



The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner



December 11, 2023

Attn: Select Board
Town of Bristol
5 School Street
Bristol, NH 03222

Re: Notice of Decision on Determination of Lake Level – Newfound Lake

This letter serves as notice that the New Hampshire Department of Environmental Services (NHDES) has prepared a decision in accordance with RSA 482:79 and Chapter Env-Wr 700 of the New Hampshire Code of Administrative Rules on the NHDES investigation into the lake level of Newfound Lake. A copy of the text for the decision is included with this letter and the full decision, including all appendices, can be found at <https://www.des.nh.gov/news-and-media/blog/newfound-lake-level-investigation-decision>.

Sincerely,

Corey Clark
Chief Engineer
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NH Department of Environmental Services

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Notice of Decision on Determination of Lake Level

December 5, 2023



**RE: Newfound Lake (Newfound Lake Dam)
Alexandria, Bridgewater, Bristol, and Hebron, NH
NH Dam # D031001**

SUMMARY OF DECISION

On May 1, 2018, the New Hampshire Department of Environmental Services (NHDES) received a petition pursuant to NH RSA 482:79¹ from 20 owners of property on Newfound Lake, an inland public water located in the New Hampshire towns of Alexandria, Bridgewater, Bristol, and Hebron. The petition² requested that NHDES investigate the lake level management policy and its potential connection to shorefront erosion at Newfound Lake and related concerns. Levels on Newfound Lake under average inflow conditions are regulated in large part through operations at the Newfound Lake Dam located on the Newfound River just downstream of the outlet of the lake. However, the lake's watershed is large with significant portions of steep slopes, and, during significant rain events, inflows into the lake can exceed the non-flooding flow capacity of the Newfound River causing the lake level to rise quickly.

In response to this petition, on June 5, 2018, the Dam Bureau at NHDES opened a preliminary investigation of conditions affecting the use and enjoyment of Newfound Lake. As a result of this preliminary investigation, NHDES decided to make further investigation into the management of Newfound Lake. A public hearing on the matter was held at the Bridgewater Town Hall on August 28, 2018,³ in accordance with RSA 482:79 and the NH Code of Administrative Rules PART Env-C 205.⁴ In addition, public meetings related to the petition were held at the Minot-Sleeper Library in Bristol on February 26, 2019,⁵ and at the Bridgewater Town Hall on August 30, 2019.⁶

At the August 2018 public hearing, NHDES received considerable testimony in support of lowering

¹ See <http://www.gencourt.state.nh.us/rsa/html/L/482/482-79.htm>. NH RSA 482:79 is entitled "Investigation of Levels of Inland Public Waters." Investigations authorized under NH RSA 482:79 are more commonly referred to as Lake Level Investigations.

² See Appendix A – Petition To The State of New Hampshire Dam Bureau.

³ See Appendix B for the August 28, 2018, Notice of Public Hearing, Public Hearing Transcript, copies of slides from the NHDES Presentation, Written Testimony From Ecosystem Management Consultants, and copies of the slides from the Presentation given at the hearing by Ecosystem Management Consultants.

⁴ See http://www.gencourt.state.nh.us/rules/state_agencies/env-c.html.

⁵ See Appendix C for the February 26, 2019, Notice of Public Meeting, Public Meeting Transcript, copies of slides from the NHDES Presentation, and Newfound Lake Current and Proposed Interim Operating Curves 2019.

⁶ See Appendix D for the August 30, 2019, Notice of Public Meeting, Public Meeting Transcript, copies of slides from the NHDES Presentation, and September 6, 2019 Notice Of Decision – Modification of Interim Operating Curve.

levels in Newfound Lake throughout the year, including a presentation on erosion concerns around the lake. Additional written testimony proposed an alternative operating curve for Newfound Lake.⁷ Despite advertising the hearing in the local newspapers and the offices of the four towns in which Newfound Lake is located, notice of the hearing did not directly reach all of the more than 1,800 shoreline property owners on the lake.

At the February 2019 public meeting, NHDES informed the public of the intent to follow an Interim Operating Curve for levels in Newfound Lake for the 2019 summer season to determine if operating the lake at lower and more consistent elevations is feasible while still meeting the needs of the majority of stakeholders.

