ENVIRONMENTAL ASSESSMENT

On the Petition of the
Rock-Koshkonong Lake District
To Amend Order 3-SD-82-809, Regarding the
Indianford Dam and Lake Koshkonong Water Levels

Draft - December 14, 2004
Final March __, 2005

Wisconsin Department of Natural Resources

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DEPT. OF NATURAL RESOURCES

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Chapter Page Number

List of Figures Page Number

List of Tables

List of Attachments

ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS)
(DNR)
Form 1600-1 Rev. 6-2001

Department of Natural Resources

Region or Bureau SCR
Type List Designation II

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., Insert Date.

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Telephone Number 608-275-3243

Applicant: Rock Koshkonong Lake District (RKLD)

Address: 374 E. Samuelsen Dr.,
Edgerton, WI. 53534

Title of Proposal: Increase Lake Koshkonong Water Level

Location: Counties: Jefferson, Rock and Dane **City/Town/Village**: Towns of Sumner, Koshkonong and Jefferson, Jefferson County; Towns of Fulton and Milton, Rock County;Town of Albion, Dane County
Township Range Section(s): Town 4 North, Ranges 12 & 13 East, Town 5 North, Ranges 12, 13 & 14 East and Town 6 North, Range 14 East

PROJECT SUMMARY

Project Background

Introduction: On April 21, 2003, the Rock-Koshkonong Lake District (RKLD) filed a petition with the Wisconsin Department of Natural Resources, (WDNR) pursuant to Section 31.02, Wisconsin Statutes, to amend Order 3-SD-82-809 Regarding the Lake Koshkonong – Indianford Dam Water Level (Attachment 1). This environmental impact report meets the requirements in NR 150, Wisconsin Administrative Code.

The Indianford Dam is located in the NW ¼, Section 21, T.4N, R.12E, Town of Fulton, Rock County and is located approximately 7 miles South West of Lake Koshkonong and is located at 42°51'38" North, 88°56'25" West (42.860475, -88.940344) (See Basin Map Attachment 2).

Specifically, RKLD has petitioned the Department to:

Eliminate the winter drawdown and set maximum, minimum and target water levels on a year-round basis.

1. Set a minimum lake elevation, subject to lower water levels due to low discharge in the Rock River, of 776.4 feet above mean sea level (msl)
2. Set a maximum lake elevation, subject to higher water levels due to high discharge in the Rock River of 777 feet msl.
3. Subject to the above, set a target lake elevation of 776.8 feet msl.
4. Require that all of the gates at the Indianford Dam shall be opened when Lake Koshkonong is at or above 777.0 feet msl.
5. Require that all of the gates at the Indianford Dam shall be closed when Lake Koshkonong is at or below 776.4 feet above Mean Sea Level.
6. Require that a minimum of 64 cubic feet of water per second be discharged through the dam.

(source – April 21, 2003 letter from Wheeler, Van Sickle & Anderson, S.C.)

RKLD reports that this proposal is consistent with the goals established in the Comprehensive Lake Koshkonong Plan and refers to this document repeatedly within the Environment Impact Report prepared by the District for this project. While the district has worked on several lake grants with the goal of advancing a Comprehensive Lake Plan the Department is unaware of a final or draft comprehensive plan. Further, the Department could not find a final or draft copy of the referenced comprehensive plan within the Environment Impact Report prepared by the District for this project. This environmental assessment describes the aforementioned proposal and all available information and data to assess how this proposal, if approved, will affect the environment in Lake Koshkonong basin.

