GIBSON RESERVOIR AND SUN RIVER WATER QUALITY MONITORING

REVISED DRAFT STUDY PLAN FOR 2005-2007

Gibson Dam Hydroelectric Project, FERC No. 12478

Gibson Dam Hydroelectric Company, LLC

December, 2005

INTRODUCTION

This study plan describes proposals for temperature monitoring for Gibson Reservoir and portions of the Sun River near Augusta, Montana from 2005 through 2007. The plan describes studies to be performed in support of licensing for the Gibson Dam Hydroelectric Project, FERC No. 12478 (Project), under a Preliminary Permit issued by the Federal Energy Regulatory Commission (FERC) to Gibson Dam Hydroelectric Company, LLC (GDHC, Applicant) which expires in April, 2007.

BACKGROUND and CONSULTATION

As part of the consultation process required by FERC regulations, GDHC distributed an Initial Consultation Document (ICD) in April, 2005. In response, several resource agencies provided study recommendations including those for monitoring of Gibson Reservoir and Sun River water quality parameters, including water temperature, dissolved gasses, and other water quality parameters. A draft water quality study plan was distributed on September 29, 2005, in response to the requests for baseline information on various water quality parameters.

Comments on the draft plan were received from the following agencies:

United States Bureau of Reclamation (USBR), November 2, 2005,
US Environmental Protection Agency (EPA), October 6, 2005,
Montana Department of Environmental Quality (MDEQ), September 22, 2005. (MDEQ comments were on a preliminary draft plan sent for their review in July 26, 2005.)
US Army Corps of Engineers (USACOE), October 14,2005.
Montana Department of Fish, Wildlife and Parks (MDFWP), September 30, 2005.

Copies of all comments are included in **Attachments I-V** to this revised draft study plan. A summary table of the comments and manner in which they were addressed is in Table 1.

Table 1. Comments on Draft Water Quality Study Plan from Various State and Federal Resource Agencies.

Agency Letter	Comment Location in Agency Letter	General Comment Topic	How Addressed (Pagination relative to revised ICD)
USBR	**USBR 1**	Suggestion to work closely with Sun River Watershed Group	Comment noted; SRWG is on the Project mailing list, and has been brought into the licensing process.
	USBR 2	Comment on description of plan content	Background section explains that both temperature, dissolved gasses, and water quality studies will be performed.
	USBR 3	Add examples of development and non-development needs	Item 3, Study Objectives, examples added.
	USBR 4	Three proposed study areas stated, only two described	Page 4, Proposed Study Areas, Gibson Reservoir, three changed to two.
	USBR 5	Asks for more detail regarding number and location of Sun River study sites	Number and locations of sites will be developed with agencies through further consultation.
	USBR 6	Request for additional detail on thermograph calibration and checking	Page 5, Sampling Equipment and Methods. Text added to respond to comment.
	USBR 7	Request for description of how equipment will be installed and accessed	Page 5, Sampling Equipment and Methods. Text added to respond to comment.
	USBR 8	Question of how loggers will be accessed during winter	Access during winter will depend on conditions; safety is the primary concern.
	USBR 9	Question of how surface logger will account for reservoir fluctuations	Page 5, description of anchoring system added.
	USBR 10	Suggests that quarterly DO monitoring might not be adequate	DO sampling frequency may be increased during summer if deemed necessary. We believe that quarterly sampling is adequate during the remainder of the year.
	USBR 11	Question about study planning	This sentence refers to water quality study planning.
	USBR 12	Request for all reports	All draft and final reports and licensing-related raw data will be

