

Hydro Operational Requirements from FERC License Articles and SOP Agreements with Agencies for NWE's 11 Hydropower Dams (3 FERC Licenses)

(January 25, 2016)

Section I: Madison-Missouri River Project 2188 License Article 403 Operations

(Hebgen, Madison, Hauser, Holter, Black Eagle, Rainbow, Cochrane, Ryan and Morony):

Hebgen Dam/Reservoir

1. maintain a continuous minimum flow of 150 cfs in the Madison River as measured just downstream from Hebgen Dam at USGS Gauge No. 6-385, and a continuous minimum flow of 600 cfs at USGS Gauge No. 6-388 near the Kirby Ranch;
2. limit flows at USGS Gauge No. 6-388 near Kirby Ranch to no more than 3,500 cfs to minimize erosion of the Quake Lake outlet;
3. limit changes in outflow from Hebgen Dam to no more than 10 percent per day for the entire year;
4. maintain the elevation of Hebgen Reservoir between 6,530.26 and 6,534.87 feet (normal full pool elevation) from June 20 through October 1. In a typical year, the Licensee shall operate the Hebgen Development so that Hebgen Reservoir would refill to approximately its full pool elevation of 6,534.87 feet in late June or early July. The Licensee shall then maintain Hebgen Reservoir near its full pool elevation until September 1. Between September 1 and March 31 of a typical year, the Licensee shall draft Hebgen Reservoir to approximately an elevation of 6,524 feet. During this period, as Hebgen Reservoir is being drafted, the Licensee shall, to the extent practical given the variability of inflows to Hebgen Reservoir, maintain a reasonably uniform discharge from the Hebgen Development. After April 1 of a typical year, the Licensee shall operate the Hebgen Development to refill Hebgen Reservoir to at least elevation 6,530.26 feet by June 20;
5. obtain concurrence from FWS, Forest Service, BLM, BOR, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
6. implement the Missouri River Coordination Agreement with the Bureau of Reclamation (BOR) (dated March 30, 1972, amended June 8, 1979); and
7. implement Article 419 Madison River Flushing Flow Plan (provide up to 3,500 cfs at Kirby gage for a minimum of 3 days in years when volume both runoff volume forecast and Hebgen storage triggers are met).

For the purpose of implementing The Missouri River Coordination Agreement with BOR, drafting of the Hebgen Reservoir shall not begin until all storage in Canyon Ferry Reservoir above elevation 3,769 feet (28 feet below Canyon Ferry's normal full pool) has been utilized.

Madison Dam/Reservoir

1. operate Madison Dam as a base load, run-of-river project (i.e., the dam shall not be used for peaking, load following, or providing non spinning operating reserves);
2. coordinate with the operation of the Hebgen Development to maintain a continuous minimum flow of 1,100 cfs in the Madison River as measured at USGS Gauge No. 6-410 downstream from the Madison Development;
3. maintain the elevation of Ennis Lake between 4,840 and 4,841 feet (normal full pool) when ice is absent, and at 4,839 feet between early December and early April;
4. provide an instantaneous minimum spawning flow of 200 cfs in the bypass reach from April 1 through June 30, and an instantaneous minimum (maintenance) flow of 80 cfs in the bypass reach from July 1 through March 31;
5. not reduce flow in the Madison bypass reach from 600 cfs to minimum flow by more than 100 cfs per hour, and not increase flow from less than 600 cfs to 600 cfs by more than 100 cfs per hour (except when needed to meet the 1,100-cfs minimum flow below the powerhouse or to avoid overfilling Ennis Lake); and
6. implement Article 419 Madison River Flushing Flow Plan.
7. obtain concurrence from FWS, Forest Service, BLM, BOR, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
8. implement Article 413 Final Madison River Pulse Flow Protocol (implement both the Madison DSS program or backup manual protocol, shown below, as required); and

Lower Madison River (below Madison Dam) Manual Pulse Flow Protocol (in cfs)

