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September 10, 2021 FERC Project No. 10855-343

SENT VIA EMAIL

Mr. Doug Clements, EGLE
Ms. Elle Gulotty, MDNR
Mr. Scott Hicks, FWS
Mr. Gene Mensch, KBIC
Mr. Jim Grundstrom, DRCI

Dead River Hydroelectric Project
Proposed Temporary Variance to Article 402 to Operate the Dead River Hydroelectric Project August 2021 through December 2022

Dear Mr. Clements, Ms. Gulotty, Mr. Hicks, Mr. Mensch, and Mr. Grundstrom:

Initial Statement

On August 4, 2021, Upper Peninsula Power Company (UPPCO) notified the Federal Energy Regulatory Commission (FERC or Commission) about the Dead River Hydroelectric Project-FERC Project No. 10855 (Project) entering into the Dry Year Consultation Process for the Silver Lake Storage Basin (SLSB) and on August 11, 2021, for the Dead River Storage Basin (DRSB) as outlined in the Operations Monitoring Plan approved under the Order Modifying and Approving Article 405 Operations Plan dated March 11, 2010, and the Order Amending Article 405 Operations Monitoring Plan dated August 4, 2010 (Operations Plan).

On August 16, 2021, UPPCO again consulted with the Michigan Department of Natural Resources (MDNR), the Michigan Department of the Environment, Great Lakes, and Energy (EGLE), the U.S. Fish and Wildlife Service (FWS), the Keweenaw Bay Indian Community (KBIC) and the Dead River Campers Inc. (DRCI) under the requirements of the Operations Plan to determine the appropriate temporary modifications to the operating requirements of Articles 402 and 403. On August 16 and 17, 2021, UPPCO received responses from the MDNR, FWS, and EGLE requesting to maintain minimum flow releases. On August 20, 2021, the DRCI filed a letter with the Commission regarding its concerns about the impacts of lower reservoir elevations on the DRSB and encouraging other consulting agencies to participate in the consultation process.

As of August 26, 2021, the SLSB elevation was 1478.80 feet NGVD with a required target elevation of 1479.5 feet and a required minimum of 1479.0 feet NGVD. The DRSB elevation was 1338.52 feet with a required target elevation of 1341.0 feet and a required minimum of 1339.5 feet NGVD. A minimum flow of 10 cfs is being released from the SLSB and 105 to 110 cfs[1] is being released from the DRSB. At the request of the MDNR, FWS, and EGLE, UPPCO is

[1] 105 cfs is typically released as a precaution to make sure the minimum flow does not drop below the required 100 cfs. There are times where additional water (5 cfs in this case) is required to offset the evaporation losses and maintain license compliance at the downstream McClure Storage Basin

currently operating to maintain minimum flows as outlined in its August 24, 2021, letter (update) to the Commission.

In an August 25, 2021 Commission response to UPPCO's update, the Commission concurred with the need to file a request for a temporary variance with the Commission due to dry year conditions.

UPPCO has requested temporary variances to the requirements of Article 402 in 2018, 2019, 2020 and 2021 to continue to determine if there are operational modifications that can be employed to improve water quality in the Dead River and reservoir elevation in the DRSB. Since the dry year consultation period could extend until spring runoff in 2022, the dry year temporary variance could overlap with a similar temporary variance UPPCO has been requesting in the previous years. In addition, previous temporary variances have been filed later in the year and approval has not occurred to comply with the request to modify the February start of month modification for the Silver Lake Storage Basin (SLSB). Therefore, UPPCO is proposing to combine the dry year temporary variance with an operation's temporary variance similar to the filings for the years 2019-2021.

Dry Year Variance

For a dry year variance, UPPCO has three main options to consider, 1) Maintain the minimum flow requirements and allow the reservoir elevations to continue to decline 2) Propose to reduce the minimum flow requirements until minimum reservoir elevations are restored at the DRSB, or 3) Release additional water from SLSB to maintain reservoir elevations at DRSB.

Expected results

To forecast expected results of reduced minimum flows as proposed, UPPCO has updated its Operational Model with inflow data that has been verified by the U.S. Geological Survey through November 2, 2020. In setting the elevations for each calendar at the elevations that exist on August 26, 2021, UPPCO has identified seven years out of the 42.75-year history where similar inflows occurred. Those years were 1986, 1987, 1988, 2000, 2007, 2010, and 2012.

