appendix E-34**.

6.1.6 Aquatic Invasive Species

Chapter NR 40 of the Wisconsin Administrative Code (NR 40) makes it illegal to possess, transport, transfer, or introduce certain invasive species into the state without a permit (WDNR, nde). NR 40 requirements are often used as a guide at hydroelectric projects to determine which species should be considered invasive. NR 40.03 classifies invasive species into two categories: prohibited and restricted. Prohibited species are defined as invasive species not currently found in Wisconsin, but if introduced are likely to survive, spread, and potentially cause negative environmental and economic impacts. Restricted species are invasive species already established in Wisconsin and have caused or are believed to cause negative environmental and economic impacts. NR 40 further categorizes invasive species by group, which include plants, algae and cyanobacteria, aquatic invertebrates (except crayfish), fish and crayfish, terrestrial and aquatic vertebrates (except fish), terrestrial invertebrates and plant disease-causing microorganisms, and fungus.

Part 413 of the Natural Resources and Environmental Protection Act (NREPA) of Michigan defines prohibited and restricted species and limits their possession, import or sale. Part 33 of NREPA defines permitted actions and procedures for the treatment of aquatic nuisance species (MIGOV, nd).

6.1.6.1 Historic Aquatic Invasive Information

A review of the WDNR Lakes and Aquatic Invasive Species (AIS) Mapping Tool did not identify any invasive species listed in NR 40 in the vicinity of either Project (WDNR, ndf). However, in their June 9, 2020 *Comments on Preliminary Application Document for the Saxon Falls Hydroelectric Project P-2610 and Superior Falls Hydroelectric Project P-2587*, WDNR indicated banded mystery snails (*Vivaparus geogianus*), narrow leaf cattail (*Typha angustifolia*), and reed canary grass (*Phalaris arundinacea*) as having been observed at the Saxon Falls Project in 2011. At the Superior Falls Project, WDNR indicated the reservoir had been surveyed for purple loosestrife annually from 1999 to 2019, with no evidence of the species since 1998 (WDNR, 2020a). The Licensee first identified purple loosestrife at the Superior Falls Project in 2020. No invasive species data for either project was provided by the State of Michigan.

6.1.6.2 Current Aquatic Invasive Species Information

The Licensee conducted an ATIS Study at both Projects in 2021. The study area encompassed the upstream and downstream inundated portions of the Montreal River and the upland areas within the current and proposed project boundaries which are owned by the Licensee. Aquatic invasive species

were identified concurrently with the submerged aquatic vegetation survey (Section 6.1.1). Each sampling point was inspected for the presence of invasive species as included in NR 40.

Saxon Falls Project

No aquatic invasive species were identified during the June or August survey (GAI, 2021b). The complete ATIS Study Report is included in **Appendix E-18** and includes maps depicting the locations of aquatic invasive species.

In addition to aquatic vegetation sampling, two water samples were collected in August using WDNR protocols to sample for the presence of spiny and fishhook water fleas (*Bythotrephes longimanus* and *Cercopagis pengoi, respectively*). One sample was taken in the reservoir and one in the tailwater. The samples were sent to the Wisconsin State Lab of Hygiene in Madison for analysis and the results are pending (GAI, 2021b). The results will be included in the FLA.

Sediment samples were collected at the Saxon Falls public boat landing using WDNR protocols and examined for the presence of invasive macroinvertebrates. The area around the sampling sites was also visually examined for live snails, crayfish, or shells. The sediment sampling did not identify the presence of any invasive macroinvertebrates (GAI, 2021b).

Superior Falls Project

No aquatic invasive species were identified during the June aquatic survey. However, three yellow iris (*Iris pseudacorus*) plants were observed growing sporadically along the west shoreline during the June survey outside of the mapped sample points. During the August survey, solitary purple loosestrife plants were observed and their locations recorded; however, no widespread populations were encountered. The complete ATIS Study Report is included in **Appendix E-18** and features maps depicting the locations of aquatic invasive species.

In addition to the aquatic vegetation sampling, two water samples were collected in August using WDNR protocols to monitor for the presence of spiny and fishhook water fleas. The samples were sent to the area invasive species coordinator for analysis and the results are pending (GAI, 2021b).

Sediment samples were collected at the Superior Falls Canoe Portage Take-Out and at the informal ramp used by the Licensee to launch motorized boats on the Project reservoir. The samples were collected using WDNR protocols and examined for the presence of invasive macroinvertebrates. The area around the sites was also visually examined for live snails, crayfish, or shells. The sediment sampling did not identify the presence of any invasive macroinvertebrates (GAI, 2021b).

6.1.7 Terrestrial Habitat

Ecological landscapes are classified by a combination of physical factors including climate, geology, topography, soils, water, and vegetation. Wisconsin defines 16 ecological landscapes (WDNR, 2015). Michigan defines four regional landscapes, which include the Southern Lower Peninsula, Northern Lower Peninsula, Eastern Upper Peninsula, and Western Upper Peninsula (MDNR, 1999).[13]

[13] Michigan does not define ecological landscapes using the same categories as Wisconsin. For the purposes of describing ecological landscapes using the same classification, the more-descriptive Wisconsin ecological landscape classifications will be

The Saxon Falls Project is located within the North Central Forest Ecological Landscape. Landforms within this ecological landscape are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Forests cover approximately 75% of the North Central Forest with mesic northern hardwood forest being dominant. The aspen-birch forest type group is also abundant, followed by spruce (WDNR, 2015).

The Superior Falls Project is located within the Superior Coastal Plain Ecological Landscape. The level plains on the south side of Lake Superior gently slope towards the lake. They are dissected by many deeply incised streams and several large rivers that flow from south to north towards the lake. Aspen-dominated boreal forests are abundant on the clay plains. In some areas, white spruce, balsam fir, and eastern white pine are now common understory species or are colonizing abandoned pastures. Older stands of boreal conifers still occur in a few places (WDNR, 2015). A map showing the ecological landscapes of Wisconsin is included in **Appendix E-35**.

The terrestrial habitat along the shoreline of each Project was characterized in 2021 during the ATIS Studies. The entire shoreline along both flowages is heavily forested and dominated with tree species typical for each ecological landscape. A more thorough listing of botanical species found in terrestrial areas is included in Section 6.1.9.

6.1.8 Wildlife

Wildlife found in each Project vicinity includes various mammals, reptiles, amphibians, and birds typical of the North Central Forest and Superior Coastal Plains Ecological Landscapes. No changes to the operation of either Project are proposed with the exception of the proposed change in minimum flow at Saxon Falls. Therefore, continued Project operation is unlikely to influence the populations or diversity of wildlife in the area.

6.1.8.1 Mammal Species

Mammal species likely to be found in the vicinity of both Projects are listed in **Table 6.1.8.1-1** (NSPW, 1988; NSPW, 1991; WDNR, 2015).

Table 6.1.8.1-1 Mammal Species in the Vicinity of Both Projects

Mammal Species	Scientific Name
Badger	*Taxidea taxus*
Big brown bat	*Eptesicus fuscus*
Black bear	*Ursus americanus*
Coyote	*Canis latrans*
Deer mouse	*Peromuscus manoculatus*
Eastern chipmunk	*Tamias striatus*
Fisher	*Martes pennanti*
Gray wolf	*Canis lupus*
Masked shrew	*Sorex cinereus*
Least chipmunk	*Eutamias minimus*

used for those portions of each Project boundary within Michigan; ecological landscape qualities are relatively the same on both shorelines of the Montreal River within each Project boundary.

Mammal Species	Scientific Name
Little brown bat	*Myotis lucifugus*
Long-tailed weasel	*Mustela frenata*
Marten	*Martes americana*
Masked shrew	*Sorex cinerus*
Meadow jumping mouse	*Zapus hudsonius*
Meadow vole	*Microtus pennsylvanicus*
Muskrat	*Ondontra zibethicus*
Mink	*Mustela vison*
Porcupine	*Erethizon dorsatum*
Northern flying squirrel	*Glaucomys sabrinus*
Northern long-eared bat	*Myotis septentionalis*
Raccoon	*Procyon lotor*
Redbacked vole	*Clethrionomys gapperi*
Red fox	*Vulpes fulva*
Red squirrel	*Tamiasciurus hudsonicus*
River otter	*Lutra canadensis*
Short-tailed weasel	*Mustela erminea*
Shorttail shrew	*Blarina brevicauda*
Shrew mole	*Neurotrichus gibbsi*
Snowshoe hare	*Lepus americanus*
Striped skunk	*Mephitis mephitus*
White-tailed deer	*Odocoileus virginianus*
Woodland jumping mouse	*Napaeozapus insignis*
Woodchuck	*Marmota monax*

6.1.8.2 Amphibian and Reptile Species

Although no records of herpetological species surveys were found during literature review, based on the geographical range and existing habitat within Iron County, Wisconsin and Gogebic County, Michigan, it is likely a variety of frogs, snakes, turtles, and salamanders exist in the area. Amphibian and reptile species likely to be found in the vicinity of both Projects are listed in **Table 6.1.8.2-1** (NSPW, 1988; NSPW, 1991; WDNR, 2001; WDNR, 2015).

Table 6.1.8.2-1 Amphibian and Reptiles Species in the Vicinity of Both Projects

Amphibians and Reptiles	Scientific Name
American toad	*Bufo americanus*
Blue-spotted salamander	*Ambystoma laterale*
Bullfrog	*Rana catesbeiana*
Central newt	*Notophthalmus viridens louisianensis*
Eastern gartersnake	*Thamnophis sirtalis*
Eastern gray treefrog	*Hyla versicolor*
Four-toed salamander	*Hemidactylium scutatum*
Fox snake	*Elaphe vulpina*

Green frog	*Rana clamitans melanota*
Mink frog	*Rana septentrionalis*
Mudpuppy	*Necturus maculosus*
Northern Leopard frog	*Rana pipiens*
Northern ring-necked snake	*Diadophis punctatus edwardsii*
Northern spring peeper	*Pseudacris crucifer*
Painted turtle	*Chrysemys picta*
Red-backed salamander	*Plethodon cinerius*
Spotted salamander	*Ambystoma maculatum*
Western and Boreal chorus frogs	*Pseudacris triseriata*
Wood frog	*Rana sylvatica*
Wood turtle	*Glyptemys insculpta*

6.1.8.3 Bird Species

Bird species likely to be found in the vicinity of both Projects are listed in **Table 6.1.8.3-1** (NSPW, 1988; NSPW, 1991; WDNR, 2015; Ebird, nd).

Table 6.1.8.3-1 Avian Species in the Vicinity of Both Projects

Avian Species	Scientific Name
Alder flycatcher*	*Empidonax alnorum*
American bittern	*Botaurus lentiginosus*
American crow*	*Corvus brachyrhynchos*
American goldfinch*	*Spinus tristis*
American redstart*	*Setophaga ruticilla*
American robin*	*Turdus migratorius*
American woodcock	*Scolopax minor*
Bald eagle*	*Haliaeetus leucocephalus*
Baltimore oriele*	*Icterus galbula*
Black and white warbler*	*Mniotilta varia*
Blackburnian warbler*	*Dendroica fusca*
Belted kingfisher*	*Megaceryle alcyon*
Black-capped chickadee*	*Poecile atricapillus*
Blackpoll warbler*	*Dendroica striata*
Black tern	*Childonias niger*
Black-throated green warbler*	*Dendroica virens*
Bluejay*	*Cyanocitta cristata*
Blue-headed vireo*	*Vireo solitarius*
Boreal chickadee	*Parus hudsonicus*
Broad-winged hawk*	*Buteo platypterus*
Brown-headed cowbird*	*Molothrus ater*

Avian Species	Scientific Name
Brown thrasher*	*Toxostoma rufrum*
Bufflehead*	*Bucephala albeola*
Canada goose*	*Branta canadensis*
Canada warbler*	*Wilsonia canadensis*
Caspian tern*	*Hydroprogne caspia*
Cedar waxwing*	*Bombycilla cedrorum*
Chestnut-sided warbler*	*Dendroica pensylvanica*
Cliff swallow*	*Petrochelidon pyrrhonota*
Common grackle*	*Quiscalus quiscala*
Common loon*	*Gavia immer*
Common merganser*	*Empidonax alnorum*
Common raven*	*Corvus corax*
Common redpole*	*Acanthis flammea*
Common snipe	*Gallinago gallinago*
Common yellowthroat*	*Geothlypis trichas*
Dark-eyed junco*	*Junco hyemalis*
Double-crested cormorant*	*Phalacrocorax auritus*
Downy woodpecker*	*Picoides pubescens*
Eastern kingbird*	*Tyrannus tyrannus*
Eastern wood pewee*	*Contopus virens*
European starling*	*Sturnus vulgaris*
Field sparrow	*Spizella pusilla*
Golden-crowned kinglet*	*Regulus satrapa*
Gray catbird*	*Dumetella carolinensis*
Great blue heron	*Ardea herodias*
Great-crested flycatcher*	*Myiarchus crinitus*
Hairy woodpecker*	*Leuconotopicus villosus*
Hermit thrush*	*Catharus guttatus*
Herring gull*	*Laurus argentatus*
Hooded merganser*	*Lophodytes cucullatus*
Horned grebe*	*Podiceps auritus*
House wren	*Troglodytes aedon*
Indigo bunting*	*Passerina cyanea*
Least flycatcher*	*Empidonax minimus*
LeConte's sparrow	*Ammospiza leconteii*
Lesser scaup*	*Aythya affinis*
Mallard*	*Anas platyrhynchos*
Merlin*	*Falco coumbarius*
Mourning warbler*	*Oporonis philadelphia*

Avian Species	Scientific Name
Nashville warbler*	*Vermivora ruficapilla*
Northern flicker*	*Colaptes auratus*
Northern goshawk	*Accipiter gentilis*
Northern parula*	*Parula americana*
Northern rough-winged swallow*	*Stelgidopteryx serripennis*
Northern waterthrush	*Seirus aurocapillus*
Olive-sided flycatcher	*Contopus borealis*
Osprey	*Pandion haliaetus*
Ovenbird*	*Seirus aurocapillus*
Palm warbler*	*Dendroica palmarum*
Pie-billed grebe*	*Podilymbus podiceps*
Pileated woodpecker*	*Dryocopus pileatus*
Pine siskin*	*Carduelis pinus*
Purple finch*	*Carpodacus purpureus*
Red-breasted nuthatch*	*Sitta canadensis*
Red crossbill*	*Loxia curvirostra*
Red-eyed vireo*	*Vireo olivaceus*
Red-winged blackbird	*Agelaius phoeniceus*
Rose-breasted grosbeak*	*Pheucticus ludovicianus*
Ruby crowned kinglet*	*Regulus calendula*
Red-tailed hawk*	*Buteo jamaicensis*
Ring-billed gull*	*Larus delawarensis*
Ring-necked duck*	*Aythya collaris*
Ruby throated hummingbird	*Archilochus colubris*
Ruffed grouse	*Bonasa umbellus*
Scarlet tanager*	*Piranga olivacea*
Sedge wren*	*Cistothorus platensis*
Spotted sandpiper*	*Actitis macularius*
Song sparrow*	*Melospiza melodia*
Sora rail	*Porzana carolina*
Swainson’s thrush	*Catharus ustulatus*
Swamp sparrow*	*Melospiza georgiana*
Tree swallow*	*Tachineta bicolor*
Turkey vulture*	*Cathartes aura*
Veery*	*Catharus fuscescens*
Warbling vireo*	*Vireo gilvus*
White-breasted nuthatch*	*Sitta carolinensis*
White-crowned sparrow*	*White-cowned sparrow*
White-throated sparrow	*Zonotrichia albicollis*

Avian Species	Scientific Name
Wilson's warbler*	*Wilsonia pusilla*
Wood duck*	*Aix sponsa*
Yellow-bellied sapsucker*	*Sphyrapicus varius*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped warbler*	*Dendroica coronata*
Yellow warbler*	*Dendroica petechia*

** Documented siting at Montreal River Mouth (Ebird, nd)*

6.1.9 Botanical Resources

The habitat along the shoreline of each Project was characterized during the 2021 ATIS Studies. The entire shoreline of both Projects was noted as being heavily forested and undeveloped. Predominant tree, shrub, and herbaceous species were noted in the ATIS Study Report (GAI, 2021b). The complete ATIS Study Report is included in **Appendix E-18**.

Forest types present within the current Superior Falls Project boundary are shown on a timber inventory map included in **Appendix E-36** and include aspen, northern hardwoods, red pine plantations, and swamp hardwoods. Aspen, red pine, and northern hardwood areas are located primarily on uplands. Swamp hardwoods are located adjacent to the reservoir and in drainages leading to the river or reservoir.

While there are no existing timber inventory maps detailing all forest types within the Saxon Falls Project, lands within the current Project boundary support similar timber communities as those at Superior Falls. Timber types include aspen dominated stands, red pine plantations, and northern hardwoods on upland areas, and swamp hardwoods adjacent to the reservoir and within drainages.

Typical tree, shrub, and herbaceous species found within the Project boundaries are shown in **Table 6.1.9-1**, **Table 6.1.9-2**, and **Table 6.1.9-3**, respectively. These tables include species identified in the ATIS Study Report as well as those found within aspen, northern hardwood, red pine, and swamp hardwood cover types.

Table 6.1.9-1 Typical Tree Species in Vicinity of Projects

Typical Tree Species	
Common Name	**Scientific Name**
American basswood*	*Tilia americana*
American elm	*Ulmus americana*
Balsam fir*	*Abies balsamea*
Black ash	*Fraxinus nigra*
Black cherry	*Prunus serotina*
Bur oak	*Quercus macrocarpa*
Cottonwood	*Populus deltoides*
Eastern hemlock	*Tsuga canadensis*
Eastern white pine*	*Pinus strobus*

Typical Tree Species	
Common Name	**Scientific Name**
Green ash*	*Fraxinus pennsylvanica*
Musclewood (American hornbeam)	*Carpinus caroliniana*
Northern red oak*	*Quercus rubra*
Paper birch*	*Betula papyrifera*
Quaking aspen*	*Populus tremuloides*
Red maple*	*Acer rubrum*
Red pine*	*Pinus resinosa*
Silver maple*	*Acer saccharinum*
Sugar maple*	*Acer saccharum*
White ash	*Fraxinus americana*
White cedar*	*Thuja occidentalis*
White spruce*	*Picea glauca*
Yellow birch	*Betula alleghaniensis*

**Documented during ATIS study (GAI, 2021b)*

Table 6.1.9-2 Typical Shrub Species in Vicinity of Projects

Typical Shrub Species	
Common Name	**Scientific Name**
Alder species*	*Alnus spp.*
Common Buckthorn*	*Rhamnus cathartica*
Glossy buckthorn*	*Frangula alnus*
Gooseberry*	*Ribes spp.*
Gray dogwood*	*Cornus racemosa*
Poison ivy*	*Toxicodendron radicans*
Riverbank grape*	*Vitis riparia*
Sumac*	*Rhus spp.*
Winterberry	*Ilex verticillata*
Willow species*	*Salix spp.*

**Documented during ATIS study (GAI, 2021b)*

Table 6.1.9-3 Typical Herbaceous Species in Vicinity of Projects

Typical Herbaceous Species	
Common Name	**Scientific Name**
Aquatic forget-me-not*	*Myosotis scorpioides*
Blackberry*	*Rubus allegheniensis*
Black-eyed Susan*	*Rudbeckia hirta*
Blue vervain*	*Verbena hastata*
Boneset*	*Eupatorium perfoliatum*

Canada goldenrod*	*Solidago canadensis*
Canada thistle*	*Cirsium arvense*
Dogbane*	*Apocynum cannabinum*
Ferns*	*Pteridophyta spp.*
Jewelweed*	*Impatiens capensis*
Joe pye weed*	*Eupatorium maculatum*
Large-leaved aster*	*Eurybia macrophylla*
Lupine*	*Lupinus spp.*
Narrowleaf/cattail*	*Typha x glauca*
Reed canary grass*	*Phalaris arundinacea*
Sedges*	*Carex spp.*
Solomon's seal	*Polygonatum biflorum*
Spotted knapweed*	*Centaurea stoebe subsp. micranthos*
Stinging nettle*	*Urtica dioica*
Sunflowers*	*Helianthus spp.*
Swamp milkweed	*Asclepias incarnata*
Sweet/wild pea*	*Lathyrus odoratus*
Tansy*	*Tanacetum vulgare*
Wild parsnip*	*Pastinaca sativa*
Woolgrass*	*Scirpus cyperinus*
Yarrow	*Achillea millefolium*

**Documented during ATIS study (GAI, 2021b)*

6.1.10 Terrestrial Invasive Species

As part of relicensing, stakeholders recommended studies to document observed invasive species in the vicinity of both Projects. Information regarding terrestrial invasive species was collected during the ATIS Surveys.