At the August 2019 public meeting, after a full season of operating under the adopted Interim Operating Curve, NHDES received additional testimony. Based on a preponderance of comments received during the public meetings and written comments received, NHDES determined that the earlier drawdown called for under the Interim Operating Curve had a negative impact on the use and enjoyment of Newfound Lake for a significant number of lake users. As a result, on September 6, 2019, NHDES issued a Notice of Decision Modification of Interim Operating Curve,⁸ whereby Newfound Lake would be no lower on Columbus Day than it would be in accordance with the 1982 Lake Level Investigation Decision and resulting Curve.⁹

NHDES received considerable testimony relative to this Lake Level Investigation (LLI) and studied several issues raised. While the petition focused on the reduction of Newfound Lake levels as a means to address shoreline erosion, environmental and other issues, several others submitting testimony highlighted the impacts of lowering lake levels to some existing dry hydrants, fish habitat and spawning,¹⁰ the volume of flow entering the Newfound River and the use and enjoyment of the resource.

Based on the results of this LLI, as documented in this Notice of Decision, NHDES has determined that it will continue to follow the 1982 Curve as the operating guide moving forward.

BACKGROUND

Newfound Lake is a natural lake that is raised by damming and is therefore a State-owned public water, held in trust by the State for public use under NH RSA 271:20.¹¹ Newfound Lake is approximately 4,410 acres in area and three miles long at elevation 587.88 NGVD29¹² (see Appendix

⁷ See Appendices B-4 and B-5 for written testimony and Public Hearing presentation slides from Ecosystem Management Consultants.

⁸ See Appendix D - Notice of Decision - Modification of Interim Operating Curve.

⁹ From 1982 to 2018, NHDES operated the Newfound Lake Dam under the "1982 Curve" (see Appendix I – 1982 Operating Curve). Appendix J contains two graphs that represent the most updated historic lake level and inflows/outflows, for a date close to the issuance of this Decision.

¹⁰ In addition to lake levels, the timing of drawdowns also has an impact on fish habitat and reproduction.

¹¹ See <http://www.gencourt.state.nh.us/rsa/html/XXII/271/271-20.htm>.

¹² NGVD 29 is the National Geodetic Vertical Datum of 1929. NGVD29 is a vertical control datum in the United States by the general adjustment of 1929. NGVD 29 was superseded by the North American Vertical Datum of 1988 (NAVD 88).

A-5, Newfound Lake Overview Images). The drainage area is roughly 95 square miles.¹³ The primary tributaries to the lake are the Cockermouth River, the Fowler River, Wise Brook, Georges Brook, Black Brook, Dick Brown Brook, Hemlock Brook, and Whittemore Brook. The majority of the surficial soils around Newfound Lake consist of glacial till, which is a non-sorted to poorly sorted mixture of silt, sand, pebble and boulders, and can be found to be very compact.¹⁴ However, in the vicinity of the Cockermouth and Fowler Rivers, stratified sand and silt consisting of glacial outwash and stream deposits can be found.¹⁵

Newfound Lake Dam, as it exists today, is approximately 12 feet high and 117 feet long, and has operational capacity from three 6-foot wide by 6-foot-tall sluice gates and 11 stoplog bays. The lake level is measured on a staff gage located on the upstream side of West Shore Road Bridge, which crosses the outlet channel of Newfound Lake approximately 540 feet upstream of the dam. On that gage, a lake level of 0.0 equals an elevation of 581.88 NGVD 29, or 6 feet below the full lake elevation established in the 1982 Curve.

According to NHDES records, the original dam on Newfound Lake was constructed in 1848 by the Bristol Water Company for downstream power generation. In 1938, Public Service Company of New Hampshire (PSNH) purchased the dam. In 1973, PSNH sold the dam to the State of New Hampshire for \$1 and provided \$50,000 for needed repairs. The State acquired all land and water rights from previous owners. The State's ownership now includes the lakebed held in trust by the State for public use below the Natural Mean High Water Mark elevation of 2.24 feet on the gage, flowage rights to elevation 7.24 feet on the gage, as well as the dam and land upstream and downstream of the dam along the Newfound River and in the lake near its outlet. In June 1976, the State completed reconstruction on the dam, which included repairs to the left abutment, and construction of new gates and spillway. The last significant reconstruction of the dam was completed in 1987 with repairs to the deteriorated timber section of the dam and the right concrete abutment. In 2008 the three gates in the gate house were equipped with automated operators, which allow for the gates to be operated remotely. A more complete chronology of correspondence in NHDES files related to the Newfound Lake Dam is provided in Appendix G.

