ORIGINAL

Public Service

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
600 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

FILED
OFFICE OF THE SECRETARY
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FEDERAL ENERGY
REGULATORY COMMISSION

June 17, 1998

The Secretary
Federal Energy Regulatory Commission
Mail Code: DLC, HL-11.2
888 1st Street N.E
Washington, DC 20426
Attention: Director, Office of Hydropower Licensing

N

Dear Secretary:

-018

Project No. 2595 - High Falls

Enclosed is the original and eight copies of the Water Quality Monitoring Plan for the High Falls Hydroelectric Project (FERC Project No. 2595) as per Article 406 of the Order Issuing New License dated June 26, 1997.

Documentation of Agency Consultation with responses to the agency comments are included with this submittal.

If you have any questions, please call me at (920) 433-5515 or you can contact Mr. W. A. Bloczynski, Hydro Operations Coordinator, at (715) 539-4016.

Sincerely,

Ronald N Schmidt for

Charles A. Schrock
Vice President - Energy Supply

WAB/jfj

cc - R. A. Lesniak, FERC (Chicago)
W. A. Bloczynski, WPSC (Merrill Hydro)
B. E. Crocker, WPSC (Crivitz)
S. C. Puzen, WPSC (A2)
R. H. Schmidt, WPSC (D2)

Enclosure

FERC - DOCKETED
JUN 19 1998

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Article 406 The licensee shall file with the Commission, for approval, a plan to monitor dissolved oxygen (DO), water temperature, and pH of the Peshtigo River upstream and downstream of the High Falls dam.

Water Quality Monitoring Plan

Objective: Implement a system-wide monitoring plan to ensure that flow releases from the project, as measured immediately downstream from the dam, maintain the following standards, except when natural conditions prohibit attainment of the standards: (1) DO concentrations shall not be less than 5.0 milligrams per liter (mg/L) at any time; (2) water temperature shall not exceed 89 degrees Fahrenheit; and (3) the pH shall be within the range of 6.0 to 9.0, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum.

I. Methods

A. A profile for dissolved oxygen and temperature will be taken in the headwater to determine if the reservoir has stratified during the summer time period. If the reservoir has stratified, the extent of the mixing zone in the tailrace will be determined by conducting profile monitoring for pH, dissolved oxygen, and temperature in a transect at the downstream edge of the mixing zone. In the same transect, flow measurements will be taken to verify the flow exceeds the 50 cfs minimum flow. Monitoring will be conducted once per month during the months of June, July, August, and September in 1999 and 2000. Wisconsin Department of Natural Resources (WDNR) Water Quality personnel will be invited to attend the monitoring. The transect will be identified in the first monitoring session. The same transect will be utilized for all remaining sampling periods. The June monitoring will be conducted provided the reservoir has stratified and there is enough time (one day) after run-of-river operation has ceased. The same transect will be utilized for all remaining sampling periods. Dissolved oxygen and temperature measurements will be taken utilizing a YSI Model 59 portable dissolved oxygen meter or equivalent. The pH readings will be taken utilizing an Orion portable pH meter with a probe extension or equivalent. All instrumentation will be calibrated according to manufacturer's specification prior to the monitoring period and will be recorded in a maintenance log for each piece of equipment.

B. Upon completion of the 2000 monitoring schedule, monitoring will be conducted in the same manner utilizing the same transect (once during June, July, August, and September) on a five year schedule for the remaining term of the license beginning in 2005.

Article 406 continued:

II. Location of Monitoring

A. The profile in the headwater will be taken directly behind the trash racks and in front of the penstock intakes. The tailwater transect location will be determined by identifying the mixing zone where water from the minimum flow unit and the leakage through the wicket gates has had a chance to thoroughly mix and provide a dissolved oxygen content greater than 5 mg/L. The first year of monitoring will require additional transects to determine the edge of the mixing zone which will be used in future monitoring periods.

III. Data Submittal and Review

A. The results of the monitoring will be supplied to the WDNR Water Quality personnel and the U. S. Fish and Wildlife Service (USFWS) in a tabular format in an Excel spreadsheet by November 30th of the year in which the monitoring occurred. Accompanying the tabular results will be a map indicating the extent of the mixing zone and the location of the transect or transects.

B. The agencies will be given 30 days for review of the results of the study. The monitoring results, agency comments and responses to agency comments will be provided to the Federal Energy Commission (FERC) by February 28th of the year following the year in which monitoring occurred.