6.1.10.1 Upland Shoreline Survey

Upland shoreline areas were surveyed from a boat, or on foot where use of a boat was not possible, while moving slowly along the shoreline. During the survey, an overall characterization of the terrestrial plant community was made. Invasive terrestrial plants listed in NR 40 were noted and their was recorded via a handheld GPS unit.

6.1.10.2 Upland Meander Survey

A meander survey was utilized on the upland areas owned in fee by the Licensee for each Project. The survey also included Project facilities, recreation sites and areas adjacent to public roads or utility corridors where there is the potential for the spread of terrestrial invasive species. A handheld GPS unit was used to identify the location of terrestrial invasive plants listed in NR 40, as well as the route traveled during the meander survey.

When invasive terrestrial plants listed in NR 40 were observed, during either the terrestrial shoreline survey or upland survey, the location, relative abundance, and length of impacted shoreline were mapped.

Seven common terrestrial invasive species were identified at the Saxon Falls Project and eight were identified at the Superior Falls Project (GAI, 2021b). Species identified during the ATIS Surveys and their NR 40 status are shown in **Table 6.1.10-1**. A description of the frequency of occurrence for each terrestrial invasive species, along with corresponding maps showing their locations, are included in the Saxon Falls and Superior Falls ATIS Study Reports included in **Appendix E-18**.

Table 6.1.10-1 Terrestrial Invasive Species Identified During Project ATIS Surveys

Common Name	Scientific Name	NR 40 Status	Saxon Falls Project	Superior Falls Project
Aquatic forget-me-not	*Myostis scopiodes*	Restricted	X	
Canada thistle	*Cirsium aryense*	Restricted	X	X
Common buckthorn	*Rhamnus cathartica*	Restricted		X
Glossy buckthorn	*Frangula alnus*	Restricted		X
Invasive Cattail spp.	*Typha spp.*	Restricted	X	X
Purple loosestrife	*Lythrum salicaria*	Restricted	X	X
Spotted knapweed	*Centaurea biebersteinii*	Restricted	X	X
Tansy	*Tanacetum vulgare*	Restricted	X	X
Wild parsnip	*Pastinica sativa*	Restricted	X	X

Source: GAI, 2021b

6.1.11 Threatened and Endangered Resources

6.1.11.1 Federal Listed Species

The USFWS Information for Planning and Conservation (IPaC) website was accessed on April 7, 2022, to develop an official IPaC Resource List for each Project. The resource lists identified the potential presence of three federal-listed species and one candidate species within the vicinity of the Projects. The species and their federal status are shown in **Table 6.1.11.1-1** and described in the paragraphs below. The IPaC Resource Lists for both Projects are included in **Appendix E-37** and **Appendix E-38**, respectively.

Table 6.1.11.1-1 IPaC Resource Species Lists for the Saxon Falls and Superior Falls Projects

Common Name	Scientific Name	Group	Federal Status	Saxon Falls Project	Superior Falls Project
Canada lynx	*Lynx canadensis*	Mammal	Threatened	X	X
Northern long-eared bat	*Myotis septentrionalis*	Mammal	Threatened	X	X
Monarch butterfly	*Danaus plexippus*	Insect	Candidate	X	X
Red knot	*Calidris canutus rufa*	Bird	Threatened	X	X

Canada Lynx

The Canada lynx is a federally endangered mammal species associated with moist, cool, boreal spruce-fir forests, with rolling terrain. They are dependent upon snowshoe hare populations and need persistent deep powdery snow, which limits competition from other predators. There is no designated critical habitat for the species in either Project boundary; however, the lynx may pass through the area (USFWS, 2021a).

Northern Long-Eared Bat

The northern long-eared bat (NLEB) is a Wisconsin, Michigan, and federally threatened mammal species. The NLEB roosts during the summer months underneath loose bark or in cavities or crevices of both live and dead trees. Non-reproducing females and males may also roost in cool places such as caves or mines. The NLEB feeds in the forest interior and hibernates in caves and mines during the months of October through April. Iron County, Wisconsin and Gogebic County, Michigan are within the NLEB range (USFWS, ndd). The location of hibernacula and maternity roost trees are tracked in Wisconsin's Natural Heritage Inventory (NHI). However, there are no known hibernacula or roost trees in the vicinity of either Project (WDNR, 2022a; WDNR, 2022b). Project operations that involve tree removal activities may impact unknown maternity roosts.

Monarch Butterfly

On December 15, 2020, USFWS announced that the listing of the monarch butterfly as endangered or threatened under the ESA was warranted but was precluded by higher priority listing actions. The decision is the result of extensive status review of the species that compiled and assessed its current and future status. The monarch butterfly is now a candidate species under the ESA. As a candidate species, its status will be reviewed annually until a listing decision is made (USFWS, nde).

Red Knot

The red knot is a federally threatened and Wisconsin special concern bird species. It is an Arctic breeder that occurs uncommonly during migration along coastal sandy beaches in Wisconsin from mid-May to early June and from mid-July to early November. The species does not breed in Wisconsin or either Project vicinity (WDNR, ndg).

6.1.11.2 State Listed Species

A review of the Wisconsin NHI conducted on January 14, 2022, indicated two Wisconsin state-listed threatened or endangered species are likely to occur within the vicinity of the Projects. The species are shown in **Table 6.1.11.2-1** and described in the following paragraphs. In addition to the species identified in the NHI review, listed species identified during relicensing studies have also been included. A copy of the Saxon Falls and Superior Fall NHI Reviews are included in **Appendix E-39** and **Appendix E-40**, respectively, as privileged information. A rare species review request has been submitted to obtain Michigan NHI information for the portion of the Projects within the State of Michigan. This information will be included in the FLA.

Table 6.1.11.2-1 State-Listed Threatened or Endangered Species for Both Projects

Species	Scientific Name	Group	WI Status*	MI Status*
Black sandshell	*Ligumia recta*	Mussel		END
Bald Eagle	*Haliaeetus leucocephalus*	Bird		SC
Braun's holly-fern	*Polystichum braunii complanata*	Plant	THR	
Broad-leaved twayblade	*Listera convallarioides*	Plant	THR	
Redside dace	*Clinostomus elongatus*	Fish		END

** State Status: END = Endangered, THR = Threatened*

Black Sandshell

The black sandshell is a Michigan endangered mussel that most commonly occupies rivers with strong currents and lakes with a firm substrate of gravel or sand. The species is vulnerable to point source and non-point source pollutants (MNFI, ndb). Two black sandshells were identified in the Montreal River downstream of the Superior Falls powerhouse during the 2021 mussel studies. No black sandshells were identified upstream of the Superior Falls waterfall (EDGE, 2021). Project operations that involve ground disturbing activities which could cause erosion or sedimentation adjacent to the river, and work on the bed of the river, have the potential to impact the species.

Bald Eagle

A review of the NHI indicated a bald eagle nest was located in the vicinity of the Superior Falls Project (WDNR, 2022b). As of August 9, 2007, the bald eagle population had recovered to the extent that it no longer required the protection of the federal Endangered Species Act. The bald eagle is protected by the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Lacey Act (USFWS, 2021b). The bald eagle is no longer listed as a threatened, endangered, or special concern species in Wisconsin; however, it is listed as a special concern species in Michigan.

The bald eagle lives near rivers, lakes, and marshes. In winter, birds congregate near open water in tall trees to spot prey and roost at night for sheltering. The bald eagle mates for life and chooses the tops of large trees to build nests, which they typically use and enlarge each year. They may have one or more alternate nests within their breeding territory. Bald eagles typically return to breeding grounds within 100 miles of where they were raised. Project activities that involve disturbance within 660 feet of a nest during the nesting season may cause impacts to the species (USFWS, 2021b).

Braun's Holly-fern

Braun's holly-fern is a Wisconsin threatened plant found in rich hardwood or mixed hardwood-conifer forests near ravine bottoms, as well as in areas of cold air drainage, on gentle to moderately steep rocky forested slopes, and at the bases of moist cliffs (WDNR, ndh). Ground disturbing or vegetation management activities occurring within areas of suitable habitat may impact the species.

Broad-leaved Twayblade

Broad-leaved twayblade is a Wisconsin threatened plant found on seepage slopes and ravine bottoms in hardwoods or mixed forests. Blooming occurs from early June through late July and fruiting occurs

from early July through late August. The optimal identification period for the species is from late June through late July (WDNR, ndi). Ground disturbing or vegetation management activities occurring within areas of suitable habitat may impact the species.

Redside Dace

Redside dace is a Michigan endangered fish that occurs in small streams with moderate to high gradients, adequate overhanging vegetation to provide ample shading of the stream, abundant coarse woody structure, and clean, rocky substrates. Redside dace use clean, rocky riffles for spawning and pools during the non-breeding season (MNFI, ndc). Three redside dace were captured within the Superior Falls reservoir upstream of the Hwy 122 bridge during 2021 fish surveys and were successfully released after they were measured and weighed. Redside dace habitat does not occur within either Project reservoir. Therefore, it is unlikely to be adversely impacted by impingement, entrainment, turbine mortality or run-of-river Project operations.

Fishery, terrestrial, and endangered resources mitigation measures recommended by resource agencies and stakeholders after their review of the DLA will be described in the following sections.

6.1.12 Recommended Aquatic Mitigation Measures

Stakeholders have not recommended specific aquatic mitigation measures but have previously provided study requests.

6.1.13 Recommended Terrestrial Mitigation Measures

Stakeholders have not recommended specific terrestrial mitigation measures but have previously provided study requests. The 2022 WDNR NHI Reviews identified measures to reduce the impacts to the bald eagle and NLEB, as well as avoidance and minimization measures for activities that may impact listed terrestrial plant species.

6.2 Anticipated Project Impacts

6.2.1 Aquatic Impacts

6.2.1.1 Aquatic Invasive Species

Maintenance of recreational facilities and Project works can increase the risk of spread or transfer of invasive species. Mitigation of potential impacts is further discussed under Section 6.3.

6.2.1.2 Work on Reservoir or River Bed

Work on the reservoir or riverbed below the ordinary high-water mark can have an adverse impact upon rare and sensitive resources.

6.2.1.3 Erosion and Siltation

Although the Licensee is not aware of any planned Project maintenance or construction activities, such activities can result in ground disturbance. Uncontrolled erosion and sedimentation from ground-disturbing activities can have an adverse impact upon aquatic resources.

6.2.1.4 Reservoir Drawdowns

Normal operation of both Projects does not require regular reservoir drawdowns. However, it will be necessary for the Licensee to occasionally lower either Project reservoir for dam structure repairs or maintenance. The timing, rate of drawdown, depth of drawdown and other factors can have adverse impacts upon aquatic resources.

6.2.1.5 Fish Entrainment and Mortality

Saxon Falls Project

The Saxon Falls Project features a main trashrack with one-inch clear spacing and an approach velocity of 0.71 feet per second. As discussed in Section 6.1.3, fish exceeding three inches in length have sustained swim speeds greater than 0.71 feet per second. Similarly, fish exceeding two inches in length have burst speeds greater than 0.71 feet per second. Therefore, fish in these length classes would be able to avoid entrainment or impingement.

Superior Falls Project

The superior Falls Project features a main trashrack with one-inch clear spacing and an approach velocity of 0.83 feet per second. As discussed in Section 6.1.3, fish exceeding four inches in length have sustained swim speeds exceeding the intake velocity. Similarly, fish longer than two inches have burst swim speeds exceeding the intake velocity. Therefore, both of these size class fish would be able to avoid impingement or entrainment.

Mitigation measures for fish entrainment and mortality have not been proposed in this application because the Licensee has not proposed any facility changes or changes to the run-of-river operations at either Project. Both projects have one-inch clear spacing with low intake approach velocities; therefore, the number of fish entrained is not expected to adversely impact the health of any fish population.

6.2.2 Terrestrial Impacts

6.2.2.1 Recreational Site Improvements

The Licensee is proposing to make improvements to recreational sites as described in Section 8.5. Installation of improvements could cause terrestrial impacts due to ground disturbing activities.

6.2.2.2 Bald Eagle Nests

The Saxon Falls and Superior Falls NHI Reviews are included in **Appendix E-39** and **Appendix E-40**, respectively. The NHI information, classified as privileged, identified a bald eagle nest within the vicinity of the Superior Falls Project. Project construction or maintenance activities have the potential to cause adverse impacts to the species if they are located within the 660-foot buffer zone of a nest. There are no Licensee facilities currently within the 660-foot buffer area.

6.2.2.3 NLEB Roosting Sites

Roosting sites of the federally threatened NLEB can occur in any tree. Much of the shoreline along each Project reservoir is forested. It is likely that trees will need to be harvested during the normal course of Project operations. The Saxon Falls and Superior Falls NHI Reviews, included in **Appendix E-39** and

Appendix E-40 as privileged information, did not identify any federally protected trees that are known maternity roosts or any areas where known hibernacula could be impacted within either Project boundary. As such, under the requirements of the Broad Incidental Take Permit and Broad Incidental Take Authorization (BITA) for Wisconsin Cave Bats dated August 25, 2016, the Licensee proposes to follow the applicable mitigation measures outlined in the BITA, included in **Appendix E-41**. Under the BITA, hydroelectric project activities are not likely to jeopardize the continued existence and recovery of the Wisconsin or Michigan population of the NLEB or the species plant-animal community.

6.2.2.4 Terrestrial Invasive Species

Activity within either Project boundary can pose an increased risk to the transfer of invasive species.

6.3.2.5 Erosion and Siltation Impacts

Erosion and siltation from ground-disturbing activities can have an adverse impact upon rare and sensitive resources.

6.3 Applicant Proposed Mitigation

With the implementation of the following proposed mitigation measures, the continued operation of the Projects is not expected to adversely impact the resources described herein.

6.3.1 Proposed Aquatic Mitigation

6.3.1.1 Aquatic Invasive Species

The Licensee will develop a rapid response invasive species monitoring plan for each Project to monitor for the introduction of new invasive species and limit the dispersal of established species. Within one year of license issuance, the Licensee proposes to develop a plan in consultation with MDNR and WDNR prior to filing the plan with the FERC for approval. It is estimated that developing a plan which incorporates both aquatic and terrestrial invasive species, and the corresponding biennial surveys, will cost $35,000 each.

6.3.1.2 Reservoir or River Bed

Licensee will consult with MDNR, USFWS, and WDNR before conducting any activities below the ordinary high-water mark which could disturb the reservoir or riverbed to implement appropriate measures to minimize or eliminate impacts to state and federal-listed species.

6.3.1.3 Erosion and Siltation

Although no ground disturbing measures are planned for either Project, it is possible future maintenance or construction activities could result in temporary ground-disturbance.

To reduce the potential for sedimentation during ongoing ground-disturbing activities, the Licensee will implement erosion and siltation controls designed to keep sedimentation from entering surface waters, such as silt fence, straw waddles, or temporary settling basins. These types of activities result in a temporary erosion control measure to mitigate future potential impacts on water quality in surface waters from sedimentation during construction.

To reduce the potential for sedimentation from a permanent ground-disturbance, the Licensee will implement erosion and siltation controls designed to stabilize bare soil as quickly as possible, such as mulching and seeding or stabilizing with rock. These types of activities would provide permanent erosion control measures to mitigate potential future impacts on surface water quality

The Licensee has also proposed to periodically monitor the shoreline for erosion at each Project throughout the term of the new license as described in Section 7.2. The costs for the 5-year joint erosion and archaeological shoreline surveys are identified in Section 7.3.2.

6.3.1.4 Reservoir Drawdowns

No routinely scheduled drawdowns are necessary for the operation of either Project. If a drawdown becomes necessary during the term of the new license, the Licensee will draft a drawdown management plan in consultation with the MDNR, USFWS, and WDNR to mitigate potential adverse environmental impacts. After the resource agencies comments are addressed, the Licensee will file the drawdown plan for FERC approval as part of its request for a temporary license amendment. This process would apply to non-emergency drawdowns greater than three weeks in duration.

6.3.2 Proposed Terrestrial Mitigation

6.3.2.1 Recreational Site Improvements

To mitigate for impacts associated with ground disturbing or vegetation management activities that may result from proposed recreational improvements, the Licensee plans to implement the terrestrial mitigation measures identified in the following four sections.

6.3.2.2 Eagle Nests

To mitigate impacts to the federally protected bald eagle, the Licensee is proposing to identify existing eagle nests in the vicinity of the Projects using the Wisconsin NHI database. If a nest is identified, Licensee will establish a buffer zone of at least 660 feet between the nest and any proposed construction, maintenance, or vegetation management activities. If any nests are encountered within 660 feet of said activities, the Licensee will schedule the activities between August 1 and January 15, which is outside of the eagle nesting season. In the event that work within 660 feet of an eagle nest cannot be avoided during the nesting season, the Licensee will consult with USFWS and implement agreed-upon protection measures.

6.3.2.3 NLEB Roosting Sites

To protect the federally threatened Northern Long-eared Bat (NLEB), the Licensee proposes to avoid tree removal at either Project unless the tree poses a threat to human life or property, or removal occurs outside NLEB pup season, which is June 1 to July 31. Additionally, the Licensee will only remove bats from structures within either Project boundary after consulting with USFWS and following their recommendations.

6.3.2.4 Terrestrial Invasive Species

To mitigate the spread of invasive species, the Licensee will develop a rapid response invasive species monitoring plan for pioneering species and limit the dispersal of established species. Within one year of license issuance, the Licensee proposes to develop an invasive species management plan in

consultation with MDNR and WDNR. The plan would then be filed with the FERC for approval. Terrestrial surveys will be conducted in conjunction with Aquatic surveys identified in Section 6.3.1.1.

6.3.2.5 Erosion and Siltation

Although no ground disturbing activities are currently planned for either Project, it is possible future maintenance or construction activities could result in temporary ground-disturbance.

To reduce the potential for sedimentation during ongoing ground-disturbing activities, the Licensee will implement erosion and siltation controls designed to keep sedimentation from entering surface waters, such as silt fence, straw waddles, or temporary settling basins. These types of activities result in a temporary erosion control measure to mitigate future potential impacts on water quality in surface waters from sedimentation during construction.

To reduce the potential for sedimentation that result in ground-disturbance on a permanent basis after potential construction would be complete, the Licensee will implement erosion and siltation controls designed to stabilize bare soil as quickly as possible, such as mulching and seeding or stabilizing with rock. These types of activities result in a permanent erosion control measures to mitigate future potential impacts on water quality in surface waters from sedimentation.

The Licensee is also proposing to monitor reservoir shorelines for erosion on a 5 to10 year schedule consistent with archaeological shoreline survey requirements. In addition to identifying the location of eroding shorelines, the routine monitoring will evaluate whether erosion is impacting historic or archaeological resources as described in Section 7.2.

6.3.2.6 Aesthetics

Project operations may impact the aesthetic features of the waterfalls located within the vicinity of both Projects. In response to the aesthetic study completed as part of the relicensing process (Section 9.2.3), the Licensee is recommending an increase in the minimum flow releases at the Saxon Falls Project. The study did not determine a need for minimum flows changes at the Superior Falls Project and therefore no changes are recommended.

7. Report on Historical and Archeological Resources

7.1 General History of the Area and Waterway

7.1.1 General History of the Project Areas

Prior to European settlement, the Montreal River was not used as a transportation route due to the presence of waterfalls and steep canyons along the lower portion of the river. However, the Flambeau Trail, which began at the mouth of the Montreal River, was used as one of the few routes from the south shore of Lake Superior to the interior of northern Wisconsin. The Flambeau Trail was the only practical way to reach the interior and was used by travelers from prehistoric times into the 19th century (NSPW, 1988). Hydroelectric power was introduced to the Montreal River when the Saxon Falls and Superior Falls Dams were completed in 1912 and 1917, respectively (NSPW, 2014a; NSPW, 2014b).

The Saxon Falls Hydroelectric Project was completed in 1912 by the Bessemer Railway and Light Company. The plant and dam were purchased in 1922 by the Lake Superior District Power Company, the predecessor to Northern States Power Company. The dam was reconstructed in 1940 to its present configuration (NSPW, 2014a).

The Superior Falls Hydroelectric Project was completed in 1917. The crest elevation of the dam was raised in 1935. A major spillway renovation was completed in 1999 and included refurbishing two existing steel radial gates, removing three existing wood radial gates, and replacing them with a larger steel radial gate and an overflow spillway (NSPW, 2014b).

