

Appendix C

Baker County

Mason Dam Hydroelectric Project
FERC No. P-12686

DO Compliance Plan

April 29th, 2013

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I. Introduction

Baker County has applied to the Federal Energy Regulatory Commission (FERC) to develop hydroelectric energy at the existing Mason Dam. Mason Dam is located along the Powder River in Baker County, Oregon approximately 11 miles southwest of Baker City off of State Highway 7 and in the Wallowa-Whitman national Forest.

Mason Dam was built by the US Bureau of Reclamation (BOR) on the Powder River for irrigation, water delivery, and flood control. Mason Dam is 173 feet high, 895 feet long and 875 feet wide from toe to toe. Phillips Reservoir is formed from Mason Dam and covers 2,235 acres, has a total of 95,500 acre-feet, with 90,500 acre-feet being active. Water is stored behind Mason Dam in Phillips Reservoir, and is released during the irrigation season by Baker Valley Irrigation District (BVID). Water is generally stored between October and March and released April through September.

The intake of Mason Dam is located within a 17 x 17 x 13.3 foot high barrier with large bars, spaced 6 inches apart that act as a trash rack. There are two pipes that can be used to release water. One is a 56 inch diameter pipe and the other is a 12 inch diameter pipe. The 56 inch pipe is split into two 33 inch, high pressure slide gates, that are located in the valve house to control the release into the stilling basin via the tail race. The 12 inch pipe uses a sleeve/weir type valve to release water into the stilling basin. The outlet works consists of a tunnel controlled by the two high pressure slide gates with hydraulic hoists that have a capacity of 875 cfs at a reservoir elevation of 4070.5 feet. The spillway has an uncontrolled crest and is concrete lined with a maximum capacity of 1,210 cfs at a reservoir elevation of 4077.25 feet. The spillway and outlet works share a common stilling basin.

The proposed hydroelectric plant will contain a single horizontal shaft Francis turbine connected to a 3.4 MW 60 hertz, 12,640 volt generator with a brushless exciter. It will operate efficiently over a head range of 10 to 150 feet, and flows from 120 to 300 cfs. An extended downward tilted draft tube will discharge into the tailrace. The draft tube will be fitted with aeration fittings to provide aspiration of air if needed to increase dissolved oxygen in the river downstream of the turbine. Plant controls will include a synchronous bypass to initiate the operation of the Reclamation high pressure slide gates during turbine shut down. A new hydraulic power unit (HPU) will be provided to increase the rate of the high pressure slide gates opening to more closely match the rate of flow lost when the turbine shuts down. Power generated will be sent to the substation .8 miles away from the powerhouse. The current plan is for the line to be overhead following the Black Mountain Road.

1.0 Purpose and Scope

The purpose of this DO compliance plan is to ensure that the state water quality standards of 8.0 mg/L or 90% saturation for May 16th through December 31, and 11.0mg/L or 95% for January 1st through May 15th are met during hydroelectric operational periods as found in Oregon Administrative Rule OAR-340-041-0061. This plan has been developed through consultation with ODEQ, ODFW and the Forest Service. Consultation with these agencies is documented in Appendix A.

The Oregon Department of Environmental Quality may require modifications to the DO Compliance Plan as deemed appropriate to assess and confirm water quality compliance.

2.0 References

2.1 Preliminary Licensing Proposal (October 2009)

The Preliminary License Proposal contains a summary of historic dissolved oxygen monitoring data for Phillips Reservoir and the Powder River below Mason Dam.

2.2 Oregon Water Quality Standards - Oregon Administrative Rule 340-041-0260

Oregon water quality standards are based on designated beneficial uses and fish use designations. The entire Powder River (including Phillips Reservoir) is designated for use by Redband and/or Lahontan Cutthroat Trout. Oregon Administrative Rule 340-041-0260 provides no specific information regarding the DO standard for the Powder River basin; rather, the rule states that water quality in the Powder River basin must be managed to protect designated beneficial uses and designated fish uses. The complete Oregon DO standard is given in Figure 1. According to ODEQ, from river mile 130 to 138.2 Phillips Reservoir and the Powder River are designated as “Cold Water” for purposes of applying DO standards. Mason Dam occurs at river mile 131. Thus, the DO standard for project waters may be summarized as follows:

- 8.0 mg/L or 90% saturation, 30-day mean minimum
- 6.5 mg/L, 7-day mean minimum
- 6.0 mg/L, absolute minimum

In addition, from January 1st to May 15th the salmonid spawning DO standard applies to the Powder River below Mason Dam. The spawning standard is:

- 11.0 mg/L or 95% saturation (whichever is less), 7-day mean minimum
- 8.0 mg/L, intergravel, spatial median minimum

FIGURE 1: OREGON DISSOLVED OXYGEN STANDARDS

Class	Concentration and Period ¹ (All Units are mg/L)				Use/Level of Protection
	30-D	7- D	7- Mi	Min	
Salmonid Spawning		11.0 ²⁻³		9.0 ³	Principal use of salmonid spawning and incubation of embryos until emergence from the gravels. Low risk of impairment to cold-water aquatic life, other native fish and invertebrates.
				8.0 ⁴	
Cold Water	8.0 ⁵		6.5	6.0	Principally cold-water aquatic life. Salmon, trout, cold-water invertebrates, and other native cold-water species exist throughout all or most of the year. Juvenile anadromous salmonids may rear throughout the year. No measurable risk level for these communities.
Cool Water	6.5		5.0	4.0	Mixed native cool-water aquatic life, such as sculpins, smelt, and lampreys. Waterbodies includes estuaries. Salmonids and other cold-water biota may be present during part or all of the year but do not form a dominant component of the community structure. No measurable risk to cool-water species, slight risk to cold-water species present.
Warm Water	5.5			4.0	Waterbodies whose aquatic life beneficial uses are characterized by introduced, or native, warm-water species.
No Risk	No Change from Background				The only DO criterion that provides no additional risks is "no change from background". Waterbodies accorded this level of protection include marine waters and waters in Wilderness areas.