IV. Correction of Potential Problems

A. If evaluation monitoring provides information to indicate water quality is not within the accepted standards beyond the mixing zone at times other than when natural conditions prohibit attainment of the standards, WPSC will reinitiate consultation with the agency water quality personnel on methods to correct periods when the water quality is not within the accepted standards.

V. Documentation of Consultation

A. Initial consultation on the design of this plan was conducted with the WDNR on March 23, 1998. Further consultation was solicited from the WDNR and USFWS on May 6, 1998. Requests for agency comments along with responses to agency comments are included in Appendix A.

Appendix A

Documentation of Consultation

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

May 6, 1998

Mr. Tom Thuemler
Wisconsin Dept. of Natural Resources
101 N. Ogden Road
Peshtigo, WI 54157

Dear Tom:

Re: Draft Peshtigo River Hydroelectric Projects Water Quality Monitoring Plans

We would appreciate your comments and concerns associated with the enclosed Draft Water Quality Monitoring Plans for the following Peshtigo River Hydroelectric Projects:

Project Name	FERC Project No.
High Falls	2595
Caldron Falls	2525
Johnson Falls	2522
Potato Rapids	2560
Peshtigo	2581
Sandstone Rapids	2546

Could you please provide comments and concerns to me within thirty days of receiving this letter. Thank-you, and I look forward to hearing from you very soon.

Sincerely,

Shawn C. Puzen
Environmental Analyst
(920) 433-1094

vav

Enclosure

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

May 6, 1998

Mr. Jim Fossum
U.S. Fish and Wildlife Service
1015 Challenger Court
Green Bay, WI 54311

Dear Jim:

Re: Draft Peshtigo River Hydroelectric Projects Water Quality Monitoring Plans

We would appreciate your comments and concerns associated with the enclosed Draft Water Quality Monitoring Plans for the following Peshtigo River Hydroelectric Projects:

Project Name	FERC Project No.
High Falls	2595
Caldron Falls	2525
Johnson Falls	2522
Potato Rapids	2560
Peshtigo	2581
Sandstone Rapids	2546

Could you please provide comments and concerns to me within thirty days of receiving this letter. Thank-you, and I look forward to hearing from you very soon.

Sincerely,

Shawn C. Puzen
Environmental Analyst
(920) 433-1094

vav

Enclosure

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor
George E. Meyer, Secretary
William R. Selbig, District Director

Department of Natural Resources
Box 127, 101 N. Ogden Rd.
Peshtigo, Wisconsin 54157
TELEPHONE 715-582-5000
FAX 582-5005

June 2, 1998

IN REPLY REFER TO: 3600

Mr. Shawn Puzen
Wisconsin Public Service Corporation
700 N. Adams
P.O. Box 19002
Green Bay, WI 54307

SUBJECT: Comments on Water Quality Monitoring Plans for the Peshtigo River Hydroelectric Projects (FERC No. 2525, 2522, 2546, 2560, 2581, 2595)

Dear Shawn:

The following are the Wisconsin Department of Natural Resources (WDNR) comments on the draft water quality monitoring plans on the Peshtigo River Hydroelectric Projects that you submitted to us for review.

These plans fall far short of what we had discussed at our consultation meeting on March 23, 1998 on this issue. Because past water quality studies at three of these projects have shown that you are not currently meeting state water quality standards, it is imperative that well thought out intensive monitoring take place at these projects.

Our specific comments by project follow:

Article 409 - Caldron Falls Project FERC No. 2525

The monitoring plan that you have proposed is unacceptable to the WDNR. As mentioned in the order issuing the license for this project, the Caldron Falls Project has not met state water quality standards for dissolved oxygen (DO) in the past. At our March 23, 1998 consultation meeting with you, we discussed the possibility of looking for a solution to the low DO levels in the tailrace of this project prior to starting the water quality monitoring program. We know that a problem exists, further monitoring of this problem will not do much to solve it. A number of possible remedies to the low DO levels were discussed at our consultation meeting. Air or water could be injected into the turbine. Plates could be placed over the lower portion of the penstock intake. Run-of-river flows could be provided through the project during the period when low DO levels are pervasive. Some monitoring would be needed to assess the value of any of these proposed fixes. Once it was felt a solution to the problem was found and implemented, then the monitoring schedule could commence. The WDNR feels that this is the most appropriate way to resolve this issue and assure that state water quality

standards are being met at this project. If a solution to the low DO levels at the Caldron Falls Project cannot be found within two years of FERC's approval of this plan, then the run-of-river mode of operation should be mandated until such time as an alternate fix is found. Run-of-river flows at this project will assure that state water quality standards are being met and the aquatic resources are being protected.