Newfound Lake has both public and private shoreline development. As a significant recreational resource in New Hampshire, much of the lake's shoreline is developed. According to the petitioners, there are over 1,820 shorefront lots. Due to the lake's scenic beauty and easy access by State Route 3A, Newfound Lake attracts thousands of visitors yearly. There are five public access areas on the lake affording the general public the opportunity to utilize the waterbody. Also, Wellington State Park is located on the westerly shore of Newfound Lake, a popular destination for visitors to the area.

Newfound Lake also serves as a storage reservoir to provide water to meet the flow needs of downstream stakeholders including hydropower entities. Presently, there are four active

¹³ See https://www.wildlife.state.nh.us/maps/bathymetry/newfound_bristol.pdf for additional information on Newfound Lake.

¹⁴ Tinkham, D.J., and Brooks, J.A., New Hampshire Geological Survey, Surficial Geologic Map of the Ashland Quadrangle, Belknap and Grafton Counties, New Hampshire, 2012

¹⁵ Goldthwait, J.W., Goldthwait, Lawrence, and Goldthwait, R.P., New Hampshire State Planning and Development Commission, The geology of New Hampshire: part I - surficial geology, 1951

hydroelectric sites in New Hampshire downstream of this dam whose owners pay the State water user fees for the storage and delivery of water from the dam that help fund the costs of operating and maintaining the dam. One such hydroelectric site, the Newfound River Hydro Dam on the Newfound River is owned by KTZ Hydro LLC and is operated by Eagle Creek Renewables. The other three dams are located on the Merrimack River and are owned and operated by Patriot Hydro LLC. These are Garvin Falls Dam in Bow, Hooksett Dam in Hooksett and Amoskeag Dam in Manchester. As of the issuance of this Decision, existing contracts or Water User Agreements (WUAs)¹⁶ between NHDES and these water users specify that, "during the period from March 15th to June 1st each year, the Project (Newfound Lake and dam) shall be filled to elevation 588.4 feet NGVD (6.5 feet on the local gauge) plus or minus 0.3 of a foot, as far as the runoff will allow. Thereafter, the stored water shall be released from the Project at such times and in such quantities as may yield the most overall beneficial use of stored water to the end that on or about March 15th of the following year, the Project shall be drawn down 3.5 feet to elevation 584.9 feet NGVD (3.0 feet on the local gauge) plus or minus 0.3 of a foot, if necessary, for the abatement of spring flood waters and impounding of the spring run-off then anticipated." The WUA between NHDES and KTZ Hydro LLC, additionally requires that "during the three months of June, July and August, the minimum release from Newfound Lake shall be 80 cubic feet per second (cfs), 60 cfs and 40 cfs, respectively, for the purposes of maintaining and enhancing the fish and wildlife habitat populations which exist in the Newfound River below Newfound Dam." The contract also requires that a minimum of 125 cfs be released from the dam during the month of January. These minimum flows may be amended on an as-needed basis in case of emergencies, prevailing meteorological conditions, or by negotiation. When strict compliance with the WUAs cannot be achieved, NHDES negotiates and discusses operations at Newfound Lake dam with downstream hydropower entities to make sure operations comply with the spirit and intent of the WUAs.

The revenue generated from these four WUAs are for the sole purpose of funding the operation, maintenance and repair of Newfound Lake Dam. This revenue partially funds the salary of Dam Bureau employees who operate the dam along with equipment and items necessary for operation and maintenance of the dam. Any additional funding necessary for the operation and maintenance of the dam comes from the State's General Fund.

HISTORIC OPERATION OF THE NEWFOUND LAKE DAM

The Newfound Lake Dam was originally constructed for the purpose of serving as a storage reservoir for power generation at downstream locations along the Newfound River through Bristol and along the Merrimack River in New Hampshire and Massachusetts. Legal rights to operate the dam to manage lake levels were held by the power companies that owned the dam until it was sold to the State in 1973. Operations prior to State ownership were conducted in the interests of downstream power production and not necessarily according to recreational or local economic interests.