Note:
Shaded values present the absolute minimum criteria, unless the Department believes adequate data exists to apply the multiple criteria and associated periods.

¹ 30-D = 30-day mean minimum as defined in OAR 340-41-006.
² 7-D = 7-day mean minimum as defined in OAR 340-41-006.
³ 7-Mi = 7-day minimum mean as defined in OAR 340-41-006.
⁴ Min = Absolute minimums for surface samples when applying the averaging period, spatial median of IGDO.

² When Intergravel DO levels are 8.0 mg/L or greater, DO levels may be as low as 9.0 mg/L, without triggering a violation.

³ If conditions of barometric pressure, altitude and temperature preclude achievement of the footnoted criteria, then 95 percent saturation applies.

⁴ Intergravel DO criterion, spatial median minimum.

⁵ If conditions of barometric pressure, altitude, and temperature preclude achievement of 8.0 mg/L, then 90 percent saturation applies.

3.0 Definitions

3.1 DO: Dissolved oxygen

3.2 DO %: The amount of dissolved oxygen in the water as a percentage of saturation.

3.3 Aeration: Adding oxygen to the water through natural and mechanical means.

3.4 "Cold Water" standard: A thirty day mean minimum DO level of 8.0 mg/L or 90% saturation; a seven day mean minimum of 6.5 mg/L; and an absolute minimum of 6.0 mg/L.

3.5 "Cool Water" standard: A thirty day mean minimum DO level of 6.5 mg/L; a seven day mean minimum of 5.0 mg/L; and an absolute minimum of 4.0 mg/L.

3.6 "Salmonid Spawning" standard: A seven day mean minimum of 11.0mg/L or 95% saturation; and an absolute minimum of 8.0 mg/L.

3.7 CFS: A measurement of water flow that stands for Cubic Feet per Second

4.0 Responsibilities

Baker County will ensure that monitoring will be completed that checks the DO and DO % for water quality purposes. The QAPP (Quality Assurance Project Plan) will be updated to reflect the monitoring that will take place after the project is operational. Baker County will work with ODEQ to ensure the plan meets their requirements.

5.0 Procedures

An adaptive management plan will be implemented to assure that state DO standards are met during hydropower operations. The dissolved oxygen (DO) compliance plan will consist of six elements as follows:

1. Description of a DO monitoring device that will provide continuous measurement of dissolved oxygen and water temperature, with capabilities for providing real time or periodic data output;
2. Specifications for installing the DO monitoring device at a designated monitoring location in the Powder River below Mason Dam;
3. A procedure for compiling, correcting and analyzing DO data to determine if DO levels meet the requirements;
4. A procedure for modifying project operations to increase DO levels in the event that they fall below the required standards; and
5. A procedure for reporting DO conditions and corrective actions to consulting agencies.
6. A procedure for installation of rock weirs in the Powder River below Mason Dam to add additional aeration if needed.

5.1 DO Monitoring Device

The proposed DO monitoring device for this application will be the Stevens-Greenspan DO100 Dissolved Oxygen Sensor or equivalent. The specifications for this sensor are shown in Appendix B.

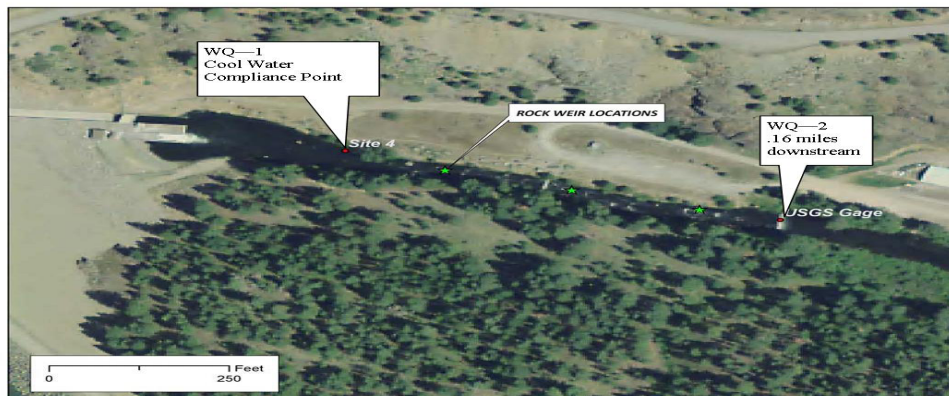
The DO100 sensor will be provided with a 12V power supply from an external power source. This power source may be a local battery, a solar panel, or a power supply cable run from a nearby source. Once calibrated for local atmospheric pressure conditions, the DO100 will measure DO in mg/L, corrected for both temperature and pressure. Initially the sensor will be cleaned and recalibrated every 3 months as described in the operation manual. If the calibration records for the first year indicate that the instrument is stable over periods longer than 3 months, calibration intervals will be extended to 6 months. All sensor maintenance activities will be recorded in a log book located at the powerhouse.