			provided to USBR.
USEPA	**EPA 1**	1) in General Study Plan, text cites three locations, then lists only two; 2) Requests for clarification on DO, WQ monitoring locations and frequency.	1). Page 4 (revised plan), text changed; 2). DO will be measured at various depths as described in plan. Other water quality parameters will not be measured at various depths.
	EPA 2	Request for description of water quality monitoring program	Comment noted. Details on monitoring will be developed during licensing, based on final construction and operation conditions.
	EPA 3	Support for instream flow and reservoir operations evaluations	Comment noted, no changes to plan.
MDEQ	**MDEQ 1**	Support for instream flow and reservoir operations modeling	See EPA 3, above.
	MDEQ 2	Addition of Total Suspended Sediment to list of parameters	Page 8, Total Suspended Sediment added to list.
USACOE	**USACOE 1**	Add purpose and need to Background section	Background considered adequate
	USACOE 2	Need to describe why plan addresses topics in addition to temperature	Background section revised to include all parameters
	USACOE 3	Add examples of development and non-development needs	Item 3, Study Objectives, examples adde**d**
	USACOE 4	Change wording to include three categories; replace "stream" with "river";	General Study Plan Section; all requested changes made.
	USACOE 5	Notes that three areas are mentioned but only two listed	Page 3, Proposed Study Areas, Gibson Reservoir, three changed to two
	USACOE 6	Comment on format	Comment noted, format retained
	USACOE 7	Request to add specific language	Page 5, Sun River Stream Temperature, third and fourth bulleted items added
	USACOE 8	Requests addition of a word.	Page 5, Sampling Time Periods. Requested word added.
	USACOE 9	Requests spelling out acronyms in headings	Comment noted; acronyms are now spelled out in headings.
	USACOE 10	Suggests spelling out "USBR"	Comment noted. USBR is the defined acronym in this report.
MDFWP	**MDFWP 1**	Request that Sun River	Page 5, first bulleted item;

		temperature monitoring stations be located to assure mixing.	language added to address comment.

PROPOSED WATER QUALITY STUDIES

STUDY OBJECTIVES

The objective of the proposed water quality studies is to obtain water temperature, dissolved gas and other parameter data of sufficient resolution to:

1) Serve as a baseline for the various state and federal environmental documents necessary for Project licensing;
2) Support analyses of how various Project operations might change existing water quality in the subject water bodies;
3) Serve as a basis for refining proposed Project operations to optimally meet both developmental (e.g. hydropower generation, irrigation water supply) and non-developmental (e.g. fisheries, wildlife, recreation) needs.

GENERAL STUDY PLAN

In this Plan, GDHC describes proposed water quality monitoring in three primary categories:

1) **Temperature, Gibson Reservoir and Sun River;**
2) **Dissolved gasses, Reservoir and River; and**
3) **Other water quality parameters, Reservoir and River, as determined.**

Under each study category, we describe:

- Proposed Study Area;
- Sampling Equipment and Methods;
- Sampling Time Periods;
- Data Retrieval and Processing; and
- Reporting.

RESERVOIR AND STREAM TEMPERATURE

Proposed Study Areas

Gibson Reservoir

Gibson Reservoir water temperature surveys will be conducted in two primary locations: 1) at the reservoir surface near the Project spillway, to help relate reservoir temperatures with Sun River stream temperatures during periods when the reservoir is spilling; and 2)

at various depth levels near the upstream dam face, to determine water temperatures at depths from which water may be drawn, depending on which of the dam's outlets is used for hydropower generation.

Each temperature monitoring point will be assigned a unique identifier and located on the Gibson Reservoir topographic/bathymetric map, to a resolution suitable to re-emplace monitors if they need to be removed and reinstalled.

To the extent possible, temperature monitoring locations will be held consistent with locations for monitoring dissolved gasses parameters, such as dissolved oxygen and other gasses, to assure analytic comparability among all parameters. Water quality parameters will not be measured at various depth levels.

Sun River

Sun River water temperatures will be continuously measured at several locations downstream of Gibson Dam. Exact locations of temperature monitoring points will be determined after field agreement among GDHC and resource agency personnel. Generally, we propose to monitor Sun River water temperatures intensively from the base of Gibson Dam to a point about 1 mile downstream of the US Forest Service (USFS) boundary near the mouth of Sun River Canyon. Downstream of that point, we propose less intensive monitoring, to be determined in the field.

In the intensive monitoring area, we propose to install continuous temperature monitoring devices in areas meeting the following conditions:

- Just below points of significant inflow from tributaries, overland flow, irrigation canals, irrigation return flow and groundwater (thermographs will be located far enough downstream from the inflow to assure proper mixing); and

- At intervals along uniform stream reaches sufficient to document longitudinal temperature increases (exact locations to be determined in the field).

In the stream reaches downstream from the intensively measured area, thermograph placement will be determined in the field.

As with Gibson Reservoir temperature monitoring, all sampling sites will be located on the Project map to a resolution sufficient to re-emplace monitors if they need to be removed and reinstalled.

Sun River temperature monitoring locations will be held consistent with locations for monitoring other water quality parameters, such as dissolved oxygen and other gasses, to assure analytic comparability among all parameters.

