Flow Monitoring Plan

for

Bigfork Hydroelectric Project

FERC Project No. 2652

Prepared by:

PACIFICORP

In Consultation with:

Montana Fish, Wildlife, and Parks

U.S. Fish and Wildlife Service

U.S. Geological Survey

American Whitewater Affiliation

January 21, 2004

TABLE OF CONTENTS

ATTACHMENTS

This page left intentionally blank.

1.0 INTRODUCTION

PacifiCorp received a 50-year license for the 4.15 MW Bigfork Hydroelectric Project (FERC No. 2652) on July 25, 2003. Among the conditions of the FERC order, Article 403 (Attachment A) requires PacifiCorp to prepare a Flow Monitoring Plan in consultation with Montana Fish, Wildlife, and Parks (MFWP), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), and American Whitewater Affiliation (AWA). The plan is to be filed with FERC within six months of the date of license issuance.

1.1 PURPOSE AND INTENT

The purpose of the Flow Monitoring Plan (Plan) is to develop (in consultation with MFWP, USFWS, USGS, AWA) measures to monitor reservoir elevations and flows in order to document compliance with the run-of-river mode of operation as required by Article 401, the minimum flow required by Article 402 and any required whitewater flows (Article 411).

The Plan presented below meets the intent of the License Article 403. Specifically the Plan includes measures to:

1. monitor and record water levels in the project impoundment for the purpose of documenting compliance with the run-of-river mode of operation;

2. locate staff gage(s) in the bypassed reach near the proposed whitewater boating put-in site for the purpose of documenting compliance with the required minimum flow and any whitewater flows;

3. determine the stage discharge relationship of the staff gage(s);

4. remove debris, ice, or other obstructions from the notch in the dam's crest to ensure compliance with the required minimum flow including the frequency and method for documenting such inspections. The licensee shall also include a description of how its method of removing debris, ice, or other obstructions from the notch protects the wetland immediately downstream of the north side of the dam;

5. document run-of-river operation, minimum flows, and any whitewater flows required by Article 411;

The Plan also contains a schedule for installing all flow measuring systems; and procedures for reporting any non-compliance with run-of-river operation, minimum flows, and any whitewater flows required by Article 411 to the Commission and procedures for providing these same data to MFWP and USFWS).

1.2 GOALS AND OBJECTIVES

The goals of the Plan are to monitor reservoir elevations and river flows in order to document compliance with:

- run-of-river mode of operation;
- minimum bypassed flows below the dam; and
- any required whitewater flows.

The Plan is the result of consultation between PacifiCorp and MFWP, USFWS, USGS, and AWA.

2.0 PLANNING, COORDINATION AND RESPONSIBILITIES

An important part of the Plan over the term of the new license involves ongoing coordination by PacifiCorp and others as conditions change over time. Section 2.1 describes the roles and responsibilities of PacifiCorp.

2.1 PACIFICORP ROLES AND RESPONSIBILITIES

The license article requires PacifiCorp to develop the Plan in consultation with MFWP, USFWS, USGS and AWA. PacifiCorp is responsible for implementing the Plan; below are the basic roles and responsibilities of PacifiCorp in Plan implementation:

- Responsible for implementing the Plan including funding or implementing specific flow monitoring actions.
- Responsible for coordinating with other Project-related resource management plans that may be affected by the Plan, including the Water Quality Management Plan (Article 404), and the Recreation Resources Management Plan (Article 411).
- Responsible for funding and/or conducting environmental compliance and permitting as needed.

3.0 GAGE INSTALLATIONS

Three gage locations have been identified to support compliance with flow requirements. Two gages will be located downstream of the dam to comply with minimum flow requirements. One gage currently existing in the reservoir will be upgraded to provide whitewater flow information and reservoir stage.

3.1 GAGE LOCATIONS AND MODIFICATIONS

Three staff gages will be used for flow compliance. One will be used to gage whitewater flows, one for minimum flow compliance in the bypassed reach, and one to validate the

minimum flow gage and indicated whitewater flows. All three staffs are expected to provide independent estimates of flow into the bypassed reach. Each is described below.