Output from the DO100 will be connected to an external data logger configured to sample the dissolved oxygen sensor at 1-hour intervals. Data will be stored in the data logger and during the first year downloaded on a monthly basis for processing. Alternately, the DO meter will have a removable storage device such as an SD card that can be periodically removed to retrieve data.

5.2 Sensor Installation

Originally Baker County proposed two monitoring sites to measure the dissolved oxygen levels. The upstream station (WQ-1) would have served to measure compliance with the year round standard and would have been used from 16-May to 31-Dec. The downstream station (WQ-2) would have served to measure compliance with the salmonid spawning standard and would have been used from 1-Jan to 15-May. However during the application process Oregon DEQ re-assessed the Powder River and determined that from river mile 130 to river mile 138.2 the DO standards are “cold water” and not “cool water.” Due to this change and the resulting increase from 6.5 mg/L to 8.0 mg/L or 90% saturation for DO Baker County now proposes that 1 monitoring station be used downstream from the dam at the WQ-2 site (see Figure 2). Baker County would have the option to remove the DO sensor during any period when the hydropower plant is not operating.

FIGURE 2: ROCK WEIR AND MONITORING SITES



The monitoring station would be prepared by installing a slotted pipe in a portion of the streambed that has continuous water flow. The installation would optionally be movable to accommodate changing flow conditions. The DO sensor would be placed inside the pipe and the installation would be tethered as necessary to prevent accidental loss.

5.3 DO Data Compilation, Analysis and Archive

Data from the DO sensor will be downloaded at a designated interval as described above and copied onto a computer for processing and archive. New data, consisting of a sequence of values (station ID, date, time, DO in mg/L, DO in % saturation, and temperature in °C) sampled at 1 hour intervals, will be appended to an Excel spreadsheet containing all data for one year of operation. Each year of operation will begin on 1-Jan and end on 31-Dec. The spreadsheet will calculate a running 30-day mean minimum and a running 7-day mean minimum. These running mean values will be used to determine compliance with the cold water and salmonid spawning standards respectively. Stored data will be added to an archive file identified by the monitoring year. Archive files will be permanently stored on site.

5.4 Modifications to Project Operations to Increase DO Levels From 1-Jan to 15-May

If, between 1-Jan to 15-May, the 7-day mean minimum of DO falls below 11 mg/L or 95% saturation, whichever is less, the powerhouse operator will immediately take the following corrective actions:

Phase 1) Aspirate air into the draft tubes through the air inlet pipe and diffuser fitted to the turbine draft tube. Allow 1 week for aspiration to take effect on the 7-day mean minimum. If corrected DO value is still below the spawning standard, then go to Phase 2 action.

Phase 2) Inject air using a blower into the draft tubes through the air inlet pipe and diffuser fitted to the draft tube of the turbine. Allow 1 week for forced aspiration to take effect on the 7-day mean minimum. If corrected DO value is still below the spawning standard, then go to Phase 3 action.

Phase 3) Open bypass valve to reduce the amount of flow passing through the turbine and increase the amount of flow passing through the high pressure slide gates. After 24 hours, measure DO. Continue adjusting high pressure slide gate settings until either the spawning DO standard is met or until all water is being released through the high pressure slide gates and no water is being released through the turbine. If at some point the 7-day mean minimum DO exceeds the spawning standard, the high pressure slide gates may be adjusted to allow more flow through the turbine provided that the standard is still being met.

The operator will record any trigger event and corrective action in the on-site logbook.

5.5 Modifications to Project Operations to Increase DO Levels From 16-May to 31-Dec

If, between 16-May and 31-Dec, the 30-day mean minimum of DO falls below 8.0 mg/L or 90% saturation, whichever is less, the powerhouse operator will immediately take the following corrective actions:

Phase 1) Aspirate air into the draft tubes through the air inlet pipe and diffuser fitted to the turbine draft tube. Allow 1 week for aspiration to take effect on the 30-day mean minimum. If corrected DO value is still below the cold water standard, then go to Phase 2 action.

Phase 2) Inject air using a blower into the draft tubes through the air inlet pipe and diffuser fitted to the draft tube of the turbine. Allow 1 week for forced aspiration to take effect on the 30-day mean minimum. If corrected DO value is still below the cold-water standard, then go to Phase 3 action.

Phase 3) Open bypass valve to reduce the amount of flow passing through the turbine and increase the amount of flow passing through the high pressure slide gates. After 24 hours, measure DO. Continue adjusting high pressure slide gate settings until either the cold water DO standard is met or until all water is being released through the high pressure slide gates and no water is being released through the turbine. If at some point the 7-day mean minimum DO exceeds the cold water standard, the high pressure slide gates may be adjusted to allow more flow through the turbine provided that the standard is still being met.

The operator will record any trigger event and corrective action in the on-site logbook.