Once a solution to the low DO levels has been found and implemented at the Caldron Falls Project then the following water quality monitoring should be conducted as required by Article 409 of your license..

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur at two locations; in the tailrace of the project, immediately below the powerhouse, and upstream from the project reservoir in the Peshtigo River. The downstream monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards, as your proposed plan seems to imply. If the licensee agrees that any violations of water quality standards are due to project operation and are not the result of background water quality, coming into the project, then the upstream sampling site can be eliminated. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

2. Monitoring Schedule:

Annual monitoring will commence once the Caldron Falls Project switches to a peaking mode of operation each summer and will terminate on or after September 30. This schedule should be maintained for two years and then once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. If violations are found the project should immediately be switched to run-of-river operation. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

Article 406 - High Falls Project FERC No. 2595

The monitoring plan that you have proposed is unacceptable to the WDNR. As mentioned in the order issuing the license for this project, the High Falls Project has not met state water quality standards for dissolved oxygen (DO) in the past. At our March 23, 1998 consultation meeting with you, we discussed the possibility of looking for a solution to the low DO levels in the tailrace of this project prior to starting the water quality monitoring program. We know that a problem exists, further monitoring of this problem will not do much to solve it. You mentioned during our consultation meeting that you could do some monitoring of a minimum flow turbine unit at the project to determine if you could meet state water quality standards by using this unit. Run-of-river flows could be provided through the project during the period when low DO levels are pervasive. Some monitoring would be needed to assess the value of either of these proposed fixes. Once it was felt a solution to the problem was found and implemented, then the monitoring schedule could commence. The WDNR feels that this is the most appropriate way to resolve this issue and assure that state water quality standards are being met at this project. If a solution to the low DO levels at the High Falls Project cannot be found within two years of FERC's approval of this plan, then the run-of-river mode of operation should be mandated until such time as an alternate fix is found. Run-of-river flows at this project will assure that state water quality standards are being met and the aquatic resources are being protected.

Once a solution to the low DO levels has been found and implemented at the High Falls Project then the following water quality monitoring should be conducted as required by Article 406 of your license..

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project, immediately below the powerhouse. The monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards, as your proposed plan seems to imply. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff. The data collected in the tailwater of the Caldron Falls Project, assuming that the water quality monitoring at both projects takes place in the same year, could be used instead of an upstream monitoring location.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log

should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

2. Monitoring Schedule:

Annual monitoring will commence once the High Falls Project switches to a peaking mode of operation each summer and will terminate on or after September 30. This schedule should be maintained for two years and then once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. If violations are found the project should immediately be switched to run-of-river operation. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

Article 407 - Johnson Falls Project FERC No. 2522

The monitoring plan that you have proposed is unacceptable to the WDNR. As mentioned in the order issuing the license for this project, the Johnson Falls Project has not met state water quality standards for dissolved oxygen (DO) in the past. The objective statement of your proposed plan states the wrong water quality standards for this project. The DO and temperature standards that apply to this project are correctly given in Article 407 of the license; DO concentrations shall not be less than 6.0 milligrams per liter (mg/L) at any time and not less than 7.0 mg/L during the spawning season; water temperature shall not be altered from natural background to such an extent that trout populations are adversely affected. At our March 23, 1998 consultation meeting, you felt that the increased minimum flow required at this project will allow you to meet these water quality standards. Once FERC approves your water quality monitoring plan you could start sampling, however if you plan on using the tailwater monitoring at the High Falls Project for the background water quality for the Johnson Falls Project then you would have to wait with the initiation of the water quality monitoring until you can meet compliance at the two upstream projects. The WDNR would also prefer to have all of the water quality monitoring at the six Peshtigo Projects take place during the same calendar years.

Once a solution to the low DO levels occurring at the upstream projects has been found and implemented then the following water quality monitoring should be conducted as required by Article 407 of your Johnson Falls Project license..