In 1971, the State received a petition requesting a review of PSNH's water management practices. The petition indicated that water withdrawals from April through August caused the lake to drop up to 6 feet in some years. The petition sought to change management to conserve spring flows to allow

¹⁶ See Appendix L for copies of Newfound Project contracts between Water Users and the State of New Hampshire

for higher levels from April through September. The State conducted a public hearing in 1974. Following an investigation, a new operating curve for the Newfound Lake Dam was ordered by the Water Resources Board (WRB) for PSNH to follow (see Appendix I – 1974 Operating Curve) which required the lake level to be at 7.1 feet on the gage on June 1st and at 2.5 feet on the gage on Columbus Day of each year.

In 1977, in response to a request of the Newfound Lake Region Association and the Newfound Region Chamber of Commerce, an alternative operating curve was implemented which sought to lower peak lake levels during the recreation season in response to high water complaints and to reduce wintertime drawdown levels to protect fish populations (see Appendix I – 1977 Operating Curve). This curve required the lake level to be at 6.0 feet on the gage on July 1st and 3.5 feet on the gage on Columbus Day of each year.

In 1982, another petition to conduct a LLI was submitted by lakefront property owners, and a public hearing was held by the Water Resources Board. In September 1982, a revised operating curve was implemented for Newfound Lake (see Appendix I – 1982 Operating Curve). This curve required the lake level to be at 6.0 feet on the gage on June 1st, 4.5 feet on the gage on Columbus Day and at 3.5 feet on the gage on March 1st of each year. From 1982 to 2018, NHDES attempted to operate the Newfound Lake Dam following the 1982 Curve.

Operating a dam to meet prescribed target lake levels by time of year is not an exact science. Lake levels are influenced by precipitation events, runoff conditions throughout the watershed, inflows from tributaries and overland, extended periods of low inflows, evaporation, and operation of the dam to regulate outflows. The repair projects to the dam completed in 1976 and 1987 enhanced overall control of operations and the ability to manage discharge capacity of the dam.

To aid in the prevention of downstream flooding during the springtime snow melts, Newfound Lake has traditionally been drawn down in the fall to provide storage to retard excessive outflows from the lake during times when runoff volumes are expected to be highest. Downstream flooding between the dam and the confluence of the Newfound and Pemigewasset Rivers occurs at a flow of roughly 1,500 cubic feet per second (cfs). As a result, NHDES seeks to limit discharges from the dam to 850 cfs to the extent possible while providing varying minimum flows based on the WUAs and attempting to meet NHF&G's goals of supporting fish habitat and other ecological concerns in the Newfound River.

To meet the goals of providing adequate downstream flows while maintaining an acceptable lake level, NHDES has at times maintained Newfound Lake slightly above the 1982 Curve. This is evident by the average level of Newfound Lake being slightly above the 1982 Curve. This average is also impacted when significant rainfall events increase the lake level for extended periods of time and by droughts and summer temperatures when evaporation reduces the level of Newfound Lake. Appendix H contains presentation slides compiled by NHDES sometime around 2006 that discusses the history of lake level management at Newfound Lake. Appendix J contains two graphs that represent the most updated historic Newfound Lake levels and inflows/outflows.

OPERATION OF THE NEWFOUND LAKE DAM IN RESPONSE TO THIS LAKE LEVEL INVESTIGATION

At the February 2019 public meeting, NHDES informed the public of the intent to follow an Interim

Operating Curve for levels in Newfound Lake for the 2019 summer season to determine if operating the lake at lower and more consistent elevations is feasible while still meeting the needs of the majority of stakeholders. At the February 2019 meeting and thereafter, NHDES received additional testimony that included some in opposition to changing operations at the Newfound Lake Dam to lower lake levels throughout the year. At the August 2019 public meeting, NHDES received additional testimony on the Interim Operating Curve. Based on a preponderance of comments made during the public meetings and written comments received, NHDES determined that the earlier drawdown called for under the Interim Operating Curve had a negative impact on the use and enjoyment of Newfound Lake for a significant number of lake users. As a result, on September 6, 2019, NHDES issued a Notice of Decision - Modification of Interim Operating Curve,¹⁷ whereby the lake would be no lower on Columbus Day than it would be in accordance with the 1982 Curve.¹⁸ NHDES operated the Newfound Lake Dam according to the Modified Interim Operating Curve for the remainder of 2019 and continued to receive testimony during that time.