5.6 Data Reporting

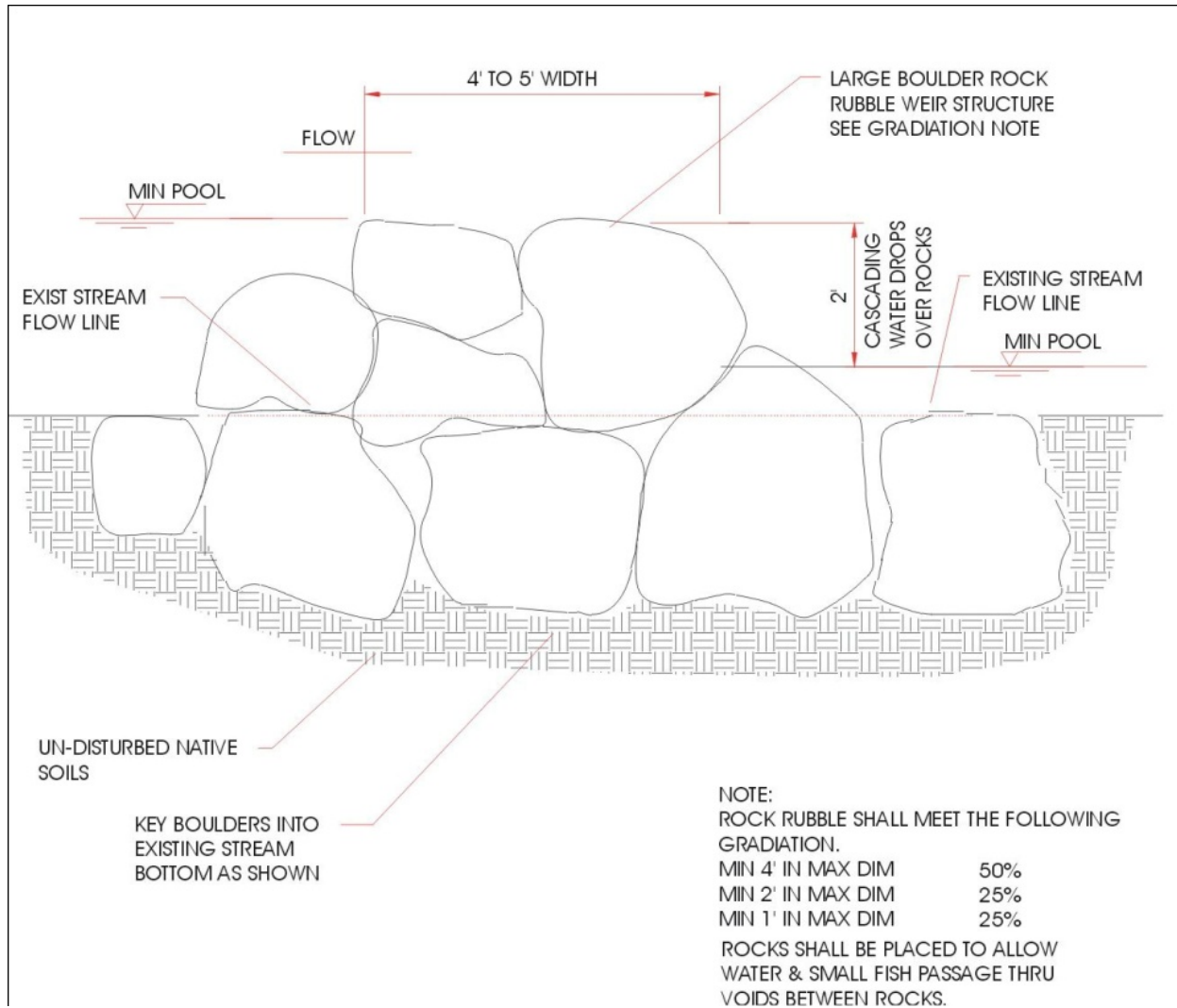
The facility owner will provide an annual DO monitoring report to all consulting agencies by March 31 of each year, covering the previous year's operations. This report will include a graph of the 7-day mean minimum and the 30-day mean minimum for the year, a copy of sensor calibration logs, and any event logs that describe measures taken to increase DO levels.

5.7 Rock Weirs

These weirs would be used to naturally increase the DO of the water released by the turbine below Mason Dam. The proposed project will build, as needed, rock weirs across the Powder River in the .16 mile stretch downstream of the stilling basin, if agreed upon (see Figure 2). These weirs will only be constructed if post-project monitoring reveals that DO concentrations drop below water quality standards. Weirs would be constructed one at a time until their number is sufficient to achieve the standard at the monitoring station.

General specifications of rock weirs can be found in Figure 2. Weirs would create a step under 2 feet high at all but minimum flows. Rock rubble sections will allow small fish to traverse the weir through large interstitial passages between boulders. Construction will be performed during minimum flow periods. Cofferdams will be used to dewater half the stream channel during weir construction. The in stream work window occurs from July 1 – October 31 for the Powder River from the mouth to Phillips Reservoir. All construction will be performed to Oregon State water quality standards with specifications developed for the weirs completed with consulting agencies prior to construction. Procedures outlined in the Erosion and Sediment Control Plan will be followed.

FIGURE 2: GENERAL SPECIFICATIONS OF ROCK WEIRS



5.8 Review of DO Monitoring Plan After 1 Year

This DO monitoring plan will be reviewed at the end of the first year of operations. If it is found that DO levels drop below required standards during the first year, monthly reports will be implemented during the months that problems occur. Also, the usefulness of the proposed remedial actions will be reviewed and altered if necessary, as well as the frequency of DO monitoring data downloads. Any changes to this plan will be approved by ODEQ, ODFW and Reclamation.

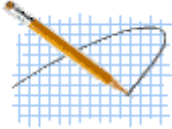
6.0 Attachments

6.1 Consultation Record

6.2 DO Sensor Specifications

Attachment 6.1

Consultation Record



Jason Yencopal

01/06/2011 05:03 PM

To: "Audie Huber" <Audiehuber@ctuir.com>, "Carolyn Templeton" <Carolyn.Templeton@ferc.gov>, "Carl Stiff" <cbstiff@wildblue.net>, "Colleen Fagan" <Colleen.E.Fagan@state.or.us>, "GRIFFIN Dennis"
cc: Heidi Martin/Baker County@Baker County, Jason Yencopal/Baker County@Baker County
Subject: Stakeholder Update Mason Dam Hydroelectric Project

Stakeholders,

Attached is an update with where we are at and where we are heading. If I may be of any help please let me know.