Sampling Equipment and Methods

All continuous water temperature measurements in both Gibson Reservoir and the Sun River will be monitored using Onset Computer "Optic StowAway" model WTA08 loggers with 8 kilobyte ("k") memory capacity. Specifications for these loggers may be reviewed at Onsetcomputer.com.

Loggers will be set to record temperature every two hours. With 8k memory capacity, this interval supports monitoring for 661 days before the need to download data.

Prior to installation, all loggers will be calibrated against water samples of known temperature, as determined using an approved hand-held thermometer. After initial installation, all loggers will be checked after 24 hours of operation to assure start-up. After that, loggers will be checked for operation at least monthly, and data retrieved.

All access to Gibson Reservoir for the purpose of installing and checking thermographs will be approved by USBR such that appropriate National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance activities will be completed.

Access to Sun River sites will be assured through consultation and approval with US Forest Service, various land owners and Greenfields Irrigation District.

Gibson Reservoir Temperature-at-Depth Monitoring

To continuously monitor Gibson Reservoir water temperature from bottom to surface, an array of 8 loggers will be attached to a line suspended down the side of a vertical rock face extending into the lake. A weight attached to the bottom of the line will keep the line taught. The array will be positioned far enough from the intake to minimize effects of water being drawn from the lake either over the spillway or through the intake. Loggers will be spaced every 15 ft, starting from the highest expected lake level, about three feet above the bottom of the spillway. The loggers will be set below this elevation at -15, -30, -45, -60, -75, -90, -105, and –120 ft. Access to the loggers will be by boat.

Gibson Reservoir Surface Water Temperature Monitoring

To monitor surface temperature a single logger will be placed near the dam, at about 18" underwater. The surface logger will be placed between the dam and any logboom or debris control structures, to prevent contact with floating material. The surface water temperature logger will be attached to a floating object which in turn will be anchored to a spring loaded cable dispenser. In this way the surface logger will remain in approximately the same proximity to the dam face under various water surface elevations.

Sun River Temperature Monitoring

Temperature loggers will be emplaced in the Sun River with consideration given to:

- Visibility (both to facilitate retrieval and to reduce vandalism);
- Freedom from stream bed material movement and sediment deposition;
- Points of significant inflow from tributaries, overland flow, irrigation canals, irrigation return flow and groundwater; and
- Determination of longitudinal temperature increases within uniform stream reaches (exact locations to be determined in the field).

Sampling Time Periods

Water temperature monitoring of both Gibson Reservoir and the Sun River will generally begin in Spring, 2006, and will continue to the end of the licensing period. After initial data evaluation, it may be advantageous to add to or detract from the initial set of monitoring locations or to change the overall monitoring time interval at certain locations.

All changes in monitoring location or time period will be approved among consulting agencies and GDHC.

Data Retrieval and Processing

Data Downloading

Data from each logger will be transferred in the field to an Onset Optic Shuttle. The Shuttle utilizes an "Optic Coupler" which holds the shuttle and logger with their optic communications windows aligned. This optical connection is immune to weather conditions and functional even underwater. Data is downloaded to a computer in the office by connecting the Optic Shuttle to an Optic Base Station, again using the Optic Coupler.

Data Processing and Operational Software

Computer processing of logger data will be done using Box Car Pro 4.3 for Windows. This software allows data export to an Excel format file or delimited text file, allowing analysis by almost any data processing program.

DISSOLVED GASSES

Monitoring of dissolved gasses will generally follow plans for the temperature monitoring surveys, with certain exceptions as noted below. Specifically, this study

component will be directed toward gathering information on dissolved oxygen and total dissolved gasses.

Dissolved Oxygen (DO)

The purpose of the DO surveys will be to determine DO levels at various levels in Gibson Reservoir and to relate those DO concentrations, during various seasons and Project operations, with DO levels in the Sun River.

Total Dissolved Gasses (TDG)

The purpose of the TDG studies will be primarily to determine whether the conditions at the Gibson Dam spillway might promote supersaturation of dissolved gasses, particularly nitrogen, which might be harmful to downstream aquatic resources. This survey will be more limited in scope that those for temperature and DO.

Proposed Study Area

Dissolved Oxygen

The DO study areas in Gibson Reservoir and the Sun River will generally be the same as those for temperature monitoring. It is expected that DO samples will be taken at the surface and temperature-at-depth monitoring locations in the reservoir and at each of the temperature monitoring locations in the Sun River.