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project, immediately below the powerhouse. The monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff. The data collected in the tailwater of the High Falls Project, assuming that the water quality monitoring at both projects takes place in the same year, could be used instead of an upstream monitoring location.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

2. Monitoring Schedule:

Annual monitoring will commence once the Johnson Falls Project switches to a peaking mode of operation each summer and will terminate on or after November 1. Monitoring at this project needs to continue until November 1, as state water quality standards for DO are 7.0 mg/L during the trout spawning season, which occurs in late September and October. If the initial year of sampling shows that DO levels are well above the 7.0 mg/L standard in October, then future years sampling could be terminated at the end of September. This decision should be made by the resource agencies after receiving the annual report for the first year of sampling. Water quality monitoring should be maintained for two years and then once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. If violations are found the project should immediately be switched to run-of-river operation. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

4. *Correction of Potential* Problems

The proposed plan does not mention how water quality problems would be corrected, if the monitoring shows that these problems are occurring. As mentioned in No. 3 above, if violations are found the Johnson Falls Project and all upstream projects should immediately be switched to run-of-river operation. Run-of-river operation would assure that state standards are being met.

Article 408 - Sandstone Rapids Project FERC No. 2546

The monitoring plan for the Sandstone Rapids Project should include the following items.

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project, immediately below the powerhouse. The monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff. The data collected in the tailwater of the Johnson Falls Project, assuming that the water quality monitoring at both projects takes place in the same year, could be used instead of collecting data at an additional upstream monitoring location.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

2. Monitoring Schedule:

Monitoring should commence once the Sandstone Rapids Project switches to a peaking mode of operation in the summer and terminate on or after September 30. Your proposed plan calling for water quality monitoring to begin in 2004 is unacceptable. Article 408 of your license calls for implementation of the monitoring program within 24 months from the date of license issuance. This means monitoring would have to start in the summer of 1999. The WDNR would support an amendment to your license to allow you to begin water quality monitoring at the Sandstone Rapids Project the same year that monitoring of the upstream projects begins. Water quality monitoring should be repeated once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. If violations are found the project should immediately

be switched to run-of-river operation. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

4. Correction of Potential Problems

The proposed plan does not mention how water quality problems would be corrected, if the monitoring shows that these problems are occurring. As mentioned in No. 3 above, if violations are found the Sandstone Rapids Project and all upstream projects should immediately be switched to run-of-river operation. Run-of-river operation would assure that state standards are being met.

Article 406 - Potato Rapids Project FERC No. 2560

The monitoring plan for the Potato Rapids Project should include the following items.

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project and above the project's reservoir. Monitoring water quality directly in front of the trash racks at the powerhouse, as proposed in your plan, is unacceptable to the WDNR. Background water quality should be defined as the river's water quality as it enters the project and not the water quality of the impoundment at the powerhouse. The project impoundment has an impact on water quality in the Peshtigo River. This should not be considered as the background water quality of the Peshtigo river entering the project. The tailwater monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards. The upstream water quality monitoring site should be near the County Trunk Highway D bridge that crosses the Peshtigo River just upstream from the Potato Rapids Flowage. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if *this criterion is not met.*

2. Monitoring Schedule:

Monitoring should commence once the upstream projects switch to a peaking mode of operation in the summer and terminate on or after September 30. Your proposed plan calling for water quality monitoring to begin in 2003 is unacceptable. Article 406 of your license calls for implementation of the monitoring program within 24 months from the date of license issuance. This means monitoring would have to start in the summer of 1999. The WDNR would support an amendment to your license to allow you to begin water quality monitoring at the Potato Rapids Project the same year that monitoring of the upstream projects begins. Water quality monitoring should be repeated once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

Article 405 - Peshtigo Project FERC No. 2581

The monitoring plan for the Peshtigo Project should include the following items.

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project and above the project's reservoir. As mentioned in your proposed plan, the WDNR would accept the water quality monitoring data from immediately downstream of the Potato Rapids Project, as the background water quality of the peshtigo River entering the Peshtigo Project. This assumes that both sets of monitoring data are collected at the same time. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift at the end of an unattended monitoring period needs to be less than 1 mg/l - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

2. Monitoring Schedule:

Monitoring should commence once the upstream projects switch to a peaking mode of operation in the summer and terminate on or after September 30. Your proposed plan calling for water quality monitoring to begin in 2003 is unacceptable. Article 405 of your license calls for implementation of the monitoring program within 24 months from the date of license issuance. This means monitoring would have to start in the summer of 1999. The WDNR would support an amendment to your license to allow you to begin water quality monitoring at the Peshtigo Project the same year that monitoring of the upstream projects begins. Water quality monitoring should be repeated once every five years for the duration of the license unless the schedule is revised by FERC.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

If you have any questions regarding these comments please feel free to contact me.