Option 1

Using the above seasonal inflow examples stated above, retaining the minimum flow requirements out of the DRSB at 100 cfs, the model shows the DRSB will be restored to the minimum elevation of 1339.5 feet NGVD by October 18th in the 1986 seasonal example, October 14th in the 1987 seasonal example, October 6th for the 1988 seasonal example, the following spring for the 2000 seasonal example, October 22nd for the 2007 seasonal example, September 26th for the 2010 seasonal example and November 26th for the 2012 seasonal example. The model shows all seasonal examples restore the DRSB to the target elevation of 1341.0 feet NGVD in April of the following year.

Option 2

Using the inflows for 1986, 1987, 1988, 2000, 2007, 2010, and 2012 and reducing the minimum flow requirements out of the DRSB to 90 cfs until the minimum reservoir elevations at DRSB are again attained, the model shows such a proposed change could produce a maximum benefit of restoring the DRSB to the minimum elevation of 1339.5 feet NGVD 11 days earlier changing it from October 29th to October 18th in the 1986 calendar water year example. The need to obtain approval for a temporary variance for this action (expected to require at least 75 days) means the option would only be implemented after any negligible expected benefit to recreation at the DRSB would occur. The model also shows any temporal effect from the decrease in minimum flow regarding the return of the DRSB target level of 1341.0 feet the following spring is negligible. Therefore, UPPCO has determined this should not be considered an option at this time of the year.

Option 3
Further reducing the reservoir elevation at SLSB is not being considered at this time because at the current elevations, the area capacity curves published in the 1994 relicensing application show if the SLSB elevation was reduced by 1.0 feet, this would raise the DRSB approximately 0.6 feet. This factor along with the need to obtain approval for a temporary variance for this action (expected to require at least 75 days) means a rapid change in elevations at SLSB (in mid-November at the earliest) could incur unnecessary adverse impacts to hibernating herptiles. In addition, there is very little positive benefit to other resources such as recreation at the DRSB if this option were implemented. Therefore, UPPCO has determined this should not be considered an option at this time of the year.

Dry year variance proposal
At this late stage in the season, based upon its analysis, UPPCO does not propose to take any additional action. Taking no action allows the reservoir elevations to continue to decrease due to the insufficient inflows to the reservoir.

Temporary Variance (February through October 2022)

Beginning March 8, 2021, the Commission issued an Order Approving Request for Temporary Variance from License Requirements of Article 402 for the Project.

In 2021, the Dead River Basin received less precipitation (snow and rainfall) to date than in 2018, 2019, or 2020. As a result, dry year consultation occurred.

Although water quality improvement is only one benefit of the temporary variance, the data shows by using Hoist low-level outlet (LLO) water releases, water quality was improved downstream of the DRSB during July and August of 2020 and 2021. The logistics surrounding the triggers to initiate and change flow volumes being released from the LLO in 2021 improved from 2020. Therefore, UPPCO believes the iterative process implemented in 2019, 2020, and 2021 could benefit from an additional season of testing.

Unfortunately, since the SLSB was unable to fill to its target elevation in the spring of 2021, the SLSB was unable to sustain its target elevations. The reduced elevations at the SLSB inhibited the ability to provide additional downstream flows near the AAO bridge and provide supplemental water to assist with maintaining target elevations at the DRSB.

For the reasons stated above and analyzed in the following paragraphs, UPPCO proposes a temporary variance that follows the 2019, 2020, and 2021 requirements.

Review of 2019, 2020, and 2021 Weather

In 2019, 2020, and 2021, UPPCO implemented temporary variances that were approved by the Commission on January 29, 2019, March 11, 2020, and March 8, 2021. The 2019 spring season was categorized by the National Weather Service Office in Negaunee Township as a prolonged record wet period and the area was experiencing the wettest 12-month period on record (last record period was 1968/1969)[2]. The wet spring season of 2019 was contrasted by a drier than average July and August.[3]

The 2020 spring season (March through June) precipitation was above normal, but the precipitation in July and August was significantly above normal.[4] August 2020 exceeded the record for total monthly rainfall of 5.60 inches set in 1970 by 0.72 inches. The snowfall and

[2] Summarized in Commission letter to Virgil Schlorke dated August 27, 2019 (20190827-3008).
[3] USGS Gage 04057800, which is utilized to calculate the inflows for the Operations Model indicates the mean monthly discharge for the period 1959-2018 in July and August is 31 cfs and 23 cfs respectively. The unverified mean monthly readings from the gage for July and August 2019 are 20.5 cfs and 12 cfs respectively.
[4] Data obtained from National Weather Service monthly weather summaries at National Weather Service Climate.

rainfall for the period May through June 2020 was 2.4 inches or 5% less than normal and 3.45 inches or 28% more than normal respectively. The normal amount of snowfall for the period is 50.9 inches of snow and 11.93 inches of rainfall (see Table 1).