2015 Manual Protocol	Tomorrow's Predicted Maximum Air Temperature (°F) and Corresponding Pulse Flow (cfs) (Look up predicted high air temperature for the next day at Sloan Station near Three Forks, MT)		
	Air Temp ≥ 75 and < 85 (cfs)	Air Temp ≥ 85 and < 95 (cfs)	Air Temp ≥ 95 and < 105 (cfs)
Today's Maximum Powerhouse Release Temperature (°F) (Look up river temperature at the Madisondss website or the USGS McAllister gage at USGS McAllister on or after 8:30 p.m.)			
greater or equal to 68 and less than 69	1150	1150	1400
greater or equal to 69 and less than 70	1150	1400	1600
greater or equal to 70 and less than 71	1150	1600	2000
greater or equal to 71 and less than 72	1400	1600	2100
greater or equal to 72 and less than 73	1450	1800	2400
greater or equal to 73 and less than 74	1600	2100	2800
greater or equal to 74 and less than 75	1800	2600	3000
greater or equal to 75	2600	3200	3200

NWE and MFWP reached agreement on 6/5/15 to the flow ramping rates directly below (see green highlighted cells) for Lower Madison River pulse flows. If DSS or manual directives call for a greater than 2,000 cfs total pulse flow (e.g. 3,000 cfs), then NWE will insert the higher Bypass Reach flow necessary (e.g. 1,600 cfs) to reach this higher total volume in each of yellow highlighted cells below. The up ramp (4 AM to 6 AM) and down ramp (noon to 3 PM) and peak pulse flow duration (6 AM to noon) remains the same for all pulse flow volumes at or above 2,000 cfs. For pulse flow directives below 2,000 cfs total flow, and/or when starting base flow is above 1,150 cfs total flow, Madison Dam operators will calculate the proper combination of powerhouse and ramped bypass reach flow response to meet that particular pulse flow need.

Time	Powerhouse	Bypass Reach	Total Flow
4:00 AM	1030	120	1150
5:00 AM	1400	360	1760
6:00 AM	1400	600	2000
7:00 AM	1400	600	2000
8:00 AM	1400	600	2000
9:00 AM	1400	600	2000
10:00 AM	1400	600	2000
11:00 AM	1400	600	2000
12:00 PM	1400	600	2000
1:00 PM	1030	400	1430
2:00 PM	1030	200	1230
3:00 PM	1030	120	1150

9. implement Article 420 Flow Restoration Plan (restore full river flow within 40 minutes after a full plant trip).

The Licensee shall also install a permanent flow gauge in the Madison bypass reach to monitor instantaneous minimum flows and flow ramping rates (at bypass stream flows less than 600 cfs).

Hauser Dam/Reservoir

1. operate the Hauser Dam as a base load, run-of-river project (i.e., the dam shall not be used for peaking, load following, or providing non spinning operating reserves);
2. maintain the elevation of Hauser Reservoir and Lake Helena between 3,634.4 and 3,635.4 feet (normal full pool) and maintain continuous, stable flows in the Missouri River immediately below Hauser Dam;
3. limit to 10 percent the difference between the daily average flow measured just below Hauser Dam (at a USGS gauging station to be installed) and the daily average inflow to Hauser Reservoir and Lake Helena. For this purpose, the inflow to Hauser Reservoir and Lake Helena shall be calculated based on the measured flow below Hauser Dam and the change in storage content of Hauser Reservoir and Lake Helena;
4. limit the difference between the highest hourly average flow and the lowest hourly average flow (as measured at the USGS gauging station to be installed) on any day to no more than the sum of (a) 10 percent of the previous day's average flow at the gauging station and (b) any increase or decrease in releases from Reclamation's Canyon Ferry Dam occurring on the day in question or on the day immediately preceding or the day immediately following the day in question;
5. limit changes in the hourly average flow measured at the gauging station to be installed to no more than 5 percent of the previous hour's average flow; and
6. enhance downstream power production, as required by the Missouri River Coordination Agreement, if extreme drought conditions persist for an extended period. The maximum required draft for this purpose is to elevation 3,621 feet. Drafting Hauser Reservoir and Lake Helena for this purpose is only required after all of the storage in Canyon Ferry Reservoir and Hebgen Reservoir has been utilized; and
7. obtain concurrence from FWS, Forest Service, BLM, BOR, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
8. implement Article 420 Flow Restoration Plan (restore full river flow within 30 minutes after a full plant trip); and
9. implement Article 415 Flow Window Excursion Plan (annual report to MDFWP, USFWS and Commission on all flow excursion events, causes and corrective actions).