3.1.1 Fish Ladder Staff Gage

PacifiCorp will refurbish and maintain, with a datum consistent with the existing staff gage, the existing bypassed reach staff gage located on the fish ladder structure along the river's right bank, henceforth referred to as the Fish Ladder staff gage. This gage is well protected from woody debris and other material that could otherwise damage the gage during high flow events in the reach. The bypassed flow vs. stage relationship of the Fish Ladder staff gage will be rated for a full range of seasonal flows.

3.1.2 Bypassed Reach Staff Gage

PacifiCorp will install a staff gage, henceforth referred to as the Bypassed Reach staff gage, within 500 feet of the diversion dam in the bypassed reach. The gage will be located on the left bank near the proposed whitewater boating put-in and will measure total releases from the dam and associated headworks. The gage will be in view from the left bank immediately downstream of the dam. The Bypassed Reach staff gage will be only partially rated to include the flow vs. stage relationship to assure the minimum bypassed flow requirement. It will be rated for flows from 50 to 120 cfs.

3.1.3 Bigfork Dam Staff Gage

PacifiCorp will extend and maintain the existing rating capacity of the staff gage immediately upstream of the Bigfork diversion dam along the river's left bank, henceforth referred to as Bigfork Dam staff gage. This gage measures reservoir stage. When minimum bypassed flows do not exceed the capacity of the weir, this staff gage is often well suited to measure flows with more resolution than the two downstream gages and is not sensitive to changes in the natural bypassed channel controls that could affect the downstream staff gages. The Bigfork Dam staff gage will be rated for a full range of seasonal flows. If any long-term changes occur to the hydraulic releases at the diversion dam (e.g. stop logs of the weir are changed), which will affect the long-term stage flow relationship of this gage and the consequential bypassed flows, PacifiCorp will correct and/or re-rate this staff gage to account for this change.

3.1.4 Staff Gage Maintenance

Staff gages will be maintained in good working order by PacifiCorp or a qualified contractor. Minimum flow compliance in the bypassed reach will be based on daily operator (or other appropriate employee or contractor) staff readings of the bypassed reach staff gage. Inasmuch as the Bypassed Reach staff gage would be vulnerable to damage given its unprotected exposure, it will be surveyed for future replacement as needed and also correlated against the other two staff gages. At any time that it is reasonably suspected that the accuracy of the gage is compromised, PacifiCorp would rely on other appropriate staff

gages (e.g. Fish Ladder staff gage and/or Bigfork Dam staff gage) until the accuracy of the Bypassed Reach staff gage can be remedied.

PacifiCorp may install other staff gage(s) as it deems appropriate, such as to corroborate bypassed reach minimum flows. For example if weather or other safety concerns limit an operator's access to the dam, PacifiCorp may, using best judgment and in good faith, rely on maintaining necessary flows based on a downstream staff gage for that short period of time until the operator can again return to the diversion dam.

3.2 DETERMINATION OF STAGE DISCHARGE RELATIONSHIP

PacifiCorp will establish the flow stage relationships for all three gages based on direct wading measurements in the bypassed reach for flows at and below 120 cfs in the bypassed reach.

PacifiCorp will establish the flow stage relationships for flows above 120 cfs in the bypassed reach based on a combination of direct wading measurements, boat and rope or cable systems, Acoustic Doppler Current Profiler (ADCP) in the river and/or impoundment, other future standard flow measurement technologies, indirect measurement via operational information (e.g. canal shutdowns), and flows as measured at the USGS river gage upstream of the dam corrected for net accretions and net diversions. PacifiCorp will reconcile and correlate inflows and outflows of the project and at each of the proposed staff gages against flows as measured at the upstream USGS river gage (USGS Gage No. 12370000). The USGS provides near real-time flow information at this gage on the Web which is available for public access.

PacifiCorp will confirm the validity of the rating tables at least annually by direct measurement and comparison with other gages, and at any time there is reason to believe a staff rating is suspect. Should a rating table need adjustment and it is determined that flows in the bypassed reach are below compliance minimum as based on the revised rating, PacifiCorp would adjust flows in the bypassed reach as rapidly and prudently as possible to comply with the new targeted compliance stage. PacifiCorp will keep a complete history of flow measurements and changes to these staff ratings for the period of the license.