Total Dissolved Gasses

TDG will only be monitored at the base of the Gibson Dam spillway, and for a distance downstream sufficient to assess how supersaturation (if documented) persists.

Sampling Equipment and Methods

Dissolved Oxygen and Total Dissolved Gasses

DO and TDG will be measured using a Hydrolab probe to a resolution of 0.1 ppm. Exact equipment and measurement procedures will be agreed upon among GDHC and consulting resource agencies both before the start of the studies, and as necessary after review of initial results.

Sampling Time Periods

Dissolved Oxygen

DO will be measured at the Gibson Reservoir and Sun River stations approximately on a quarterly basis, with adjustment in frequency agreed upon among GDHC and consulting resource agencies.

Total Dissolved Gasses

TDG will only be monitored below the spillway during periods of spill. Since these periods vary each year, exact monitoring times cannot be stated. Researchers, however, will know the general spill time period and may coordinate with USBR operators to generally determine when spill will occur each year. Once spill has commenced, the objective will be to measure TDG during low-, medium- and high-flow regimes at the base of the spillway. Depending on the dissolved gas concentrations relative to saturation, TDG concentration will be measured at various points downstream to determine the rate and distance over which concerning conditions exist.

Data Retrieval and Processing

Data for dissolved gasses will be downloaded and/or recorded after each measurement. To the extent that the data recording process may be automated, under approved procedures, GDHC will reduce the potential for data loss and transcription errors.

OTHER WATER QUALITY PARAMETERS

These parameters will be determined during study planning, but generally include parameters to be monitored during and after Project construction to aid in determining water quality standard compliance. Other water quality parameters will not be measured at various depth levels. These parameters generally include:

- Turbidity
- Total dissolved solids;
- Heavy metals;
- Petroleum distillates;
- Pesticides an PCB's; and
- Total Suspended Sediment.

In most areas, the agency responsible for water quality certification and standards compliance develops a "suite" of parameters which address all relevant constituents and measurement techniques.

Proposed Study Area

Other water quality parameters will be measured in both Gibson Reservoir and the Sun River. Gibson Reservoir data will be taken primarily near the dam face, and will be useful to determine starting conditions, when taken in association with Sun River measurements.

Study Area in the Sun River will generally correspond to the sites at which temperature and dissolved oxygen are sampled, with sampling intensity reduced downstream of the USFS boundary.

Sampling Equipment and Methods

Other water quality parameters will be measured using equipment and process approved among GDHC and consulting resource agencies. Generally, direct monitoring equipment, such as that provided by Hydrolab instrumentation will be used, although certain parameters in the "suite" may require sending samples to an analytical lab. In such cases, the sampling taking and fixing technique, chain of custody and analytic lab selected will all be approved among GDHC and consulting resource agencies.

Sampling Time Periods

Other water quality parameter sampling time periods will generally follow those for dissolved oxygen except when spills, floods, droughts or other man-made or natural or human-related events prompt additional measurements. In such cases, GDHC and consulting resource agencies will agree on changes to the sampling time period protocol.

Data Retrieval and Processing

As with dissolved gasses sampling, data will be retrieved and processed as taken in most cases. Automation will be used to the extent deemed desirable. In the case of analytic lab processing, the lab will be asked to provide complete reporting on methods and results for all parameters tested for.

REPORTING

Reports for the Gibson Reservoir and Sun River water quality monitoring studies will be prepared annually and distributed as drafts to interested parties in the Project mailing list. The annual reports will describe monitoring methods and locations, and present results for all water quality sampling during the applicable report period. The current proposal is for draft reports to be distributed no later than February 28 of each applicable year.

Reports will be in standard technical format, including:

Introduction
Material and Methods (to include sampling locations, dates, equipment and procedures)
Results
Discussion
Conclusions (If and when appropriate).

ATTACHMENT I

Comments on Draft Water Quality Study Plan, U.S. Bureau of Reclamation

United States Department of the Interior

BUREAU OF RECLAMATION
Great Plains Region
Montana Area Office
P.O. Box 30137
Billings, Montana 59107-0137

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

MT-434
PRJ-18.00

NOV - 2 2005

Rec'd 11-4-05

Richard Rosenberg
Gibson Dam Hydroelectric Company, LLC
3633 Alderwood Ave.
Bellingham, WA 98225

Subject: Bureau of Reclamation's Comments on the Draft Study Plan for Gibson Reservoir and Sun River Water Quality Monitoring, Gibson Dam Hydroelectric Project – Federal Energy Regulatory Commission (FERC) Project No. 12478, Sun River Project, Montana

Dear Mr. Rosenberg:

Thank you for the opportunity to review the Gibson Dam Hydroelectric Corporation's Draft Study Plan for Water Quality Monitoring for the Gibson Dam Hydroelectric Project. Enclosed are Bureau of Reclamation's comments on the Plan for your consideration.