In an effort to collect more data and continue to encourage interested parties to submit testimony on the LLI, NHDES decided in January 2020 to continue following the Modified Interim Operating Curve for another year.

During the monthly period between June 1st and September 1st of 2020, the Newfound Lake region of New Hampshire received much below average precipitation.¹⁹ Operations at the Newfound Lake Dam by NHDES during that time reflected best efforts to maintain target lake levels according to the Modified Interim Operating Curve, including limiting outflows from the dam to the extent possible throughout the summer. As a result, flows in the Newfound River were well below ecological and WUA target levels.²⁰ Due to the drier than normal conditions, it was also not possible to maintain the lake level as intended and in early September the level of Newfound Lake was about 9 inches below the target on the Modified Interim Operating Curve.

Because 2020 represented an incomplete indicator of the impact of operating according to the Modified Interim Operating Curve, NHDES continued operating following that curve through 2021 to collect more data and receive additional testimony. However, even with much above average rainfall during the same 3-month period of 2021, NHDES found it difficult to meet the targeted lake levels of the Modified Interim Operating Curve while providing adequate discharge flows into the Newfound River.

Due to the inability to achieve the goals of the Modified Interim Operating Curve while meeting downstream flow commitments both during dry and wet summer seasons, NHDES elected to operate Newfound Lake in accordance with the 1982 Curve in 2022.

¹⁷ See Appendix D - Notice of Decision - Modification of Interim Operating Curve.

¹⁸ Lake levels were managed from 1982 through 2018 under the 1982 Operating Curve. See Appendix I.

¹⁹ See [Climate Monitoring | National Centers for Environmental Information \(NCEI\) at https://www.ncei.noaa.gov/access/monitoring/products/](https://www.ncei.noaa.gov/access/monitoring/products/).

²⁰ NHDES received multiple testimony submittals highlighting concerns about low flows in the river and the negative impact on the fishery.

SUMMARY OF PUBLIC TESTIMONY²¹

NHDES received considerable testimony relative to this LLI and studied several issues raised. While the petition focused on the reduction of lake levels as a way to address shoreline erosion, environmental and other issues, several others submitting testimony highlighted the impacts of lowering lake levels to some existing dry hydrants that use the lake as a water source, fish habitat and spawning,²² the volume of flow entering the Newfound River and the use and enjoyment of the resource.

At the August 2018 public hearing, NHDES received considerable testimony in support of lowering levels in Newfound Lake throughout the year, including a presentation on erosion concerns around the lake. Additional written testimony proposed an alternative operating curve for Newfound Lake.²³ At the February 2019 public meeting, NHDES informed the public of the intent to follow an Interim Operating Curve for levels in Newfound Lake for the 2019 summer season to determine if operating the lake at lower and more consistent elevations is feasible while still meeting the needs of the majority of stakeholders. At that time, NHDES received additional testimony and announced that the comment period would remain open. Testimony received included some in opposition to changing operations at the Newfound Lake Dam to lower lake levels throughout the year. At the August 2019 public meeting, NHDES received additional testimony, with more testimony focused on the negative impacts of lowering lake levels on the use and enjoyment of the lake throughout the year. Following the 2020 recreation season, NHDES received considerable testimony in opposition to lowering lake levels throughout the year, with many preferring to maintain the curve that has been followed since 1982.

INVESTIGATION

As part of this LLI NHDES performed the following:

- reviewed the history of the Newfound Lake Dam including ownership and construction and rehabilitation projects;
- reviewed historic and contemporary operation of the Newfound Lake Dam;
- reviewed the current dam files including dam inspection reports and other NHDES program files;
- reviewed the makeup of the soils along the shoreline of Newfound Lake;
- reviewed historical aerial imagery and mapping of Newfound Lake²⁴;
- scheduled and presided over a public hearing and two public meetings;
- received oral and written testimony in accordance with RSA 482:79 and the NH Code of Administrative Rules PART Env-C 205²⁵;
- reviewed the history of LLIs for Newfound Lake and their resultant operating practices;

²¹ Copies of testimony received related to this LLI are included in Appendices B, C, D, E, and F.