Sincerely,

Thomas F. Thuemler
Regional FERC Coordinator

cc: Greg Sevener - WDNR, Peshtigo
Mary Gansberg - WDNR, NERH
Jim Fossum - U.S. Fish and Wildlife Service

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High Falls Hydroelectric Project
Responses to Wisconsin Department of Natural Resources (WDNR) Water Quality Monitoring Plan Comments

Comments on the Water Quality Monitoring Plan

These plans fall far short of what we had discussed at our consultation meeting on March 23, 1998 on this issue. Because past water quality studies at three of these projects have shown that you are not currently meeting state water quality standards, it is imperative that well thought out intensive monitoring take place at these projects.

Response: It is important to note that WDNR has waived all 401 Water Quality Certification requirements for this project by not responding to WPSC's request within one year. Requesting the operation of the project be changed to run-of-river operation to modify any conditions that may create situations where flow releases are not within state standards is beyond the scope of Article 406. Run-of-river operation is not the most feasible alternative. Requesting run-of-river operation is an issue that should have been included under 401 water quality certification, but was not addressed due to the WDNR's lack of a response to that request. WPSC has had discussions with WDNR personnel about investigating possible remedies to the conditions that occur directly within the tailrace of the High Falls Hydroelectric Project. However, WPSC believes these conditions that occur within the tailrace are in compliance with state water quality standards. Therefore, WPSC is not willing to discuss any additional possible remedies until the scope of the situation can be identified through the proposed water quality monitoring plan.

The situation that has occurred in the tailrace of High Falls in the past, only occurs during the summer season when the reservoir was stratified and the hydroelectric plant was not operating. Due to the design of the hydro plant, the intakes for the generating units draw water from the bottom of the reservoir. When at least one generating unit is operating, the volume of water passed through the intake or intakes is large enough to require a mix of water from both the hypolimnion and the eplimnion. In summers past, before a minimum flow was required, when the plant was not operating, only a small amount of leakage through the wicket gates entered the tailwater. The leakage through the wicket gates, which amounts to approximately 26 cfs, is water that has low concentrations of dissolved oxygen, which is characteristic of the natural condition of stratification.

In the past, the monitoring equipment has been placed in the tailwater downstream of the discharge. Therefore, during the summer months, when the plant was not operating and a minimum flow was not required, the monitoring showed levels of low dissolved oxygen in the tailrace due to the leakage through the wicket gates.

When the plant is operating in the modified peaking mode, the required minimum

flow of approximately 50 cfs for the project is passed through a minimum flow turbine. However, the ability to maintain the required minimum flows at the downstream projects (200 cfs at Johnson Falls-2522 and 250 cfs at Sandstone Rapids-2546) would be in question if the minimum flow at High Falls was maintained at 50 cfs at all times.

The water passed through the minimum turbine is higher in dissolved oxygen. The water being passed through minimum flow turbine unit enters directly into the tailrace, but does not immediately mix with the other water in the tailrace area.

Due to the temperature differences, the colder water, low in dissolved oxygen, leaking through the wicket gates does not immediately mix with the warmer water, high in dissolved oxygen, until a point further downstream. A point which WPSC's proposed water quality monitoring plan is designed to identify.

WPSC is not aware of any section of the Wisconsin Administrative Code that prohibits a mixing zone. The mixing zone concept is a widely accepted practice for water quality in the State of Wisconsin. For example, the Wisconsin River Waste Load Allocation (WLA) system is a series of mixing zones along the course of the Wisconsin River. The Wisconsin River WLA system is designed to provide limits for criteria pollutants and physical parameters which are known to have hazardous effects upon living organisms.

WPSC believes their proposed monitoring plan is best suited to determine if the project is within compliance with state water quality standards by determining the extent of the mixing zone in the tailrace of High Falls and by periodically monitoring the extent of the mixing zone for changes due to channel morphology. The license article does not require continuous monitoring and continuous monitoring is not necessary to assure releases from the project maintain state water quality standards. The condition below High Falls occurs in the same manner every time the plant is not operating beyond minimum flow and the reservoir is stratified. Therefore, summer transect monitoring with profiles on the downstream edge of the mixing zone once per month during the first two years of approval of the plan is more than adequate to assure releases from the project are in compliance with state standards at all times.