For the period July and August 2020, the precipitation (rainfall only) was 5.67 inches or 97% more than normal. The normal amount of rainfall for the period is 5.84 inches of rainfall.

The dry period for the 2021 season began in December of 2020. Precipitation continued to be below the historical monthly mean according to the records beginning in 1871 for most of the months (see Table 1). On an average monthly basis, the area was a total of 3.99 inches of precipitation below normal. As a result, the SLSB did not store water up to its full potential. It filled to a maximum elevation of 1481.51 feet NGVD on May 13, 2021, and was unable to store additional water to augment downstream flows.

Table 1: Variance Period Precipitation[5]

Month/Year	Average Monthly Precipitation for the Period of Record (inches)	Average Precipitation for the Stated Month (inches)	Net Inches of Precipitation
December 2020	2.36	1.40	(0.96)
January 2021	2.12	1.44	(0.68)
February 2021	1.81	1.67	(0.14)
March 2021	2.27	2.46	0.19
April 2021	2.65	3.47	0.82
May 2021	2.98	0.96	(2.02)
June 2021	3.35	3.36	0.01
July 2021	3.01	1.8	(1.21)
Net Total			**(3.99)**

2020 Variance Evaluation[6]

As part of their comments on a previous temporary variance, the Michigan Department of Natural Resources (MDNR) requested UPPCO provide a report including operations data during the 2019 summer season, information about channel forming flows, the metrics for predicting dry year consultations, the extent that predicted benefits are achieved, and erosion data or anecdotal comments received from recreation or other affected users.

In keeping with the requested evaluation methodology requested by the MDNR for 2019, UPPCO is providing the following evaluation summary. It again discusses the same information for 2021 that was originally requested in 2019 as follows:

Silver Lake stranding report

UPPCO did not withdraw more than minimum flows from the SLSB for the 2021 variance. Therefore, the drawdown rate at the SLSB did not exceed 0.3-0.5 feet/day for two or more days. The elevation also was not reduced by one foot or more within any three-day period. Therefore, no stranding survey was conducted or required as part of the 2021 temporary variance.

[5] Climate (weather.gov)
[6] For these evaluations using the Operations Model, UPPCO was required to update the model with unverified USGS gage data for the period November 2020 to August 2021.

Channel forming flows

Due to the SLSB being unable to fill to its target elevation during spring runoff, the channel forming flows of 150 cfs for 72 hours were not released from the SLSB in 2021.

UPPCO has fulfilled its requirements for releasing channel forming flows as required in the 2009 Consent Judgment with EGLE as referenced in previous temporary variance requests. Therefore, without a future temporary variance to allow for spillway activation, no channel forming flows will be released from the SLSB.[7] Channel-forming flows from the SLSB will not occur often enough to provide a positive benefit if SLSB is not allowed to fill to the spillway elevation in future years.

Increased chance of spillway flows at SLSB

In 2021, UPPCO was unable to implement its proposed start of month target elevation for SLSB during February 2021 because Commission approval on the variance was not received until early March 2021. Therefore, UPPCO reduced the reservoir elevation to approximately 1477.4 feet NGVD during February. Under the proposed variance a revised start of month target for February and March results in an estimated additional 1,800 acre-feet stored at SLSB until spring runoff. Therefore, when spring runoff arrives more water will be passed over the spillway during spring runoff to facilitate more frequent seasonal channel forming flows downstream.

