

Lake Hopatcong Water Level Management Plan
Comment – Response Document

While we recognize that there may be emergency occasions when deviations from the passing flow are necessary, the proposal contains far too many opportunities to deviate from the passing flow and far too few protections for downstream users. The plan lacks any specific guidance or criteria to guide the NJDEP officials in making the necessary determinations. Any such important decision requires scientifically-based criteria, based upon in-stream conditions and containing specified thresholds and decision points.

The goal of the Lake Hopatcong Water Level Management Plan, (WLMP) as agreed to by the Citizens Advisory Committee is “to protect the environmental health and the natural, and scenic resources of Lake Hopatcong / Musconetcong River System, maximize recreational opportunities, minimize the potential for damage to property and waterfront structures, while maintaining the minimum flow requirements necessary to protect downstream uses, including but not necessarily limited to: aquatic biota, historic resources and water quality.” Therefore, the WLMP must balance the needs of the Lake community with those of the downstream community. Weather exerts the primary influence over water level in the Lake. It is not difficult to write a plan that would work under “normal” conditions. However, weather and precipitation in particular is not distributed equally over time. In order to accomplish the stated goal of the plan there will be times when the lack of precipitation causes lake levels to fall to elevations that could compromise its use as recreational resource. During these times the Department must at a minimum assess downstream conditions to determine if a deviation from the WLMP can be implemented that will better accomplish our stated goal. It must be noted, that a reduction in outflow under these conditions is not automatic. An assessment of downstream conditions will be conducted, and if a reduction can be accommodated without serious risk to downstream resources, those conditions will continue to be closely monitored to ensure that resources are protected. The Department amended the draft WLMP to include additional information in Appendix E of the WLMP concerning the downstream monitoring locations and parameters.

The draft plan would allow a deviation from the minimum required passing flow in the event that the spring lake water level recovery is “delayed.” What is the basis for the choice of the proposed “significantly more than 20% below average” criteria?

The phrase significantly more than 20% below average criteria cited in the draft plan was carried over from the prior plan (see page 11) The Department agrees with the commenter that this standard lacks the clarity necessary to achieve the objective of the plan “to establish a set of easily understood management and operational guidelines. The Department has altered the final plan to eliminate this reference and replaced it with a standard that if precipitation for any three month period prior to or during refilling drops below 7 inches, (8 inches for a five-foot drawdown), the Department will assess downstream conditions to determine whether a reduction in out flow can be sustained to

assist in spring water level recovery. The Department has added charts that show the historic frequency of these occurrences.

The draft plan would also allow deviations from the passing flow whenever water level in Lake Hopatcong during the boating season falls to more than 1 foot below the top of the Lake Hopatcong dam. Has the Department analyzed the frequency or recurrence interval when that condition occurs? That data is readily available! How was the one-foot figure chosen? What scientific data supports the 1-foot threshold?

The one-foot below normal pool elevation was not derived scientifically. The goal of the WLMP is, among other things, to maximize recreational opportunities and use of Lake Hopatcong while protecting downstream uses and resources. Several members of the CAC noted that when the water level in Lake Hopatcong drops below 8 or 7.5 feet more than a significant percentage, 10 percent or more at marinas, for recreational boats becomes unusable. At least one member noted that at the 8 foot level her boat would have to be removed from the lake. Many members of the CAC also noted that other navigational hazards such as submerged rocks become problematic under these low water conditions. Again the Department stresses that under these low water conditions a decrease in outflow is not automatic. The Department will assess downstream conditions to determine whether a reduction of out flow can be accommodated while still protecting downstream resources, and only upon an affirmative conclusion will a reduction occur.

A crude analysis of the data available from the USGS web site (1982-2010) indicates that over 25 percent of the time the lake elevation of 8 feet is not achieved in late September and about 10 percent of the time 8 feet is not met in early June. However, it is important to note that these statistics include years during which a five-foot drawdown occurred. As the five-foot drawdown historically began on the day after Labor Day and occurred every 5 years this greatly skews the statistics. Similarly, lake level recovery in the spring following the five foot drawdown may influence those statistics. During the months of July and August the lake level is at or above 8 feet more than 90 percent of the time.

During the 2010 season, when the passing flow was reduced, the normal flow was not restored for several days after the water level in Lake Hopatcong was higher than the 1 foot level. What was the justification for the continuation of the reduced flow? If implemented, at what point is the normal passing flow to be restored?