Article 406 - High Falls Project FERC No. 2595

The monitoring plan that you have proposed is unacceptable to the WDNR. As mentioned in the order issuing the license for this project, the High Falls Project has not met state water quality standards for dissolved oxygen (DO) in the past. At our March 23, 1998 consultation meeting with you we discussed the possibility of looking for a solution to the low DO levels in the tailrace of this project prior to starting the water quality monitoring program. We know that a problem exists, further monitoring of this problem will not do much to solve it. You mentioned

during our consultation meeting that you could do some monitoring of a minimum flow turbine unit at the project to determine if you could meet state water quality standards by using this unit. Run-of-river flows could be provided through the project during the period when low DO levels are pervasive. Some monitoring would be needed to assess the value of either of these proposed fixes. Once it was felt a solution to the problem was found and implemented, then the monitoring schedule could commence. The WDNR feels that this is the most appropriate way to resolve this issue and assure that state water quality standards are being met at this project. If a solution to the low DO levels at the High Falls Project cannot be found within two years of FERC's approval of this plan, then the run-of-river mode of operation should be mandated until such time as an alternate fix is found. Run-of-river flows at this project will assure that state water quality standards are being met and the aquatic resources are being protected.

Response: WDNR provides no reason based upon the Wisconsin Administrative Code why the proposed water quality monitoring plan is unacceptable. WPSC is not aware of any section of the Wisconsin Administrative Code that prohibits a mixing zone. The plan proposed by WPSC is in compliance with Article 406 of the Order Issuing a License for the High Falls Hydroelectric Project. WPSC has already implemented measures to increase the level of dissolved oxygen in the tailrace by discharging a minimum flow into the tailrace. This proposed monitoring plan is designed to monitor the effectiveness of these measures and according to the Wisconsin Administrative Code, a mixing zone is within compliance. Also, through other water quality issues within the state of Wisconsin, WPSC believes that a mixing zone within the tailrace is acceptable as long as the size of the mixing zone can be identified and the area beyond the mixing zone meets the standards for dissolved oxygen.

Prior to investigating the mixing zone, WPSC did have discussions with WDNR personnel about investigating possible remedies to the conditions that occur directly within the tailwater area of the High Falls Hydroelectric Project. WPSC did not, however, at any time discuss the possibility of operating the project in the run-of-river mode to increase the levels of dissolved oxygen within the tailrace. WPSC does not believe that run-of-river operation is a feasible method to increase the level of dissolved oxygen within the tailrace area.

Once a solution to the low DO levels has been found and implemented at the High Falls Project then the following water quality monitoring should be conducted as required by Article 406 of your license.

Response: WPSC believes they have already implemented a solution to the DO levels below High Falls and intends to monitor the results by implementing the proposed monitoring plan.

Monitoring Plan

1. Monitoring Locations/Equipment:

Continuous monitoring of DO, water temperature and pH should occur in the tailrace of the project, immediately below the powerhouse, and upstream from the project reservoir in the Peshtigo River. The downstream monitoring site should be located as close to the powerhouse as practical. The WDNR will not allow for a mixing zone to meet the DO, temperature or pH water quality standards, as your proposed plan seems to imply. The exact placement of the water monitoring instruments should be decided in consultation with WDNR water resources staff. The data collected in the tailwater of the Caldron Falls Project, assuming the water quality monitoring at both projects takes place in the same year, could be used instead of an upstream monitoring location.

Response: Continuous monitoring is not required because the dissolved oxygen situation that exists in the tailrace occurs whenever the reservoir stratifies and the project is not generating. Therefore, this situation can be re-created anytime the reservoir has stratified. WDNR provides no reason based upon the Wisconsin Administrative Code why it will not allow a mixing zone. According to the Wisconsin Administrative Code, a mixing zone is within compliance.