²² In addition to lake levels, the timing of drawdowns also has an impact on fish habitat and reproduction.

²³ See Appendices B-4 and B-5 for written testimony and Public Hearing presentation slides from Ecosystem Management Consultants.

²⁴ See <https://www.historicaerials.com/viewer>.

²⁵ See http://www.gencourt.state.nh.us/rules/state_agencies/env-c.html.

- reviewed historic lake level data including maximum-average-minimum lake levels by time of year and statistical data related to historic water levels²⁶;
- reviewed historic estimated inflows into the lake and discharges from the Newfound Lake Dam;
- implemented Interim and Modified Interim Operating Curves for Newfound Lake based on testimony received at the outset and during the LLI;
- reviewed data and testimony provided by lakefront property owners and other interested parties throughout the LLI period;
- reviewed WUAs held by hydropower interests downstream of the Newfound Lake Dam;
- reviewed the Shoreland Water Quality Protection Act (RSA 483-B) and documentation pertaining to protected shoreland;
- solicited input from the NHDES Instream Flow Program (RSA 483:9-c) on adequate discharges into the Newfound River to support aquatic habitats;
- solicited input of the Newfound Lake and Newfound River fisheries with the NH Fish & Game Department; and
- reviewed all known interests in the use and enjoyment of the lake.

FINDINGS

NHDES findings regarding the major issues raised in the Petition and during the public comment period are summarized as follows:

- NHDES finds that operations at the outlet of Newfound Lake were originally focused almost entirely on the use of the stored water for downstream power generation. Whatever rights that were necessary to operate the dam for the sole purpose providing on-demand downstream flows were held by the power company(s). There were no laws or rules requiring investigations of the impact of dramatic changes in water levels at Newfound Lake on the ecology of the watershed, water quality, fisheries, wildlife habitat, shoreline property values, local economies, and the use and enjoyment of the resource. Shoreline property owners and other citizens had little say in how and when operations at the dam would impact the use and enjoyment of the resource. Under NH RSA 482:79, owners of property on a public water have the right to request an investigation of the lake level management policy. The evolution of the rehabilitation and operations at the Newfound Lake Dam, and the target operating curves for lake levels throughout the year, were a result of past investigations that included testimony and collaboration with shoreline property owners, local businesses and citizens, and other interested parties. The 1982 Curve that was used by NHDES to guide its operations at Newfound Lake Dam from 1982-2018 was developed in consideration of all interests in the important State resource that is Newfound Lake.
- NHDES finds that the shorelines on Newfound Lake in the vicinity of the Cockermouth and Fowler Rivers are highly susceptible to erosion due to the presence of unconsolidated soils primarily consisting of sand.

²⁶ Statistical data include the standard deviations for historic water levels and estimated inflows from 1982-2019, and average rainfalls from 1982-2020 (as measured at the Lakeport Dam).