The Department does not believe it reasonable to simply get to 8-foot and then restore the 12 CFS passing flow only to have the lake elevation drop below 8 feet again repeating the cycle. As noted in the WLMP, once out flow has been reduced below 12 CFS, the Division of Fish and Wildlife will be monitoring downstream conditions on a routine basis to ensure that the conditions downstream do not deteriorate to the point where aquatic life will be put at risk. The stated objective of the WLMP is: "To establish a set of easily understood management and operational guidelines for the manipulation of the Lake Hopatcong water control structure to maintain a lake elevation as near as possible to 9 feet in Lake Hopatcong between May 1st and November 19th conditions permitting,

except during the five-foot drawdown years when the drawdown shall start on or about September 22, while meeting the requirements of downstream uses.” The objective of the plan would be met by leaving the outflow reduced until the water elevation in the Lake is restored to 9-feet, unless conditions downstream deteriorate to the point where downstream uses are in danger of not being met. If monitoring indicates that downstream uses may not be met then the 12 CFS passing flow will be restored immediately.

We are concerned with the impact of the deviations of the passing flows on the calculation of the assimilative capacity of the Musconetcong River at the point of the discharge of the Musconetcong Sewerage Authority (MSA). At that point, the bulk of the flow in the River is from Lake Hopatcong. (Exact information is not available since there is apparently no flow gauging station at the site.) The proposed allowable deviations from the passing flow, as allowed in the draft plan, could ultimately result in a new “mean average 7 day low flow.”

Effluent limits for the MSA plant (NJPDES Permit # NJ0027821) are based on MA1CD10 flow (the one day minimum flow with a return interval of 10 years) for acute criteria; and the MA7CD10 (the seven day minimum flow with a return interval of 10 years) for chronic and human health non-carcinogenic criteria; and the MA30CD10 (the 30 day low flow with a return interval of ten years) for ammonia nitrogen. These flows at the MSA plant are currently calculated as 3.6 CFS, 4.4 CFS and 5.4 CFS respectively at the discharge point. During the 2002 drought the 5.4 CFS flow level was evaluated and found to provide inadequate dilution to protect aquatic life from toxic concentrations of ammonia due to the loading from a downstream publicly owned wastewater treatment plant and a new low flow criterion of 6.8 CFS was recommended. Reductions in outflow from Lake Hopatcong will not likely be reduced below 6.8 CFS as any reduction below 6.8 CFS would not be protective of aquatic life. Given that 6.8 CFS is higher than any of the low flows used presently to calculate effluent limits, we do not foresee an impact on MSA’s current effluent limits resulting from a reduction in the outflow from Lake Hopatcong

We are concerned with the delay in and the compression of the fall drawdown schedules, both normal winter drawdown and the five-year drawdown. In reality, the two week delay in the normal year November drawdown has no practical effect on boating on Lake Hopatcong. It is simply too cold! The compressed five-year drawdown schedule relies too heavily on the new USGS “flood stage” and will result in sustained higher flows. Further, significant fall rainfall events will wreck havoc on both schedules (as demonstrated in fall 2010 trial winter drawdown.)

The CAC recommended delaying the drawdown so as to provide ample opportunity to schedule the removal of recreational craft from the water prior to the onset of winter. To the extent that a compressed drawdown schedule can be met the Department will accommodate this request. The Department acknowledges the difficulty in meeting the accelerated drawdown during the fall of 2010 due to a two inch rainfall event on December 1. That event caused the Department to miss the target date of December 15 by seven days. At the February 2011 CAC review this difficulty was discussed and the

Department has decided to move the start date for the 26 inch drawdown up by one-week, to November 12. We have adjusted the charts in the WLMP to reflect this change. In addition the WLMP requires an annual review of the prior year's experience and adjustment of the WLMP procedures as necessary. Further Appendix C of the WLMP identifies unresolved issues that may be revisited during the annual review by the CAC. The Department has added the compressed schedule for the sixty (60) inch drawdown to that list of issues.

Lake Musconetcong is infested with the water chestnut, an invasive species that can threaten the entire recreational use of a water body. The LMRPB requested from the Department and was approved for a winter drawdown of Lake Musconetcong in an attempt to inhibit the invasive by exposing it to the elements and through freezing. The delayed Lake Hopatcong drawdown, combined with a heavy late autumn rain, resulted in Lake Musconetcong completely refilling, thereby negating any of the anticipated beneficial effects of the Lake Musconetcong drawdown.