7.2 Efforts to Identify Significant Properties (National Register Status)

On December 30, 1993, the *Programmatic Agreement among the FERC, Advisory Council on Historic Preservation, the State of Wisconsin - State Historic Preservation Officer, and the State of Michigan SHPO, for Managing Historic Properties That May Be Affected By New and Amended Licenses Issuing for the Continued Operation of Existing Hydroelectric Projects in the State of Wisconsin and Adjacent Portions of the State of Michigan* was executed (Programmatic Agreement). The Licensee's completed efforts to identify historic and archaeological properties within each Project's Area of Potential Effects (APE) in accordance with the Programmatic Agreement are detailed in the sections below.

The Programmatic Agreement defines the APE as:

- Lands enclosed by the Project boundary as delineated in the existing license.
- Attached or associated buildings and structures extending beyond the Project boundary, which contribute to the National Register of Historic Places eligibility of the hydroelectric generating facility.
- Lands or properties outside the Project boundary, where the Project may cause changes in the character or use of historic properties, if any historic properties exist.

7.2.1 Historic Properties

7.2.1.1 Saxon Falls Project

A review of the Wisconsin Architecture and History Inventory identified one structure, the Saxon Falls Hydroelectric Dam, within the Project boundary. The dam, assigned site number 227618, is over 50 years old and is part of the proposed Saxon Falls Hydroelectric Dam Historic District (SHPO, nd). The Project was previously evaluated for the NRHP and determined ineligible. No further evaluation of the site was conducted as part of the relicensing process.

7.2.1.2 Superior Falls Project

A review of the Wisconsin Architecture and History Inventory located one structure, the Superior Falls Hydroelectric Plant, within the Project boundary. The structure is assigned site number 26872 and is part of the proposed Superior Falls Hydroelectric Plant District (SHPO, nd). The site was evaluated in 1989 and determined ineligible for inclusion in the NRHP. No further evaluation of the site was conducted as part of this relicensing process.

7.2.2 Archaeological Properties

Section 106 of the National Historic Preservation Act and 36 CFR Part 800 requires a Phase I Archaeological Survey be completed at each Project to determine whether any archaeological sites are eligible for the NRHP and if they would be affected by continued operation of the Projects. NSPW hired an archaeologist in 2021 to conduct literature research and complete shoreline surveys at both Projects.

7.2.2.1 Saxon Falls Project

The archaeologist retained by the licensee conducted a literature review and archives search for the Saxon Falls Project and identified one archaeological site, 20GB51. The site is located within the Project boundary in Gogebic County, Michigan. Information about site 20BG51 is included in **Table 7.2.2.1-1**.

Table 7.2.2.1-1 Previously Identified Archaeological Sites within Saxon Falls Project APE

Site Number	Site Type	Within Proposed Project Boundary?
20GB51	House and Garden	Yes, adjacent to reservoir

The archaeologist also conducted a Phase 1 Archaeological Survey that included a visual inspection of the entire shoreline by boat. The archaeologist noted that site 20GB51 was not impacted by Project operations due to its distance downstream of the powerhouse.

When conducting the shoreline survey, the archaeologist noted erosion at one location caused by a major flood event in 2016 (see Section 4.3.4.1). The site has since re-vegetated and is stable. No other areas of erosion were noted along the Project shoreline. The archaeologist recommended that the shoreline monitoring schedule in the existing Historic Resource Management Plan (HRMP) be retained, which requires monitoring of the shoreline every five years. No additional archaeological work was recommended (TRC, 2021). The complete Archaeological Survey Report in included in **Appendix E-16**.

7.2.2.2 Superior Falls Project

The archaeologist conducted a literature review and archives research for the Superior Falls Project and identified four archaeological sites within the current Project boundary. Three of the sites, which include 47IR46, 47IR47, and 47IR48, are in Saxon Township, Wisconsin and one site, 20GB3, is in Gogebic County, Michigan. Sites 47RI46 and 20GB3 are adjacent to the Project shoreline and have the potential to be impacted by project operations (TRC, 2021). Information about the sites is included in **Table 7.2.2.2-1**.

Table 7.2.2.2-1 Previously Identified Archaeological Sites within Superior Falls Project APE

Site Number	Site Type	Within Proposed Project Boundary?
47IR46	Early-to mid- 20th century Euro-American; scattering of structural depressions, berms, foundations, and dump	Partially within, adjacent to reservoir
47RI47	Early-to mid- 20th century Euro-American, former habitation location	Partially within
47RI48	Historic Euro-American site	No
20GB3	Old garden, house remnants	Partially within, adjacent to reservoir

The archaeologist also conducted a Phase 1 Archaeological Survey, by boat and on foot when necessary, that included a visual inspection of the entire shoreline including surface inspections of the known archaeological sites listed above. Two archaeological sites, 47IR46 and 20GB3, were identified adjacent to the reservoir, while sites 47IR47 and 47IR48 are not near the river.

When conducting the shoreline survey, specific attention was given to known archaeological sites. No areas of erosion were encountered during the survey. The surface investigation at site 47IR46 noted the shoreline was well vegetated and the site was protected from any effects from Project operations. The archaeologist noted site 20GB3 is far enough downstream from the dam to be unaffected by Project operations. The remaining shoreline was well vegetated with areas of emergent and submergent vegetation along parts of the shoreline.

The archaeologist recommended that the shoreline monitoring schedule in the existing HRMP be retained, which requires monitoring every five years. No additional archaeological work was recommended (TRC, 2021). The complete Archaeological Survey Report in included in **Appendix E-16**.

7.2.3 Wisconsin Historic Society Review of Historical/Archaeological Reports

The Licensee has submitted the Saxon Falls and Superior Falls Phase 1 Archaeological Survey Report to the Wisconsin Historic Society, the Lac Du Flambeau Band of Lake Superior Chippewa Indians Tribe, Miami Tribe of Oklahoma, and Keweenaw Bay Indian Community for review as part of this application.

7.3 Proposed Mitigation Measures

7.3.1 Programmatic Agreement

The Programmatic Agreement assigns a Licensee the responsibility to "ensure that historic properties are considered in the continued operation and maintenance of hydroelectric facilities during the term of their licenses." To further this purpose, a Licensee is required to develop a HPMP or HRMP within one year of any license issuance.

7.3.2 Historic Properties Management Plans

In accordance with Stipulation II of the Programmatic Agreement, the Licensee will develop a HPMP for each Project within one year of license issuance in consultation with the following:

- Wisconsin State Historic Preservation Officer (SHPO)
- Michigan SHPO
- Lac Du Flambeau Band of Lake Superior Chippewa Indians
- Miami Tribe of Oklahoma
- Tribal Historic Preservation Officers
- Keweenaw Bay Indian Community

The HPMP will incorporate the Programmatic Agreement requirements regarding the routine monitoring of the shoreline (every five years after HPMP approval) to determine whether continued Project operation is causing shoreline erosion that may be impacting historic sites. The Licensee anticipates the cost to develop the HPMP will be approximately $15,000 at each Project. The Licensee also estimates the 5-year shoreline surveys proposed in the HPMP will cost approximately $15,000 at each Project each time a survey is completed. The costs above are in 2022 dollars.

8. Report on Recreational Resources

8.1 Existing Recreational Resources

8.1.1 Saxon Falls Project

The Saxon Falls Project is located within the Town of Saxon, Wisconsin and Ironwood Township, Michigan. Recreation sites located on Licensee-owned property are depicted on the Project boundary drawings provided in Exhibit G of this application and are listed in **Table 8.1.1-1**. The Saxon Falls Boat Launch, Canoe Portage Take-Out and Put-in, and Saxon Falls Tailwater Access are the only recreation sites currently identified as FERC-approved recreation facilities according to the Form 80 Report filed in 2015 (NSPW, 2015a). The scenic overlook is currently an informal recreation site. Additional recreation sites in the vicinity of the Saxon Falls Project are listed in **Table 8.1.1-2**.

Table 8.1.1-1 Recreation Sites Within the Saxon Falls Project Boundary

Recreation Site	Boundary Location	Owner	Operate/ Maintain	Amenities
Saxon Falls Boat Landing, Canoe Portage Take-Out	Within	NSPW	NSPW	• Bank fishing • Boat launch (single lane) • Canoe portage take-out • Parking • Signage
Saxon Falls Scenic Overlook	Within	NSPW	NSPW	• Hiking path • Scenic overlook • Parking • Portable toilet • Signage
Saxon Falls Tailwater Access, Canoe Portage Put-In	Within	NSPW	NSPW	• Bank fishing • Canoe portage put-in access • Tailwater access

Table 8.1.1-2 Recreation Sites in the Vicinity of the Saxon Falls Project Boundary

Recreation Site	Boundary Location	Owner	Operate/ Maintain	Amenities
Gogebic County Powers Road Recreation Area	Adjacent	Gogebic County	Gogebic County	• ATV/ snowmobile trails • Hiking, biking trails • Horse trails • Hunting trails
Iron County Forest	Outside	Iron County	Iron County	• ATV/Snowmobile trails • Boating areas • Camping • Cross-country ski, snowshoe trails • Hiking, biking trails

8.1.2 Superior Falls Project

The Superior Falls Project is located within the Town of Saxon, Wisconsin and Ironwood Township, Michigan. Recreation sites on Licensee-owned property are depicted on the Project boundary drawings provided in Exhibit G of this application and are listed in **Table 8.1.2-1**. The Superior Falls Canoe Take-Out, Superior Falls Scenic Overlook, and Superior Falls Tailwater Fishing Access are currently identified as FERC-approved Project recreation facilities according to the Form 80 Report filed in 2015 (NSPW, 2015b). Additional recreation sites in the vicinity of the Saxon Falls Project are listed in **Table 8.1.2-2**.

Table 8.1.2-1 Recreation Sites Within the Superior Falls Project Boundary

Recreation Site	Boundary Location	Owner	Operate/ Maintain	Amenities
Superior Falls Canoe Take-Out	Within	NSPW	NSPW	• Canoe portage take-out • Parking • Signage
Superior Falls Scenic Overlook	Within	NSPW	NSPW	• Hiking path • Scenic overlook • Parking • Portable toilet • Signage
Superior Falls Tailwater Fishing Area	Within	NSPW	NSPW	• Bank fishing • Hiking path • Parking • Signage
North Country National Scenic Trail	Within	NCSTA	NCSTA	• No amenities[14]

Table 8.1.2-2 Recreation Sites in the Vicinity of the Superior Falls Project Boundary

Recreation Site	Boundary Location	Owner	Operate/ Maintain	Amenities
Gogebic County Lake Superior Overlook	Adjacent	Gogebic County	Gogebic County	• Benches • Hiking path • Scenic overlook
Saxon Harbor Country Park	Outside	Iron County	Iron County	• Boat launch • Campground • Marina • Parking area • Picnic shelters • Picnic area • Playground facilities • Restrooms • Shelters
Gogebic County Powers Road Recreational Area	Adjacent	Gogebic County	Gogebic County	• Hunting trails • Hiking/biking trails • Horse trails • ATV/ snowmobile trails

[14] The first 13.5 miles of trail from the Michigan state line to the west is currently classified as a “Road Walk” (NCTA, nd). There are no amenities or signs identifying this trail within the Superior Falls Project boundary, which runs on the shoulder of Hwy 122.

Recreation Site	Boundary Location	Owner	Operate/ Maintain	Amenities
Iron County Forest	Outside	Iron County	Iron County	• ATV/snowmobile trails • Boating areas • Camping • Cross-country ski/ snowshoe trails • Hiking/biking trails

8.2 Existing Recreation Plans

The area around the Saxon Falls and Superior Falls Projects offers an abundance of outdoor recreation opportunities. Iron County and Gogebic County have recognized the contribution of recreation to the quality of life for its citizens. Recognizing the need to plan for orderly growth, each unit of government has developed outdoor recreation plans which are described in the following sections.

8.2.1 Iron County Outdoor Recreation Plan

Iron County developed the *Iron County Outdoor Recreation Plan 2016-2020*, which is included in **Appendix E-42**. This plan evaluates existing outdoor recreation resources, anticipates future demands, and identifies recommendations for county-administered outdoor recreation facilities. It serves to meet varied recreation needs of county residents and visitors, as well as protect, conserve and enhance the county's natural, historical, and cultural resources. The plan places a high priority on maintenance of existing facilities and increasing the promotion of recreation opportunities in the county (IC&PC, 2016).

The plan specifies improvements to Saxon Harbor County Park, which is approximately 1 mile west of the Superior Falls Dam, and continued maintenance of existing Iron County ATV and snowmobile trails, which are near the Saxon Falls and Superior Falls Projects. Iron County also plans to continue cooperation with the North Country Trail Association to expand certified portions of the national scenic trail (IC&PC, 2016).

8.2.2 Gogebic County Recreation Plan

Gogebic County developed *Gogebic County 2018-2022 Recreation Plan,* which is included in **Appendix E-43**. The plan ensures quality recreational facilities are available to both residents and visitors and was written to guide future parks and recreation improvement activities for the county. The intent of this plan is to evaluate the county's existing recreation facilities, determine future needs, and establish a program of facility improvements to county-owned facilities (GC, 2018).

The plan identifies improvements for two county-owned areas near the Saxon Falls and Superior Falls Projects. They include the Powers Road Recreation Area adjacent to both Projects and Little Girl's Point Park located 5 miles northeast of the Superior Falls Project. Planned improvements at the Powers Road Recreation Area include upgrading the trailhead with new gravel and making improvements to existing trails. Planned improvements to Little Girl's Point Park include installation of new restrooms with flush toilets. (GC, 2018).

8.2.3 Wisconsin Statewide Comprehensive Outdoor Recreation Plan

Wisconsin regualary publishes a Statewide Comprehensive Outdoor Recreation Plan as required by the Federal Land and Water Conservation Fund Act of 1965. The SCORP is used to help allocate federal funds among local communities and focuses on preserving and improving recreation opportunities in Wisconsin while targeting relationships such as public health and wellness, urban access to outdoor recreation, and public and private partnerships. The SCORP recognizes that one of the top-priority needs is to provide more recreation places near urban centers to support a variety of nature-based recreation (WDNR, 2019). The Wisconsin SCORP is included in **Appendix E-44**.

8.2.4 Michigan Statewide Comprehensive Outdoor Recreation Plan

Michigan regularly publishes a Statewide Comprehensive Outdoor Recreation as required by the Federal Land and Water Conservation Fund Act of 1965. The SCORP is used to help allocate federal funds among local communities and focuses on raising awareness of recreational opportunities, improving recreational access, providing quality experiences, and enhancing health by increasing physical activity levels (MDNR, 2017). The Michigan SCORP is included in **Appendix E-45**.

8.3 Estimated Use of Existing and Potential Recreation Resources

8.3.1 Recreation Survey Methods and Results

As part of relicensing consultation, stakeholders requested that recreational use information be collected at recreation areas in the vicinity of both Projects to document recreation utilization and recreation needs within each Project boundary.

The Licensee conducted a recreation study consisting of the following:

- Recreation site inventory
- Recreation facility condition assessment
- Recreation use surveys
- Recreation questionnaire

Recreation in the vicinity of the Saxon Falls and Superior Falls Projects is dominated by county park and county forest facilities. Many of these facilities offer dispersed recreation opportunities which are not dependent upon either Project. Therefore, during the recreation study, only those facilities within the current project boundaries were evaluated. Other park recreation needs have been identified in each entity's recreation plans and were described above in Section 8.2.

8.3.2 Recreation Site Inventory

8.3.2.1 Saxon Falls Project

The recreation site inventory for Saxon Falls was completed during the summer of 2021 to collect information on recreation amenities and capacities, primary type of recreation provided at each site, existing sanitation facilities, type of vehicle access and parking, presence and type of barrier free facilities, and photographs of amenities. A summary of amenities at the Saxon Falls Project is shown in **Table 8.3.2.1-1** Recreation Inventory and Condition Assessment Forms are included in **Appendix E-46** and photographs of amenities are included in **Appendix E-47**.

Table 8.3.2.1-1 Saxon Falls Recreation Site Inventory

Recreation Site	Parking Sites	Boat Launch/ Put-In Access	Picnic Facilities	Bank Fishing	Part 8 Sign	Other Signage
Saxon Falls Boat Landing, Canoe Portage Take-Out	9-10 (vehicle-trailer)	Boat Launch (1 lane)	No	Yes	Yes	• Regulation (3) • Directional (2) • Interpretive (1) • Part 8 (1)
Saxon Falls Scenic Overlook*	8-10 (vehicle)	No	No	No	Yes	• Regulation (3) • Directional (4) • Part 8 (1)
Saxon Falls Tailwater Access, Canoe Portage Put-In*	8-10 (vehicle)	Put-In Access	No	Yes	Yes	• Regulation (3) • Directional (4) • Part 8 (1)

** These sites share a parking area, portable toilet, and signage*

Saxon Falls Boat Landing

The Saxon Falls Boat Landing is owned and maintained by NSPW. The site has a one lane boat launch with a gravel base as shown in **Figure 8.3.2.1-1**. A canoe portage take-out is located on the left side of the dam. There are seven signs including three regulatory signs, two directional signs, one interpretive sign (**Figure 8.3.2.1-2**), and one Part 8 sign.

Figure 8.3.2.1-1 Saxon Falls Boat Launch with Canoe Portage Take-Out in Background

Figure 8.3.2.1-2 Interpretive Sign at the Saxon Falls Boat Landing

Saxon Falls Scenic Overlook and Tailwater Access

The Saxon Falls Scenic Overlook and Tailwater Access sites are owned and maintained by NSPW. These two sites have a shared gravel parking area that can accommodate 8-10 vehicles as shown in **Figure 8.3.2.1-3**. The site also features a portable toilet. A short hiking path leads to a scenic overlook of the Saxon Falls waterfall as shown in **Figure 8.3.2.1-4**. The stairway shown in **Figure 8.3.2.1-5** leads down to the tailwater access and canoe portage put-in, which is depicted in **Figure 8.3.2.1-6**. There are a total of eight signs at the site including three regulatory signs, four directional signs, and one Part 8 sign.

Figure 8.3.2.1-3 Saxon Falls Scenic Overlook and Tailwater Access Parking Area

Figure 8.3.2.1-4 Saxon Falls Scenic Overlook

Figure 8.3.2.1-5 Stairway Leading to Tailwater

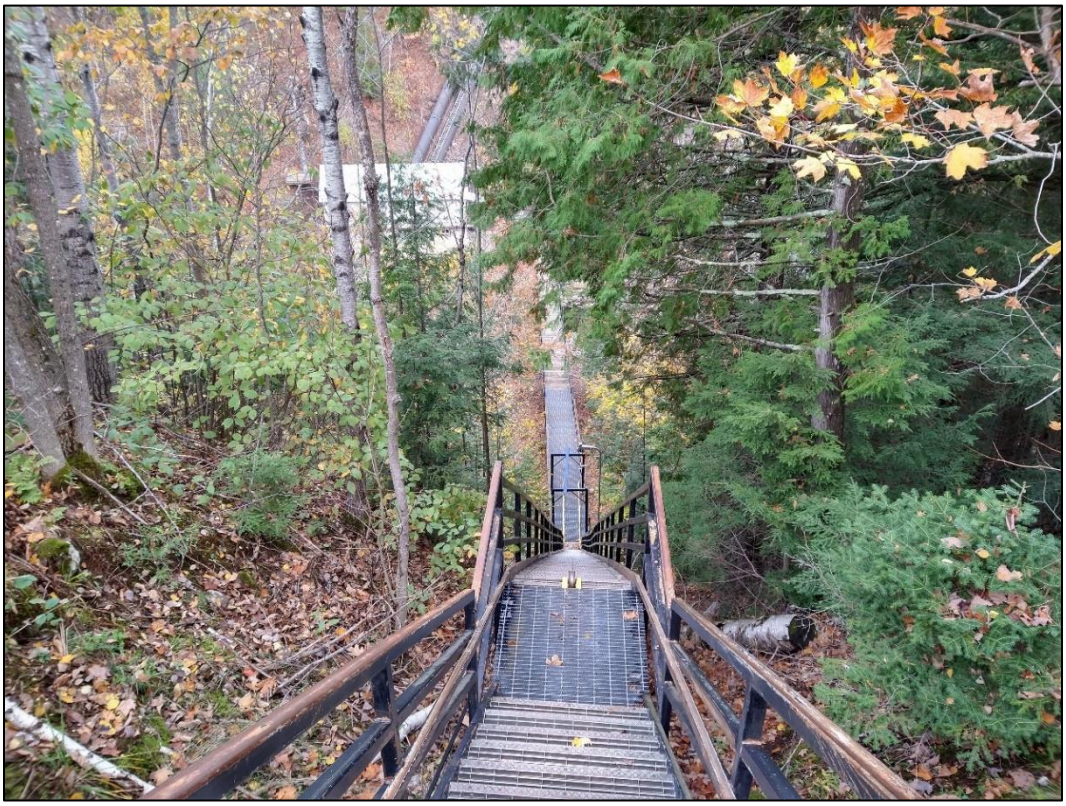


Figure 8.3.2.1-6 Canoe Portage Put-In Access

8.3.2.2 Superior Falls Project

The recreation site inventory for Superior Falls was completed during the summer of 2021 to collect information on recreation amenities and capacities, primary type of recreation provided at each site, existing sanitation facilities, type of vehicle access and parking, presence and type of barrier free facilities, and photographs of amenities. A summary of amenities at the Superior Falls Project is shown in **Table 8.3.2.2-1**. The Recreation Inventory and Condition Assessment Forms are included in **Appendix E-46** and photographs of the amenities are included in **Appendix E-47**.