3.3 SCHEDULE

The three staff gages will be installed and rated in the late summer of 2004. Routine recording of the staff gages and appropriate reporting will commence at that time.

4.0 RECORDING AND OPERATIONS

4.1 RECORDING SCHEDULE

PacifiCorp will read and record the Bypassed Reach and Bigfork Dam gages daily, safety concerns and crew availability permitting. PacifiCorp will read and record the Fish Ladder staff gage monthly, safety concerns and crew availability permitting.

Readings will be recorded in a daily plant log and will include:

? Staff gage name
? Recorded stage of staff gage (nearest 0.01 feet)
? Date and time of day when reading was taken
? Name of person that read the staff and prepared the form
? Remarks/explanations regarding any events or conditions of note

If flow at the gage site is found to be less than the required minimum, flows will be corrected as rapidly and prudently as possible. PacifiCorp will keep a complete history of staff readings for the period of the license.

4.2 BYPASSED REACH FLOW MONITORING DURING WHITEWATER FLOWS

As part of implementing Article 411 (item 8), PacifiCorp will establish a correlation of bypassed reach streamflow changes as measured at the dam, to stage changes at the braided channel near the recreation park area downstream of the dam. Each year prior to special whitewater flow releases into the bypassed reach (Article 411), PacifiCorp will deploy data logger(s) within the wetted perimeter to record hourly river stage changes of consequential downramping in the bypassed reach throughout the season of supplemental whitewater releases. PacifiCorp will download and review the resulting information before the end of each calendar year.

4.3 OBSTRUCTION REMOVAL FROM LOW-FLOW NOTCH

A notch in the dam is located approximately 40 feet from the right abutment. During low flow periods, streamflow is primarily confined to this notch. There is a possibility that the notch could be obstructed with debris or ice and consequentially reduce flows to the bypassed reach.

In the event that the notch becomes obstructed, debris will be removed by operators taking a boat to the weir and attaching a cable around the obstruction. The cable will be attached to a piece of equipment on the upstream right bank and the obstruction pulled away from the notch for removal. Debris removed from the weir will be placed in a location away from the wetland immediately downstream of the north side of the dam.

Minimum instream flow compliance will be based on readings from the bypassed reach staff gage as required in Article 403 of the license. In the event that the notch in the dam becomes obstructed, operations at the dam will be modified as necessary to ensure sufficient flows are released from the dam to meet minimum flow compliance in the bypassed reach. While removal of obstructions is not necessary to maintain minimum flow compliance, the operator will remove obstructions as soon a conditions and crew availability permit. Any obstructions to the notch and actions taken will be recorded in the Operators daily log.

5.0 DOCUMENTATION AND REPORTING

5.1 RATING GAGE TABLES

Data, rating tables and measurement records will be managed by PacifiCorp or qualified contractors. Any deficiencies discovered during the review will be addressed to produce accurate records. PacifiCorp will make available the flow stage rating tables for all staff gages developed for this PLAN. Rating tables, updates and revised rating tables will also be made available to MFWP, USFWS, USGS and AWA as they are developed. This information will be in the form of a printed table or, if agreeable by the agency, by electronic means.

5.2 FLOW REPORTING

PacifiCorp will publish an annual report reconciling daily impoundment elevations, estimated inflows, bypassed reach flows, power canal flows, and combined flows below the tailrace of the power house for each water year ending September 30. The report will be sent to MFWP, USFWS, USGS, AWA and upon request, the Commission, by December 31 following each water year.

5.3 ACCESS

PacifiCorp will allow reasonable access for agencies to perform their own corroborating flow measurements, staff readings and staff ratings with reasonable notice of the request.

5.4 AGENCY CONSULTATION

PacifiCorp will consult with agencies prior to planned flows in the bypassed reach below the 70 cfs minimum. PacifiCorp will consult with agencies prior to making any changes to this Flow Monitoring Plan.