Please contact Steve Davies at 406-247-7322, or Email at sdavies@gp.usbr.gov , if you have any questions regarding our comments.

Sincerely,

Richard Long, Manager
Facility Operation & Maintenance Division

Enclosure

cc: Mr. Bob Hardin, Manager
Greenfields Irrigation District
P.O. Box 157
Fairfield, MT 59436

Secretary
Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street NE
Washington, DC 20426

Reclamation Comments on Draft Study Plan for
Gibson Reservoir and Sun River Water Quality Monitoring
Gibson Dam Hydroelectric Project
FERC Project No. 12478

The following provides Reclamation's comments on the September 29, 2005 Draft Water Quality Study Plan for Gibson Dam Hydroelectric Project, FERC Project No. 12478 (submitted electronically to Reclamation by Dick Rosenberg of Whitewater Engineering):

1. General Comment – The Montana DEQ and Sun River Watershed Group are very active in the watershed and have many water quality measuring stations already developed. Reclamation suggests working closely with these agencies to prevent duplication of data collection and to ensure compliance with State Standards.

2. Page 1, Introduction and Background: The Introduction and Background indicate that the purpose of the Draft Study Plan is to describe proposals for performing temperature monitoring only for Gibson Reservoir and portions of the Sun River downstream of Gibson Dam. These sections also indicate that Draft Plans for other water quality parameters (e.g., dissolved gasses, turbidity, suspended sediments, etc.), will be developed. The remainder of the document describes how the developer intends to study various water quality parameters. Suggest clarifying the purpose of this document within the Introduction and Background sections as it appears that this will be the only plan for studying water quality.

3. Page 1, Study Objectives: Bullet 3 suggests that the proposed development will change or alter project operations to "optimally meet both developmental and non-developmental needs". Please identify and describe all "developmental and non-developmental needs" within the Draft Study Plan. While development of the proposed project may provide an additional outlet from which to make releases from the dam from (i.e., the power penstock outlets), development of this project cannot alter the authorized purposes of the Sun River Project.

4. Page 2, Proposed Study Areas, Gibson Reservoir: This section indicates that water temperature surveys will be conducted in three primary locations, but only two sites are identified. Please identify the third location.

5. Page 2, Proposed Study Areas, Sun River: This section mentions that ***several*** locations will be monitored downstream of Gibson Dam. The term "several" is vague. If more information is known, please include. It is also mentioned that sites will be chosen by agency personnel. Please identify the agencies that will be responsible for identifying monitoring locations. Refer also to comment No. 7 below.

6. Page 3, Sampling Equipment and Methods: This section states that water temperature monitoring will be completed using "Optic Stow Away" loggers, which supports monitoring for 661 days before data is downloaded. That leads the reader to assume these may be deployed for that period without required maintenance, calibration, etc. Please identify anticipated maintenance requirements and how equipment calibration will be handled. Quality assurance should be addressed for other monitoring components as well.

7. Page 3, Sampling Equipment and Methods: Please describe how all equipment will be installed, maintained, and accessed throughout the monitoring period. Details of any ground disturbing activities must be provided prior to installing any equipment so that appropriate National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance activities can be completed.

8. Pages 3 & 4, Gibson Reservoir and Sun River Temperature Monitoring: Please identify how researchers intend to deal with winter weather conditions while collecting data on the reservoir and river. For example, the Draft Plan indicates that access to the loggers on the reservoir will be by boat. This is not possible during the winter months.

9. Page 4, Gibson Reservoir Surface Water Temperature Monitoring: Please identify how researchers will monitor reservoir temperatures with a fluctuating reservoir level.

10. Page 6, DO: This section indicates that DO will be measured approximately on a quarterly basis. DO is likely to fluctuate significantly over the summer months due to varying algae growth in the system, nutrient inputs, water temperature, reservoir stratification and other conditions. A snapshot every 3 months does not appear adequate to assess DO concerns.