- NHDES finds that aerial imagery between 1956 and 2018 indicates that both the Cockermouth and Fowler Rivers meander as they flow into Newfound Lake. This meandering characteristic is likely caused by flowing river water eroding the unconsolidated sandy soil in these river valleys, resulting in changes in the location of the river channel and numerous oxbows along both rivers. Due to the nature of the soils in the vicinity of the rivers, this process of erosion along the rivers and at the mouth of the rivers has resulted in the formation of deltas within Newfound Lake. The extent of these deltas in the 1956 imagery is similar to the extent in the 2018 imagery. However, the patterns in the deltas do appear to change over time, as do the locations of the flow channels within these deltas. This is particularly evident in the Fowler River delta, in which the mouth of the river relocated approximately 600 feet to the southeast along the shoreline of Newfound Lake between 1956 and 2018, resulting in new flow characteristics and deposits within the delta in Newfound Lake. NHDES does not find that the changes to the flow channels of major tributaries and their inflow locations at Newfound Lake are a result of operations at the dam.
- NHDES finds that areas of shoreline that do not have natural shoreline vegetation are more susceptible to erosion.
- NHDES finds that increased development can lead to an increase in the quantity of suspended sediments within stormwater runoff. Suspended sediments in stormwater may then find their way directly into Newfound Lake or into tributaries flowing into Newfound Lake which leads to sediment deposition in Newfound Lake.
- NHDES finds that shoreland development and maintenance consistent with existing Shoreland Protection Act and Wetlands permitting, as discussed in documents included in Appendix M, offer the best protection of shoreline properties against erosion.
- NHDES finds that prior to 1972, no state agency was responsible for operations at the Newfound Lake Dam. Ownership of the dam was transferred to the State in 1973. NHDES has operated the dam in accordance with Decisions issued following Lake Level Investigations in 1974, 1977, and 1982. Following the Decision in 1982, other than during the course of this investigation, NHDES has attempted to operate the dam according to the 1982 operating curve.
- NHDES finds that development of shorefront property around the lake and the volume of boat traffic has increased significantly between 1982 and time of the issuance of this Decision.
- NHDES finds in accordance with four WUAs, during the period from March 15th to June 1st each year, the lake shall be filled to elevation 588.4 feet NGVD29 (6.5 feet on the gauge) plus or minus 0.3 feet, to the extent that inflow and dam operation will allow. Thereafter, the stored water shall be released from the lake at such times and in such quantities as may yield the most overall beneficial use of stored water until on or about March 15th of the following year, when the lake shall be drawn down 3.5 feet to elevation 584.9 feet NGVD (3.0 feet on the gauge) plus or minus 0.3 feet. This shall be in accordance with established operating principles in view of the prevailing and/or anticipated meteorological conditions.
- NHDES finds that the WUA between NHDES and KTZ Hydro LLC, additionally requires that during the three months of June, July and August, the minimum release from Newfound Lake shall be 80 cubic feet per second (cfs), 60 cfs and 40 cfs, respectively, for the purposes of maintaining and enhancing the fish and wildlife habitat populations which exist in the Newfound River below Newfound Dam. The WUA also requires that a minimum of 125 cfs be

released from the dam during the month of January. These minimum flows may be amended on an as-needed basis in case of emergencies, prevailing meteorological conditions or by negotiation.

- NHDES finds that, as the owner of the dam, it has fiduciary responsibility to maintain the structure. Without the WUAs, funding to support the ongoing operation and maintenance would be severely diminished.
- NHDES finds that downstream ecological resources and fisheries are impacted by low flow discharges from Newfound Lake Dam into the Newfound River.
- NHDES finds that the NHDES Instream Flow Program, which operates under RSA 483:9-c, is now conducting a protected instream flow study of the Pemigewasset River which may result in future Newfound Lake Dam discharge requirements that meet or exceed what is required in the WUAs. The required discharges would likely take place during periods of low precipitation or drought conditions which would result in the lowering of Newfound Lake by a few inches when discharges occur.
- NHDES finds that water levels on Newfound Lake should not go below 3.0 feet on the gage at any point in the year if possible to protect the lake trout and round whitefish spawning activities.
- NHDES finds that the timing of drawdowns has an impact on fish habitat and reproduction, and that final winter levels should be reached by Columbus Day.
- NHDES finds that several lakefront properties and marina locations are severely impacted when lake levels reach 6.0 feet on the gauge at any point in the year or drop below the 1982 Curve during the latter half of the recreational season.
- NHDES finds that the winter drawdown of Newfound Lake is essential to the provision of flood control.
- NHDES finds that the relatively steeply sloped Newfound Lake watershed is large in comparison to the storage volume of the lake, and that significant precipitation events can cause in-lake and downstream flooding. This is particularly the case under conditions where there is little absorption of runoff within the watershed, i.e., when the ground is predominantly frozen, saturated and/or the forest has been clear cut. NHDES modeling estimates that runoff from 1" of rain across entire watershed would raise the level in the lake approximately 14" when the vegetation in the watershed is largely dormant during the non-growing seasons and there is very little absorption.
- NHDES finds that a more accurate hydrologic model of the Newfound Lake watershed and hydraulic model of Newfound Lake Dam are warranted to understand how Newfound Lake and Newfound Lake Dam respond to current rainfall data. NHDES will be working with outside consultants to prepare this analysis and model in 2024. This model will not only be used to determine flow through the dam and adjacent river channel, but also to assist with future efforts to identify and remedy any discharge deficiencies at the dam.
- NHDES finds that flooding of downstream buildings along the Newfound River occurs when releases flows from the Newfound Lake Dam exceed approximately 1,500 cfs.
- NHDES finds that local emergency response agencies have installed dry hydrants with inlet elevations based on the operating curve used between 1982 and 2018.
- NHDES finds that continuing to pursue ways of refining operations at the dam, such as gate and/or other outlet modifications, could allow for a more natural release of water from the

lake into the Newfound River.