Holter Dam/Reservoir

1. operate holter Dam as a baseload, run-of-river project (i.e., the dam shall not be used for peaking, load following, or providing non spinning operating reserves);
2. maintain the elevation of Holter Reservoir between 3,563 and 3,564 feet (normal full pool) and maintain continuous, stable flows in the Missouri River immediately below the Holter Development;
3. limit to no more than 10 percent the difference between the daily average flow measured just below Holter Dam (USGS Gauge 6-665) and the daily average inflow to Holter Reservoir. For this purpose, the inflow to Holter Reservoir shall be calculated based on the measured flow at USGS Gauge No. 6-665 and the change in storage content of Holter Reservoir;
4. limit the difference between the highest hourly average flow and the lowest hourly average flow (as measured at USGS Gauge No. 6-665) on any day to no more than the sum of (a) 10 percent of the previous day's average flow at USGS Gauge No. 6-655 and (b) any increase or decrease in

releases from BOR's Canyon Ferry Dam occurring on the day in question or on the day immediately preceding or immediately following the day in question;

5. limit changes in the hourly average flow measured at USGS Gauge No. 6-655 to no more than 5 percent of the previous hour's average flow; and
6. obtain concurrence from FWS, Forest Service, BLM, BOR, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
7. implement Article 420 Flow Restoration Plan (restore full river flow within 30 minutes after a full plant trip); and
8. implement Article 415 Flow Window Excursion Plan (annual report to MDFWP, USFWS and Commission on all flow excursion events, causes and corrective actions).

The Licensee may temporarily (for a period of a few to several days) increase flows from the Holter Development during and immediately preceding periods of extreme cold to maintain or enhance power production at the Great Falls developments downstream. The Licensee shall endeavor to minimize the reservoir drafts and downstream flow fluctuations caused by this type of operation by coordinating the increased flows from the Holter Development with increased flows from the Canyon Ferry Project:

SOP (MFWP APPROVED) EMERGENCY WINTER FLOWS BELOW HOLTER DAM

- Initiate request when weather forecast for Great Falls consistently (at least 2-3 days in a row) predicts 3 or more consecutive days with below-zero daily minimum temperatures.
- Peak flow condition can be maintained for several days if necessary until conditions indicate river flow is returning to pre-event levels.
- Avoid emergency winter flow requests during trout spawning season in November and March unless absolutely necessary. If special releases are needed during this period, attempt to minimize the amount of flow change.
- Monitor weather forecasts for Great Falls twice daily (morning and late afternoon) during the planning stage and make flow requests at the last possible moment while being sure adequate time is allocated for required internal and external communication.
- Make every reasonable effort to cancel or reduce the flow request if forecasts change or extreme cold weather abates.
- Recommended flow increases and staging guidelines are presented in Table 1 below. Recommended increases range from 20-40%, depending upon estimated ice cover on the river between Great Falls and Holter Dam.

Table 1. Guidelines for Emergency Winter Flow Releases From Holter Dam

Ice Cover (Morony Reservoir to Hardy Cr area)	Recommended Holter Flow Increase	Guidelines For Flow Step-Up	Guidelines For Flow Step-Down
0-60%	Up to 40% over pre-event base flow	- No more than 5% change per hour	- Decrease by no more than 10% per day. - No more than 5% change per hour.
61-80%	Up to 30% over pre-event base flow	- No more than 5% change per hour	Same as above
>80%	Up to 20% over pre-event base flow	- No more than 5% change per hour	Same as above

Black Eagle Dam/Reservoir

1. operate black Eagle dam as a base load, run-of-river project;
2. maintain the elevation of Black Eagle Reservoir near its normal full pool elevation of 3,290 feet;
3. spill a minimum of 200 cfs at Black Eagle Dam between the hours of 9:00 a.m. and 8:00 p.m. on weekends and holidays during the summer, beginning with the Memorial Day weekend and ending with the Labor Day weekend (except during years when the April–June natural runoff into Canyon Ferry Reservoir is less than 900,000 acre-feet [50 percent of the 1961–1990 average]); and
4. obtain concurrence from FWS, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
5. Implement Article 403 Black Eagle Drawdown Plan (specific drawdown rates to limit reservoir sediment re-suspension and downstream transport)

The Licensee may increase generation above the normal run-of-river level for up to four hours to provide short-term generation reserves.