The Department acknowledges this as an issue, but we are unconvinced that the compressed drawdown schedule is solely responsible. The two inch rainfall on December 1 raised the water surface of Lake Hopatcong by some 8 inches. Regardless of the drawdown rate this additional water would have had to be passed downstream to reach the 26 inch drawdown target by December 15. Lake Musconetcong is situated down stream of Lake Hopatcong and is more than two thousand acres smaller than Lake Hopatcong. The ability to successfully maintain a lower water level in Lake Musconetcong while lowering Lake Hopatcong during any rain event of this size is questionable.

We are concerned with the impacts on both the Musconetcong River and Lake Musconetcong of the five year compressed drawdown schedule. Specifically, the new proposed schedule involves higher outflows than previously utilized. This is supposedly based a recalculated flood state based upon the record flow in 2003. Again, there is no provision for significant rainfall. Further, there has been no analysis of the impact of the higher flows on both Lake Musconetcong and on the Musconetcong River between the lakes. The higher flows could result in additional erosion, stream bank instability and siltation within Lake Musconetcong.

As noted above, the Department is committed to an annual review of the WLMP to determine whether adjustments are required based on prior years' experiences. The Department acknowledges that the accelerated drawdown schedule reduces the margin available to address large rainfall events should they happen. The Department does note that the 1 inch per day drawdown rate attempted in the fall of 2010 is equal to the rate previously employed for the 60 inch drawdown. However, because the 26 inch drawdown at one inch per day only lasts for 26 days (as opposed to two months for a 60 inch drawdown), the time allowance to recover from a significant rainfall makes "catching up" to the schedule more difficult.

The USGS has calculated the flood stage in the Musconetcong River below Lake Hopatcong to be 4 feet on the gauge which translates into 292 CFS. In reality, Superintendent Maurella now believes that the maximum discharge that can be safely accommodated is 3.5 feet on the stream gauge which equates to 213 CFS. While stream flows of this magnitude may not be common due to the influence of Lake Hopatcong, this is not equivalent to a 100 year flood. In fact the 95th percentile daily flows for the months of September and October exceed this rate. Consequently, we do not expect that high flow releases at 3.5 or 4 feet on the gauge from Lake Hopatcong will cause stream bank erosion beyond that which would occur naturally and thus will not contribute an inordinate sediment load to Lake Musconetcong. Flooding is a part of natural stream ecology, and while the Musconetcong is no longer a “natural” stream due to the influence of Lake Hopatcong we do not believe these discharge rates will harm the established biota in the River below.

The LMRPB notes that the draft plan was amended at the point of the final draft to provide notice to the LMRPB of any changes to the passing flow from Lake Hopatcong. We thank the Department for that consideration. However, the draft plan continues to fail to provide any actual consultation with significant downstream parties during the decision making processes. The LMRPB strongly recommends that significant downstream stakeholders, particularly both the LMRPB and the MSA, be consulted prior to any decision.

The Department would certainly be willing to consider any information provided by any interested party, either from the downstream communities or the Lake Hopatcong community that could aid in its decision making process. However, the Department cannot agree to a protracted negotiation process that would eliminate our ability to be responsive to unusual circumstances. The WLMP includes clearly articulated benchmarks that when met would cause the Department to initiate an analysis of conditions both in Lake Hopatcong and downstream in the Musconetcong River system to determine whether a departure from normal operating procedures is warranted. Information relative to these benchmarks is available to the public on the USGS stream flow web site:

http://waterdata.usgs.gov/nj/nwis/uv/?site_no=01455500&PARAMeter_cd=00065,00060

Information concerning precipitation is also available on the web site:

http://climate.rutgers.edu/stateclim_v1/monthlydata/tpcp/belvidere.html

Consequently, it is possible for any interested party to review information from these sources and determine whether the Department may consider a departure from normal operations in accordance with the WLMP and provide any additional information they would like the Department to consider during its deliberations.

Out flow from Lake Hopatcong should not be allowed to be reduced below 12 CFS until DEP completes a thorough impact analysis of a reduced flow on the ecology and biology of the Musconetcong River and Lake Musconetcong; and the impact on the Musconetcong Sewerage Authority.