Table 8.3.2.2-1 Superior Falls Recreation Site Inventory

Recreation Site	Parking Sites	Boat Launch/ Put-In Access	Picnic Facilities	Bank Fishing	Part 8 Sign	Other Signage
North Country Trail	0	No	No	No	No	No
Superior Falls Canoe Take-Out	3	Yes (small boats)	No	Yes	No	• Directional (1)

Recreation Site	Parking Sites	Boat Launch/ Put-In Access	Picnic Facilities	Bank Fishing	Part 8 Sign	Other Signage
Superior Falls Scenic Overlook	15*	No	No	No	Yes**	• Regulation (9) • Directional (3) • Interpretive (1) • Part 8 (1)
Superior Falls Tailwater Area	15*	No	No	Yes (fishing area)	Yes**	• Regulation (7) • Directional (3) • Interpretive (1) • Part 8 (1)

** These sites share a parking area and portable toilet*
*** Part 8 Sign does not meet regulations*

Superior Falls Canoe Take-Out (Superior Falls Flowage)

The Superior Falls Canoe Take-Out is owned and maintained by NSPW and located within the road right-of-way of State Hwy 122. The site features parking that can accommodate up to three vehicles along the side of the road as shown in **Figure 8.3.2.2-1**. The site also includes one directional sign and a path leading from the water's edge to the parking area (see **Figure 8.3.2.2-2**).

Figure 8.3.2.2-1 Superior Falls Canoe Take-Out Parking Area

Figure 8.3.2.2-2 Superior Falls Canoe Take-Out Signage and Path to Parking Area

Superior Falls Scenic Overlook

The Superior Falls Scenic Overlook is owned and maintained by NSPW and includes a short hiking path with views of the Superior Falls waterfall (**Figure 8.3.2.2-3**). The associated parking area can accommodate approximately 15 vehicles and includes a portable toilet (**Figure 8.3.2.2-4**). The parking area and toilet are shared amenities with the tailwater access site. There are fourteen signs at the site including nine regulatory signs, three directional signs, one interpretive sign, and a Part 8 sign.

Figure 8.3.2.2-3 Superior Falls Scenic Overlook View

Figure 8.3.2.2-4 Superior Falls Scenic Overlook Parking Area, Portable Toilet, and Signage

Superior Falls Tailwater Fishing Area

The Superior Falls Tailwater Fishing Area is owned and maintained by NSPW. The site shares a gravel parking area and portable restroom with the Superior Falls Scenic Overlook. A path leads from the parking area to the tailwater access as shown in **Figure 8.3.2.2-5**. There are twelve signs at the site including seven regulatory signs, three directional signs, one interpretive sign, and one Part 8 sign. **Figure 8.3.2.2-6** shows one of the seven regulatory signs.

Figure 8.3.2.2-5 Superior Falls Path to Tailwater Fishing Area

Figure 8.3.2.2-6 Safety Signage at Tailwater Access

8.3.3 Recreation Facility Condition Assessment

An assessment of recreation facilities was completed for both Projects to determine if their amenities were in good condition or required maintenance, repair, or replacement.

8.3.3.1 Saxon Falls Project

A summary of recommended recreational improvements at the Saxon Falls Project is shown in **Table 8.3.3.1-1**. The complete results for the recreation site condition assessments can be found in **Appendix E-46**.

Table 8.3.3.1-1 Recommended Saxon Falls Recreation Facility Improvements

Recreation Site	Recommended Improvements
Saxon Falls Boat Landing	• Maintenance of boat ramp is recommended (additional gravel and/or grading). • Recommend relocating take-out from dam to boat ramp so boaters do not need to cross under the safety buoys.
Saxon Falls Scenic Overlook	• Part 8 sign does not meet current standards; replacement is recommended. • Additional safety signage requesting recreationists to stay behind safety fencing at the overlook is recommended.
Saxon Falls Tailwater Access	• Replace signage on gate prohibiting use of the stairs to access the tailwater area.

8.3.3.2 Superior Falls Project

A summary of recommended recreational improvements at the Saxon Falls Project is shown in **Table 8.3.3.2-1**. The complete results for the recreation site condition assessments can be found in **Appendix E-46**.

Table 8.3.3.2-1 Recommended Superior Falls Recreation Facility Improvements

Recreation Site	Recommended Improvements
North Country Trail	• No recommendations for improvements were provided for this site.
Superior Falls Canoe Take-Out	• Path from take-out to parking area is overgrown; maintenance is recommended. • No Part 8 sign at the site; recommend installation of a Part 8 sign meeting current standards.
Superior Falls Scenic Overlook	• Informational sign is weathered; replacement is recommended. • Part 8 sign does not meet current standards; replacement is recommended. • Gravel parking area needs maintenance; add gravel and/or grade.
Superior Falls Tailwater Area	• Informational sign, Part 8 sign, and parking area are shared with Superior Falls Scenic Overlook. Recommendations are above. • Two warning signs on north side of powerhouse are faded and hard to read; replacement of the signs is recommended. • The No Trespassing sign at penstock stairway is damaged and faded; replacement is recommended.

8.3.4 Recreation Use Surveys

Surveys were conducted on 14 randomly selected weekdays, weekends, and holiday weekend days from April through September 2021 to quantify recreational during the recreation season. The recreational use survey schedule is shown in **Table 8.3.4-1** and a summary of the recreation observations are discussed in the sections below.

Table 8.3.4-1 Recreation Use Survey Dates

Date (2021)	Type of Day
April 11	Weekend
April 17	Weekend
May 22	Weekend
May 30	Holiday Weekend
June 5	Weekend
June 15	Weekday
June 19	Weekend
July 17	Weekend
July 21	Weekday
July 25	Weekend
August 10	Weekday
August 15	Weekend
August 21	Weekend
September 12	Weekend

8.3.4.1 Saxon Falls Project

Saxon Falls Boat Launch

The Saxon Falls Boat Launch experienced 14 recreation users over the 14 days surveyed. The number of individuals recreating at the site ranged from a maximum of four users at one time on both May 22 and May 30, to a minimum of zero individuals on nine observation days. The primary recreation activities observed were boat fishing and sightseeing.

Saxon Falls Scenic Overlook

The Saxon Falls Scenic Overlook experienced 27 recreation users over the 14 days surveyed. The number of individuals recreating at the site ranged from a maximum of four users on both June 5 and August 21, to a minimum of zero individuals on both April 17 and August 10. The primary recreation activity observed was sightseeing.

Saxon Falls Tailwater Access

The Saxon Falls Tailwater Access area experienced six recreation users over the 14 days surveyed. The number of individuals recreating at the site ranged from a maximum of four users at one time on April 17 to a minimum of zero individuals on 11 observations days. The primary recreation activities observed were non-power boating and sightseeing.

8.3.4.2 Superior Falls Project

North Country Trail

The North County Trail experienced a total of one recreation user over the 14 days surveyed. The recreation user was observed sightseeing on April 11.

Superior Falls Canoe Take Out

The Superior Falls Canoe Take out did not experience any recreation user over the 14 days surveyed.

Superior Falls Scenic Overlook

The Superior Falls Scenic Overlook experienced 25 recreation users over the 14 days surveyed. The number of individuals recreating at the site ranged from a maximum of five users on July 17 to a minimum of zero users on 6 observation days. The only recreation activity observed was sightseeing.

Superior Falls Tailwater Access

The Superior Falls Tailwater Access experienced a total of 76 recreation users over the 14 survey days. The number of individuals recreating at the site ranged from a maximum of 13 users on July 17 to a minimum of two users at one time on June 15. The primary recreation uses observed were shore fishing, non-powered boating, and sightseeing.

8.3.5 Overall Recreation Use Summary

Each recreation site was analyzed for current capacity or use and maximum capacity. The analysis included two assumptions, that the number of parking spaces was the limiting factor for capacity at each recreation site and each observed vehicle represented an average of 1.5 people. The daily capacity was then calculated by multiplying the number of dedicated parking spaces at each site by 1.5. The results from the analysis are included in the following sections. Completed recreation survey forms and summary spreadsheets for the both Projects are included in **Appendix E-46**.

8.3.5.1 Saxon Falls Project

Recreation use recorded at Saxon Falls during the survey period is shown in **Table 8.3.5.1-1**. The Saxon Falls Scenic Overlook received the most use during the survey period with 28 observed users, followed by the Saxon Falls Boat Launch with 14 observed users, and the Saxon Falls Tailwater Access with six observed users. Based on the analysis, the Saxon Falls Scenic Overlook had the highest annual average utilization rate at 12.9%, followed by the Saxon Falls Boat Launch at 6.7%, and the Saxon Falls Tailwater Access at 2.9%. All three recreation sites had maximum daily utilization rates of 26.7%.

Table 8.3.5.1-1 Saxon Falls Recreation Use Survey Summary

Recreation Site	Total Users Observed (All dates)	Average Percent Capacity Observed (All dates)	Maximum Daily Percent Capacity Observed
Saxon Falls Scenic Overlook	28	12.9%	26.7%
Saxon Falls Boat Launch	14	6.7%	26.7%
Saxon Falls Tailwater Access	6	2.9%	26.7%

8.3.5.2 Superior Falls Project

Recreation use recorded at Superior Falls during the survey period is shown in **Table 8.3.5.2-1**. The Superior Falls Tailwater Access received the most use during the survey period with 76 observed users, followed by the Superior Falls Scenic Overlook with 25 observed users, and the North Country Trail with one observed user. No use at the Canoe Portage Take-Out was noted during the survey. Based on the analysis, the Superior Falls Tailwater Access had the highest annual average utilization rate at 36.2%, followed by the Superior Falls Scenic Overlook at 11.9%, North Country Trail at 1.0%, and Superior Falls Canoe Take-Out at 0.0%.

Table 8.3.5.2-1 Superior Falls Recreation Use Survey Summary

Recreation Site	Total Users Observed (All dates)	Average Percent Capacity Observed (All dates)	Maximum Daily Percent Capacity Observed
Superior Falls Tailwater Area	76	36.2%	86.7%
Superior Falls Scenic Overlook	25	11.9%	33.3%
North Country Trail	1	1%	1.4%
Superior Falls Canoe Take-Out	0	0%	0%

** Since there is no parking area for the North Country Trail, it was assumed to have a capacity of five hikers*

8.3.6 Estimate of Current and Future Recreation Use

8.3.6.1 Saxon Falls Project

Based upon the results from the Saxon Falls recreation use study, a total of 47 users were observed over fourteen recreation days for an average of 3.4 users per day (47 users divided by 14 days). Assuming each observation accounted for an entire recreation day, the recreation total from April through September, 2021 was 622 days (183 days multiplied by 3.4 users per day). Assuming that 25% of recreation use occurs during the off-season (October to March), the Saxon Falls Project experienced 156 recreation days during the off-season. This calculates to an annual total of 778 estimated recreation days at the Project's recreation facilities in 2021.

As stated in Section 4.6, Iron County is projected to experience a population decrease of 11.7% during the 2020 to 2040 timeframe (DSC, 2013b). Typically, it can be assumed that the population growth rate will have a corresponding impact on recreation use. Licensee used a conservative approach in its recreation analysis and assumed that the recreation demand would remain unchanged from 2020 – 2040, despite the expected population decrease.

8.3.6.2 Superior Falls Project

Based upon the results from the Superior Falls recreation study, a total of 102 users were observed over fourteen recreation days for an average of 7.3 users per day (102 users divided by 14 days). Assuming each observation accounted for an entire recreation day, the total recreation use from April through September, 2021 was 1,336 days (183 days at 7.3 users per day). Assuming that 25% of recreation use occurs during the off-season (October to March), the Superior Falls Project experienced 334 recreation days during the off-season. This calculates to an annual total of 1,670 estimated recreation days at the Project's recreation facilities in 2021.

As stated in Section 4.6, Gogebic County is projected to have a population decrease of 11.3% from 2020 to 2040 (DTMB, nd). Typically, it can be assumed that the population growth rate will have a corresponding impact on recreation use. Licensee used a conservative approach in its recreation analysis and assumed that the recreation demand would remain unchanged from 2020 – 2040, despite the expected population decrease.

8.3.7 Recreation Questionnaires

A questionnaire was sent to local municipalities and other entities responsible for recreation facilities in the vicinity of the Projects determine future recreation needs. Those entities included: AW, FOG, Hurley Chamber of Commerce, North Country Trail Association, Ironwood Chamber of Commerce, Iron County Forestry and Parks, and Gogebic County Forestry and Parks Commission. Responses were received from the Iron County Forestry and Parks Department and Gogebic County Forestry and Parks Commission and are described below. No questionnaires were received from AW, FOG, Hurley Chamber of Commerce, North Country Trail Association, or Ironwood Chamber of Commerce. The completed questionnaires that were returned to the licensee are included in **Appendix E-48**.

8.3.7.1 Iron County Forestry and Parks

Iron County Forestry and Parks indicated it oversees all motorized recreational trails in the county, as well as a state-funded snowmobile trail that runs along Hwy 122 in the Superior Falls Project vicinity. In addition, the agency indicated the amenities and parking areas associated with their recreation sites do not exceed capacity. They did not identify any planned improvements or development of new recreation sites, nor a need for any new recreation facilities.

8.3.7.2 Gogebic County Forestry and Parks Commission

Gogebic County Forestry and Parks Commission is responsible for maintenance and access to the Montreal River Gorge Overlook, as well as the Lake Superior Overlook and Trail 160 (multiuse) along the Montreal River. The Parks Commission indicated that the Lake Superior Overlook parking area exceeds capacity at times during the summer. There are no planned improvements to any of the County's existing recreation sites or plans to develop any other recreation facilities. The Park Commission did identify the need for improved walking and multi-use trails within the Project vicinity.

8.4 Whitewater Recreation

Several entities requested that Licensee conduct a whitewater flow study to determine the need for whitewater recreation below Saxon Falls. Study requests were received from AW, FOG, NPS, and several recreational boaters.

The Licensee conducted a Whitewater Recreational Flow Study on May 15, 2021 to evaluate the optimal flow for whitewater recreation downstream of the Saxon Falls Project.

8.4.1 Whitewater Study Goals and Objectives

The goal of the Whitewater Recreational Flow Study was to evaluate the effects of various flow releases from the Saxon Falls Project on the availability of whitewater boating opportunities downstream in the Montreal River Canyon.

The study objectives included the following:

- Evaluate incremental flow releases from the Saxon Falls Project to determine optimal whitewater boating conditions for various skill sets.
- Quantify the effect on lost generation and the impact on water levels at the upstream Gile Flowage for any period of planned flow releases adjusted for the month in which it could occur.
- Develop an estimate of potential whitewater boating use if scheduled releases were provided.
- Identify any competing recreational uses or environmental needs associated with scheduled releases.
- Quantify the difficulty rating for each river reach at various flows as listed on the AW website.
- Evaluate existing and any other potential enhancements needed for boating this reach of the Montreal River.

8.4.2 Whitewater Recreation Study Methods

The flow study began immediately downstream of the Saxon Falls Powerhouse and extended approximately 2.1 miles downstream to the upper reaches of Superior Falls Flowage. Once boaters exited the Montreal River Canyon, an additional 1.2-mile paddle across the Superior Falls Flowage was required to reach the canoe take-out at Hwy 122. Since it is not possible to exit the canyon due to the steep topography and lack of access, the entire 3.3 mile run was considered one reach for study purposes.

To conduct the study, it was necessary for water to be released from the Licensee's upstream Gile Flowage since the Saxon Falls Flowage has no storage capacity. It took approximately 10 hours for water released from the Gile Flowage to arrive at the Saxon Falls Powerhouse.

Eleven boaters participated in the study which included eight individuals with hard shell kayaks and three individuals in one raft. Boaters were instructed to exit the water at the proposed canoe portage take-out described in Section 8.7.2 and evaluate said take-out. Boaters provided input on recommended flows to be evaluated prior to each run. Two runs were made, the first run was at 700 cfs (actual: 700 cfs) and the second run was at 900-1,000 cfs (actual: 950 cfs).[15]

After each run, boaters filled out the "Boater Evaluation Form" which asked them the following:

- How would you rate the whitewater classification of the reach?
- Would you choose to paddle that specific flow again in the future?
- Would you prefer a higher or lower flow level or was that specific flow the optimum level?
- Was the reach boatable and safe at that specific level?
- Were there any specific challenges at that specific flow?
- Did you portage any features at that specific flow?

[15] Based on post-study review of gate opening and inflow from the West Fork of the Montreal River, the actual flows evaluated were 700 cfs and 950 cfs.

Boaters completed the "Summary Boater Evaluation Form" after each run was completed, which allowed them to compare the different flow releases. Boaters were asked the following:

- What is the lowest flow needed to adequately boat the bypass reach?
- What is the lowest flow that provides quality boating?
- What is the optimal range that provides the best whitewater boating?
- What is the highest flow that can safely be boated?
- What is the minimum acceptable flow?
- What is the optimal flow?
- What is the best or optimal flow for a standard trip?
- What is the best or optimal flow for a high challenge trip?
- If one flow were to be released for boating, what would be the preferred flow?

Additional data was collected regarding the length of the trip, portages, sufficiency of the put-in and take-out, likelihood of returning to boat the bypass if the optimum flow were provided, time of year they would be likely to return to boat the reach, and how they would like to receive flow information for releases.

Completed evaluation forms were used to generate a discussion with all boaters regarding the optimum flow range and the highest safe flow for their watercraft. A follow-up email was also sent those boaters who participated in the study one week after the event to request any additional comments or clarifications not previously provided on the forms or the post-study discussion. The Whitewater Flow Study Protocol is included in **Appendix E-49**.

8.4.3 Whitewater Recreation Flow Study Results - Boater Evaluation Form

Boater ratings (skill level) for difficulty based on the International Whitewater Scale needed to paddle the reach for the two flows studied are shown in **Table 8.4.3-1** and included in **Appendix 50**. The majority of boaters rated the 700 cfs flow as a Class II to Class III.[16] Boaters were evenly split on whether the 900-1,000 cfs flow was a Class II to Class III or a Class III.[17]

Table 8.4.3-1 Boater Rating (Skill Level) Needed to Run the Montreal River Below the Saxon Falls Powerhouse Based on Whitewater Classification for Flow

Difficulty	Flow 1: 700 cfs (actual: 700 cfs)	Flow 2: 900-1,000 cfs (actual: 950 cfs)
Class I to Class II	1	0
Class I to Class III	0	1
Class II	1	0
Class II to Class III	7	2
Class II+ to Class III-	1	0
Class II+ to Class III	1	0
Class II+ to Class III+	0	2
Class III	0	5
Class III +	0	1

[16] Actual flow was determined post-study to be 700 cfs.
[17] Actual flow was determined post-study to be 950 cfs.

Boaters were asked how likely they would be to return for future boating for each of the two studied flows. Responses are shown in **Table 8.4.3-2** and indicate boaters would either "Probably" or "Definitely Yes" return to boat the studied flows.

Table 8.4.3-2 Probability of Boaters to Return to Boat the Studied Flows

Study Flow	Likelihood to Return to Boat the Studied Flow			
	Definitely No	Possibly	Probably	Definitely Yes
Flow 1: 700 cfs (actual: 700 cfs)	0	0	3	8
Flow 2: 900-1,000 cfs (actual: 950 cfs)	0	0	1	10

Based on each flow studied, boaters were asked to indicate whether they would prefer a flow that was much lower, lower, higher, much higher, or whether they considered the studied flow to be optimal. Responses are shown in **Table 8.4.3-3**. All boaters indicated that recreation flows should be higher than Flow 1, while a slight majority indicated that Flow 2 was the optimal flow. The remaining boaters preferred higher flows.