Decreased probability of entering dry-year consultation

During 2021, due to the low inflow conditions and low summer precipitation, inflows and precipitation were not sufficient to maintain start of month target elevations. According to the Operations Model, both the variance operating mode and the licensed operating mode will enter dry-year consultation. If the variance operating mode and the licensed operating mode are compared in the Operations Model, both modes of operation reach a peak elevation on May 14, 2021. However, the variance mode reaches a SLSB peak elevation of 1481.2 feet NGVD and the licensed mode reaches a peak elevation of 1478.99 feet NGVD. The variance mode allows for 2.7 feet of storage for minimum flow releases until entering dry-year consultation at an elevation of 1478.5 feet NGVD in May while the licensed mode only provides 0.49 feet of storage. Therefore, there is a decreased probability of entering dry-year consultation at the SLSB when the variance mode was implemented in 2021.

From the perspective of the DRSB and the Operations Model, the temporary variance to change the start of month target elevation for May 2021 to 1341.0 feet NGVD delayed the need to enter dry year consultation at the DRSB from July 23, 2021, to July 27, 2021.

Therefore, the temporary variance decreased the probability of entering dry year consultation at the DRSB in 2021. However, the difference of four days could be considered negligible.

Decreased probability of spill occurring at the DRSB

The DRSB achieved a peak elevation of 1342.08 feet on May 4, 2021. The inflows did not cause the spillway to activate in 2021. According to the Operations Model, the 2021 inflows would have caused the DRSB to achieve a peak reservoir elevation of 1341.04 feet NGVD on April 17, 2021[8] with the temporary variance.

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[7] The Operations Model shows the channel forming flows would have only been released over the spillway one year out of the 43.75-year record if not for recent temporary variances being granted.

[8] Since the actual date of peak elevation under the licensed operating mode is not known, the comparison must use the two values derived from the operations model and not the actual date peak elevation was observed under the variance operating mode.

Without the temporary variance, the 2021 inflows would have caused the DRSB to achieve a peak elevation of 1341.31 feet NGVD on April 15, 2021. The only reason there is a difference is because the temporary variance is not requiring more water to be released from the DRSB to keep the May start of month target elevation 1340.0 feet NGVD. Since both operating modes attained peak elevations well below the spillway elevation at the peak of spring runoff, it cannot be determined if the variance was successful in decreasing the probability of spilling (exceeding elevation of 1344.6 feet) in 2021.

Increased probability of reaching an elevation of 1341.0 at the DRSB by June 1
According to the Operations Model, the 2021 inflows would have caused the DRSB to maintain 1340.92 feet NGVD by June 1 with the temporary variance and 1340.73 feet NGVD without the temporary variance. Therefore, for this metric the difference could be considered negligible.

Constant SLSB elevation from November 1 to spring runoff
In 2021, UPPCO was unable to implement its proposed start of month target elevation for SLSB during February 2021 because Commission approval on the variance was not received until early March 2021. Therefore, there is no actual field measurements to determine what the SLSB reservoir fluctuation would have been. However, according to the Operations Model, the variance shows a maximum SLSB elevation during the period November 1, 2020, and spring runoff of 1480.06 feet NGVD, with a minimum elevation of 1478.75 feet NGVD. This provides a maximum change of 1.30 feet. Without the variance, the Operations Model, shows a maximum SLSB elevation during the period November 1, 2020, and spring runoff of 1480.08 feet NGVD, with a minimum elevation of 1477.30 feet NGVD. This provides a maximum change of 2.77 feet. This demonstrates the variance operating mode is much more promising than the licensed operating mode to provide constant elevations at SLSB during the period November 1 to spring runoff.

Provide a steady SLSB elevation from the end of spring runoff to July 1
During the period following spring runoff from May 27 until July 1, reservoir elevations at the SLSB ranged from a maximum of 1481.51 feet on May 13 to a minimum of 1480.25 feet on June 25. This resulted in a maximum reservoir elevation reduction of 1.26 feet based on the temporary variance operating parameters. This change reduces the area of the reservoir from an estimated 1,266 acres to 1,217 acres or 3.8%.

According to the Operations Model updated with the 2021 spring inflow data, under the variance operating mode, the SLSB elevation would have been lowered from 1482.40 feet NGVD to a minimum of 1481.92 feet NGVD. The SLSB elevation would have fluctuated a maximum of 0.48 feet in 2021. This change reduces the area of the reservoir from an estimated 1,301 acres to 1,282 acres or 1.5%.