11. Page 6, OTHER WATER QUALITY PARAMETERS: The section indicates that other water quality parameters (several are listed) will be determined during study planning. Is this "study planning" the water quality study planning or the overall project study planning? Please clarify.

12. Page 7, REPORTING: Reclamation requests copies of all reports documenting the results of water quality monitoring studies.

ATTACHMENT II

Comments on Draft Water Quality Monitoring Plan, EPA Region 8 Montana Office

EPA Comments on Draft Water Quality Study Plan for Gibson Reservoir

1. It is stated (page 2) that Gibson Reservoir water temperature surveys will be conducted in three primary locations, and then two locations are listed: 1) near the reservoir surface near the spillway; 2) at various depth levels near the upstream dam face. It is then stated (page 3) under the heading, ***Gibson Reservoir Temperature-at-Depth Monitoring,*** that Gibson Reservoir water temperature will be continuously monitored from bottom to surface at 8 different depths. This monitoring discussion is confusing (i.e., Are there two or three locations for temperature monitoring or will temperature be monitored at multiple locations in the reservoir?). We suggest clearer discussion of the locations of reservoir temperature monitoring. We also understand that dissolved oxygen levels will be monitored at all temperature monitoring locations (page 5). Is this correct?

2. The draft study plan suggests that additional water quality monitoring will be carried out during and after project construction to aid in determining compliance with Montana Water Quality Standards (page 6). Potential parameters to be monitored are identified (e.g., Turbidity, Total dissolved solids, Heavy metals, Petroleum distillates, Pesticides, PCB's, Total Suspended Sediment), but no specific details on the frequency and locations of such monitoring or an actual commitment to carry out such monitoring are included. We suggest that you work closely with the Montana Dept. of Environmental Quality (MDEQ) to determine appropriate monitoring plan components to evaluate and assure compliance with Montana Water Quality Standards during project development and implementation. It appears to us that a biological monitoring component may be helpful in assuring compliance with Water Quality Standards (e.g., macroinvertebrate, fish populations). We also recommend that MDEQ validate proposed monitoring of total dissolved gases to evaluate, and thus, avoid supersaturation problems in the river below the dam.

3. We understand that the Montana Dept. of Fish, Wildlife & Parks (MDFWP) is interested in finding ways to improve streamflows in the Sun River, since chronic dewatering of this waterbody has impacted fisheries and aquatic life more than any water quality issue. We support MDFWP's recommendations that you carry out modeling of reservoir inflows, storage, and dam releases and Sun River diversion needs so that reservoir/dam and irrigation project managers have the best information possible to satisfy diversion needs while allowing adequate flows to remain in the river to benefit fisheries and aquatic life. We also support the

MDFWP recommendations for minimum Sun River flows of 220 cfs, with an absolute minimum flow during drought periods of 100 cfs to ensure survival of fish and aquatic life.

ATTACHMENT III

Comments on Draft Water Quality Monitoring Plan,
Montana Department of Environmental Quality

Montana Department of
ENVIRONMENTAL QUALITY

September 22, 2005

Dick Rosenberg
Gibson Dam Hydroelectric Company, L.L.C
3633 Alderwood Ave
Bellingham, WA 98225

Dear Mr. Rosenberg;

I have discussed the Gibson Dam Hydroelectric Project (FERC No. 12478) in detail with staff of MT Fish, Wildlife and Parks (FWP) as well as with staff from the MT Department of Environmental Quality (Department) who were involved with the Sun River Total Maximum Daily Load (TMDL). Based on our discussions, I believe that a useful effort to accompany your existing Draft Study Plan for 2005-2007 would be an examination of Gibson Dam's existing water delivery operations plan to determine if specific minimum daily flows can be maintained in the Sun River from the Pishkun Reservoir diversion to the Muddy Creek confluence.

According to FWP staff and the Sun River TMDL, the Sun River requires a minimum flow of 100 CFS year-round just for the survival of aquatic life. More preferable yet would be a flow of 220 CFS, which would achieve a more optimal base flow for the Sun River. The Department would like an analysis undertaken, using existing data, to determine if these flows can be achieved in the Sun River while at the same time maintaining a reasonable minimum pool in Gibson Reservoir that will not cause sedimentation and turbidity problems downstream.