Table 8.4.3-3 Boater Study Flow Preferences

Study Flow	Preference of Study Flow				
	Much Lower	Lower	Higher	Much Higher	Optimum
Flow 1: 700 cfs (700 actual) cfs)	0	0	11	0	0
Flow 2: 900-1,000 cfs (950 actual cfs)	0	0	5	0	6

Various characteristics for each river reach, including boatability, boater safety, and aesthetics, were rated on a scale of 1 to 5, with 1 being "Strongly Disagree" and 5 being "Strongly Agree." The study reach was deemed to be boatable, safe, and aesthetically pleasing under both flows. **Tables 8.4.3-4 and 8.4.3-5** provide a comparison of the boater responses for Flow 1 and Flow 2, respectively. Responses indicate Flow 1 and Flow 2 provided a quality boating experience, but Flow 2 received higher approval ratings.

Table 8.4.3-4 Boater Responses for Flow Characteristics for Flow 1: 700 cfs (700 actual cfs)

Reach at Flow 1 Statement	(1)	(2)	(3)	(4)	(5)	Average
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	
Boatable	0	0	0	5	6	4.5
Safe	0	0	0	4	7	4.6
Aesthetic	0	0	0	2	9	4.8

Table 8.4.3-5 Boater Responses for Flow Characteristics for Flow 2: 900-1,000 cfs (actual: 950 cfs)

Reach at Flow 2 Statement	(1) Strongly Disagree	(2) Disagree	(3) No Opinion	(4) Agree	(5) Strongly Agree	Average
Boatable	0	0	0	1	10	4.9
Safe	0	0	0	1	10	4.9
Aesthetic	0	0	0	1	10	4.9

8.4.4 Whitewater Recreation Flow Study Results - Summary Boater Evaluation Form

After the last run was completed and the corresponding boater evaluation forms were completed, boaters were asked to complete a Summary Boater Evaluation Form to compare the two flows studied (**Appendix 50**). The six tables that follow summarize boater responses to the various questions included on the summary forms.

Table 8.4.4-1 summarizes boater responses assessing flow levels in the reach for various whitewater boating opportunities.[18] The boaters' responses for what the optimal range should be that provides the best whitewater boating for the reach, optimal flow for a standard trip, and preferred flow if only one flow was released were fairly close, ranging between 950 to 2,500 cfs. The average values ranged between 1,082 to 1,259 cfs. The optimal flow for a high challenge trip varied between 1,000 to 5,000 cfs, with an average value of 2,300 cfs. The variation is due in part to boater skill and experience and personal preference.

Table 8.4.4-1 Comparative Flow Levels

Statement	Boater Response		Average (cfs)
	Low (cfs)	High (cfs)	
Optimal range to provide best whitewater boating for this reach	950	2,500	1,200
What is the highest safe flow for your craft and skill level	950	15,000	5,217
For you, what is the optimal flow for this run	950	2,500	1,341
What is the best or optimal flow for a "standard" trip	950	1,500	1,082
What is the best or optimal flow for a "high challenge" trip	1,000	5,000	2,300
If one flow were released, what flow would you prefer	950	2,000	1,259

Boaters provided opinions on the specifics of the river reach, such as length of run and portages, using a scale of 1 (strongly disagree) to 5 (strongly agree). Individual boater responses are summarized in **Table 8.4.4-2**. All boaters agreed that the reach provided a run of significant length and portages were adequate. Although it was not a question included on the survey forms, all boaters indicated the proposed canoe portage take-out was preferred to the existing take-out at Hwy 122.

[18] Please note: These results are skewed because the boater perception of flow amounts was based upon a different value than the actual flow value determined after the study.

Table 8.4.4-2 Whitewater Reach Specifics

Statement	(1) Strongly Disagree	(2) Disagree	(3) No Opinion	(4) Agree	(5) Strongly Agree	Average
Run is a good length	0	0	0	4	7	4.6
Portages are not a problem	0	0	0	3	8	4.7

Boaters provided input on their use of the Montreal River Canyon in the future and suitability for boaters will varying skill sets. Boaters' responses are summarized in **Table 8.4.4-3**. All boaters indicated that they would probably or definitely return if the optimum flow were provided. Only two boaters felt the study flows were not suitable for beginner boaters. All boaters felt that the reach provided suitable "boat-play" opportunities at flows ranging from 700 to1,200 cfs.

Table 8.4.4-3 Potential Use of the Montreal River Canyon for Boating and Associated Flow

Statement	Definitely No	Possibly	Probably	Definitely Yes
Likely to return f if optimum flow provided	0	0	1	10
Would any study flow be suitable for beginners	2	0	3	6
Would any study flow be suitable for play boating	0	0	1	10
Statement	**Range (cfs)**		**Average (cfs)**	
If suitable for beginners, at what flow	500 to 1,000		811.1	
If suitable for play boating, at what flow	700 to 1,200		977.5	

Boaters were asked what months they would return to boat the reach and their responses are summarized in **Table 8.4.4-4**. Most boaters selected a range of months, with June through September being the most popular.

Table 8.4.4-4 Preferred Timing of Boating Releases

Apr	May	June	July	Aug	Sept	Oct	Nov
3	8	11	11	10	10	4	2

Boaters were provided three options for indicating their preferred method for receiving information regarding recreational flow releases. Those options included telephone number with recorded message, website, or email notification. **Table 8.4.4-5** summarizes the responses and indicates that boaters would prefer to access this information via a website.

Table 8.4.4-5 Preferred Flow Information Notification Format

Statement	Telephone	Website	E-mail
How would you like to receive flow information	3*	9*	5*

**Several boaters selected more than one method of notification.*

Boaters were asked their opinion on what flow releases would create a desirable boating experience and their responses are summarized in **Table 8.4.4-6**. At least half of the boaters stated that flows less than 700 cfs (actual: 700 cfs) would not provide boating opportunities, while over 80% of boaters felt that flows from 800 to 1,200 cfs would provide desirable boating opportunities.

Table 8.4.4-6 Suitability of Hypothetical Flow Releases for Whitewater Boating Opportunities

Would the following flow release create a desirable boating experience on this reach?		
Flow Release	**Yes**	**No**
600 cfs	4	6
700 cfs (study flow, actual: xxx cfs)	5	5
800 cfs	9	1
900 cfs	10	0
1,000 (study flow, actual: xxx cfs)	10	0
1,100 cfs	9	1
1,200 cfs	8	2

**one boater did not provide answers to this question*

Boaters were asked if there were other whitewater boating opportunities in the area that were preferrable to the two flows studied below Saxon Falls. Two boaters indicated there were other opportunities preferrable to the flows evaluated on the Montreal River. One boater noted that the Grandfather Falls whitewater release occurred on the same day as the Saxon Falls Study. Both boaters indicated their decision on whether other opportunities would be preferrable to those studied at Saxon Falls would be dependent on the flows actually released at Saxon Falls.

8.4.5 Analysis of Whitewater Recreation Flow Releases

Flows exceeding 170 cfs at the Saxon Falls Project and 220 cfs at the Superior Falls Project must be passed through the spillway and into the bypass reach. A minimum flow of 5 cfs is released from the Saxon Falls Dam into the bypass reach from ice-out to October 31. A minimum flow of 10 cfs is released from the Superior Falls Dam into the bypass reach from the Saturday prior to Memorial Day to October 15; on weekends and holidays during this timeframe, a minimum flow of 20 cfs is released from 8 am and 8 pm.

When daily inflows exceed 175 cfs at the Saxon Falls Project or 240 cfs at the Superior Falls Project,[19] not all of the flow that would be required for recreational releases would result in lost generation. However, when discharge from the Gile Flowage is needed to augment flows for downstream generation, a release of more than 175 cfs incurs a loss of stored kilowatt-hours at the Saxon Falls Project and a release of more than 240 cfs results in a loss of stored kilowatt-hours at the Superior Falls Project since water released from Gile Flowage would no longer be available for power generation during low flow periods.

Based on the results of the Boater Evaluation Form, the optimal flow (average) that provides the best whitewater boating experience is 1,200 cfs, as shown previously in Table 8.4.4-1. Flow duration data from 1986 to 2017 for the Saxon Falls Project and the Superior Falls Project are included in **Table 8.4.5-1** and

[19] Assuming any recreational release from Superior Falls will occur on weekends or holidays between the hours of 8 am to 8 pm.

Table 8.4.5-2, respectively. April is the only month where the daily average discharge I exceeds 1,200 cfs.

The Saxon Falls Flowage does not have the storage capacity to sustain recreational flow releases; therefore, all water necessary recreational releases in excess of natural flows must be discharged from the Gile Flowage.

Table 8.4.5-1 Flow Duration at The Saxon Falls Project, April to November,1986-2017

Month	Daily Average Discharge Exceeded (cfs) on Specified Percentage of Days				
	90%	75%	50%	25%	10%
April	200	325	600	1,180	2,080
May	171	200	260	570	1,120
June	125	165	200	260	500
July	70	115	183	235	375
August	50	95	120	205	265
September	42	65	100	180	255
October	53	80	140	240	420
November	82	115	185	250	415

Table 8.4.5-2 Flow Duration at Superior Falls, April to November, 1986-2017

Month	Daily Average Discharge Exceeded (cfs) on Specified Percentage of Days				
	90%	75%	50%	25%	10%
April	202	327	605	1,189	2,096
May	172	202	262	574	1,129
June	126	166	202	262	504
July	96	116	184	237	378
August	60	96	121	207	267
September	50	65	101	181	257
October	60	81	141	242	423
November	95	116	186	252	418

Based on the results of the Boater Evaluation Forms, the preferred months for whitewater releases are May through September.

8.5 Stakeholder Comments and Recommended Recreational Development

Recommended recreational development brought forward by stakeholders throughout Stage 1 and Stage 2 consultation are included in *Volume 4, Documentation of Consultation*. Any additional stakeholder comments regarding recommended recreational development received on the DLA will be addressed in this section of the FLA.

8.6 Measures Recommended for Creating, Preserving, or Enhancing Recreational Opportunities

8.6.1 Cooperate with Local Entities

The path to the Superior Falls Tailwater Access crosses lands owned by Gogebic County. The Licensee will continue to cooperate with Gogebic County through the term of the new license should any improvements to the path be necessary.

8.7 New Measures or Facilities Proposed by the Applicant

The proposed measures and improvements listed in the sections below for both Projects will be completed within 1 year of license issuance, unless stated otherwise.

8.7.1 Saxon Falls Project

8.7.1.1 Boat Launch/Canoe Portage Take-Out

- Relocate take-out from left side of dam to boat launch area.
- Relocate take-out signage to new location.
- Conduct routine maintenance of boat launch area throughout the term of the new license.
- Add new directional signage identifying the canoe portage route.
- Review and update Part 8 signage as necessary to meet current standards.

8.7.1.2 Scenic Overlook

- Formally establish the Wisconsin viewing site as a FERC-approved recreation site.
- Add additional safety signage requiring recreationists to stay behind safety fencing.
- Review Part 8 signage and update as necessary to meet current standards.
- Continue routine maintenance of parking area throughout term of new license.[20]
- Trim trees that may obstruct the view of the falls for the term of the license.

8.7.1.3 Tailwater Access/Canoe Portage Put-In

- Review Part 8 signage and update as necessary to meet current standards.
- Replace signage on gate prohibiting use of the stairs to access the tailwater area.
- Develop a program where electronic keys could be purchased (for a one-time fee) to provide access through the locked gate at the top of the stairs at the Tailwater Access site to provide access and enhance safety at the site.
- Add real-time flow information to company website.

[20] Parking area shared with Saxon Falls Tailwater Access site.

8.7.1.4 Whitewater Release

NSPW proposes to release water from the Gile Flowage for whitewater recreation purposes downstream of the Saxon Falls Project in the Montreal River Canyon.

The number, timing and volume of the releases from Gile Flowage will need to be evaluated based on an environmental review of additional resource needs for the water stored at the Gile Flowage, as well as the economic impact from lost generation.

Note: due to the estimated 10-hour travel time for water to reach the Saxon Falls powerhouse, NSPW began releases at 1 pm the day prior to the event on May 14, 2021; the releases extended until 11 pm on the day of the event. During this timeframe, the Gile Flowage elevation decreased 0.45 feet.

The Licensee also recommends the number of releases, the timing of releases, and volume of each release be included in the FERC license to be issued for the Gile Flowage.

8.7.2 Superior Falls Project

8.7.2.1 Canoe Portage Take-Out

- Remove existing canoe portage take-out signage on Hwy 122 roadside.
- Install a new put-in access/canoe portage take-out site upstream of the dam on the Michigan side to improve safety for users.
- Establish a gravel parking area with a capacity for up to six vehicles.
- Install Part 8 signage (to meet current standards), directional signage, and regulatory signage.

8.7.2.2 Scenic Overlook

- Conduct routine maintenance of the parking area over the term of the new license.
- Replace weathered informational signage.
- Review and update Part 8 signage as necessary to meet current standards.[21]

8.7.2.3 Tailwater Access

- Conduct routine maintenance of Tailwater Access area (i.e., mowing, trail maintenance, litter removal) over the term of the new license.
- Replace weathered safety signage near the powerhouse.

8.7.3 Estimated Costs of Proposed Improvements

Estimated costs for proposed improvements at the Saxon Falls Project and Superior Falls Project are shown in **Table 8.7.3-**1 and **Table 8.7.3-2**, respectively. The costs are reflected in 2022 dollars.

[21] Parking area, informational signage, and Part 8 signage serve both the Superior Falls Scenic Overlook and the Superior Falls Tailwater Access sites.

Table 8.7.3-1 Estimated Recreational Improvement Costs for the Saxon Falls Project

Recreation Site	Improvement	Estimated Costs (2022 dollar)	
		Capital	Annual Maintenance
Saxon Falls Boat Launch, Canoe Portage Take-Out	Relocate canoe portage from left side of dam to boat launch area and relocate or add directional signage, as necessary	$10,000	$3,000
	Conduct maintenance of boat launch area via grading or addition of gravel	$3,000	$1,000
	Add new directional signage along relocated canoe portage route	$2,000	$400
	Review Part 8 signage and update as necessary to meet current standards	$2,000	$400
Saxon Falls Scenic Overlook	Establish and maintain scenic overlook as a FERC-approved recreation site, including parking lot and portable toilet	$0	$10,000
	Install safety signage directing recreationists to stay behind safety fencing	$1,000	$200
	Review Part 8 Signage and update as necessary to meet current standards	$2,000	$400
	Trim trees blocking view of the falls	$0	$1,000
Saxon Falls Tailwater Access, Canoe Portage Put-In	Review Part 8 signage and update as necessary to meet current standards	$2,000	$400
	Replace signage on gate prohibiting use of the stairs to access the tailwater area	$500	$100
	Develop a program where electronic keys could be purchased (for a one-time fee) to provide access through the locked gate at the top of the stairs at the Tailwater Access site to allow access and enhance safety at the site.	$30,000	$5,000
	Add real-time flow information to website	$30,000	$2,500
Saxon Falls Whitewater Release	Conduct two whitewater releases for a 3-hour durations each per year between the months of May and September	$NA	$NA

Table 8.7.3-2 Estimated Improvement Costs for the Superior Falls Project

Recreation Site	Improvement	Estimated Costs (2022 dollar)	
		Capital	Annual Maintenance
Superior Falls Canoe Portage Take-Out	Remove existing canoe portage take-out signage on Hwy 122 roadside; install a new put-in access/canoe portage take-out site a short distance upstream of the dam to improve safety for users; and establish a gravel parking area with a capacity for up to six vehicles	$50,000	$3,000
	Install new Part 8 signage to meet current standards, as well as directional signage and regulatory signage	$2,000	$400
Superior Falls Scenic Overlook	Conduct maintenance of parking area and portable toilet	$3,000	$11,000
	Replace weathered informational signage at parking area	$500	$100
	Review Part 8 Signage and update as necessary to meet current standards	$2,000	$400
Superior Falls Tailwater Fishing Area	Conduct routine maintenance (i.e., mowing, litter removal, trail maintenance) over term of new license	$0	$2,000
	Replace weathered safety signage	$2,000	$400

9. Report on Land Management and Aesthetics

9.1 Existing Development and Use of Project

In Wisconsin and Michigan, land-use regulation and zoning occur at the county government level, excluding incorporated villages and cities within the county. The provisions of certain county zoning ordinances may not take effect for a particular rural civil town area within the county until the county ordinance is adopted by the respective civil town government. Regulations for navigable waters of the state occur at the state and federal level and are controlled by EGLE, WDNR, and USACE.

In the vicinity of the Saxon Falls and Superior Falls Projects, land use and zoning are regulated by Iron County and the Town of Saxon in Wisconsin and Gogebic County and Ironwood Township in Michigan. The Projects' facilities are surrounded primarily by undeveloped, forested lands. Both counties maintain shoreland zoning and floodplain ordinances that limit development along the shoreline and in floodplain.

The Town of Saxon developed a comprehensive plan in 2003. The plan recommends working to minimize incompatible land uses by depicting natural limitations for building sites, such as floodplains, wetlands, and other sensitive lands, in future land use maps. The plan also recommends that any new development, where there currently is no public sewer system, be at least five acres in size to ensure there is adequate space for an onsite waste system (TS, 2003).

Ironwood Township developed a master plan in 2012 which recommends vegetated buffer zones, mature tree preservation guidelines, and wetland protections be incorporated into development plans, as well as restricting or controlling development in areas with steep slopes, soil erosion potential, and wellhead protection areas (IT, 2012).

9.2 Measures Proposed to Ensure Modifications Blend with Surrounding Environment

9.2.1 Saxon Falls Project

The Saxon Falls Project, and its associated hydroelectric facilities, has been operating in its current location since 1912 (NSPW, 2014a). From its original construction to the present, the Project has become part of the local environment. Continued operation of the Saxon Falls Project under the new license will not violate any federal or state policies or regulations. There are no known conflicts between the respective local governmental planning and/or zoning ordinances and the Project's development or operation. Existing Project aesthetics and facilities are shown in **Figures 9.2.1-1, 9.2.1-2, 9.2.1-3**, and **9.3.2.1-4**.

Figure 9.2.1-1 View Upstream of the Saxon Falls Dam

Figure 9.2.1-2 Saxon Falls Dam and Right Earth Embankment

Figure 9.2.1-3 Saxon Falls Scenic Overlook

Figure 9.2.1-4 Saxon Falls Powerhouse-Looking Downstream

9.2.2 Superior Falls Project

The Superior Falls Project, and its associated facilities, has been operating in its current location since 1917 (NSPW, 2014b). From its original construction to the present, the Project has become part of its local environment. Continued operation of the Superior Falls Project under the new license will not violate any federal or state policies or regulations. There are no known conflicts between the respective local governmental planning and/or zoning ordinances and the Project's development or operation. Existing Project aesthetics and facilities are shown in **Figures 9.2.2-1, 9.2.2-2, 9.2.2-3**, and **9.2.2-4**.

Figure 9.2.2-1 View Upstream of Superior Falls Dam

Figure 9.2.2-2 View of Bypass Reach Downstream of Superior Falls Dam

Figure 9.2.2-3 Superior Falls Scenic Overlook

Figure 9.2.2-4 View from Powerhouse Looking Downstream towards Mouth of Montreal River and Lake Superior

9.2.3 Aesthetic Flow Study

AW, FOG, MDNR, and NPS requested an aesthetic flow study be conducted to evaluate the impacts of Project operation on aesthetic flows over the Saxon Falls and Superior Falls waterfalls. NSPW proposed in its study summary to take representative photographs of flows at 5 cfs increments during normal workdays from designated vantage points at each Project and record the flow information at the time the photographs were taken (NSPW, 2020).

9.2.3.1 Saxon Falls Project

NSPW released designated flows from the Saxon Falls Project on October 20, 2021, to document the aesthetic impacts at the Saxon Falls waterfall. Flows released included 5 cfs (current required minimum flow), 10 cfs, 15 cfs, 20 cfs, and 25 cfs. Representative photographs of each flow were taken from the scenic overlook and are shown in **Figure 9.2.3.1-1**, **Figure 9.2.3.1-2**, **Figure 9.2.3.1-3**, **Figure 9.2.3.1-4**, and **Figure 9.2.3.1-5**.