In the licensed operating mode, the SLSB elevation would have been lowered from 1478.89 feet NGVD to a minimum of 1478.37 feet NGVD. The SLSB elevation would have fluctuated a maximum of 0.52 feet in 2021. This change reduces the area of the reservoir from an estimated 1,165 acres to 1,145 acres or 1.8%.

Water quality improvement by releasing more water from SLSB during summer months
Water temperature is influenced by air temperature, sunlight, and the temperature of other water input sources, which are important factors to think about when assessing water quality. With the variability of natural conditions listed above, it is difficult to

determine if water quality improvements occurred in 2021 solely because of the temporary variance.

In 2021, monitoring data through August 26, 2021[9] at the AAO Bridge monitoring location, indicated 25 hours of DO deviations occurred in August[10] while experiencing air temperatures above normal for August 2021.[11] This is compared to no DO deviations occurring in August of 2020. Due to the SLSB not achieving its target elevations, coupled with the dry year conditions, no additional water was available to provided additional flows during the months of July and August.

Water quality improvement by releasing water through the LLO
During July and August of 2021, UPPCO used Hoist Low-level Outlet releases to improve the DO content downstream of the Hoist Powerhouse.

Although DO deviations downstream of the Hoist Powerhouse (DRSB) occurred, a monthly average temperature deviation did not occur in July of 2021.[12] The 2021 WQ data is not comparable to 2019 and 2020 data because the Hoist Powerhouse was taken out of service on August 19, 2021, and did not return to service by the end of August 2021. Therefore, any quantifiable comparisons that include August 2021 data are not representative. However, UPPCO believes the DO levels improved in 2021 downstream of the Hoist Powerhouse due to LLO releases and its improved response in adjustments for the LLO (see Table 2).

Table 2: July and August DO Reading Comparison

Year	Hourly DO Deviations	Minimum Daily Average (mg/l)	Average Reading during July and August (mg/l)
2019	293	7.34	7.48
2020	106[13]	7.46	7.53
2021	82 (through August 19)	6.93 (through August 19)	7.71 (through August 19)

The information included in Table 3 is impacted by several variables including the following main variables:

1) Quantity of flow released from the Hoist Powerhouse
2) Weather (air temperature and solar radiation)
3) Releases from the LLO

Quantity of flow released from the Hoist Powerhouse
The Hoist Powerhouse average hourly outflow in July 2021 was approximately 110 cfs and 110 cfs in August 2021. This is compared to 179 cfs and 159 cfs in August 2020 and 165 cfs and 125 cfs for July and August 2019 respectively.

[9] The rest of the August 2021 data will not be available until the monitor is again downloaded on September 9, 2021.
[10] In UPPCO's deviation report filed with the Commission for the deviations, it believes the lack of additional water above the minimum flow of 10 cfs being released from the SLSB is only one factor that may have caused the DO deviations. UPPCO is unable to report there were no DO deviations at the AAO Bridge location like it was able to report for 2020.
[11] According to the National Weather Service's Marquette monthly climate summaries, the monthly mean air temperature in July 2021 was 65.6° F or 0.1° F lower than normal and August 2021 was 67.6° F or 3.3° F higher than normal.
[12] The Hoist Powerhouse was taken out of service to repair generator leads on August 19, 2021. At that time, flow from the powerhouse ceased and 110 cfs was released from the LLO. As of end of August 2021, all flow was still being released from the LLO.
[13] Only 17 of the hourly DO deviations occurred while UPPCO was releasing 20 cfs or greater from the LLO.

Weather
UPPCO recognizes solar radiation has an impact on water quality. However, UPPCO does not have information to compare July and August solar radiation from 2021 to 2019. Therefore, UPPCO relies on air temperature for comparison purposes. The mean monthly air temperature in July 2021 was 69.0° F and 69.2° F in August 2021. The mean monthly air temperature in July 2020 was 68.3° F and 64.0° F in August 2020. This is compared to 67.3° F and 61.5° F for July and August 2019 respectively. The air temperatures in 2021 were higher than 2020 and 2019.

Releases from the LLO
In response to DO readings observed on its real-time monitoring device in the Hoist Powerhouse tailwater, UPPCO began releasing 5 cfs through the LLO on July 19, 2021. Table 3 depicts the LLO releases for July and August 2020 and 2021.