Rainbow Dam/Reservoir

1. operate Rainbow dam as a base load, run-of-river project;
2. maintain the elevation of Rainbow Reservoir near its normal full pool elevation of 3,224 feet;
3. spill a minimum of 200 cfs at Rainbow Dam between the hours of 9:00 a.m. and 8:00 p.m. on weekends and holidays during the summer, beginning with the Memorial Day weekend and ending with the Labor Day weekend (except during years when the April–June natural runoff

into Canyon Ferry Reservoir is less than 900,000 acre-feet [50 percent of the 1961–1990 average]); and

4. obtain concurrence from FWS, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions.; and
5. Implement Article 403 Rainbow Drawdown Plan (specific drawdown rates to limit reservoir sediment re-suspension and downstream transport)

The Licensee may increase generation above the normal run-of-river level for up to four hours to provide short-term generation reserves.

Cochrane Dam/Reservoir

1. at its discretion, operate the Cochrane Development to provide base load generation, short-term generation reserves, load-following generation, and, on a coordinated basis with the Ryan and Morony developments, peaking generation;
2. during base load operation, maintain the elevation of Cochrane Reservoir near its normal full pool elevation (currently 3,116.5 feet and proposed 3,120 feet);
3. during operations other than base load, maintain the elevation of Cochrane Reservoir between 3,105 and 3,116.5 feet until the Rainbow Development has been modified, and between 3,110 and 3,120 feet thereafter; and
4. obtain concurrence from FWS, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
5. Implement Article 403 Cochrane Drawdown Plan (specific drawdown rates to limit reservoir sediment re-suspension and downstream transport)

Ryan Dam/Reservoir

1. at its discretion, operate the Ryan Development to provide base load generation, short-term generation reserves, load-following generation, and, on a coordinated basis with the Cochrane and Morony developments, peaking generation;
2. during base load and other operations, maintain the elevation of Ryan Reservoir near its normal full pool elevation of 3,037 feet by coordinating operations with the Cochrane Development;
3. spill a minimum of 200 cfs at Ryan Dam between the hours of 9:00 a.m. and 8:00 p.m. on weekends and holidays during the summer, beginning with the Memorial Day weekend and ending with the Labor Day weekend (except during years when the April–June natural runoff into Canyon Ferry Reservoir is less than 900,000 acre-feet [50 percent of the 1961–1990 average]); and
4. obtain concurrence from FWS, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions.; and
5. Implement Article 403 Ryan Drawdown Plan (specific drawdown rates to limit reservoir sediment re-suspension and downstream transport)

Morony Dam/Reservoir

1. operate the Morony Development as a base load project with outflows approximately equal to inflows into the Great Falls developments upstream;
2. not operate the Morony Development for peaking, load following, or providing non spinning operating reserves;
3. use the Morony Development to re-regulate releases from the Cochrane and Ryan developments when they are operated to provide short-term reserve generation, load-following generation, or peaking generation;
4. during base load operations at the Ryan and Cochrane developments, maintain the elevation of Morony Reservoir between 2,885 and 2,888 feet;
5. during Ryan and Cochrane operations other than base load, maintain the elevation of Morony Reservoir between 2,878 and 2,888 feet;
6. limit to 10 percent the difference between the daily average flow measured just below Morony Dam (at USGS Gauge 6-903) and the daily average inflow to the Great Falls developments. For this purpose, the inflow to the Great Falls developments shall be calculated based on the measured flow at USGS Gauge No. 6-903 and the change in storage content of Black Eagle, Rainbow, Cochrane, Ryan, and Morony reservoirs;
7. limit the difference between the highest hourly average flow and the lowest hourly average flow (as measured at USGS Gauge No. 6-903) on any day to no more than the sum of (a) 15 percent of the previous day's average flow at USGS Gauge No. 6-903 and (b) the greater of the sum of the differences between the highest hourly average flow and the lowest hourly average flow measured as inflows to Black Eagle on the day in question or the day preceding the day in question;
8. limit changes in the hourly average flow measured at USGS Gauge No. 6-903 to no more than 7.5 percent from the previous hour's average flow; and
9. obtain concurrence from FWS, Montana DNRC, and Montana DFWP, and approval from the Commission, to intentionally deviate from proposed operations during normal river flows and normal facility conditions; and
10. implement Article 420 Flow Restoration Plan (restore full river flow within 30 minutes after a full plant trip); and
11. implement Article 415 Flow Window Excursion Plan (annual report to MDFWP, USFWS and Commission on all flow excursion events, causes and corrective actions); and
12. Implement Article 403 Morony Drawdown Plan (specific drawdown rates to limit reservoir sediment re-suspension and downstream transport)

Project 2188 License Article 403 Non-Emergency Reservoir Drawdown Plans for all 9 Developments

Ninety days prior to any scheduled reservoir drawdown, the Licensee shall file, for Commission approval, a reservoir drawdown plan. The Licensee shall prepare the plan after consultation with the Forest Service, BLM, BOR, FWS, Montana DFWP, Montana DEQ, and other interested entities. The Licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan.