Sincerely,
Jason



Stakeholder Updates of January 6 2011b.pdf

January 6, 2011

Subject: Mason Dam Hydroelectric Project Update

Dear Stakeholders:

I appreciate your understanding as I have had to set up a temporary office. The County Courthouse had a flood in November in which most of the Courthouse Departments had to be relocated. I am now able to get back to some sort of normalcy.

Since our May 20th meeting, there has been some agency contact changes. Colleen Fagan with Oregon Department of Fish and Wildlife (ODF&W) has accepted a new position. Ken Homolk, ODF&W's hydropower program leader in Salem will be the new contact. The Forest Service has a new Whitman District Ranger, Jeff Tomac. I also wanted to remind everyone that Paul DeVito with the Oregon Department of Environmental Quality accepted a new position (midyear 2010) and Steve Kirk is now the main contact.

For the main update I will be summarizing the August 18, 2010 update that focused on the three following issues and add to it:

1. Transmission line route
2. Dissolved oxygen in the Powder River below Mason Dam
3. Fish entrainment and mortality through Mason Dam

Transmission Line Route

The preferred transmission line route is a 0.83 mile long, 12.47 kV over head line with 40 ft tall poles that would follow Black Mountain Road. This route would consist of the following segments:

Segment 1: 150 ft long, across open space at the base of the dam

Required Tree Clearance: None

Segment 2: 500 ft long, through sparse trees to Black Mountain Road

Required Tree Clearance: 40 ft wide by 500 ft long corridor through sparse trees

Segment 3: 1900 ft long, along Black Mountain Road, crossing the road as necessary to minimize tree clearance.

Required Tree Clearance: A few trees

Segment 4: 1300 ft long, on the west side of Black Mountain Road to the Idaho Power Corridor

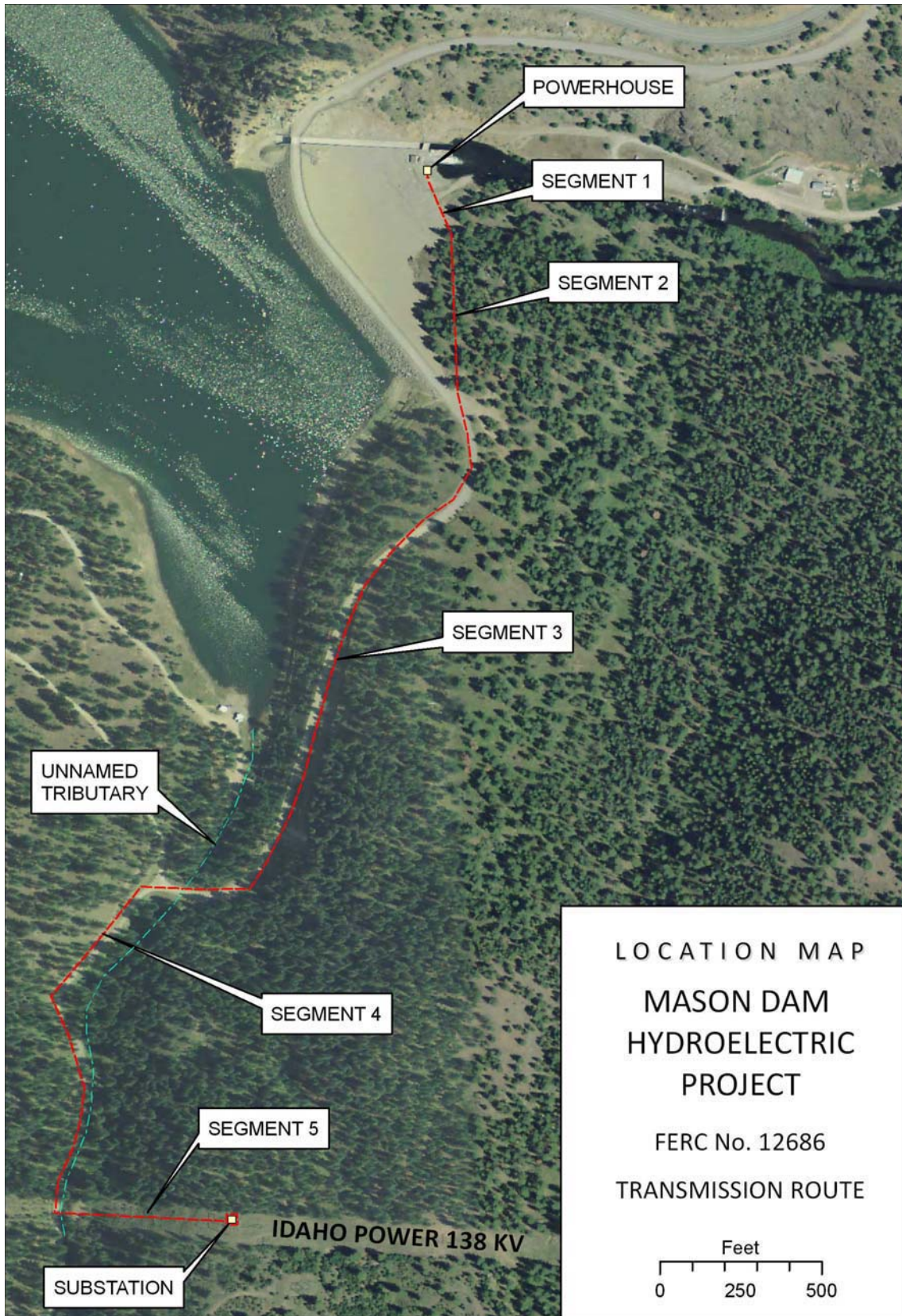
Required Tree Clearance: A few trees on the northern end of the segment and a 20 ft wide by 900 ft long corridor on the southern end of segment

See Figure 1 for a map.