5.5 NON-COMPLIANCE REPORTING

When flows at the compliance gage site are found to be less than the required minimum flow, PacifiCorp will report these events within ten days to MFWP, USFWS, and the Commission. Similarly, exceedances of ramp rate limitations will be reported to MFWP, USFWS, and the Commission within twenty days of PacifiCorp becoming aware of the incident(s). Similarly

non run-of-river operations will be reported to the Commission within ten days of PacifiCorp becoming aware of the incident(s). Special and emergency project operations (e.g. the plant or a unit tripping offline, facility maintenance, etc.) will not be considered to be non-compliance with the run-of-river mode of operations. Reports will describe the location, time, duration, magnitude, cause and corrective actions taken.

This page left intentionally blank.

ATTACHMENT A

Article 403 - Federal Energy and Regulatory Commission Order Issuing New License for the Bigfork Hydroelectric Project (FERC Project No. 2652) (July 25, 2003)

Article 403. Within 6 months from the date of this license, the licensee shall file, for Commission approval, a flow monitoring plan. The plan shall contain measures to monitor reservoir elevations and flows in order to document compliance with the river-of-river mode of operation required by Article 401, the minimum flow required by Article 402, any required whitewater flows, and for any other flow monitoring purposes.

The plan shall include, at a minimum:

1. specific measures to monitor and record water levels in the project impoundment for the purpose of documenting compliance with the run-of-river mode of operation;

2. the location of a staff gage in the bypassed reach near the proposed whitewater boating put-in site for the purpose of documenting compliance with the required minimum flow and any whitewater flows;

3. the method for determining the stage discharge relationship of the staff gage;

4. the method for removing debris, ice, or other obstructions from the notch in the dam's crest to ensure compliance with the required minimum flow including the frequency and method for documenting such inspections. The licensee shall also include a description of how its method of removing debris, ice, or other obstructions from the notch protects the wetland immediately downstream of the north side of the dam;

5. any additional measures necessary for documenting run-of-river operation, minimum flows, and any whitewater flows required by Article 411;

6. a schedule for installing all flow measuring devices; and

7. procedures for reporting any non-compliance with run-of-river operation, minimum flows, and any whitewater flows required by Article 411 to the Commission and procedures for providing these same data to Montana Fish, Wildlife, and Parks (MFWP), U.S. Fish and Wildlife Service (FWS) and the Commission when requested.

The licensee shall prepare the plan after consultation with MFWP, FWS, U.S. Geological Survey, and American Whitewater Affiliation. The licensee shall include with the plan documentation of agency and non-governmental entity consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the consulted entities, and specific descriptions of how the consulted entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the consulted entities to comment and to make recommendations before filing the plan for Commission approval. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons based on site-specific information.

The Commission reserves the right to require changes to the plan. The plan shall not be implemented until the licensee is notified by the Commission that the plan is approved.

Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

ATTACHMENT B

Agency Consultation

Article 403 of the Bigfork license requires the licensee to prepare a Flow Monitoring Plan in consultation with Montana Fish Wildlife and Parks (MFWP), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), and American Whitewater Affiliation (AWA). On November 24, 2003, PacifiCorp submitted the draft Flow Monitoring Plan to the USFWS offices in Helena and Kalispell, Montana; to the MWFP office in Helena; to the USGS office in Kalispell, and to AWA in Bigfork, Montana. PacifiCorp requested comments and recommendations be returned by December 30, 2003. AWA and USFWS provided comments (attached); MFWP notified PacifiCorp by letter that the plan was acceptable as written (attached). USGS did not provide any comments.

This page left intentionally blank.

PacifiCorp's Response to AWA Comments re: Flow Monitoring Plan

1. ***Section 1, page 1: Introduction:*** Be sure to refer to American Whitewater as an Affiliation not an Association.

   PacifiCorp's response:
   Section 1 has been modified to reflect this comment.