The WLMP specifies that even under scenarios where a departure from normal operating procedures may be contemplated, a decision to reduce outflow will not occur until the Department has assessed downstream conditions and determined that a reduction can be accommodated with minimal impact on the downstream ecology and users of the Musconetcong River.

DEP should have a Quality Assurance Protection Plan for any monitoring done in support of a reduced outflow from Lake Hopatcong.

The Department has included a new Appendix E which sets forth the monitoring plan to be employed by the Department in evaluating downstream conditions.

The Draft Plan does not meet the statutory obligation to maintain the water level in Lake Hopatcong at the normal high water mark, natural elements permitting.

The Department considers natural stream flow to be among the “natural elements” that affect whether the water level in the Lake can be maintained at the normal high water mark. Completely eliminating the stream flow out of Lake Hopatcong would produce a condition that, based on the Department’s flow reconstruction analysis, would not occur naturally, and which would have potentially devastating impacts to the River between the Lake and Lubbers Run. Consequently, the Department does not believe that maintaining the water level in the Lake at the normal high water mark to the exclusion of all other natural conditions downstream is demanded by the Statute. Moreover, such an interpretation would violate other water resource law including but not limited to the Federal Clean Water Act which demands that designated uses in the Musconetcong River be protected.

There most likely was not a ‘millers’ judicial decision, but maybe something specific for the millers, which is 10cfs during the summer months, but not necessarily the rest of the year.

Reference to a court action brought by the Association of Musconetcong Millers and a court order requiring the construction of a fountain designed to measure 7.5 MGD (12 CFS) is referenced in “A Summary Report on the Morris Canal and Banking Company” by Frederick A Eckart Sr. (June 27, 1975). This reference is carried into the prior version of the WLMP. The Department has endeavored to locate a copy of the court order and has been unable to do so. However, the Department has found two letters nearly contemporaneous with the elusive court order (Hartwell 1923 and Vermeule 1924) referencing a dispute between downstream millers and the Lake Hopatcong community. The 10 CFS reference is lifted from the 1923 letter which suggests that 10 CFS is the evaporation loss resulting from the whole of Lake Hopatcong. The letter suggests that the Lake could make up for the evaporation loss of 10 CFS thus negating any claims of damage that may be brought by the millers. This must be recognized as one man’s opinion and should not be interpreted as a final settlement of the dispute. Indeed the 1924 letter references the construction of a fountain but clearly states that “The amount [of water] to be let down to the mill owners remains to be fixed.” As the fountain was

ultimately designed and constructed to pass 12 CFS, we are left to assume that this was the agreed upon or ordered minimum outflow. In any event the letters are provided as evidence that a dispute between the millers and the Lake Hopatcong community did exist and an agreement or order to pass a minimum flow down river likely resulted.

Four inches of assumed evaporation is too high. When comparing the volume of water discharged through the gates with the elevation of water in the lake when there had not been rainfall for a long time, we did NOT see 4 inches of evaporation, I believe it was more like 2-3 inches in the hottest times, much less rest of year.

The WLMP assumes 4.5 inches of evaporation as a maximum based on pan evaporation studies conducted at the Canoe Brook Reservoir. This maximum evaporation rate would only be realized during hot, sunny, periods with relatively low humidity. The Department agrees that this figure likely exceeds the evaporation that would occur under normal summer conditions and greatly exceeds any evaporation that might occur during the late fall through early spring period. However, water elevation in the Lake will be most critical during the summer months, and in particular during hot and dry periods when precipitation is insufficient to make up for the loss to evaporation and passing flow. The Department thought it best to acknowledge the potential for these conditions in the plan and to provide a reasonable worst-case estimate of the rate of declining water levels under these conditions.

A 12 CFS minimum outflow has not been the norm. For instance, for all of recorded March's 30.6% of the days out flowed less than 12cfs, and 19.2% of the days out flowed less than 9cfs. On the other hand, December is 12 CFS or above, 92.1% of the time (only 7.9% of the days are less than 12cfs).