A five-year MFWP, MDEQ and Commission approved Article 403 Drawdown Plan for the five Great Falls reservoirs (specific drawdown rates for each reservoir to limit reservoir sediment re-suspension and downstream transport) is being implemented. Contemporary Drawdown Plans for Hebgen, Madison, Hauser and Holter will need to be developed and approved as the need for a non-emergency drawdown of any of these reservoirs arises.

Project 2188 License Operational Temporary Exceptions and Modifications

Article 403 flows and water surface elevation requirements may be temporarily modified (1) if required by operating emergencies or flow conditions beyond the control of the Licensee, (2) pursuant to approved maintenance activities, or (3) for short periods upon mutual agreement among the Licensee, the Forest Service as appropriate, BLM, FWS, Montana DFWP, and Montana DEQ to: (a) accommodate special maintenance or construction requirements; (b) allow for archaeological studies; (c) implement the temperature enhancing pulsed flow protocol at the Madison development, required in Article 413; (d) satisfy power production purposes during an extended period of extreme drought; or (e) implement the Missouri River Coordination Agreement with BOR, which requires that water stored in the reservoirs at the nine project developments be used to enhance downstream power production if extreme drought conditions persist for an extended period. If the flows or water surface elevations are so modified, the Licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

The Commission is not restricting temporary modifications to flows and water surface elevations to the enumerated reasons in paragraph above. The above enumerated reasons are restrictions that apply only to short-term modifications that are mutually agreed upon by the Licensee and the specified agencies. Independent of these reasons, Article 403 allows the Licensee to modify flows and elevations if required by operating emergencies or flow conditions beyond the control of the Licensee, and pursuant to approved maintenance activities. As above, if flows or water surface elevations are so modified, the Licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

In a July 17, 2014 Commission letter to the Project 2188 Licensee, the Commission reaffirmed that:

- Article 403 requires Licensee to maintain certain reservoir elevations, minimum flows and/or ramping rates as specified for each hydro development and to, before intentionally deviating from the specified operations at the developments, obtain concurrence from specified state and federal agencies. Article 403 also states that the flow and elevation requirements may be temporarily modified: (1) if required by conditions beyond Licensee control; (2) for approved (*by Commission*) maintenance activities or (3) under specified conditions, for short periods upon agreement with certain state and federal agencies.
- If flow releases, ramping rates, flow restoration, or reservoir elevations required by the Project 2188 license, as measured by the approved monitoring systems at the project, are not met, Licensee shall file a report with the Commission's Division of Hydropower Administration and Compliance within 10 days of the incident... Licensee shall include with the report, or include in

an additional filing within 30 days of the incident, copies of any comments or correspondence received from resource agencies or other entities regarding the incident.

- Licensee is to continue to file annual flow window excursion reports with the Commission by March 30 of each year pursuant to Article 415.
- Based on Commission staff review of Licensee's last five quarterly flow window excursion reports documenting Licensee's work in reducing deviations below the Hauser, Holter, and Morony developments, Licensee no longer needs to file quarterly reports as required by our April 2007 letter... Commission may request Licensee begin filing such reports again if Licensee is not successful in continuing to reduce the frequency of the deviations from the flow requirements of Article 403 below these hydro developments.