2. ***Section 3.1, page 3:*** Gage Locations and Modifications: The list of gages does not include the USGS Gage on the Swan River upstream of the project reservoir (USGS Gage No. 12370000). Because summer whitewater releases are contingent on adequate inflow (800 cfs or greater) there needs to be a correlation established between the PacifiCorp reservoir gage and the USGS gage. This correlation will help the public boating community monitor inflows the day of a potential release to determine if inflows are sufficient for a release. In essence, the USGS gage will serve as an index and communication tool for the public.

   PacifiCorp's response:
   Section 3.2 has been modified to reflect this comment.

3. ***Section 3.1.1, page 3:*** Fish Ladder Staff Gage: PacifiCorp proposes to "refurbish" this gage. This gage has been used by kayakers as a reference for years. Kayakers rely on this gage to determine whitewater difficulty prior to "putting-on" for a run. The difficulty of the Swan's Wild Mile changes dramatically with flow. Any refurbishment to this gage must keep in tact the exact reference points on the gage. Any alterations to the current gage heights relative to water levels becomes a safety issue for boaters. American Whitewater urges PacifiCorp to use extreme caution when refurbishing this gage.

   PacifiCorp's response:
   Section 3.1.1 has been modified to reflect this comment.

4. ***Section 3.1.3, Page 3:*** Bigfork Dam Staff Gage: PacifiCorp asserts that the reservoir gage is "well suited to estimate whitewater flows in the bypassed reach." American Whitewater requests PacifiCorp demonstrate how this gage is well suited for estimating whitewater flows in the bypass reach. The boating public has never used this gage as a reference point. The boating public typically references the USGS gage (Gage No. 12370000) on the Swan River to evaluate inflows in combination with reading the fish ladder gage to account for project diversions. PacifiCorp should demonstrate how the reservoir gage correlates with the USGS gage.

   PacifiCorp's response:
   Sections 3.1.3 and 3.2 have been modified to reflect this comment.

Furthermore, since summer whitewater releases are contingent on reservoir inflows being equal to or greater than 800 cfs it is critical that PacifiCorp communicate with the boating public if a given whitewater release will occur on a specific day. This is best done by relying on a publicly accessible hydrologic gage. American Whitewater recommends that PacifiCorp include the USGS gage in their flow monitoring plan as a means of communicating with the public boating community. Developing a correlation between the USGS Gage No. 12370000 and the reservoir gage will be critical for informing the public about potential releases.

PacifiCorp's response:
Section 3.2 has been revised to reflect this comment.

5. ***Section 3.3, page 4, Schedule:*** The correlation between the reservoir gage and the USGS gage needs to be completed prior to July 1 for this year's whitewater release schedule. PacifiCorp should be able to complete work on the reservoir gage prior to the run-off season. We also believe that the fish ladder gage can be refurbished prior to the run-off season since this gage is largely out of the water in a safe wading area during minimum instream flow periods in March.

   PacifiCorp's response:
   PacifiCorp is aware of AWA's interest in having the new monitoring plan in place as soon as possible. However, uncertainty associated with weather, icing, crew availability and high spring flows will not make it practical to commit to having all gages and ratings in place by July 1 of this year.

6. ***Section 4.2, page 5, Bypassed Reach Flow Monitoring During Whitewater Flows:*** American Whitewater requests that this paragraph specify that the dataloggers will be deployed within the wetted perimeter prior to a whitewater release. Ideally, the dataloggers will be deployed in the wetted perimeter for minimum instream flows (MIFs) and left in place for July and August. This placement will enable us to track the stage relationship with MIFs particularly as MIFs become the more prevalent flow during August.

   PacifiCorp's response:
   Section 4.2 has been modified to reflect this comment.

PacifiCorp's Response to USFWS Comments re: Flow Monitoring Plan

1. Article 402 of the license for the Big Fork Hydroelectric Dam establishes minimum instream flow within the bypass reach of 70 cfs. Article 403, intending to meet the BiOp's Term and Condition 1A requires PacifiCorp to file a flow monitoring plan and for the plan to "contain measures to monitor the reservoir elevations and flows…" Please indicate in the plan that PacifiCorp will provide, to the Service, a printed copy of the rating gage tables for all gages when PacifiCorp has them developed and verified.