Figure 9.2.3.1-1 Saxon Falls 5 cfs Flow

Figure 9.2.3.1-2 Saxon Falls 10 cfs Flow

Figure 9.2.3.1-3 Saxon Falls 15 cfs Flow

Figure 9.2.3.1-4 Saxon Falls 20 cfs Flow

Figure 9.2.3.1-5 Saxon Falls 25 cfs Flow

Currently, the Licensee is required to release 5 cfs into the bypass reach from ice-out to October 31 of each year. The flow is released from a low-level outlet. The Project has a maximum hydraulic capacity of 170 cfs. A review of streamflow data indicates that flows exceed the hydraulic capacity of the powerhouse approximately 60% of the time flows and these surplus flows are passed over the spillway, thus supplementing the existing minimum flow.

After completing a review of the aesthetic flows that were studied, NSPW is proposing to revise the minimum flow requirements for the Project. NSPW is proposing to maintain the existing 5 cfs minimum flow at all times from the Saturday before Memorial Day to October 15.[22] On weekends and holidays during the same timeframe, the Licensee is proposing to increase the minimum flow to 10 cfs between the hours of 8 am to 8 pm to improve the aesthetics of the waterfall. This will result in the use of approximately 249 acre-feet of water.[23] The 249 acre-feet of water will be released from the upstream Gile Flowage and will result in approximately 26.5 MWh of lost generation at the Saxon Falls Project per year.

[22] These dates will match when minimum flows are currently required for the Superior Falls Project. Natural flows within the river during the months of March and April result in the Licensee spilling at least 5 cfs into the Saxon Falls bypass reach at least 85% of the time according to flow records. Therefore, the current requirement to begin minimum flows at ice-out is not necessary.

[23] The 249 acre-feet was calculated as follows: 48 days at 14 hours per day = 602 hours; 602 hours x 3,600 seconds/hour x 5 cfs = 10,836,000 cubic feet; 10,836,000 cubic feet / 43,560 square feet = 248.76 acre feet.

9.2.3.2 Superior Falls Project

NSPW released designated flows from the Superior Falls Project on October 20, 2021, to document the aesthetic impacts at the Superior Falls waterfall. Flows released included 8 cfs (current required minimum flow), 15 cfs, 20 cfs, 25 cfs, 30 cfs, and 35 cfs. Representative photographs of each flow were taken from the Project's scenic overlook as shown in **Figure 9.2.3.2-1**, **Figure 9.2.3.2-2**, **Figure 9.2.3.2-3**, **Figure 9.2.3.2-4**, **Figure 9.2.3.2-5** and **Figure 9.2.3.2-6**.

Figure 9.2.3.2-1 Superior Falls 8 cfs Flow

Figure 9.2.3.2-2 Superior Falls 15 cfs Flow

Figure 9.2.3.2-3 Superior Falls 20 cfs Flow

Figure 9.2.3.2-4 Superior Falls 25 cfs Flow

Figure 9.2.3.2-5 Superior Falls 30 cfs Flow

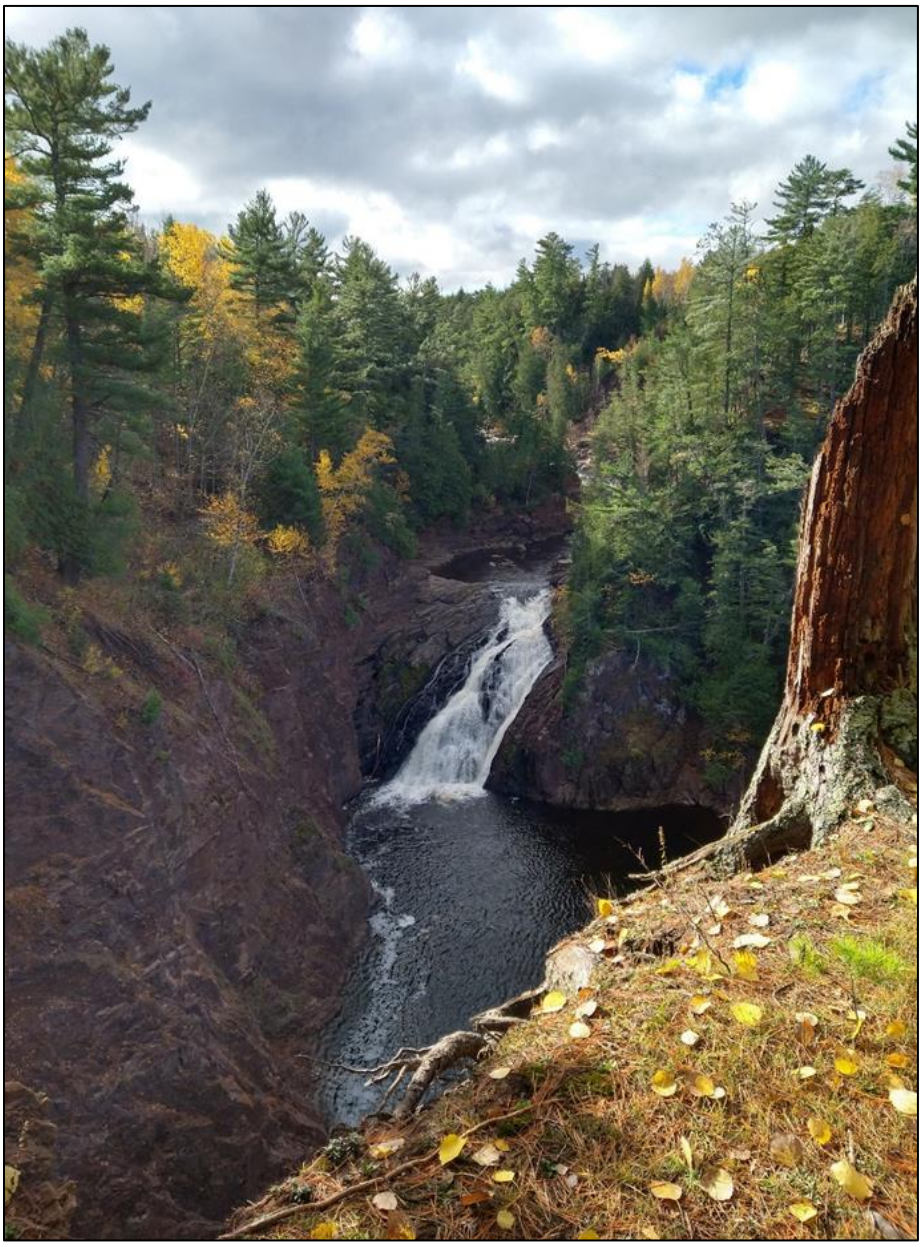


Figure 9.2.3.2-6 Superior Falls 35 cfs Flow

Currently, the Licensee is required to release 8 cfs into the bypass reach from the Saturday before Memorial Day through October 15. Additionally, a minimum flow of 20 cfs must be released between 8 am and 8 pm on weekends and holidays during the same time period. The minimum flow is released via a gate setting. A review of the photographs of the different aesthetic flows did not identify significant differences for flows between 15 cfs and 35 cfs. Additionally, flows exceed the hydraulic capacity of the powerhouse (220 cfs) approximately 45% of the time and this surplus flow is passed through the spillway into the bypass reach, thus supplementing the existing minimum flow requirement. Finally, the current minimum flow already provides 20 cfs during weekends and holidays when the majority of visitors view the falls. Thus, NSPW is not proposing any changes to the current minimum flow requirement.

9.3 Project Boundary Changes

9.3.1 Saxon Falls Project

The current FERC license established the Saxon Falls Project boundary with a reservoir surface elevation of 997.0 feet, including additional Licensee-owned lands on both sides of the river. The current Project boundary is depicted in the existing Exhibit G. The Licensee-owned Project lands include the dam, conduit, surge tank, penstocks, powerhouse, canoe portage, boat launch, and adjacent undeveloped, forested lands. NSPW completed a review of the current Project boundary, which was likely developed using USGS topographic maps that displayed 10 or 20-foot contours.

In order to develop a more accurate depiction of the Project, NSPW remapped the Project boundary using LiDAR elevation data with an accuracy of +/- 0.1 feet. Analysis of the LiDAR data revealed that the upper extent of the current Project boundary did not extend far enough upstream to encompass all areas inundated by the Saxon Falls Dam at elevation 997.0 feet. The proposed Project boundary was modified to include lands upstream of the Saxon Falls Dam to elevation 997.0 feet and exclude those lands not impounded at that elevation. This resulted in a significant decline in the acreage of uplands within the proposed boundary.

The proposed Project boundary also includes lands owned by the Licensee with project facilities and all lands within the current Project boundary located downstream of the Saxon Falls Dam to provide an aesthetic buffer for the Saxon Falls waterfall and Montreal River Canyon. The proposed Project boundary includes all land and water necessary for the safe and effective operation of the Saxon Falls Project and all lands required for other Project purposes, including but not limited to, aesthetics, flowage, public recreation, shoreline control, and protection of environmental resources, archaeological and historical resources, wetlands, and threatened or endangered species.

The current Project boundary encompasses approximately 240.9 acres, which includes 166.1 acres of Project lands and 74.8 acres of inundated land. The inundated land is further divided into 69.8 acres of reservoir area upstream of the Saxon Falls Dam, 3.8 acres of bypass reach between the dam and powerhouse, and 1.2 acres of tailwater area downstream of the powerhouse (MH, 2022c).

The proposed Project boundary encompasses approximately 145.8 acres, which includes 73.5 acres of Project lands and 70.5 acres of inundated land. The inundated land is further divided into 65.5 acres of reservoir area upstream of the Saxon Falls Dam, 3.8 acres of bypass reach between the dam and powerhouse, and 1.2 acres of tailwater area downstream of the powerhouse (MH, 2022c).

Maps depicting Licensee's upland and submerged lands within both the current and proposed Saxon Falls Project boundary are included in **Appendix E-51**.

9.3.2 Superior Falls Project

The current FERC license established the Superior Falls Project boundary with a reservoir surface elevation of 740.2 feet (top of overflow spillway), including additional Licensee-owned lands on both sides of the river. The current Project boundary is depicted in the existing Exhibit G. The Licensee-owned Project lands include the dam, conduit, surge tank, penstocks, powerhouse, canoe portage, boat launch,

and adjacent undeveloped, forested lands. NSPW completed a review of the current Project boundary, which was likely established using USGS topographic maps that displayed 10- or 20-foot contours.

In order to develop a more accurate depiction of the Project, NSPW remapped the Project boundary using LiDAR elevation data with an accuracy of +/- 0.1 feet. Analysis of the LiDAR data revealed that the upper extent of the current Project boundary includes free flowing river reaches that are not impounded at a reservoir surface elevation of 740.2 feet. The proposed Project boundary only includes lands upstream of the Superior Falls Dam to elevation 740.2 feet (the top of the overflow spillway) and thus excludes the river reach not impounded at elevation 740.2 feet. This resulted in a significant decline in the acreage of uplands within the Project boundary.

The proposed Project boundary also encompasses all Licensee-owned lands within the current Project boundary on the east side of the Montreal River, with the exception of lands east of Hwy 122. On the west side of the river, an aesthetic buffer of at least 100 feet in width is maintained on all Licensee-owned lands downstream of the Superior Falls Dam. The proposed Project boundary includes all land and water necessary for the safe and effective operation of the Superior Falls Project and all lands required for other Project purposes, including but not limited to, aesthetics, flowage, public recreation, shoreline control, and protection of environmental and archaeological resources.

The current Project boundary encompasses approximately 390.2 acres, which includes 360.4 acres of uplands and 29.8 acres of inundated land. The inundated land is further divided into 16.3 acres of reservoir area upstream of the Superior Falls Dam, 2.7 acres of bypass reach between the dam and powerhouse, and 0.3 acres of tailwater area downstream of the powerhouse (MH, 2022d).

The proposed Project boundary encompasses approximately 46.1 acres, which includes 26.8 acres of upland and 19.3 acres of inundated land. The inundated area is further divided into 16.3 acres of reservoir area upstream of the Superior Falls Dam, 2.7 acres of bypass reach between the dam and powerhouse, and 0.3 acres of tailwater area downstream of the powerhouse (MH, 2022d).

Maps depicting Licensee's upland and submerged ownership within both the current and proposed project boundaries are included in **Appendix E-52**.

9.4 Wetlands or Floodplains within or Adjacent to the Project Boundary

9.4.1 Description of Existing Wetlands

Wetlands are transition habitats between land and water and have unique hydrologic, soil, and vegetative qualities that allow them to be differentiated (delineated) from other habitat types. Wetlands function to improve water quality, wildlife habitat, nutrient cycling and storage, aesthetics, and recreation. Large wetlands absent from human influence are generally higher quality wetlands. In riverine systems, wetlands provide for floodwater storage and filtration of water contaminants and sediment, as well as provide an environmental corridor for enhanced aesthetics and recreation. The National Wetland Inventory data layers were used to determine the types of wetlands located within each Project boundary.

9.4.1.1 Saxon Falls Project

Wetland types and their corresponding acreages within the current and proposed Saxon Falls Project boundary are shown in **Table 9.4.1.1-1**. Wetlands identified, in order of abundance, are categorized as follows: lacustrine, freshwater forested shrub, riverine, and freshwater emergent. A comparison between the current and proposed Project boundary shows an increase in the riverine wetlands and decreases in the other three wetland types. All wetlands proposed for removal from the current Project boundary are located on lands that are not inundated by the dam at the reservoir elevation of 997.0 feet and are not impacted by Project operations. Even though wetland areas are being removed from the current Project boundary, they will still remain protected under existing state and federal laws. Maps illustrating wetlands within each boundary are included in **Appendix E-53**.

Table 9.4.1.1-1 Wetlands within Current and Proposed Saxon Falls Project Boundary

Wetland Type	Project Boundary	
	Current	Proposed
Lacustrine (Lake)	56.6 acres	48.3 acres
Riverine	6.8 acres	10.0 acres
Freshwater Forested/Shrub	27.9 acres	7.5 acres
Freshwater Emergent	5.4 acres	3.3 acres
TOTAL	**96.7 acres**	**69.1 acres**

Source: MH, 2022e

There are no proposed operational changes regarding run-of-river operations or reservoir elevations at the Saxon Falls Project. Therefore, the continued operation of the Project is not anticipated to cause wetland impacts.

9.4.1.2 Superior Falls Project

Wetland types, and their corresponding acreages within the current and proposed Superior Falls Project boundary, are shown in **Table 9.4.1.2-1**. Wetlands identified within the current Superior Falls boundary, in order of abundance, are categorized as follows: freshwater forested shrub, riverine, and freshwater emergent. A comparison between the current and proposed Project boundary shows a decrease in all three wetland types. All wetlands proposed for removal from the current Project boundary are located on lands that are not inundated by the dam at the reservoir elevation of 740.2 feet and are not impacted by Project operations. Even though wetlands areas are being removed from the current Project boundary, they will remain protected under existing state and federal laws. Maps the illustrating wetlands within each boundary are included in **Appendix E-54**.

Table 9.4.1.2-1 Wetlands within Current and Proposed Superior Falls Project Boundary

Wetland Type	Project Boundary	
	Current	Proposed
Riverine	21.2 acres	13.7 acres
Freshwater Forested/Shrub	72.6 acres	1.5 acres
Freshwater Emergent	0.4 acres	0.1 acres
TOTAL	**94.2 acres**	**15.3 acres**

Source: MH, 2022f

There are no proposed operational changes regarding run-of-river operations or reservoir elevations at the Superior Falls Project. Therefore, the continued operation of the Project is not anticipated to cause wetland impacts.

9.5 Buffer Zone

As stated previously herein, the Licensee has been operating the Saxon Falls and Superior Falls Projects and their associated facilities in their present locations since 1912 and 1917, respectively. During that period, the Projects have become part of the environment. The shorelines of both Project reservoirs are undeveloped and heavily wooded with the exception of Project's generation and recreational facilities. The Licensee proposes to retain its lands downstream of each Project dam to serve as an aesthetic buffer zone for the Montreal River Canyon and the Projects' waterfalls. Any timber management activities in this buffer zone will follow WDNR's Forest Management Guidelines, Chapter 4 Visual Quality and Chapter 5 Riparian Areas and Wetlands, which are included in **Appendix E-56** and **Appendix E-57**, respectively.

9.6 Applicant's Policy Toward Development of Shoreline Facilities

In the State of Wisconsin, the WDNR is charged under Wisconsin Statutes with the licensing, permitting, and supervision of all structures in lakes or streams that extend beyond the ordinary high-water mark. In the State of Michigan, EGLE is charged under Michigan statutes with the licensing, permitting, and supervision of all structures in lakes or streams that extend beyond the ordinary high-water mark.

The Licensee plans to monitor shoreline use during routine field activities according to the appropriate statutes as administered by WDNR and EGLE and their administrative regulations for any piers, docks, boat landings, extended bulkheads, or other structures owned by others that extend into Project waters. The Licensee is not opposed to these developments as permitted by WDNR or EGLE and will develop a consistent policy regarding these structures if the demand requires. The Licensee owns the majority of the shoreline at both Projects and does not intend to permit any private docks or private structures originating on lands under the Licensee's fee ownership.

9.7 Maps or Drawings of Proposed Measures

Volume 2, Exhibits F and G, include drawings and maps depicting the nature and location of the Saxon Falls and Superior Falls Projects. As part of this DLA, the Licensee is not proposing any new measures concerning project works, right-of-way, access roads, or any other topographic alternations.

10. Comprehensive Plans per 18 CFR Part 16.8 [F][6]

Section 10(a)(2) of the Federal Power Act requires the FERC to consider the extent to which a proposed project is consistent with existing federal and state comprehensive plans, as defined in Section 2.19 under Part 2 of Chapter 1, Title 18 CFR. A current list of FERC-approved comprehensive plans that may be applicable to the relicensing of the Saxon Falls and Superior Falls Projects is included in this section. This DLA was prepared in consultation with various resource agencies, including those that prepared the comprehensive plans outlined in the following sections.

Volume 4, Documentation of Consultation, details all consultation between the applicant, resource agencies, and other stakeholders. The license application incorporates various recommendations made by stakeholders during consultation, which are outlined in the license application.

With the exception of the proposed increase in the minimum flow at the Saxon Falls Project, the Licensee is not proposing any changes to the current operation of either the Saxon Falls Project or Superior Falls Project. If the environmental reviews conducted by the resource agencies identified any operational characteristics that require mitigation, appropriate mitigation has been proposed herein. As such, continued operation of both Projects, with proposed mitigation measures, is not expected to adversely impact the resources in the area.

10.1 National Park Service Plans

10.1.1 The Nationwide Rivers Inventory (1993)

The Nationwide Rivers Inventory is a listing of more than 3,200 free-flowing river segments in the United States that are believed to possess one or more “outstandingly remarkable” values. The Montreal River section where the Projects are located is not listed in the inventory (NPS, 2020).

10.2 USFWS Plans

10.2.1 North American Waterfowl Management Plan (1986)

The North American Waterfowl Management Plan covers geographical areas the size of Wisconsin and Michigan. The plan is general in nature and outlines specific policies, goals, and recommendations. The plan does not establish goals or recommendations specific to either Project area; however, it does stress the importance of resource conservation, management, and enhancement (USFWS, 1986).

This DLA has been developed to analyze impacts based upon resource conservation, management, and enhancement. There are no conflicts between this plan and continued operation of either Project.

10.2.2 Upper Mississippi River & Great Lakes Region Joint Venture Implementation Plan (1993)

The Joint Venture is a partnership of resource agencies, Tribes, corporations, individuals, and organizations that have accepted the responsibility of implementing conservation plans within this geographic region. The Joint Venture conducts activities that support bird conservation goals and are the standard for effective, science-based delivery of bird conservation through partnerships (USFWS, 1993).

10.2.3 Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish & Wildlife Service (1989)

This plan covers geographical areas the size of Wisconsin and Michigan. The plan is general in nature and outlines specific policies, goals, and recommendations. The plan does not establish goals or recommendations specific to either Project; however, it does stress the importance of resource conservation, management, and enhancement (USFWS, 1989).

This DLA has been developed to analyze impacts based upon resource conservation, management, and enhancement. There are no conflicts between this plan and continued operation of either Project.

10.3 State of Wisconsin Plans

10.3.1 Lake Superior WDNR Basin Area Wide Water Quality Management Plan (1979)

This plan provides a snapshot of the current condition of land and water resources in the basin and creates a means for increased interagency cooperation and public involvement through identification and prioritization of issues and objectives (WDNR, 1979).

10.3.2 Statewide WDNR Comprehensive Outdoor Recreation Plan for 2019-2023 (2019)

The SCORP is discussed in Section 8.2.3 and provided in **Appendix E-44**.