Project 2188 SOP Operational Agreements with Commission/U.S. BLM

- **As proposed to the Commission**, annual draft of Hauser Reservoir and Lake Helena 9 inches from full pool, December 1 until April 1 to reduce or eliminate Lake Helena north shore winter ice heave erosion and to reduce spring ice thaw shoreline erosion on both water bodies.
- **As agreed to with U.S. BLM**, annual, 9 inch draft of Holter Reservoir drawdown (from normal full pool 3564 feet elevation) from March 15 to spring ice off to help reduce ice expansion/wind driven ice erosion of reservoir shorelines and associated recreation infrastructure during the spring thaw period.
- **As agreed to with MFWP**, crack designated Holter flow restoration gate (Article 420 above) to reduce or eliminate the risk of gate seal icing and potential non-function.
- **As agreed to with MFWP**, crack designated Morony flow restoration gate (Article 420 above) to reduce or eliminate the risk of gate seal icing and potential non-function.

Section II: Mystic Lake Project Operations Required by Commission Order Approving New License (12/17/07):

Mystic License Mandatory Section 4(e) Conditions 14, U.S. Forest Service in stream Flows:

The Licensee shall provide continuous minimum flows and ramping rates on West Rosebud Creek as follows:

- During fall, winter, and spring months (September through May) the Licensee shall provide a minimum bypass reach flow of 5 cfs with the option to provide up to 11 days (selected at Licensee's discretion) each month of 4 cfs as measured at the upper weir, located upstream of the return flow from the powerhouse. Any release of 4 cfs, even if less than a full 24 hour period, shall count toward the 11-day per month maximum.
- During summer months (June through August) the Licensee shall provide a minimum bypass reach flow of 10 cfs as measured at the upper weir.
- During the entire year the Licensee shall ramp descending bypass reach flows below 10 cfs at 2 cfs per hour maximum, as measured at the upper weir. No ramp rate limits are required at flows above 10 cfs.
- The Licensee shall provide for a minimum flow release of 20 cfs downstream of the Regulation Dam except when natural inflow is less than 20 cfs or when maintenance of facilities prevents such a release. This minimum flow shall be measured at the new USGS gage (#06204070) on West Rosebud Creek immediately downstream of the bridge to Emerald Lake Campground.

The minimum stream flows may be temporarily modified, not to exceed 24 hours, if required by equipment malfunction or operating emergencies reasonably beyond the control of the Licensee. If the stream flow is so modified, the Licensee shall provide notice to the Commission and the Forest Service as soon as possible, but no later than 10 days after such incident.

- Maintain a minimum water surface elevation at Mystic Lake of 7,663.5 ft (USGS datum) from July 10 to September 15 each year.

Mystic License Mandatory MDEQ Section 401 Water Quality Certification Flow Terms and Conditions:

1. In order to protect aquatic life LICENSEE shall provide a minimum flow in West Rosebud Creek from Mystic Lake to the Powerhouse, the "Mystic bypass reach," as measured at the weir in West Rosebud Creek immediately upstream of the Powerhouse (the upper weir) as follows:

- a) During the months June, July and August, Licensee will provide a minimum Mystic bypass reach flow of 10 cfs as measured at the upper weir.
- b) During the months September through May, Licensee will provide a minimum Mystic bypass reach flow of 5 cfs with the option to provide up to 11 days (randomly selected) each month of 4 cfs as measured at the upper weir. Any release of 4 cfs, even if less than a full 24-hour period, will count toward the 11-day per month maximum.

c) Licensee will provide flow ramping rates from the Mystic “fish valve” at no more than 2 cfs per hour, measured at the upper weir, to the bypass reach during planned flow decreases (e.g. summer 10 cfs to winter minimum on August 31) or during other flow reductions when flow in the bypass reach is less than 10 cfs. There will be no ramp rate requirements for the bypass reach at flows above 10 cfs.

2. Licensee shall provide for a minimum flow release of 20 cfs downstream from the West Rosebud Creek Re-regulation Dam except when natural inflow is less than 20 cfs or when maintenance of facilities prevents such a release. This minimum flow will be measured at the USGS gage (#06204070 installed October 2006) in West Rosebud Creek located immediately downstream of the bridge to the Emerald Lake Campground.

6. Licensee shall, within five years of the license date, develop an emergency flow plan that will provide for flows up to 20 cfs below the West Rosebud Lake Re-regulation Dam (measured at USGS gage #06204070) in the event that flows from the power house are interrupted and in accordance with the minimum flow requirement in Conditions 1 and 2. The plan and any Project modifications are to be implemented as soon as practicable with the concurrence of the Department.

a) Licensee is to notify the Department and the Montana Department of Fish Wildlife & Parks of any flow interruption within 24 hours.