The Department acknowledges that there have been times when the outflow from Lake Hopatcong has been less than 12 CFS. In fact the Department reduced the outflows in the spring of 2009 to help recover the water level after the five-foot drawdown and again in the fall of 2010 due to concerns over the falling water level. Both times these decisions were made only after the Department was convinced that the downstream uses and ecology would be adequately protected under reduced flow conditions. During the drought of record, 1961-65, the Department also reduced the outflow from Lake Hopatcong in an attempt to conserve emergency water supplies. There are undoubtedly other situations that have been encountered over the years that warranted a change in the normal operations of the Lake Hopatcong Dam. This revised WLMP likewise includes a description of conditions under which exceptions to the normal operating procedures may occur. The individual analysis provided by the commenter is not surprising. Air and water temperatures in March are generally cool enough to ameliorate any concerns that a decreased passing flow would jeopardize the aquatic ecology. Generally in December the lake has already been lowered and the water level is being maintained, so all water entering the lake is being released downstream. The lack of evapo-transpiration losses translates to more runoff to the Lake than in the summer from an equal amount of precipitation. Thus a higher outflow from the lake is to be expected in December. During the five-foot drawdown years, some recovery of the water level would be

attempted before a hard freeze occurs, which may explain the 7.9 percent of the days when outflow was below 12 CFS.

Low water level in the Lake causes adverse impacts in parts of Lake Hopatcong, such as the miles of Jefferson canals, where there were a lot of dead fish last summer.

Fish kills are an unfortunate event where ever and whenever they occur and to the extent that the Department can take action to prevent fish kills it does so. The Jefferson canals are poorly flushed backwater areas of Lake Hopatcong that also experience a high degree of eutrophication. Eutrophication, the excessive growth of photosynthetic plants including algae, result in dissolved oxygen swings that lead to saturation during the daylight hours when photosynthesis occurs and depletion during the night when plants respire. The poor flushing in the canals likely results in localized hypoxia (low oxygen) conditions at night. If there is a large die off of algae or other aquatic plants due to a decrease in light penetration or some other environmental factor, those dead plants sink to the bottom and begin to decompose. Decomposition consumes additional oxygen often resulting in anoxic conditions, which then result in fish kills due to suffocation. The Department does not believe that the low water levels are a significant contributor to this phenomena and that it may occur at any time during hot sunny weather with low precipitation.

The Musconetcong River immediately below the Lake Hopatcong dam obviously is not properly designated as FW2-TM for many reasons including the warm water coming out of the lake in August, and needs to be corrected.

The Department disagrees with the commenter's assertion. Ambient water quality data and the fact that there are hold over trout in this reach indicate that this reach is properly designated.

Water Quality, water volume and the lake's environmental health are intrinsically related. DEP must address the impact of the Water Level Management Plan on water quality in Lake Hopatcong.

The only parameter for which Lake Hopatcong has been identified as impaired is total phosphorus. Phosphorus is an essential nutrient for all life on earth, including photosynthetic plants. Adenosine triphosphate (ATP) is a critical compound in the transport of energy in photosynthetic plants. Phosphorus becomes a water quality concern when it stimulates excessive plant growth. A Total Maximum Daily Load has been established for Lake Hopatcong and work has been underway for several years to implement projects that reduce phosphorus loadings to levels that are in line with appropriate amounts of plant growth.

It is noteworthy that phosphate is commonly attached to particles. In a lacustrine environment where water is quiescent the particulate phosphorus settles to the bottom. During stratification periods when oxygen levels at the bottom are low, some phosphorus

becomes soluble and is resuspended in the lake during turnover events, making it available for plant growth.

The water level in Lake Hopatcong will have no effect on the amount of particulate phosphorus entering the lake or the settling of particulate phosphorus within the lake. As to the dissolved fraction, the basic laws of chemistry dictate that molecules in solution distribute equally over time. Consequently, under normal conditions we would expect the dissolved fraction of phosphorus to be relatively uniform in concentration such that the concentration of phosphorus in outflow water would be similar to the concentration remaining in the lake. This means that releasing water from the lake will remove a proportional mass of phosphorus from the lake, it will not concentrate the phosphorus in the lake.

There will of course be localized variability in lake quality which may be observed in areas of poor circulation and/or where local physical/chemical/biological processes concentrate plant growth and sediment oxygen demand, such as coves and inlets. However, it is unlikely that an overall lower water level in would alter these dynamics or have a discernable impact on water quality.

Siltation in the Lake increases the concern over maintaining an adequate water level. There is no mention of the need for routine dredging in the plan. There should be an annual program of dredging small areas covering all parts with water less than 10 feet deep as part of the Water Level Management Plan.

Dredging needs in Lake Hopatcong is beyond the scope of this water level management plan.