10.3.3 Wisconsin WDNR Water Quality Report to Congress (2020)

This report details the findings of water quality assessments in the state and describes specific state programs that control, manage, and prevent water quality degradation (WDNR, 2020b). This report indicates that the Projects meet water quality standards.

10.3.4 Wisconsin's WDNR Biodiversity as a Management Issue (1995)

This document presents a strategy for the conservation of biological diversity and presents general strategic recommendations and possible actions for specific biological community types (WDNR, 1995a).

10.3.5 Wisconsin’s WDNR Forestry Best Management Practices for Water Quality (1995)

This document provides cost-effective methods to protect water quality in lakes, streams, and wetlands before, during, and after forest management activities. While no forest management practices are proposed as part of this DLA, any tree removal activities during the term of the license will follow the Forestry Best Management Practices for Water Quality (WDNR, 1995b).

10.3.6 Town of Saxon. Montreal River Canyon: A management plan. (1972)

This plan recommends the Montreal River Canyon remain a largely undeveloped area and provide limited access for small numbers of visitors. Land managers should adopt the WDNR “Stand Treatment for Aesthetic Zones.” The plan also recommended several alternatives for recreational development between the Saxon Falls reservoir and Lake Superior (TS, 1972).

10.4 State of Michigan Plans

10.4.1 Michigan Department of Environmental Quality. Non-indigenous aquatic nuisance species, State management plan: A strategy to control their spread in Michigan (1996)

This plan is an update to the Nonindigenous Aquatic Nuisance Species State Management Plan, approved in 1996 as Michigan's plan under the auspices of the National Invasive Species Act. The purpose of this updated plan is to summarize the good work accomplished during the previous six years and provide guidance to continue the effort. (MDNR, 1996)

10.4.2 Michigan Department of Natural Resources. Statewide Comprehensive Outdoor Recreation Plan for 2018-2022. (2017)

The Michigan SCORP is discussed in Section 8.2.4 and provided in **Appendix E-45**.

11. Requested License Term

The Licensee respectfully requests a license term for the standard 40 years plus seven months for the Saxon Falls Project and Superior Falls Project to coordinate the future expiration dates of these Projects with the anticipated issuance date of the license for the Gile Flowage Storage Reservoir Project. This will allow for coordination of future relicensing efforts on the Montreal River and provide for a comprehensive, basin-wide analysis of the projects' impacts.

12. Documentation of Consultation

Volume 4, Documentation of Consultation, details all phases of consultation between the Licensee and resource agencies, Indian Tribes, and the public during the development of this DLA. By reference here, *Volume 4, Documentation of Consultation,* becomes part of Exhibit E of this DLA.

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Superior Falls Hydroelectric Project
FERC Project No. 2587

Exhibit H
Additional Information Required Under Section 16.10

Draft License Application

Prepared for

Northern States Power Company
a Wisconsin Corporation

Prepared by

Mead & Hunt
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July 2022

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TABLES

LIST OF ABBREVIATIONS

Applicant	Northern States Power Company, a Wisconsin Corporation
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
Superior Falls Project	Superior Falls Hydroelectric Project
DSM	Demand Side Management
FERC	Federal Energy Regulatory Commission
FOE	Focus on Energy® Program
Licensee	Northern States Power Company, a Wisconsin Corporation
MW	Megawatt
MWh	megawatt hour
NGVD	National Geodetic Vertical Datum 1929
NSPW	Northern States Power Company, a Wisconsin Corporation
PSCW	Public Service Commission of Wisconsin
RFP	Request for Proposal

1. Information Provided by All Applicants

A. Discussion of the plans and ability of the Applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service, including efforts and plans to:

The Superior Falls Hydroelectric Project (Superior Falls Project or Project) is owned and operated by Northern States Power Company, a Wisconsin corporation (NSPW). The Project is operated in a run-of-river mode with a minimum reservoir elevation of 739.7 feet NGVD as measured immediately upstream of the dam (FERC, 1997). A minimum flow of 8 cubic feet per second (cfs) must be released into the bypassed reach from the Saturday before Memorial Day to October 15 of each year. A minimum flow of 20 cfs into the bypassed reach is required between 8:00 am and 8:00 pm on weekends and holidays during the same timeframe (FERC, 1995). NSPW has the financial resources and personnel sufficient to reliably maintain and operate its hydroelectric projects and has a demonstrated record of license compliance.

(1) Increase capacity or generation at the project;

NSPW does not propose additional development or upgrades for the Superior Falls Project at this time. Both generator units have previously been rewound to increase their capacities to better match each turbine's rated horsepower. Routine maintenance and/or replacement of project facilities will be undertaken as-needed.

(2) Coordinate the operation of the project with any upstream or downstream water resource projects; and

NSPW operates and maintains two hydroelectric projects on the main branch of the Montreal River and one non-generating storage reservoir on the West Branch of the Montreal River. From upstream to downstream they are the Gile Flowage Storage Reservoir Project (P-15055), the Saxon Falls Project (P-2610) and the Superior Falls Project (P-2587). The outcome of the licensing process for the Gile Flowage Storage Reservoir Project will have a significant impact on the operation of the Superior Falls run-of-river operation because all water storage is provided upstream at Gile Flowage.

An operator for the facility is on call 24 hours per day, seven days per week. The plant is manually operated with controls installed for automatic shutdown in case of operational emergencies. Whenever a plant shutdown occurs or if high or low water alarms are activated, the continually staffed control center at the Licensee's Wissota Hydro Project is notified (NSPW, 2014).

The Project is operated in a run-of-river mode whereby discharge measured immediately downstream of the Project tailrace approximates inflows into the Project reservoir with a minimum reservoir elevation of 739.7 feet NGVD as measured immediately upstream of the dam (FERC, 1997). A minimum flow of 8 cfs is required to be released into the bypassed reach of the Montreal River from the Saturday before Memorial Day to October 15 for enhancement of scenic resources. A minimum flow of 20 cfs is required to be released into the bypassed reach from 8 am to 8 pm on weekends and holidays during the same timeframe (FERC, 1995).

(3) Coordinate the operation of the project with the Applicant's other electrical systems to minimize the cost of production.

Within the Licensee's system, hydroelectric generation is one of the least costly alternatives to generate energy and will be used to the extent possible. NSPW operates the Superior Falls Project in a run-of-river mode with a minimum reservoir elevation of 739.7 feet NGVD as measured immediately upstream of the dam (FERC, 1997). NSPW also maintains the required minimum flow releases of 8 cfs or 20 cfs as described in Section 1.A.(2), above.

During times of low flow, water is released from the Gile Flowage to supplement natural river flows for power generation at the Licensee's two run-of-river hydroelectric Projects downstream. NSPW has historically operated in this mode and proposes to do so over the term of the next License.

B. Discussion of the need of the Applicant over the short- and long-term for the electricity generated by the project, including:

(1) Reasonable costs and reasonable availability of alternative sources of power that would be needed by the Applicant or its customers, including wholesale customers, if the Applicant is not granted a license for the project;

If a license is not granted for the Superior Falls Project, the Applicant would need to obtain alternative power on the open market. Over the 2018-2020 time period, the average cost to obtain replacement power (including all on-peak and off-peak usage) was $24.29 per megawatt hour (MWh). With the annual energy usage of 11,436.4 MWh, the cost to replace power generated at the Superior Falls Project is estimated to be $277,790 per year.

Table B-1 Surplus Capacity Credit and Table B-2 Fuel and Market Price Forecasts, from the June 30, 2020 NSPW Integrated Resource Plan Supplement, represent the current forecast for capacity and energy costs.

Table B-1 Surplus Capacity Credit

Surplus Capacity Credit

The surplus capacity credit of up to 500 MW is applied for all twelve months of each year and is priced at the avoided capacity cost of a generic brownfield H-Class combustion turbine on an economic carrying charge basis.

Table IV-10: Surplus Capacity Credit

Surplus Capacity Credit																				
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
$/kw-mo	4.57	4.66	4.75	4.85	4.95	5.05	5.15	5.25	5.35	5.46	5.57	5.68	5.80	5.91	6.03	6.15	6.27	6.40	6.53	6.66
	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057
$/kw-mo	6.79	6.93	7.07	7.21	7.35	7.50	7.65	7.80	7.96	8.12	8.28	8.44	8.61	8.79	8.96	9.14	9.32	9.51	9.70	9.89

Source: June 30, 2020 NSP Inetgrated Resource Plan Supplement

Table B-2 Fuel and Market Price Forecasts

Table IV-9: Fuel and Market Price Forecasts

	Base Price Forecast				Low Price Forecast				High Price Forecast			
	Fuel Price ($/mmBTu)		Market Price ($/MWh)		Fuel Price ($/mmBTu)		Market Price ($/MWh)		Fuel Price ($/mmBTu)		Market Price ($/MWh)	
Year	Generic Coal	Ventura Hub	Minn Hub On-Peak	Minn Hub Off-Peak	Generic Coal	Ventura Hub	Minn Hub On-Peak	Minn Hub Off-Peak	Generic Coal	Ventura Hub	Minn Hub On-Peak	Minn Hub Off-Peak
2018	$2.19	$2.74	$28.60	$21.61	$2.19	$2.74	$28.60	$21.61	$2.19	$2.74	$28.60	$21.61
2019	$2.08	$2.60	$26.93	$20.98	$2.08	$2.60	$26.93	$20.98	$2.08	$2.60	$26.93	$20.98
2020	$2.11	$2.26	$25.78	$20.13	$2.11	$2.26	$25.78	$20.13	$2.11	$2.26	$25.78	$20.13
2021	$2.14	$2.23	$25.32	$19.06	$2.14	$2.23	$25.32	$19.06	$2.14	$2.23	$25.32	$19.06
2022	$2.19	$2.33	$26.92	$20.45	$2.17	$2.28	$26.33	$20.00	$2.24	$2.38	$27.52	$20.90
2023	$2.25	$2.45	$29.31	$22.19	$2.19	$2.34	$27.96	$21.17	$2.36	$2.57	$30.68	$23.23
2024	$2.30	$2.58	$30.00	$23.20	$2.22	$2.40	$27.94	$21.60	$2.46	$2.76	$32.16	$24.87
2025	$2.35	$2.79	$31.47	$24.36	$2.24	$2.50	$28.17	$21.80	$2.57	$3.11	$35.04	$27.12
2026	$2.40	$2.96	$32.30	$24.99	$2.27	$2.58	$28.01	$21.67	$2.69	$3.42	$37.09	$28.70
2027	$2.45	$3.12	$33.35	$26.71	$2.29	$2.64	$28.28	$22.64	$2.81	$3.66	$39.16	$31.36
2028	$2.51	$3.26	$34.09	$26.97	$2.32	$2.71	$28.25	$22.35	$2.93	$3.92	$40.92	$32.38
2029	$2.57	$3.44	$35.21	$28.25	$2.34	$2.78	$28.42	$22.79	$3.07	$4.24	$43.38	$34.80
2030	$2.62	$3.70	$38.27	$30.69	$2.37	$2.88	$29.83	$23.92	$3.20	$4.71	$48.76	$39.09
2031	$2.68	$3.87	$39.33	$32.07	$2.40	$2.95	$29.97	$24.44	$3.35	$5.04	$51.22	$41.77
2032	$2.75	$4.02	$39.75	$33.14	$2.43	$3.01	$29.71	$24.77	$3.51	$5.34	$52.76	$43.99
2033	$2.81	$4.10	$39.93	$33.46	$2.45	$3.03	$29.58	$24.79	$3.67	$5.48	$53.47	$44.80
2034	$2.87	$4.20	$41.13	$34.56	$2.48	$3.07	$30.08	$25.28	$3.83	$5.70	$55.76	$46.86
2035	$2.94	$4.35	$42.15	$35.66	$2.51	$3.13	$30.32	$25.65	$4.00	$6.00	$58.12	$49.17
2036	$2.99	$4.47	$42.79	$36.60	$2.53	$3.17	$30.37	$25.97	$4.14	$6.24	$59.80	$51.13
2037	$3.07	$4.65	$44.00	$38.21	$2.56	$3.24	$30.61	$26.58	$4.36	$6.63	$62.69	$54.44
2038	$3.14	$4.86	$44.95	$39.45	$2.60	$3.31	$30.60	$26.85	$4.58	$7.08	$65.43	$57.42
2039	$3.23	$5.04	$45.82	$40.48	$2.63	$3.37	$30.63	$27.06	$4.83	$7.47	$67.88	$59.98
2040	$3.31	$5.22	$46.61	$41.48	$2.66	$3.43	$30.61	$27.25	$5.06	$7.87	$70.25	$62.53
2041	$3.37	$5.32	$46.52	$41.48	$2.69	$3.46	$30.27	$26.99	$5.26	$8.10	$70.79	$63.12
2042	$3.45	$5.47	$47.61	$42.64	$2.72	$3.51	$30.57	$27.38	$5.51	$8.43	$73.40	$65.74
2043	$3.53	$5.62	$48.37	$43.71	$2.75	$3.56	$30.64	$27.69	$5.77	$8.78	$75.56	$68.28
2044	$3.62	$5.78	$49.72	$44.99	$2.79	$3.61	$31.04	$28.09	$6.05	$9.17	$78.79	$71.29
2045	$3.70	$5.99	$51.23	$46.37	$2.82	$3.68	$31.45	$28.46	$6.31	$9.65	$82.57	$74.73
2046	$3.78	$6.17	$52.49	$47.53	$2.85	$3.73	$31.74	$28.74	$6.59	$10.09	$85.85	$77.73
2047	$3.86	$6.29	$53.27	$48.57	$2.88	$3.77	$31.89	$29.08	$6.88	$10.40	$87.98	$80.22
2048	$3.95	$6.46	$54.39	$49.88	$2.91	$3.82	$32.15	$29.49	$7.20	$10.80	$90.96	$83.42
2049	$4.04	$6.66	$55.69	$50.92	$2.95	$3.88	$32.43	$29.65	$7.53	$11.30	$94.52	$86.43
2050	$4.13	$6.77	$56.64	$51.71	$2.98	$3.91	$32.70	$29.85	$7.87	$11.60	$96.97	$88.53
2051	$4.22	$6.96	$58.23	$53.16	$3.01	$3.96	$33.16	$30.27	$8.21	$12.08	$101.05	$92.24
2052	$4.31	$7.13	$59.62	$54.42	$3.04	$4.01	$33.56	$30.63	$8.57	$12.51	$104.64	$95.53
2053	$4.41	$7.29	$61.00	$55.68	$3.08	$4.06	$33.94	$30.99	$8.94	$12.95	$108.29	$98.85
2054	$4.50	$7.46	$62.38	$56.95	$3.11	$4.10	$34.33	$31.34	$9.33	$13.39	$111.97	$102.21
2055	$4.60	$7.62	$63.76	$58.21	$3.14	$4.15	$34.71	$31.69	$9.73	$13.83	$115.69	$105.61
2056	$4.69	$7.79	$65.15	$59.47	$3.17	$4.19	$35.09	$32.03	$10.12	$14.28	$119.45	$109.05
2057	$4.79	$7.95	$66.53	$60.73	$3.21	$4.24	$35.48	$32.37	$10.52	$14.74	$123.26	$112.52

*Coal prices are delivered prices, while gas and market prices are hub prices.

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Source: June 30, 2020 NSPW IRP Supplement

(2) Discussion of the increase in fuel, capital, and any other costs that would be incurred by the Applicant or its customers to purchase or generate power necessary to replace the output of the licensed project, if the Applicant is not granted a license for the project;

If the Applicant is not granted a license for the Superior Falls Project, additional power would need to be procured to replace the lost generation. It is assumed this replacement power would be supplied via a purchase on the open market. If all the power produced by the Superior Falls Project were instead purchased, the annual cost for NSPW to purchase said power will be included in the FLA.

(3) Effect of each alternative source of power on:

(a) Applicant's customers, including wholesale customers:

The rates charged to customers for power generated by NSPW are based on the cost of production, operation, maintenance, debt service, and a Public Service Commission of Wisconsin (PSCW)-approved profit from sale of power. The use of alternative sources of power would increase the costs to NSPW electricity end users.

(b) Applicant's operating and load characteristics: and

NSPW uses all power generated by the Superior Falls Project. Alternative sources of power would have no significant effect on the NSPW operating and load characteristics.

(c) Communities served or to be served, including any reallocation of costs associated with the transfer of a license from the existing licensee.

Since NSPW is the regional utility, if the Superior Falls Project were transferred to a different entity, it would still be responsible for distributing power to residential, commercial, and industrial customers within the area. The power currently generated by the Superior Falls Project would need to be replaced from another source. It is assumed a transfer of the existing license would therefore result in higher power costs for residential, commercial, and industrial customers that utilize the power sold by NSPW.

C. Following data showing need and the reasonable cost and availability of alternative sources of power:

(1) Average annual cost of power produced by project, including basis for calculation;

The average annual cost of power produced by the Project, including basis for the calculation will be included in the FLA.

(2) Projected resources required by the Applicant to meet the Applicant's capacity and energy requirements over the short- and long-term including:

(a) Energy and capacity resources, including the contribution from the Applicant's generation, purchases, and load modification measures (such as conservation, if considered as a resource), as separate components of the total resources required;

NSPW has existing and committed resources available to meet its customer capacity and energy requirements. These resources include:

- NSPW-owned generating facilities (see Table C-1)
- RFPs for new resources
- Demand side management (DSM)

Table C-1 NSPW System Resources

System Resources Located in Wisconsin[1]															
Year	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**
MW	494	493	493	493	493	493	493	493	493	493	493	170	170	170	170

[1] NSPW system resources are a part of the overall NSPW system. Additional system resources are located outside of Wisconsin.

In 2021, NSPW's existing supply side resource mix was made up of 7,900 MW thermal resources, 1,875 MW renewable intermittent resources and 1,045 MW of demand response[2]. The resources consist of owned generation resources, purchase power agreements, and Utility DSM programs.

NSPW's plans are developed recognizing the uncertainty associated with forecasting demand, as well as supply, including the level of non-utility purchases and life-extendible capacity. The generation technologies, fuels used, sites, and costs for these resources will be determined through the Integrated Resource Planning process, and subsequent resource acquisition efforts. System resource additions are acquired through competitive Request for Proposals (RFP).

NSPW's resource mix is a diverse mix of generation sources. Table C-2 shows the Load and Resources Table from NSPW's 2020-2034 Integrated Resource Plan. This represents the most current forecast of system obligation and resources needed. The planned resources reflect the proposed preferred plan. New technologies and fuel types are continually evaluated to create a more diverse energy mix to prevent reliance on any single fuel, make better use of available resources, and satisfy customers demands for environmentally sound, low-cost energy.

Table C-2 Load and Resources Table[3]

Load and Resources Table

NSP 2020-2034 Integrated Resource Plan

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
2 Forecast Net Load	9,115	9,067	9,101	9,111	9,092	9,068	9,057	9,072	9,080	9,029	9,041	9,049	9,090	9,143	9,205
3 MISO System Coincident	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
4 Coincident Load	8,659	8,614	8,646	8,655	8,638	8,615	8,604	8,618	8,626	8,578	8,589	8,597	8,636	8,686	8,745
5 MISO PRM	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
6 NSP Obligation	9,430	9,380	9,416	9,426	9,406	9,382	9,370	9,385	9,393	9,341	9,354	9,362	9,404	9,459	9,523
7															
8	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
9 Thermal Resources, Existing and Approv	7,905	7,905	7,905	7,881	7,088	6,753	6,462	6,235	6,223	5,740	5,229	4,677	4,401	3,880	3,382
10 Large Hydro, Existing	709	831	831	831	831	-	-	-	-	-	-	-	-	-	-
11 Small Hydro, Existing	172	170	162	162	162	162	162	162	162	162	162	162	156	152	152
12 Wind, Existing	498	623	672	647	635	631	626	611	605	583	582	566	563	498	479
13 Solar, Existing	495	531	574	608	595	576	557	536	518	497	476	454	432	408	412
14 Demand Response	1,045	1,192	1,273	1,349	1,407	1,454	1,470	1,488	1,499	1,511	1,518	1,526	1,536	1,547	1,560
15 Total Existing & Approved Resources	10,824	11,252	11,418	11,478	10,717	9,576	9,278	9,052	9,007	8,493	7,967	7,386	7,087	6,486	5,986
16															
17 Net Resource (Need)/Surplus Position	1,394	1,871	2,002	2,052	1,311	195	-92	-334	-386	-848	-1,387	-1,976	-2,317	-2,973	-3,537
18 Planned Resources	0	0	0	0	0	230	440	420	600	950	1,581	2,153	2,529	3,226	3,672
19 Net Resource (Need)/Surplus Position	1,394	1,871	2,002	2,052	1,311	425	348	86	214	102	194	176	212	253	135

The Applicant is committed to DSM measures as a resource to meet customer energy needs. Cost-effective DSM resources, in the form of capacity and energy savings, are in essence "purchased" from the customer through incentives, subsidies, rate structures, or other means needed to meet system DSM goals and commitments. NSPW offers programs for the residential sector, business sector, and agricultural sectors. Specific options in these programs include but are not limited to:

[2] This resource mix applies to the overall NSPW system.
[3] Load and Resources Table applies to entire NSPW system.