   PacifiCorp's response:
   Section 5.1 has been revised to reflect this comment.

This page left intentionally blank.

AMERICAN
AW
WHITEWATER
www.americanwhitewater.org

John T. Gangemi
Conservation Director
482 Electric Avenue
Bigfork, MT 59911
Phone/Fax: (406) 837-3155/3156
jgangemi@digisys.net

December 16, 2003

Dave Leonhardt
Program Manager
PacifiCorp
825 N.E. Multnomah, Suite 1500
Portland, OR 97232
(503)813-5000

RE: Comments on the Flow Monitoring Plan
Bigfork Hydroelectric Project, FERC No. 2652

Dear Dave:

Thank you for circulating the Draft Flow Monitoring Plan for the Bigfork Hydroelectric Project, FERC No. 2652. American Whitewater has reviewed the document and offers the following comments. The comments parallel the numerical paragraph format in the draft.

Section 1, page 1: Introduction: Be sure to refer to American Whitewater as an Affiliation not an Association.

Section 3.1, page 3: Gage Locations and Modifications: The list of gages does not include the USGS Gage on the Swan River upstream of the project reservoir (USGS Gage No. 12370000). Because summer whitewater releases are contingent on adequate inflow (800 cfs or greater) there needs to be a correlation established between the PacifiCorp reservoir gage and the USGS gage. This correlation will help the public boating community monitor inflows the day of a potential release to determine if inflows are sufficient for a release. In essence, the USGS gage will serve as an index and communication tool for the public.

Section 3.1.1, page 3: Fish Ladder Staff Gage: PacifiCorp proposes to "refurbish" this gage. This gage has been used by kayakers as a reference for years. Kayakers rely on this gage to determine whitewater difficulty prior to "putting-on" for a run. The difficulty of the Swan's Wild Mile changes dramatically with flow. Any refurbishment to this gage must keep in tact the exact reference points on the gage. Any alterations to the current gage heights relative to water levels becomes a safety issue for boaters. American Whitewater urges PacifiCorp to use extreme caution when refurbishing this gage.

Section 3.1.3, Page 3: Bigfork Dam Staff Gage: PacifiCorp asserts that the reservoir gage is "well suited to estimate whitewater flows in the bypassed reach." American Whitewater requests PacifiCorp demonstrate how this gage is well suited for estimating whitewater flows in the bypass reach. The boating public has never used this gage as a reference point. The boating public typically references the USGS gage (Gage No. 12370000 on the Swan River) to evaluate inflows in combination with reading the fish ladder gage to account for project diversions. PacifiCorp should demonstrate how the reservoir gage correlates with the USGS gage.

Furthermore, since summer whitewater releases are contingent on reservoir inflows being equal to or greater than 800 cfs it is critical that PacifiCorp communicate with the boating public if a given whitewater release will occur on a specific day. This is best done by relying on a publicly accessible hydrologic gage. American Whitewater recommends that PacifiCorp include the USGS gage in their flow monitoring plan as a means of communicating with the public boating community. Developing a correlation between the USGS Gage No. 12370000 and the reservoir gage will be critical for informing the public about potential releases.

Section 3.3, page 4, Schedule: The correlation between the reservoir gage and the USGS gage needs to be completed prior to July 1 for this year's whitewater release schedule. PacifiCorp should be able to complete work on the reservoir gage prior to the run-off season. We also believe that the fish ladder gage can be refurbished prior to the run-off season since this gage is largely out of the water in a safe wading area during minimum instream flow periods in March.

Section 4.2, page 5, Bypassed Reach Flow Monitoring During Whitewater Flows: American Whitewater requests that this paragraph specify that the dataloggers will be deployed within the wetted perimeter prior to a whitewater release. Ideally, the dataloggers will be deployed in the wetted perimeter for minimum instream flows (MIFs) and left in place for July and August. This placement would enable us to track the stage relationship with MIFs particularly as MIFS become the more prevalent flow during August.

Please contact me if you have any further questions regarding these comments.