There is no need for upstream monitoring because WPSC has proven from past monitoring that the dissolved oxygen situation is due to the stratification of the reservoir and occurs in the same manner each time the reservoir is stratified. The idea of upstream monitoring to take into account any discharges into the river system upstream is unnecessary because the river upstream from the project is in an undeveloped forested setting which has no recorded point discharges and very little agricultural land. Furthermore, almost the entire shoreline of the High Falls Reservoir is under the ownership of WPSC and is in an undeveloped state with the exception of project facilities. There is also less than one mile of free-flowing stream between the tailwater of the Caldron Falls Project (FERC Project No. 2525) and the High Falls Reservoir. WPSC also believes that the WDNR request for upstream monitoring is based upon the supposition that the presence of the reservoir is a direct result of project operations or "flow releases" which Article 406 is designed to monitor. WPSC retains the position that the reservoir is an existing feature that produces many benefits, including those for recreation and the fishery and the presence of the reservoir is an issue that is separate from the objective of Article 406. Therefore, the naturally occurring phenomena (stratification) that occurs in the reservoir is not required to be monitored. Only the flow release from the project should be monitored. WPSC has also allowed for consultation with WDNR on the location of the monitoring transects in its proposed plan.

Continuous monitoring instruments should be used. The instruments need to be cleaned and calibrated weekly. The DO measurements need to be air calibrated per the manufacturer's specification and water temperature should be checked with a National Institute of Science and Technology certified thermometer. The DO meter error or drift

at the end of an unattended monitoring period needs to be less than 1 mg/L - 70 percent of the time. A maintenance log should be kept on each DO monitoring unit. More frequent service visits shall be scheduled if this criterion is not met.

Response: Continuous monitoring is not required because the dissolved oxygen situation that exists in the tailrace has occurred in the past whenever the reservoir was stratified and the project was not generating. Therefore, this situation can be re-created anytime the reservoir has stratified. WPSC agrees to calibrate the monitoring equipment that will be utilized during the proposed profile monitoring period. The calibration will be conducted according to manufacturer's specifications and will be recorded in a maintenance log for each piece of equipment.

2. Monitoring Schedule:

Annual monitoring shall commence once the High Falls Project switches to a peaking mode of operation each summer and will terminate on or after September 30. This schedule should be maintained for two years and then once every five years for the duration of the license unless the schedule is revised by FERC.

Response: The monitoring plan proposed by WPSC commences in the month of July, which is the first full month beyond the run-of-river period of operation and continues once per month for the months of August and September. WPSC is willing to also preform the transect monitoring in the month of June, provided the reservoir has stratified and there is enough time in June to conduct the monitoring after run-of-river operation has ceased. WPSC has also proposed transect monitoring be conducted the first two years after plan approval (1998 and 1999) and on a five year schedule beginning in 2005 and continuing for the duration of the license.

3. Data Reporting

As recorded data is downloaded from the instrument to a computer, data should be screened for compliance with state standards. If any violations of state water quality standards are found, the WDNR should be informed immediately. If violations are found the project should immediately be switched to run-of-river operation. Assuming that no violations are noted, the data should be stored on computer and backed up with a hard copy. If requested by the WDNR, the licensee should make any data available for review within ten working days.

Response: WPSC has not proposed to use continuous monitoring as explained earlier. Therefore, data is not available to be downloaded. WPSC has however, proposed to conduct the transect monitoring and provide all the data collected in tabular format in an Excel spreadsheet along with a map indicating the extent of the mixing zone by November 30th in the year in which monitoring occurs. If requested by WDNR, WPSC can provide any data collected to the WDNR within ten working days of the request.

Absent special requests, data summaries consisting of data plots or graphed data for the sampling season should be prepared and filed with FERC and the resource agencies (WDNR and the U.S. Fish and Wildlife Service) no later than December 30, of each year. The raw data should be placed on diskette and provided to the agencies along with this annual report.

Response: As indicated above, data from the proposed monitoring plan will not be available for downloading. WPSC has proposed to supply all of the recorded monitoring data collected to the WDNR and the U.S. Fish and Wildlife Service (USFWS) in tabular format in an Excel spreadsheet along with a map indicating the extent of the mixing zone by November 30th of the year in which monitoring occurred. WPSC has also proposed to allow the WDNR and USFWS 30 days to comment upon the results. After the expiration of the 30 days, a copy of the agency comments along with WPSC's responses to agency comments will be provided to FERC by February 28th of the year following the year in which monitoring occurred. WPSC's proposed data submittal schedule provides for both avenues of comment by the agencies and provisions for FERC to settle possible disagreements.

The U.S. Fish and Wildlife Service Did Not Comment on the Water Quality Monitoring Plan