Residential Programs

- Residential Rate Plans
    - Time of Day Service
    - Optional Off-Peak Service
    - Savers Switch Credit
- Residential Rewards {Focus on Energy (FOE)[4]}
    - Energy Saving Tips
    - Home rebates
        - Home Performance
        - Simple Energy Efficiency
        - New Homes
- Renewable Choices
    - Renewable Connect
    - Solar Connect Community
    - Net metering

Business Programs

- Equipment Rebates
- Energy Audits
- Renewable Programs
    - Renewable Connect
    - Solar
    - Working with Third Party Providers
- Energy Efficient Buildings
    - Multi-Family Building Efficiency (FOE)
    - Custom Efficiency
    - Efficient Facilities (FOE)
    - Energy Benchmarking
- Rate Programs
    - Electric Rate Savings
    - Savers Switch for Business

Farm Programs

- Farm Rewiring
- Agriculture and Farm Rebates

(b) Resource analysis, including a statement of system reserve margins to be maintained for energy and capacity; and

The Applicant and its parent company are members of Midwest Reliability Organization, which requires members to carry an 8.9% reserve margin. NSPW's obligation and net capacity position reflects this requirement (see Table C-2).

[4] Funded through the Focus on Energy® program. Focus on Energy® is Wisconsin's energy efficiency and renewable resource program. It is funded by Wisconsin's investor-owned utilities and participating municipal and electric cooperative utilities, including Xcel Energy.

(c) If load management measures are not viewed as resources, the effects of such measures on the projected capacity and energy requirements indicated separately;
Applicant considers all DSM load measures as resources.

(3) For alternative sources of power, including generation of additional power at existing facilities, restarting deactivated units, the purchase of power off-system, the construction or purchase and operation of a new power plant, and load management measures such as conservation:

(a) The total annual cost of each alternative source of power to replace project power;
The total annual cost to purchase equivalent power off-system from an alternative source is estimated to be $277,790 per year.

(b) The basis for the determination of projected annual cost; and
Annual cost was determined by multiplying the average off-system cost of on-peak and off-peak power of $24.29 per MWh by the average annual energy demand of 11,436.4 MWh.

(c) Discussion of the relative merits of each alternative, including the issues of the period of availability and dependability of purchased power, average life of alternatives, relative equivalent availability of generating alternatives, and relative impacts on the Applicant's power system reliability and other system operating characteristics; and
The best source of power available for NSPW is power produced by its own facilities. If the Superior Falls Project is not granted a new FERC license, the Project's average annual generation of approximately 11,436.4 MWh would be replaced with purchased power.

The availability and dependability of purchased alternative power is considered to be approximately equal to the availability and dependability of power from the existing Project.

(4) Effect on direct providers (and immediate customers) of alternate sources of power.
No detrimental effect would be expected, as it is anticipated adequate supply is available or could be developed to replace power generated by the Project.

D. If an Applicant uses power for its own industrial facility and related operations, the effect of obtaining or losing electricity from the project on the operation and efficiency of such facility or related operations, its workers, and the related community.

Applicant does not use project power to meet its own industrial needs; not applicable.

E. If an Applicant is an Indian tribe applying for a license for a project located on the tribal reservation, a statement of the need of such tribe for electricity generated by the project to foster the purposes of the reservation.

Applicant is not an Indian tribe; not applicable.

F. Comparison of the impact on the operations and planning of the Applicant's transmission system of receiving or not receiving the project license, including:

(1) Analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects;

Since the existing facilities are capable of handling the maximum capacity of the Superior Falls Project, no impacts to line loading, line losses, new construction of transmission facilities, or upgrading of existing facilities would be necessary whether or not a new license is issued.

(2) Analysis of the advantage that the Applicant's transmission system would provide in the distribution of the project's power; and

The NSPW transmission system, consisting of transformers and switchgear, along with associated metering and protection equipment, is necessary to distribute generated power to its customers. If the Superior Falls Project were operated by another entity, the new Licensee would be required to either wheel the power through the existing transmission system or construct additional facilities.

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number that show system transmission elements in relation to the project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if Applicants believe such data would be useful to show that the operating impacts described would be beneficial.

A copy of the one-line system diagram for the Superior Falls Project is included in Appendix A-8 in *Volume 3 of 4, Appendices.*

G. If the Applicant has plans to modify existing project facilities or operations, a statement of the need for, or usefulness of, the modification, including at least a reconnaissance-level study of the effect and projected costs of the proposed plans and any alternate plans, which in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

Applicant has no plans to modify the existing Superior Falls Project facilities or operations; not applicable.

H. If the Applicant has no plans to modify existing project facilities or operations, at least a reconnaissance-level study to show that the project facilities or operations in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

Discussion of the Superior Falls Project’s conformance with comprehensive plans for developing or improving the waterway and for other beneficial uses is provided in Exhibit E, Section 10.

I. Statement describing the Applicant's financial and personnel resources to meet its obligations under a new license, including specific information to demonstrate that the Applicant's personnel are adequate in number and training to operate and maintain the project in accordance with the provisions of the license.

NSPW resources are adequate to meet the needs of the hydro department. NSPW has a consistent record of satisfactory performance with respect to reliability, price competitiveness, and safety. NSPW maintains a staff of more than 60 individuals with expertise in engineering, maintenance, electric system operations, mapping, and planning. Hydro department personnel conduct routine training and have adopted standardized maintenance practices for all NSPW hydro facilities.

J. If Applicant proposes to expand the project to encompass additional lands, a statement that the Applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.

There are no plans to expand the Superior Falls Project to encompass additional lands; not applicable.

K. Applicant's electricity consumption efficiency improvement program, as defined under Section 10(a)(2)(c) of the Federal Power Act, including:

(1) Statement of the Applicant's record of encouraging or assisting its customers to conserve electricity and a description of its plans and capabilities for promoting electricity conservation by its customers; and

The Applicant's continued and dedicated commitment to energy conservation is included in its DSM programs listed in Section 1.C.(2)(a). The Applicant, along with other Wisconsin and Michigan utilities, are nationally recognized as leaders in promoting and implementing DSM measures that benefit both the consumer and the company.

(2) Statement describing the compliance of the Applicant's energy conservation programs with any applicable regulatory requirements.

NSPW's conservation programs have been approved by the PSCW.

L. Names and mailing addresses of every Indian tribe with land on which any part of the proposed project would be located or which the Applicant reasonably believes would otherwise be affected by the proposed project.

Ms. Edith Leoso, THPO
Bad River Band of Lake Superior Tribe of Chippewa Indians
P.O. Box 39
Odanah, WI 54862

Mr. Bryan Newland, Chairman
Bay Mills Indian Community of Michigan
12140 W. Lakeshore Drive
Brimley, MI 49715-9319

Ms. Jill Hoppe, THPO
Fond du Lac Band of Lake Superior Chippewa
1720 Big Lake Road
Cloquet, MN 55720

Mr. Benjamin Rhodd, THPO
Forest County Potawatomi Community of Wisconsin
5320 Wensaut Lane
P.O. Box 340
Crandon, WI 54520

Mr. Michael Blackwolf, THPO
Fort Belknap Indian Community
656 Agency Main Street
Harlem, MT 59526-9455

Ms. Mary Ann Gagnon, THPO
Grand Portage Band of Chippewa Indians
PO Box 428
Grand Portage, MN 55605

Mr. Earl Meshigaud, Cultural Director
Hannahville Potawatomi Indian Community
M-14911 Hannahville B1 Road
Wilson, MI 49896

Mr. William Quackenbush, THPO
Ho-Chunk Nation
Executive Offices
P.O. Box 667
Black River Falls, WI 54615

Iowa Tribe of Oklahoma
Cultural Preservation Office
RR 1, Box 721
Perkins, OK 74059

Mr. Warren Swartz, President
Keweenaw Bay Indian Community
16430 Beartown Road
Baraga, MI 49908-9210

Mr. Brian Bisonette, THPO
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
13394 West Trepania Road
Hayward, WI 54843

Ms. Melinda Young, THPO
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin
P.O. Box 67
Lac du Flambeau, WI 54538

Ms. Alina Shively, THPO
Lac Vieux Desert Band of Lake Superior Chippewa Indians
P.O. Box 249, E23857 Poplar Circle
Watersmeet, MI 49969

Mr. James Williams, Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
E23968 Pow Wow Trail
Watersmeet, MI 49969

Ms. Amy Burnette, THPO
Leech Lake Band of Minnesota Chippewa Tribe
190 Sailstar Drive NE
Cass Lake, MN 56633

Mr. David Grignon, THPO
Menominee Indian Tribe of WI
W3426 Cty VV
P.O. Box 910
Keshena, WI 54135-0910

Ms. Diane Hunter, THPO
Miami Tribe of Oklahoma
PO Box 1326
Miami, OK 74355

Ms. Natalie Weyaus, THPO
Mille Lacs Band of Ojibwe
43408 Oodena Drive
Onamia, MN 56359

Ms. Stacy Cutbank, THPO
Oneida Nation of Wisconsin
P.O. Box 365
Oneida, WI 54155-0365

Mr. Ryan Howell, THPO
Prairie Island Indian Community
5636 Sturgeon Lake Road
Welch, MN 55089

Ms. Hattie Mitchell, THPO
Prairie Band Potawatomi Nation
162Q Road
Mayetta, KS 66509

Mr. Marvin Defoe, THPO
Red Cliff Band of Lake Superior
Chippewa Indians of Wisconsin
88385 Pike Road HWY 13
Bayfield, WI 54814

Mr. Jonathan Buffalo, NAGPRA Rep.
Sac and Fox of the Mississippi in Iowa
349 Meskwaki Road
Tama, IA 52339-9629

Mr. Gary Bahr
Sac and Fox Nation of Missouri in Kansas and Nebraska
305 N. Main
Reserve, KS 66434

Ms. Sandra Massey, NAGPRA Rep.
Sac and Fox Nation of Oklahoma
920883 S. Hwy 99 Bldg. A
Stroud, OK 74079

Mr. Cecil E. Pavlat Sr., Cultural Repatriation Specialist
Sault Ste. Marie Tribe of Chippewa Indians
523 Ashmun Street
Sault Ste. Marie, MI 49783

Mr. Chris McGeshick, Chairman
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Crandon, WI 54520

Mr. Michael LaRonge, THPO
Sokaogon Chippewa Community Mole Lake Band
3051 Sand Lake Road
Crandon, WI 54520

Mr. Lewis Taylor, President
St. Croix Chippewa Indians of WI
24663 Angeline Ave.
Webster, WI 54893

Ms. Wanda McFaggen, THPO
St. Croix Chippewa Indians of Wisconsin
24663 Angeline Avenue
Webster, WI 54893

Mr. Nathan Allison, THPO
Stockbridge-Munsee Community
86 Spring Street
Williamstown, MA 01267

Ms. Sherry White, THPO
Stockbridge Munsee Community of Wisconsin Tribal Office
PO Box 70
Bowler, WI 54416

Ms. Jamie Arsenault, THPO
White Earth Band of the Minnesota Chippewa Tribe
P.O. Box 418
White Earth, MN 56591

2. Information Provided by Existing Licensee

A. Information provided by all applicants.

See Section 1 of this Exhibit.

B. A statement of measures taken or planned by the licensee to ensure safe management, operation, and maintenance of the project, including:

The Superior Falls Project is operated in conjunction with the upstream Saxon Falls Project and Gile Flowage Storage Reservoir Project. Two operators are assigned to oversee the daily operation and routine maintenance of all three Projects. Eight-hour coverage is provided five days a week, Monday through Friday. An operator for the facility is on call 24 hours per day, seven days per week. The plant is manually operated with controls installed for automatic shutdown in case of operational emergencies. Whenever a plant shutdown occurs or if high or low water alarms are activated, the continually staffed control center at the Licensee's Wissota Hydroelectric Project is notified (NSPW, 2014).

For emergency operation of the facility, an operator is available 24 hours a day and can also be supported by the Licensee's White River Hydro operator, local line crews, the Ashland Bay Front Plant maintenance staff, and personnel from the Licensee's Hydro Maintenance Department in Chippewa Falls, Wisconsin (NSPW, 2014).

(1) Description of existing and planned operation of the project during flood conditions;
Under circumstances when the reservoir cannot be maintained at the normal pool elevations, water can be discharged through the three radial gates, the sluice gate, the slide gate, and over the middle and left overflow sections (NSPW, 2014).

The most frequently operated gate, Tainter gate 3, is operated via an electric hoist system, but it can be operated with a portable drill or manually if power is lost. Tainter gates 1 and 2 are operated via hydraulic hoist systems and a backup generator onsite is available to operate gates if power is lost (NSPW, 2014).

(2) Discussion of any warning devices used to ensure downstream public safety;

NSPW maintains an Emergency Action Plan (EAP) for the Superior Falls Project even though the Project is assigned a low hazard potential and it is not required by FERC. The Licensee holds annual tests of the EAP including contacting key personnel and agencies listed in the EAP for appropriate readiness to respond in the event of an emergency (FERC, 2015).

NSPW maintains a public safety plan for the Project. The most recent public safety plan was submitted to FERC on August 31, 2015 (NSPW, 2015). Safety devices at the Project include a boat barrier upstream of the spillway, warning signs upstream and downstream of the Project, and fencing at the waterfall area downstream of the dam and around the penstock and substation area. The dam is also lighted at night for visibility. A horn and strobe light on the dam are activated whenever the radial gates are opened (FERC, 2015).

(3) Discussion of any proposed changes to the operation of the project or downstream development that might affect the existing Emergency Action Plan, as described in Subpart C of Part 12 of this chapter, on file with the Commission;

There are no proposed changes to the operation of the Superior Falls Project at this time with the exception of a possible new minimum flow requirement. In the event NSPW personnel detect an actual or potential failure through remote surveillance or direct observation, they will implement the EAP.

(4) Description of existing and planned monitoring devices to detect structural movement or stress, seepage, uplift, equipment failure, or water conduit failure, including a description of the maintenance and monitoring programs used or planned in conjunction with the devices; and

A formal operator inspection is performed monthly. These inspections include observations of each component of the dam (embankments, concrete structures, gates, and penstocks) for deformation cracks, leaks, deterioration, mechanical defects, etc. The operator also notes any changes from previous inspections. Operators inform the plant engineer or superintendent of any unusual findings (NSPW, 2014).

Whenever a plant shutdown occurs or if high or low water alarms are activated, the continually staffed control center at the Licensee's Wissota Hydroelectric Project is notified and an operator is dispatched to investigate the situation (NSPW, 2014).

There are thirteen survey monuments on and around the dam that are used to determine if there is any movement of the structures. Soundings downstream of the powerhouse were first performed in 2013. Monument surveys and soundings are completed at the time of the Consultant's Safety Inspection. The results are reviewed by a professional engineer as part

of the safety inspection. No other surveillance and monitoring devices are located at the Project (NSPW, 2014).

(5) Discussion of the project's employee safety and public safety record, including the number of lost-time accidents involving employees and the record of injury or death to the public within the project boundary.

The number of lost-time accidents in the hydro department logged by NSPW in the last five years that will be included in the FLA. One death was reported within the Superior Falls Project boundary during the current license term. The death occurred in 2008 and was not related to Project operations (FERC, 2009).

C. Description of the current operation of the project, including any constraints that might affect the manner in which the project is operated.

As described in Section 1.A.(2) of this Exhibit, the Project is operated in a run-of-river mode whereby discharge measured immediately downstream of the Project tailrace approximates inflows into the Project reservoir with a minimum reservoir elevation of 739.7 feet NGVD as measured immediately upstream of the dam (FERC, 1997). A minimum flow of 8 cfs is required to be released into the bypassed reach of the Montreal River from the Saturday before Memorial Day to October 15 for enhancement of scenic resources. A minimum flow of 20 cfs is required to be released into the bypassed reach from 8 am to 8 pm on weekends and holidays during the same timeframe (FERC, 1995).

The plant is manually operated with controls installed for automatic shutdown in case of operational emergencies. Whenever a plant shutdown occurs or if high or low water alarms activate, the continually staffed control center at the Licensee’s Wissota Hydroelectric Project is automatically notified and an operator is dispatched to investigate the situation.

D. Discussion of the history of the project and record of programs to upgrade the operation and maintenance of the project.

The Superior Falls Project, completed in 1917, was originally constructed to produce electrical power. In 1935, major construction was performed that included raising the crest elevation of the dam, the construction of a redwood conduit and surge tank, and installation of two steel penstocks. In 1954 and 1957, the generators were rewound to increase their capacity to 825 kW each at unity power factor. In 1964, the twin steel penstocks were replaced after a failure due to water-hammer overpressures occurred. In 1972, the redwood conduit was replaced with a buried reinforced concrete pressure pipe and a new surge tank was constructed. In 1987, the penstock thrust block and steel liner, draft tubes, and powerhouse tailrace were replaced and/or reconstructed. In 1999, a major spillway rehabilitation was completed. The work consisted of adding earth fill behind the right non-overflow section, refurbishing two existing steel tainter gates, removing three timber tainter gates and replacing them with a larger steel tainter gate and overflow spillway. The rehabilitation also included the installation of new piers and an operator’s bridge for the new tainter gate and overflow spillway (NSPW, 2014). In 2019 an earthen embankment with a crest elevation of 745.4 feet NGVD was installed on the right side of the dam to prevent water from flowing through the operations and maintenance buildings and low-lying wooded area

on the right side of the dam. In addition to the items listed above, routine maintenance activities have been completed since the dam was installed.

E. Summary of any generation lost at the project over the last 5 years because of unscheduled outages, including the cause, duration, and corrective action taken.

Lost generation data will be provided in Table E-1 for the period of January 2017 through December 2021 in the FLA.

Table E-1: Superior Falls Project Lost Generation Summary (2017-2021)

Unit ID	Cause Code	Event Start	Event End	Verbal Description	Equivalent MWh	Total Duration (Hours)
To	Be	Included	In	FLA		

F. Discussion of the licensee's record of compliance with the terms and conditions of the existing license, including a list of all incidents of noncompliance, their disposition, and any documentation relating to each incident.

There are no known outstanding compliance issues associated with the Superior Falls Project.

G. Discussion of any actions taken by the existing licensee related to the project which affect the public.

Applicant maintains signage to warn the public of potential hazards associated with turbulent water from project operations, steep cliffs, and sources of high voltage. Fencing has been erected to prevent access to operational or unsafe areas.

Under its current FERC license, the Applicant is subject to a number requirements, including project operations, designed to protect the environment. License articles direct NSPW to maintain specific reservoir elevations and run-of river flows to protect environmental, cultural, and recreational resources. They also provide for minimum flows within the bypassed reach to protect aesthetic resources.

H. Summary of the ownership and operating expenses that would be reduced if the project license were transferred from the existing licensee.

The ownership and operating expenses associated with the Project include various components of production costs. Total ownership and operating costs that would be reduced if the Project license were transferred to another licensee will be provided in the FLA. Personnel expenses would not be significantly reduced because personnel at the Wissota Control Center would still be necessary for monitoring NSPW's other hydro projects.

I. Statement of annual fees paid under Part I of the Federal Power Act for the use of any Federal or Indian lands included within the project boundary.

None.

3. List of References

(FERC, 1995) Federal Energy Regulatory Commission. 1995. *Order Issuing Subsequent License P-2587 (Major Project).* January 19, 1995.

(FERC, 1997) Federal Energy Regulatory Commission. 1997. Order on Rehearing of Order Issuing License to Northern States Power Company for Superior Falls Project (P-2587). May 31, 1997.

(FERC, 2015) Federal Energy Regulatory Commission. 2015. 2015 Dam Safety Inspection. Superior Falls Project No. 2587. December 1, 2015.

(NSPW, 2014) Northern States Power Company-Wisconsin. 2014. *Superior Falls Hydroelectric Project, FERC No. 2587. Supporting Technical Information Document*. March 22, 2014.

(NSPW, 2015) Northern States Power Company-Wisconsin. 2015. *Revised Public Safety Plans (NSP Wisconsin and NSP Minnesota) et.al. under P-1982 et. al*. August 31, 2015.