Sincerely,

John T. Gangemi
Conservation Director

January 7, 2004

Mr. David Leonhardt
Program Manager
PacifiCorp
825 N.E. Multnomah, Suite 1500
Portland, Or. 97232

Subject: Transmittal of U.S. Fish and Wildlife Service's (Service) comments regarding PacifiCorp's draft Flow Monitoring Plan, draft Water Quality Monitoring Plan and the draft Erosion Control Plan for Big Fork Hydroelectric Project (FERC No. 2652) located in Big Fork, MT.

The Service received PacifiCorp's draft Flow Monitoring Plan, draft Water Quality Monitoring Plan and draft Erosion Control Plan (collectively, the Plans), on December 1, 2003. These plans were submitted to the Service for review and approval in accordance with the Service's Biological Opinion (BiOp) dated May 28, 2003, regarding the effects to bull trout from the operation and maintenance of PacifiCorp's Big Fork Hydroelectric Dam (FERC No. 2652) located in Big Fork, MT. The plans, which require Service approval, are intended to satisfy the BiOp's Terms and Conditions 1A, 1B, and 2A respectively. To facilitate the approval process, the Service is providing the following comments on the draft plans:

Flow Monitoring Plan

Article 402 of the license for the Big Fork Hydroelectric Dam establishes minimum instream flow within the bypass reach of 70 cfs. Article 403, intending to meet the BiOp's Term and Condition 1A requires PacifiCorp to file a flow monitoring plan and for the plan to "contain measures to monitor the reservoir elevations and flows…"

1. Please indicate in the plan that PacifiCorp will provide, to the Service, a printed copy of the rating gage tables for all gages when PacifiCorp has them developed and verified.

Water Quality Monitoring Plan

Article 404 of the license requires PacifiCorp to file a water quality monitoring plan which should "contain measures to monitor dissolved oxygen (DO) and temperature in the bypassed reach during July, August, and September for three consecutive years." After review of the draft water quality monitoring plan, the Service has the following comments:

1. We do not believe that comparing water temperatures within the canal to those of the bypass reach, as proposed, will provide the necessary information regarding any natural warming which may occur within the bypass reach. The volume and the geomorphic characteristics (including shading effects and canal cross section) of the canal seem to vary significantly from those parameters within the bypass

reach. To adequately enumerate any naturally occurring warming within the bypass reach, anthropogenic effects should be excluded; one potential option is to measure the temperatures during the installation of the fish screens if the installation matches the time of potentially stressful warming trends within the bypass reach (July-September). Based upon a conference call with PacifiCorp on January 9, 2004, the Service understands that PacifiCorp will incorporate provisions to provide the full flows of the Swan River to the bypass reach for the period of August 9th to August 28th, 2004. Additionally, PacifiCorp will measure the water temperatures at the dam and at a station immediately upstream of the powerhouse. PacifiCorp should submit to the Service for approval the changes to the Water Quality Plan as discussed during the January 9th conference call.

2. The Service would like to see at least one temperature measurement station located upstream of the impoundment to record water temperatures entering the area influenced by project. This would provide the most reasonable method to measure the "naturally occurring water temperature" as described in the Montana Department of Environmental Quality's (DEQ) standards. The water entering into the impoundment in the vicinity of the Ferndale Bridge is the location where the influence of the project shouldn't be affecting the water quality (i.e. temperature, DO) and therefore project effects are absent. By comparing the "naturally occurring water temperature" to the temperature at the downstream portion of the bypass reach, temperature changes resulting from the operation of the project can be estimated. For example, if the water entering the impoundment is 63°F and the water temperature at the lower end of the bypass reach above the powerhouse tailrace is 65°F, the increase in temperature could be compared to any naturally occurring warming trends, as established in comment #1, to determine the potential effects the project has on water temperature.

3. PacifiCorp should indicate in the plan that they will initiate consultation with the State, the FERC and the Service should temperature monitoring indicate water temperature fluctuations exceed DEQ standards. This consultation should occur during the winter months following the summer when temperatures exceeded the standards.

4. The Service suggests establishing a DO monitoring location upstream of the impoundment to allow comparison between the DO levels coming into the system with those levels at the other monitoring locations.