Dissolved Oxygen

Baker County developed a DO Compliance Plan in October and submitted for stakeholders to comment on.

Figure 1.



Fish Entrainment and Turbine Mortality

Baker County originally proposed to screen the intake in lieu of conducting an entrainment study. Our understanding after the May 20th 2010 meeting was that the entrainment would not change from the addition of the hydroelectric project but the mortality would. Thus a turbine and valve mortality analysis would be done to satisfy the entrainment requirement that was waived by the agencies. We understand that the agencies have some existing projects that would benefit the resources of upper Powder River basin habitat and we would encourage these projects be submitted to the County to be discussed and incorporated in future plans.

Recent Progress

Baker County developed four plans for stakeholder review and comments. These plans include:

- Erosion and Sediment Control Plan
- Revegetation/Noxious Weed Management Plan
- Bypass Flow Plan
- DO Compliance Plan

We have received comments back on these plans from the Oregon Department of Environmental Quality and Oregon Department of Fish and Wildlife. We will continue to modify these plans based on the comments received.

Baker County is also working on the License Application to continue to develop this valuable energy resource.

A tentative timeline is to provide updates to the plans mentioned above in the next couple of weeks and at the latest have a license application by March.

We hope to dry out here at the Courthouse and continue to work together with all of you on the Mason Dam Hydroelectric Project.

Nicholas E Josten

From: jyencopal@bakercounty.org
Sent: Wednesday, October 20, 2010 3:03 PM
To: Audie Huber; Carolyn Templeton; Carl Stiff; Colleen Fagan; GRIFFIN Dennis; Emily Carter; Fred Warner; Gary Miller; Ken Anderson; Kenneth Hogan; GRAINEY Mary S; Mike Gerdes; Micheal Hall; Randy Joseph; KIRK Steve; Quentin Lawson; LUSK Rick M; Robert Ross; Shawn Steinmetz; Susan Rosebrough; Thomas Stahl; Timothy Welch; GRIFFIN Dennis; Joseph Hassell; Carl Merkle; lgecy@ecowest-inc.com; ted@tsorenson.net; gsense@cableone.net
Cc: hmartin@bakercounty.org; jyencopal@bakercounty.org
Subject: Mason Dam Plan Review
Attachments: Baker County Bypass Flow Plan Oct_20_2010_plusattachments_ap.pdf; Baker County DO Compliance Plan Oct_20_2010_plusattachments_ap.pdf; Baker County Erosion and Sedi...t_20_2010_plusattachments_ap.pdf

Dear Stakeholders,

Based on the PLP comments received and with FERC's recommendation, Baker County has developed plans that cover: Erosion and Sediment control, Bypass flow, DO compliance, and Noxious Weed management. Baker County would like to provide the agencies the following plans at this time. Attached are the Erosion and Sediment Control Plan, Bypass Flow Plan, and DO Compliance Plan. Comments on these plans will be due November 22nd, 2010. The Noxious Weed Management Plan is being reviewed by the Baker County Weed Department and will be distributed after their review, with comments from stakeholders due at a later date.

Thank you for your time and consideration. If I may be of any help please let me know.

Sincerely,
Jason

(See attached file: Baker County Bypass Flow Plan Oct_20_2010_plusattachments_ap.pdf)(See attached file: Baker County DO Compliance Plan Oct_20_2010_plusattachments_ap.pdf)(See attached file: Baker County Erosion and Sedi...t_20_2010_plusattachments_ap.pdf)



Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

Eastern Region Bend Office
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Bend, OR 97701-7415
(541) 388-6146
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November 23, 2010

Jason Yencopal
Baker County
1995 Third Street
Baker City, OR 97814

RE: ODEQ Comments to the DO Compliance Plan (October 2010)
Mason Dam Hydroelectric Project (FERC No. P-12686)

Dear Mr. Yencopal:

The Oregon Department of Environmental Quality is submitting comments on the October 2010 Dissolved Oxygen (DO) Compliance Plan for the Mason Dam proposed hydroelectric project, FERC No. P-12686. These comments have been prepared to assist Baker County in refining the DO compliance plan prior to the License Application.

General Comments

The draft DO compliance plan lacks the detail necessary to insure that the applicant will comply with state water quality standards. In general, there is a lack of detail regarding system design and the procedures to implement the tiered approach. The following comments address specific issues.

Specific Comments:

I. Introduction: Add the following sentence: "The ODEQ may require modifications to the DO Compliance Plan as it deems appropriate to assess and confirm water quality compliance."

1.0 Purpose and Scope: Please provide reference to the Oregon Administrative Rules that specify the DO criteria applicable to the Powder River. Also include a description of the designated fish use for the stilling basin and downstream of the stilling basin with the applicable DO criteria. Oregon Department of Fish and Wildlife has designated the still basin as "redband trout rearing" and the Powder River immediately downstream of the stilling basin as "redband trout spawning" (personal communication with Colleen Fagan, ODFW)

Provide a summary description of the proposed seasonal operations relative to the seasonal DO criteria.