Table 3: LLO releases for July and August 2020 and 2021

Date of Increase	Increase in cfs	Total LLO Releases
7/22/20	5	5
7/23/20	5	10
7/31/20	5	15
8/6/20	5	20
8/10/20	5	25
8/25/20[14]	(10)	15
8/28/20	(10)	5
8/31/20	(5)	0
7/19/21	5	5
7/21/21	(5)	0
7/21/21	5	5
7/26/21	5	10
8/16/21	(5)	5
8/17/21	105	110

The effectiveness of the LLO releases is believed to be impacted by the amount of water being released from the LLO, the amount of water being released from the Hoist Powerhouse, the temperature of the water being released from the LLO, and the temperature of water being released from the Hoist Powerhouse.

Erosion information
UPPCO completed the license-required five-year shoreline erosion survey in 2020. The survey did not identify any significant erosion concerns resulting from the temporary variance. The final report was filed with the Commission on February 1, 2021.

Other Supporting Factors
Since the temporary variance is designed to provide the most benefit with average water years, 2021 did not show as great of an improvement as was experienced in 2019 and 2020. However, without the temporary variance in 2021, the Operations Model indicates approximately 85 acres less of aquatic habitat would have been provided at SLSB in 2021 during the peak elevation on May 14. The license operating mode requires this additional water

[14] The LLO releases were reduced on August 25, 28, and 31 when the real-time monitoring was indicating DO levels were greater than the 7.0 mg/l standard and UPPCO did not know the monitor used downstream for compliance purposes was reading less than the standard because the compliance monitor cannot produce real-time data to trigger LLO releases changes.

that composes the additional aquatic habitat (approximately 2,700 acre-feet) to be released in March and April and it is not held in SLSB until May.

With having to balance the minimum flow needs downstream (100 cfs) with the reservoir elevation needs, additional water to the DRSB is required to be released from the SLSB to test the efficacy of the LLO releases in improving water quality. Since a blend of releases is necessary to improve water quality, water will be required to be released from the DRSB through the Hoist Powerhouse during the entire July and August period. However, the lowest amount of water that can be released from the Hoist Powerhouse without either of the units cavitating and causing damage to them is approximately 80 cfs. Therefore, hypothetically if a 25% LLO, 75% Hoist Powerhouse blend were to be required to improve water quality, a continuous flow from the DRSB of 100 cfs would be required (80 cfs Hoist Powerhouse and 20 cfs LLO). When reviewing the results of the updated model for the last ten years of USGS data, there is significantly lower chance of maintaining 1341.0 feet NGVD during July and August and having enough water to maintain minimum flows of 100 cfs and implement the proposed blending without the 2022 temporary variance.

UPPCO's 2022 Proposal

Start of Month Target Elevations

The proposed start of month target elevations are displayed in the table below. The proposed changes from the current license are in red.

Silver Lake Storage Basin				
Month	Min. flow (cfs)	Min. Elev. (ft)	License Target Elev. (ft)	2022 Proposal Target Elev. (ft)
January	15	1477.5	1479.0	1479.0
February	15	1477.0	1477.5	1479.0
March	15	1477.0	1477.5	1479.0
April	25	1477.0	1477.5	1485.0
May	20	1478.5	1479.0	1485.0
June	15	1480.5	1481.0	1485.0
July	10	1480.0	1481.5	1485.0
August	10	1479.0	1480.0	1482.5
September	10	1479.0	1479.5	1480.0
October	15	1479.0	1479.5	1480.0
November	15	1478.5	1479.0	1479.0
December	15	1478.5	1479.0	1479.0

Dead River Storage Basin				
Month	Min. flow (cfs)	Min. Elev. (ft)	License Target Elev. (ft)	2022 Proposal Target Elev. (ft)
January	100	1337.5	1339.0	1339.0
February	100	1337.0	1337.5	1337.5
March	100	1337.0	1337.5	1337.5
April	100	1337.0	1337.5	1337.5
May	100	1339.0	1340.0	1341.0
June	100	1339.0	1341.0	1341.0
July	100	1339.5	1341.0	1341.0
August	100	1339.5	1341.0	1341.0
September	100	1339.5	1341.0	1341.0
October	100	1339.5	1341.0	1341.0
November	100	1339.5	1341.0	1341.0
December	100	1338.5	1339.0	1339.0

Planned Deviations

UPPCO proposes to continue to consult with the Agencies (Michigan Department of Environment, Great Lakes, and Energy (EGLE), MDNR, and U.S. Fish and Wildlife Service (FWS)) for concurrence prior to implementing any planned deviations.