- NHDES finds that between 1982 and 2022, the average level of Newfound Lake was slightly above the 1982 Curve during the majority of the time.
- NHDES finds that during the monthly period between June 1st and September 1st of 2020, the Newfound Lake region of New Hampshire received much below average precipitation and that during the same 3-month period of 2021 the Newfound Lake region received much above average precipitation. During both 2020 and 2021, NHDES was attempting to operate Newfound Lake Dam to achieve the goals of the Modified Interim Operating Curve and during both years NHDES found that in order to meet the targeted lake levels of the Modified Interim Operating Curve the discharge flows into the Newfound River had to be reduced to a level that did not meet either ecological or WUA target levels.
- NHDES finds that between 1965 and 2015, the state experienced very few severe droughts. Between 2016 and 2022, the state experienced drought in 5 out of 7 years.
- NHDES finds that attempting to maintain a constant level for Newfound Lake during multiple months of the year, such as what was attempted to meet the Interim Operating and Modified Interim Operating curves, is very difficult to achieve and requires a significant amount of resources to make frequent operations at Newfound Lake Dam due to constantly changing inflow into Newfound Lake that is influenced by precipitation events, runoff conditions throughout the watershed, changing inflows from tributaries, evaporation, and other processes that affect how much water is entering or leaving Newfound Lake.
- NHDES finds that operation of Newfound Lake dam to maintain lower water levels in the lake year-round for two years did not result in the generation of compelling data related to shoreland erosion, sedimentation at tributary inlet locations, and undesirable aquatic vegetation in comparison to levels consistent with the 1982 Curve.

As a result of this investigation and the testimony received throughout, NHDES finds that lowering target lake levels throughout the year as compared to the 1982 Curve is not in the best interests of the citizens of New Hampshire. By virtue of this Decision, NHDES will operate the Newfound Lake Dam in an effort to maintain Newfound Lake in a range as closely to as reasonably possible, and not on average higher than, the 1982 Curve. Adhering to the 1982 Curve is in the state's best interest to preserve public enjoyment of all resources on Newfound Lake and in the Newfound River.

DECISION

NHDES finds that, on balance, operation of the Newfound Lake Dam according to the 1982 Decision and resulting operating curve (see Appendix I), is in the best interest to preserve public enjoyment of all resources on Newfound Lake, and meets, to the extent possible, existing obligations to hydropower operators and to the fishery and aquatic resources in the Newfound River. Therefore, in accordance with Chapter Env-Wr 704.02(a) of the New Hampshire Code of Administrative Rules, NHDES is ordering no change in the management and control of the outlet of Newfound Lake from the 1982 Decision and resulting operating curve.

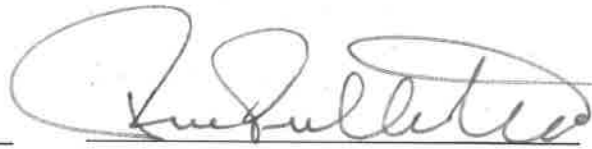
APPEALS

With the issuance of this Decision the public comment period for the investigation of levels of inland

waters at Newfound Lake is closed. This Decision may be appealed to the New Hampshire Water Council (Water Council) by filing an appeal to the Water Council that meets the requirements specified in the Procedural Rules of the Water Council, Env-WC 200, within 30 days of the date of this Decision. Copies of the rules are available from the NHDES Public Information Center at (603) 271-2975 or online at https://www.gencourt.state.nh.us/rules/about_rules/listagencies.aspx.

Date: _____

12/5/23



Rene Pelletier, P.G.
Director, Water Division
Department of Environmental Services