4.0 Responsibilities: Provide assurance that the approved Quality Assurance Project Plan (QAPP) for collection of the DO data will be followed and any changes in monitoring activities that do not conform to the QAPP will be reported to DEQ.

5.0 Procedures: Provide a more complete description of the tiered approach for DO compliance including; 1) decision process for changing compliance actions, 2) schedule of decision process for taking corrective actions to comply with DO, and 3) consideration of adaptive management to revise tiered approach based on DO compliance monitoring data.



5.1: Include a detailed description of the Draft Tube Aeration system with design specifications.

5.1.1 Draft Tube Aeration: the text states: "... that once it is open will allow air to enter the system through the venture effect..." Do you mean venturi effect?

5.1.2 Rock Weirs: Include an analysis of potential impacts to sediment erosion and sediment geomorphology that supports the designated fish use and associated water quality criteria.

5.1.3.1 Bypass Flow: Provide a description of the corrective action procedures and reporting schedules.

5.2 Monitoring: Provide additional information regarding the locations selected for monitoring DO. Since the proposed project is required to meet the DO criteria for trout rearing in the stilling basin, DEQ recommends monitoring DO at the downstream boundary of the stilling basin and at one location downstream of the stilling basin and within the area of proposed rock weirs to monitor DO relative to the DO criteria associated with redband trout spawning.

6.0 Summary of Mitigation Measures: Provide a more complete summary of mitigation measures and adaptive management used to implement the mitigation measures. For instance, the text states: "... adjustments will be made to operation criteria if DO levels fall below the state water DO standard." What is the schedule for reporting the DO levels? What is the decision process and schedule for taking corrective action?

7.0 Attachments: DEQ recommends deleting Section 7.0. Details regarding the weir locations, weir design specifications and Draft Tube Aeration System should be included in Section 5.1.1 Draft Tube Aeration and Section 5.1.2 Rock Weirs.

If you have any questions or need any additional information regarding these comments, please contact me at (541) 633-2023 or by email at kirk.steve@deq.state.or.us.

Sincerely,



Steve Kirk
Eastern Region Hydroelectric Specialist
Oregon Department of Environmental Quality



Oregon

Theodore R. Kulongoski, Governor

Department of Fish and Wildlife

Northeast Region

107 20th Street

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November 22, 2010

Jason Yencopal
Mason Dam Project Manager
1995 Third Street
Baker City, Oregon 97814

Subject: ODFW's Comments on Baker County's draft plans for the proposed Mason Dam Hydroelectric Project (FERC No. 12686).

Dear Mr. Yencopal:

Baker County has requested comments on draft plans associated with its efforts to install hydroelectric power at the existing Bureau of Reclamation's Mason Dam. Enclosed are ODFW's comments on Baker County's DO Compliance Plan, Bypass Flow Plan, Erosion and Sediment Control Plan, and Revegetation/Noxious Weed Management Plan.

DO Compliance Plan

3.0 - Baker County defines spawning as "the time that fish are spawning and fry are emerging and rearing". Baker County's definition includes spawning, incubation, emergence, and rearing. All four of these life history stages should be defined separately, particularly since the Oregon Department of Environmental Quality (DEQ) has separate dissolved oxygen (DO) standards for salmonid spawning use and salmonid rearing and migration use.

5.1.1.1 - Baker County indicates that a pipe will be attached to the draft tube with a valve that once it is open will allow air to enter the system through the venture effect and aerate the water. ODFW requests clarification on whether Baker County is referring to the Venturi effect.

5.1.2.2 - Baker County indicates that it will build rock weirs, as needed, across the Powder River in the 0.16 mile stretch downstream of the stilling basin, if agreed upon. Additional information is needed on the potential effects of these weirs on stream flows, fish passage, entrapment and stranding, and erosion. Upstream and downstream passage of all life stages of native migratory fish species, which include redband trout, needs to be provided throughout this stretch of the Powder River.

5.1.2.3 – According to Baker County, rock weirs would only be constructed if post-project monitoring reveals that DO concentrations drop below 95% saturation during spawning times at the DO monitoring station. Baker County, however, has not identified the proposed location of the DO monitoring station. Redband trout rearing occurs in the stilling basin with redband trout spawning likely occurring immediately downstream of the stilling basin. Therefore, ODFW believes DO monitoring for rearing should occur in the stilling basin at the first location where accurate readings can be taken, and monitoring for spawning should occur immediately downstream of the stilling basin.

5.1.2.4 – As proposed, weirs would be constructed one at a time until their number is sufficient to achieve the standard at the monitoring station. Additional information is needed on monitoring that will occur and how the project will be operated during weir construction to ensure water quality standards are met.

5.1.2.5 – ODFW believes that state water quality standard for DO will need to be met at the downstream end of the stilling basin. According to Attachment 7.1, however, three rock weirs would be placed within the 0.16 mile section of the Powder River downstream of the stilling basin. Therefore, the state standard for DO would not be met at the downstream end of the stilling basin. If DO standards cannot be met at the downstream end of the stilling basin with installation of rock weirs, ODFW recommends that other alternatives be investigated that would provide a reasonable assurance of compliance with state water quality standards. Further, how were locations and numbers of weirs determined?