Protocol for West Rosebud Creek Whitewater Flow Enhancement

Under normal, routine operation of the Mystic Lake Hydroelectric Project by Licensee during the descending limb of the West Rosebud Creek annual hydrograph:

- When the Wednesday noon stream flow reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) is greater than 400 cfs, no white water flow enhancement will be provided.
- When the Wednesday noon stream flow reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) is between 286 cfs and 400 cfs, Licensee will endeavor to release 500 cfs for 5 hours from the West Rosebud Lake Dam on the following Saturday and Sunday, except:
 - When the following Friday noon stream flow reported on the USGS Stream flow Gauge #06204050 is less than 270 cfs due to rapidly decreasing inflow, Licensee will endeavor to release 500 cfs for 5 hours from the West Rosebud Lake Dam on the following Saturday only.
- When the Wednesday noon stream flow reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) is between 250 cfs and 285

cfs, Licensee will endeavor to release 500 cfs for 5 hours from the West Rosebud Lake Dam on the following Saturday only, except:

- When the following Friday noon stream flow reported on the USGS Stream flow Gauge #06204050 is less than 250 cfs due to rapidly decreasing inflow, a Saturday release will not be provided.
- When the Wednesday noon stream flow reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) is less than 250 cfs, no whitewater flow enhancement will be provided.
- Licensee will endeavor to operate West Rosebud Lake below 6397.6 feet and above 6395.0 feet elevation during whitewater flow enhancement events.
- Minimum flow below West Rosebud Lake, during whitewater flow enhancements, will be maintained at 200 cfs or greater as measured at the USGS Stream flow Gauge West Rosebud Creek at Emerald Lake Campground (#06204070).
- White water releases from West Rosebud Lake Dam will begin at 8:30 AM. Peak flow (near 500 cfs) will reach the Emerald Lake Outlet between approximately 11:00 AM and 12:00 noon and will continue for approximately 2.5 hours, gradually reducing to pre-enhanced base flow conditions thereafter.
- When the Wednesday noon stream flow reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) indicates a pending whitewater flow enhancement on the following weekend, Beartooth Paddlers and American Whitewater will endeavor to communicate this information to the paddling community through social media, websites, email and other means.
- Rapidly decreasing flows as reported on the USGS Stream flow Gauge West Rosebud Creek near Roscoe MT (#06204050) can, on rare occasions, cause whitewater flow enhancements to be less than optimal on the first and second day of a 2-day flow enhancement, when releases of 500 cfs for less than a 5-hour duration from West Rosebud Dam occur.

Mystic Lake Project SOP (MFWP Approved)

Maintain the following minimum flows as measured at the USGS Emerald Lake Campground gage (06204070):

- October 1 thru November 30 75 cfs (minimum adult BT spawning flow)
- December 1 thru April 15 43 cfs (minimum egg/fry recruitment flow)

Mystic crew should remember that these are minimum (not optimum) flows. If (when) we have the operational margin to operate above minimums, we should consider it.

Section III: Thompson Falls (TFalls) Project Operations Required by License Article 411 and 1990 Commission License Amendment

Allowable operation of the TFalls Project includes power peaking. However, daily water elevation in TFalls Reservoir (during peaking operations) is limited to a maximum of 4 feet below full pool elevation (2396.5 feet) with a instantaneous minimum flow release of 6,000 cfs, or river inflow, whichever is less, below the TFalls Project.

The U.S. Fish and Wildlife Service and Commission Approved Thompson Falls Fish Ladder operates annually from March 15 to November 1 depending on weather (shuts down when freeze conditions are imminent). Total flows thru the Fish ladder range from 9 cfs to 81 cfs, but typically run at the high end (80 cfs) of this range. In addition to these flows through the ladder, NWE seasonally or when warranted by other factors, opens one spill gate near the fish ladder to provide an additional fish attractant flow of 25 cfs to 100 cfs. The spill flow rate (in this range) is variable as factors warrant it.

The elevation of Thompson Falls Reservoir must be maintained from March 15 thru November 1 near full pool (2396.5 feet) to provide the required 9 cfs (6 cfs down the ladder and 3 cfs thru the fish working station) for fish ladder functionality. The required 20 cfs and 60 cfs fish attractant flows that exit at the bottom of the fish ladder are not affected by a potential 4 foot draft of Thompson Falls Reservoir as the intakes for both are much lower on the dam.