5. The Service recommends developing criteria to allow for increases in the frequency of DO sampling should a DO threshold be observed during the weekly sampling. Individual criteria for all three DEQ standards (30-day Mean, 7-day Mean Minimum and 1-Day Minimum) should be established with associated responses identified. For example, if the weekly DO measurement is less than 5.0 mg/L, sampling would be conducted for a period of 7 consecutive days to verify that the DEQ standard of the 7-day Mean Minimum is not being exceeded. PacifiCorp should indicate in the plan that they will initiate consultation during

the winter months with the State, the FERC, and the Service should DO levels fail to meet DEQ standards.

6. PacifiCorp should indicate in the plan that they will provide the Service the raw water quality data electronically. It can be sent to paul_hanna@fws.gov.

Erosion Control Plan

The Service does not have any comments regarding the Erosion Control Plan.

The Service looks forward to working with PacifiCorp in the development of these plans and the incorporation of our comments. Upon receipt of the final plans the Service will submit a letter detailing our approval or changes necessary for our approval in accordance with the BiOp's Terms and Conditions. The point of contact for these comments and the project in general is Paul Hanna (406) 758-6871.

Sincerely,

R. Mark Wilson

Copy To: Kalispell ES, Kalispell, MT
Federal Energy Regulatory Commission (attn: Steve Hocking)
MT Dept of Fish, Wildlife and Parks, Kalispell, MT. (Attn: S. Rumsey)

12/30/03

Montana Fish, Wildlife & Parks

490 N. Meridian Road
Kalispell, MT 59901
(406) 752-5501
FAX (406) 257-0349
December 19, 2003
REF:SR022-03.doc

Dave Leonhardt, Program Manager
PacifiCorp
825 NE Multnomah, Suite 1500
Portland, OR 97232

RE: Bigfork Hydroelectric Project (FERC No. 2652) Comments

Dear Dave,

Enclosed are comments pertaining to the above project on: (1) Draft Erosion Control Plan; (2) Draft Flow Monitoring Plan, and the; (3) Draft Water Quality Monitoring Plan.

1. Draft Erosion Control Plan Comments

Two types of erosion sites were identified in the plan: historic canal dewater sites and their associated downslope gullies, and recent canal dewatering sites (Sites 1 and 2). All of these sites have some type of canal opening (gate or valve). The first course of action should include permanent closures of all canal openings to absolutely prevent future discharges. After the potential sources are eliminated, steps should be taken to permanently stabilize the existing erosion gullies.

The erosion control plan for Site 1 proposes the installation of erosion control fiber-log check dams anchored with wood stakes on 25-foot intervals down the gulley.

The proposed structures do not appear durable enough for long-term stabilization and sediment control. Leaving the deeply eroded gullies in place will likely continue to concentrate future runoff and transport sediment.

A more thorough plan should be developed to vertically and longitudinally stabilize the gullies surface with contouring and the installation of more suitable structures and extensive revegetation. Check-dams should include

large rock and large woody debris for stability and longevity. Drainage features may need to be installed and fill material imported. A spider hoe would be very useful for this work and would minimize disturbance.

At Site 2, I would recommend complete stabilization of eroded sites as outlined above. Routing of a durable pipeline to a permanent emergency spillway structure is appropriate as long as this structure is erosion-proof and does not contribute sediment to the Swan River.

As well as stabilize these sites, I recommend that a sediment source survey be conducted during a major spring snowmelt period and also during a significant rain event to detect additional sediment sources to the Swan River. I would first survey the area at the south bank of the Swan River below the project where turbidity plumes would be obvious, and then investigate sources.

The additional sites used to historically dewater the canal may also require restoration and stabilization.

Montana DEQ should take the lead on additional stabilization and water quality issues due to their jurisdiction over water quality.

2. Draft Flow Monitoring Plan Comments

   This plan as written is acceptable.

3. Draft Water Quality Monitoring Plan Comments

   This plan as written is acceptable.

Thank you for allowing me the opportunity to comment.

Sincerely,

Scott Rumsey
Fisheries Biologist

/sj