5.1.2.8 – Baker County indicates upstream passage for small fish will be provided through large interstitial passages between boulders. Oregon's fish passage law (ORS 509.580 - 509.645) requires upstream and downstream passage at all artificial obstructions in those Oregon waters in which migratory native fish are currently or have historically been present. Additional information needs to be provided to demonstrate that upstream and downstream passage will be provided throughout the year for all life stages of native migratory fish. This should include a discussion of how interstitial spaces will be maintained. Rock weir designs should be provided to ODFW for review and approval. No construction should occur until ODFW approves rock weir designs.

5.1.2.9 – Construction is proposed for minimum flow periods. Construction will need to occur during ODFW's instream work window, unless a variance is requested and approved by ODFW.

5.2 – Insufficient information is provided to determine if monitoring will be sufficient to determine if the Project is in compliance with DEQ's water quality standards. A water quality monitoring plan should be developed in consultation with ODFW and ODEQ and included in this plan or the license application. The monitoring plan should include DO, TDG, and temperature monitoring.

7.3 – ODFW recommends that the Draft Tube Aeration System article be removed from the plan. Instead, Baker County should summarize it and other relevant literature on draft tube aeration within the DO Compliance Plan.

Bypass Flow Plan

This plan should include the minimum flows that this plan is intended to ensure will be maintained during construction and operation of the Project.

2.0 - More information on these references is needed including date and author so that they can be accessed by ODFW.

4.1 - Baker County indicates it will work with BOR and Baker Valley Irrigation District, but it fails to identify what they will be working on.

5.3.1 – Additional operations information is needed in this plan including emergency backup and notification components. ODFW should be notified of any emergencies as soon as possible.

5.4.1 – Additional information is needed on maintenance including procedures and timing.

6.2 – Additional information is needed to ensure identified minimum flows will be maintained below the project, including how and where they will be measured.

6.3 and 6.4 – These sections do not appear relevant to this plan. ODFW recommends they be removed.

Erosion and Sediment Control Plan

2.0 – Unclear what reference Baker County has identified. Additional information such as author, agency, and date should be provided.

3.3 – ODFW should also be consulted regarding revegetation of disturbed areas.

3.4 – Insufficient information is provided to determine adequacy of implementation schedule.

5.0 – Insufficient information is provided by Baker County for ODFW to determine what construction activities are planned for the Project, when these construction activities will occur, which BMPs will be implemented for each to control and manage erosion, dust, and soil movement, and how activities will be monitored. ODFW requests that Baker County elaborate on procedures.

5.2 – Who will be contracted to conduct weekly inspections and what information will they be collecting?

6.4 - When is tailrace construction proposed to occur?

6.5 – ODFW should be consulted on appropriate seed mixes to ensure no impacts to wildlife.

7.0 – These attachments should be removed from the plan. Instead, Baker County should summarize relevant sections and measures that will be implemented at this project.

Revegetation/Noxious Weed Management Plan


Baker County identifies the purpose of this plan is for the control and prevention of noxious weeds at the Mason Dam Hydroelectric Project. ODFW requests that the boundary for the plan be more clearly identified.

5.0 – Insufficient information is presented for ODFW to determine if implementation of this plan will result in control and prevention of noxious weeds. Proposed methods and monitoring for control and prevention of noxious weeds need to be included in the plan.

7.0 – ODFW recommends that the attachments be deleted from the plan. Instead, Baker County should clearly describe the efforts it will undertake to prevent the introduction and spread of noxious weeds as well as treatments that will be applied to decrease or eliminate noxious weed infestations. The majority of information included in these attachments is not relevant to this project.

Thank you for the opportunity to review these draft plans. If you have any questions on these comments or need additional information, please contact me at (541) 962-1835 or colleen.e.fagan@state.or.us.

Sincerely,



Colleen Fagan
NE Region Hydropower Coordinator

Attachment 6.2

DO Sensor Specifications

Specifications	Model DO100	Model DO300
Dissolved oxygen range	0–20ppm or 0–200% saturated	same as DO100
Temperature range	0–55 °C	same as DO100
Dissolved oxygen linearity	0.1 ppm or 1%	0.1 ppm or 1%
Dissolved oxygen accuracy	5–35°C ±0.2 ppm	2–35°C ±0.2 ppm
Output	DO 4–20 mA Temperature 4–20 mA	RS232
Temperature accuracy	±1 °C	±0.5 °C
Supply voltage	9–27 V • Reverse polarity protected • Surge protected to 2kV	8-15V • Reverse polarity protected • Surge protected to 2kV
Warmup time to stable reading	1 sec	1 sec
Response time to 6ppm step change	15 minutes	same as DO100
Dimensions	length 14.5in (370mm) 1.25in (32mm) OD Stainless 1.5in (38mm) OD Delrin	length 16.6in (423mm) 1.7in (44mm) OD Stainless 1.8in (47mm) OD Delrin optional battery pack adds extra 10.25in (260mm) to length
Weight	9.9oz (280g) Delrin 10.9oz (310g) Stainless	14.1oz (400g) Delrin 18.7oz (530g) Stainless
Sensor type	Chemical Cell	
Wetted materials	316 stainless steel, Delrin, silicon diffusion membrane	
Software supplied	AQUAGRAPH, SMARTCOM	

Standard configuration

- Sensor calibrated to 0–20ppm
- Temperature output
- Cable to requested length and terminated with data connector and tinned copper wires
- Copper nosepiece for anti fouling

Options

- Electrical connectors
- 0–200% output
- Longer copper shroud
- A complete Delrin body can be provided for use in corrosive water