In addition, snowpack measurements and weather forecasts may require a planned drawdown of the DRSB prior to spring runoff 2022. Such a planned deviation can reduce the amount and duration of spill over the DRSB spillway during spring runoff. UPPCO proposes to consult with the Agencies as soon as adequate snowpack and weather information is available for UPPCO to propose a planned deviation. The purpose of the consultation will be to agree on the specifics of any planned pre-spring runoff drawdown of the DRSB.

Dry-Year Consultation

UPPCO will continue to consult with the Agencies, KBIC and DRCI to determine appropriate temporary modifications if minimum reservoir elevations cannot be maintained while releasing the minimum flows. The dry-year consultation will begin no later than the first business day following the day when the reservoir decreases below the monthly minimum elevation at the time due to inflow conditions. In the event the dry-year consultation extends beyond three weeks, UPPCO is proposing to request a temporary variance from the Commission only if the Operations Model indicates there is a benefit, or the consultation period provides for agreement in modifying the requirements of Article 402.

LLO releases for water quality improvement downstream of the DRSB

Since the specific weather conditions for July and August 2022 are unknown, UPPCO proposes to use the following points as guides to test the effectiveness of the blended LLO releases in improving water quality downstream of the Hoist Powerhouse:

1) Continue measures implemented in 2021 to improve the accuracy of the real-time monitoring device[15].

[15] UPPCO will consider options to include, but not be limited to equipment change, redundant monitoring device, or a relocation of a monitoring device.

2) Beginning no later than July 1, 2022, and ending no earlier than August 30, 2022, monitor DO content downstream of the powerhouse releases on a continuous basis.
3) Manually operate the LLO to release water from the LLO to increase DO content to 7.0 mg/l or above at the current DRSB monitoring location downstream of the powerhouse.
4) As soon as operationally possible, manually open the LLO to initiate or increase flow from the LLO[16].
5) Suspend or reduce LLO flow releases as deemed necessary based upon current real-time readings.

Current water quality conditions, water availability, and weather will dictate UPPCO's final operational decisions.

Expected Benefits

UPPCO's 2022 proposal is expected to provide the following benefits:

1) Avoid dewatering of hibernating herptiles by attempting to keep the SLSB reservoir elevation constant until spring runoff after it is reduced to the January start of month target elevation of 1479 and providing more submerged habitat during that period. The current license requires a 1.5-foot reduction during the month of January.

2) Allow for a steady reservoir elevation at the SLSB following spring runoff until July 1. This will benefit the spawning period of all fish in the SLSB including the bluegill spawning in June.

3) Minimize the potential for dry-year consultations at the SLSB and the DRSB.

4) Increase the probability of spilling at the SLSB, which consequently supports spring channel forming flow releases downstream of the SLSB.

5) Significantly increase the probability that an elevation of approximately 1341.0 feet NGVD can be maintained during the summer recreation season.

6) Reduce the probability of spilling at the DRSB by approximately 20%[17]. The probability of not reaching 1341.0 feet NGVD by June 1 is expected to remain the same.

7) Require UPPCO to release more water into the Dead River downstream of SLSB during the summer months (July and August). This has been documented to have a positive impact on water quality at the AAO Bridge.

In addition to the benefits listed above, UPPCO's 2022 proposal is also necessary to continue to provide additional water for blending through the LLO during July and August to improve water quality downstream of the DRSB.

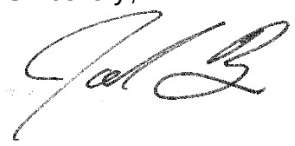
Please provide your comments on this temporary variance request as soon as possible, but no later than 30 days of receipt.

[16] The DO levels will be measured hourly near the Hoist Powerhouse by UPPCO, and operations changes made during normal business hours.
[17] If the last 10+ years of verified USGS data is analyzed.

If you have any questions about material presented in this letter, please do not hesitate to contact me at (906) 485-2419.

Thank you for your time and consideration.

Sincerely,



Josh Ball
Generation Supervisor

SCP

cc: Mr. Virgil Schlorke, UPPCO
Ms. Emily Rushford, UPPCO
Mr. Matt Annala, UPPCO
Mr. Shawn Puzen, Mead & Hunt