What effect are dam removals downstream having on the dry weather flows in the Musconetcong River?

In general the removal of dams restores a water course to its natural flow and would have a positive impact by allowing unfettered migration of finfish, and removing pools of water where temperatures increase due to solar heating. We do not believe that any of these dams is actively manipulated to regulate the downstream flow in the river and do not presently provide significant storage volume for water that could be used to augment dry weather flows if that became necessary.

Twelve (12) CFS has not been the norm in the past, and allows too much water out of the Lake. Twelve CFS should not be the new standard minimum for outflow.

Twelve (12) CFS was included in the prior version of the WLMP as the minimum passing flow out of Lake Hopatcong, and references in that plan cite back to the first operating rules dated October 20, 1932 which are included in that plan as Appendix A. The first rule cited states “There shall be discharged at all times through the fountain, supplemented if necessary by gate openings, 12 cubic feet per second.” While the Department acknowledges that there have been times where the passing flow has been

reduced to below 12 CFS as necessary to respond to abnormal circumstances, we do believe that the “norm” has been to pass a minimum of 12 CFS.

As regards the statement that 12 CFS is too much, the Department has performed a flow reconstruction of the Musconetcong River at the Lake Hopatcong Dam to estimate what the flow in the river would look like if the Lake did not exist. The results of that reconstruction analysis point to 12 CFS as the low flow that would be expected in a normal rainfall year. The 1923 Hartwell letter provides an independent analysis and concludes that “During ordinary years the dry weather flow would be approximately .48 second-feet per square mile...” Given that the watershed at the Lake Hopatcong Dam is 25.3 square miles, the proportionate amount of water that would be passed at Lake Hopatcong Dam is approximately 12.1 CFS. The convergence of these two independent analyses at 12CFS in a normal rainfall year validates that 12 CFS is a reasonable estimate of the natural flow under dry conditions.

As a third point of reference the Department performed a crude water budget for Lake Hopatcong. Average rainfall during June, July and August is about 4.5 inches per month. Based on observations of summer water level response to precipitation, each inch of rain generally raises the lake elevation by two inches. Therefore the monthly gain in lake elevation from rainfall in an average year is around 9 inches. The assumed evaporation loss is approximately 4.3 inches per month in the summer and the 12 CFS passing flow reduces the lake elevation by about 3.6 inches per month. The combined loss is about 7.9 inches per month. Since the gain exceeds the loss in an average year, the Department concludes that the 12 CFS is sustainable and reasonable.

The NJGS report tables that are used to justify 12 CFS as historical outflow, exclude many years of low-flow data from the calculations. By comparing footnote 5 of both Table 9 and Table 10 of the NJGS report with actual USGS data, the data only includes 1928-1962, and 2002-2009. The data excludes key USGS data from the 1963-1975 timeframe. Those missing years from the 1960’s and 1970’s would have significantly lowered the calculated historical outflow numbers.

The Department is in the process of going through the log books from Hopatcong State Park to fill in the data gaps. These logs are hand written daily reports. It is going to take considerable time before the Department can analyze this data.

Lake Hopatcong is actually NOT a major contributor to the river, but appears to be considered as such in this proposed plan. Although there is a focus on square miles of watershed in the plan, this is misleading, as all areas do not contribute the same amount of water. The contribution of Lake Hopatcong is literally a drop in the bucket to most of the river, but maintaining a 12 CFS outflow can kill Lake Hopatcong. Both Hackettstown and Bloomsbury sensors always show significant flow of water BEYOND anything from Lake Hopatcong. Lake Hopatcong should NOT be a major consideration for water that far downstream.

We agree with the commenter that the relative contribution of Lake Hopatcong to the overall flow in the Musconetcong River decreases as one moves downstream. This fact is referenced in the WLMP (See page 9 and 18). However, at the Lake Hopatcong Dam the entire flow in the Musconetcong River is dependent upon Lake Hopatcong. While small increments of drainage area are added to the Musconetcong River watershed as the river flows downstream, Lake Hopatcong remains the dominant source of water into and out of Lake Musconetcong and downstream to the Musconetcong Sewerage Authority (MSA) outfall. The first major tributary to enter the Misconnecting River, Lubbers Run, is located downstream of the MSA outfall. Consequently, outflow from Lake Hopatcong is exceedingly important to the health of the ecosystem and maintenance of downstream uses down to its confluence with Lubbers Run. Even at Saxton Falls, Lake Hopatcong is responsible for about one-third of the dry weather flow.