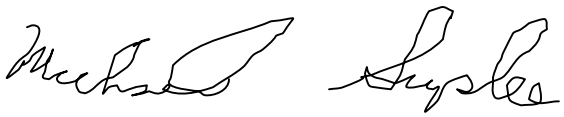
It is my understanding that the Bureau of Reclamation has already taken steps towards reviewing its Gibson Dam water-delivery operations plan. The Department recommends partnering with the Bureau of Reclamation to undertake this effort. The Department

anticipates that the product of this study would be a model indicating which of the two flows (100 or 220 CFS), or perhaps some intermediate flow, could be routinely maintained in the Sun River. The output of the model could then be used as the basis for establishing a minimum instream flow requirement. It is our belief that this modeling effort can be accomplished quickly and cost effectively, and will be a valuable, quantitative contribution to our decision making as the licensing process progresses.

Regarding the already-submitted study plan ("July 2005: Draft Gibson Reservoir and Sun River Water Quality Monitoring — Draft Study Plan for 2005-2007"), the Department is generally satisfied with the proposed plan and the list of parameters to be measured. We would, however, like to see an additional parameter listed in the last section, "Other Water Quality Parameters". Among the five already-listed parameters (Turbidity, TDS, heavy metals, petroleum distillates and pesticides & PCBs), please also include total suspended sediment (TSS).

I hope that this clarifies our additional expectations for the Gibson Dam study plan. It is my understanding that these suggestions will be incorporated into the current plan and that an updated version will be sent to me for review. If you have any questions, please contact me at (406) 444-0831 or by email at msuplee@mt.gov. Also, if you would like a copy of the Sun River TMDL the Department can provide one to you on CD. The TMDL contains a great deal of analysis that may be helpful to the modeling effort.

Sincerely,



Michael Suplee, Ph.D.
Water Quality Standards Section
Montana Department of Environmental Quality
1520 East 6th Ave
Helena, MT 59601

Cc: Mike Prewitt

ATTACHMENT IV

Comments on Draft Water Quality Monitoring Plan, US Army Corps of Engineers

General Comments for the
Draft Gibson Reservoir and Sun River Water Quality Monitoring

1. Background Section, first sentence: Consider revising, maybe with a purpose and need statement, i.e. what GDHC is doing what and why.

2. Background Section, last two sentences: If the resource agencies recommended that water temp, dissolved oxygen and total dissolved gasses be monitored, why is it stated that the plan is in response to requests for water temp only? In addition, the document includes monitoring plan for dissolved oxygen and total dissolved gasses. It could be stated that the plan is in response to those items. Also, the last sentence is incomplete.

3. Study Objectives Section, 3): You could add some examples of developmental and non-developmental needs.

4. General Study Plan, 1-3): Sentence states there are two primary categories for water control monitoring; however, there are three listed. The document has three categories including: 1) reservoir and stream (consider revising to river) temperature; 2) dissolved gasses (consider revising to include total dissolved gasses, and whether in reservoir and stream/river); and, other water quality parameters, as determined (consider revising to include whether in reservoir and stream/river).

5. Reservoir and Stream Temperature, Proposed Study Area, Gibson Reservoir, first sentence: Sentence states there are three primary locations for water temp surveys, but only two are included.

6. Sampling Equipment and Methods, Gibson Reservoir Temperature-at-Depth Monitoring: At this point in the document it started to get difficult to follow the format. Consider using an outline of numeric/roman numeral headings for each major topic.

7. Sun River Temperature Monitoring, third bullet: Sentence references previously stated information; recommend referring to the exact location of reference instead of "listed above".

8. Sampling Time Periods, first sentence: Add "the", in-between "to" and "end" in the sentence, to read: "…to the end of the licensing period."

9. General Comment: Spell-out headings, e.g. DO – Dissolved Oxygen

10. Spell out acronym USBR, page 6.

ATTACHMENT V

Comments on Draft Water Quality Monitoring Plan, Montana Department of Fish, Wildlife and Parks.

From: Phillips, Glenn
To: Dick Rosenberg
Sent: Friday, September 30, 2005 7:16 AM
Subject: RE: Draft water quality study plan, Gibson Dam Project, FERC P-12478

Dick, for the most part, the plan looks fine to me. My only comment, and I suspect you have already taken this into account, is that you be certain to situate temperature monitoring stations, that are proposed to be located downstream of water inflows to the mainstem, far enough downstream of the inflow in order to be certain that complete mixing is achieved.

Dick, how are you intending to respond to our request for development of a water management plan that will optimize stream flow downstream of the Pishkin diversion?