This proposed plan, unlike the procedure followed for decades until 2005, releases water even during the wet spring and rainy times, and then, when the lake is down a foot, begins to consider water conservation, when it is too late.

The preceding water level management plan also required that a minimum flow of 12 CFS be passed out of Lake Hopatcong at all times. This plan does clarify that if the passing flow is being met by water spilling over the dam, the gates and fountain should be closed. If the commenter has other specific recommendations that would continue to meet the 12 CFS passing flow requirement, while retaining more water in Lake Hopatcong, the Department requests that those recommendations be provided for consideration.

This plan assumes that more warm water out lake Hopatcong mixed with cooler water from other streams, will cool the water downstream, when actually mixing more hot water with cooler water, makes for warmer water, not cooler water. This means releasing 12 CFS from Lake Hopatcong is often bad for the river, rather than beneficial to the downstream habitat.

The gates at Lake Hopatcong are twelve feet below the spillway crest of the Lake Hopatcong Dam. Even though the gate elevation is located above the thermocline in Lake Hopatcong, water released from Lake Hopatcong through the gates as required to meet the 12 CFS passing flow requirement is far cooler than the solar heated surface water. There are numerous beneficial effects of providing additional water in a stream, particularly when supporting a cold-water fishery. One such positive is that water moves more quickly through areas exposed to sunlight and thus reduces the resulting increase in water temperature. Another benefit is increased turbulence in riffle areas thus elevating the dissolved oxygen content of water.

The Department agrees that water spilling over the top of the dam in the summer time could be significantly higher in temperature than downstream water temperatures. One could argue that this higher water temperature should be mitigated by making sufficient bottom releases of colder water through the gates. The Department does not believe this is necessary for two reasons. First if water is spilling over the dam, the fall will infuse

oxygen into the warm water ameliorating the immediate negative effects of higher water temperatures. Secondly, if water is spilling over the dam we assume that recent rainfall will also be feeding downstream segments mitigating the temperature effects of the Lake.

The DEP refuses to consider that the millers downstream on the Musconetcong River are gone, and continues to require 12 CFS outflow from Lake Hopatcong. Until the details of the Miller decision are disclosed, it cannot bind Lake Hopatcong. Notably, if a decision called for 12 CFS for the purposes of the Millers, that would not necessarily bind 12 CFS for any other purpose.

The Association of Musconetcong Millers court action is not the sole reason, nor even the primary reason, that the Department has suggested 12 CFS should be the minimum required passing flow out of Lake Hopatcong. If it were, the Department could not depart from the minimum passing flow as necessary to assist in lake level recovery or drought emergencies. However, the decision is an important historical reference that illuminates a long history of releasing 12 CFS, upon which the ecology of the river has become dependent. As noted above the Department investigated the reasonableness of the 12 CFS as a passing flow by comparing it to the flow that would occur in the River absent the dam. This analysis indicates that 12 CFS is a reasonable approximation of what the natural dry weather flow in the River would be during a year with average summer precipitation.

This plan sets in motion a process where the lake becomes part of a plan “to protect the environmental health and the natural, and scenic resources of Lake Hopatcong / Musconetcong River System, ...”. But this is supposed to be the Lake Hopatcong Water Level Management Plan, not the Musconetcong River Water flow plan. Clearly the Musconetcong River needs a flow management plan, but should not be looking at Lake Hopatcong as the reservoir to meet this need.

Under the federal Clean Water Act the Department has an obligation to ensure that downstream uses of the Musconetcong River are protected and maintained. The Department bears that same obligation with respect to Lake Hopatcong. Therefore, neither resource can lay claim to all of the water. Lake Hopatcong sits in the headwaters of the Musconetcong River watershed. Consequently, the management of Lake Hopatcong has a direct impact on the resources and uses of the Musconetcong River system. These two resources are joined by nature sharing the same water and thus they cannot be separated. The Lake Hopatcong Water Level Management Plan must necessarily concern itself with the impact of the recommended management and operational guidelines on downstream resources. As stated in the WLMP, the plan seeks to balance the needs of the Lake with those of the River. Neither resource is assigned priority to the exclusion of the other. The goal is to protect both resources, and in so doing, to maximize the combined environmental and public benefit.