History

Lake Koshkonong, meaning, 'the lake we live by', was named by Native Americans. Prior to the 1850's, the open water area was limited to the main channel of the river. The remainder of the lake and the margins of the river channel as far upstream as Fort Atkinson were covered with a profuse growth of emergent vegetation, including wild rice, wild celery, cattails and sedges. In 1877, approximately 26 years after the first dam was constructed, Thure Kumlein (Kumlein 1877) described the area as follows:

> "The land surrounding the lake consists to a great extend of low and very extensive marshes, on which thousand of tons of hay are annually cut; but limestone bluffs exist in many places all around the lake…. The Lake, with its, in many places, marshy shores and hundreds of acres of wild rice, and grass-like plant, know to botanists as Vallisneria spiralis , growing in it in the greatest abundance, used to be a great favorite place for ducks, and especially the far-famed Canvasback (Aythya vallisneria), which, with the Redhead, is particularly fond of the Vallisneria spiralis . Geese, cormorants and white pelicans were also very numerous, and fifty to one hundred of those latter birds could be seen at one time in the latter part of April or first of May."

Construction of the Indianford Dam in the 1850's, subsequent dam modifications, changing bio-diversity and operation regimes have changed the ecology of the basin including impacts to wetlands, wildlife, water quality, aquatic life, and recreation. The positive and negative impacts of water level changes and other environmental factors are discussed in the Affected Environmental section of this report. See the Affected Environment section of this report for a more detailed description of the history of this area.

Physical Geography

Lake Koshkonong is contained wholly within the Lower Rock River Basin in South Central Wisconsin (See Basin Map, Attachment 2). The Rock River Basin drains an area of 2,630 square miles, all of which lies within the glaciated portion of the state in the southeast upland soil-landform region. The basin can be separated into 19 watersheds. Thirteen of these watersheds are in the Upper Rock Basin and six are in the Lower Rock Basin.

Lake Koshkonong is a shallow natural widening of the Rock River and was first dammed sometime around 1851. The current dam has created a pool of approximately 10,460 acres. Lake Koshkonong is a very eutrophic impoundment with a mean depth of 5 feet and maximum depth of 7 feet. The majority of the shoreline of the Lake remains undeveloped. The total length of shoreline is approximately 27 miles of which 10 miles is developed residential/recreational .

Surface Area	10,460 acres
Maximum Depth	7 feet
Mean Depth	5.33 feet
Volume at 775.5 feet msl	55,792.8 acre feet
Maximum Length	3.3 miles
Drainage Basin	2,594 square miles
Length of Shoreline	27 miles
Length of Developed Shoreline	10 miles
Average Gradient of Rock River - Watertown to State Line	1.2 feet per mile
Width of River Channel at Indiandford Dam	300-400 feet
Ordinary High Water Mark – 1980 (Maple Beach)	776.7 feet msl
Ordinary High Water Mark – 2001 (widespread)	778.1 – 778.3 feet msl

Current Conditions

Wetlands: An estimated 3080 acres of wetlands adjoin the lake and the mouths of its tributary streams. Wetland ecotypes include floodplain forests, forested wetland, shrub carr, emergent deep and shallow water marshes, and emergent meadows. Marshes are dominated by stands of cattails, river bulrush, reed canary grass, sedges, and other wet meadow species

Submerged Aquatic Vegetation: The greatest depth of rooted submergent macrophytes observed during 2000, 2001 and 2002 was approximately 4 feet or 1.3 meters. Photic zone depths may increase slightly in areas of submerged vegetation. However, the dominant submergent vegetation in Lake Koshkonong is sago pondweed (Potamogeton pectinatus) and this species does not grow in densities sufficient to affect water clarity.

Turbidity during the growing season from suspended sediment and algae blooms is likely a major factor affecting the submergent vegetation in Lake Koshkonong. Increased turbidity limits light penetration and the maximum depth that submerged macrophytes can survive at. Macrophyte beds provide refuge habitat for zooplankton. Without ample macrophytes, zooplankton populations are compromised (size and numbers), resulting in increased algae and consequently more turbid water (Kahl, 1991).

The overabundance of nutrients are caused by rough fish disturbance and wave action combined to create turbid conditions during the growing season resulting in algal blooms. In the shallow marsh areas, the turbid conditions

favor certain species such as cattail and river bulrush and can have a negative effect on annual vegetation establishment by reducing or eliminating the light needed for germination.

Water Clarity: Typical Secchi disc measurements collected during 2000 – 2002 were in the range of 0.25 to 3.7 feet in depth during the growing season. Secchi depths reported for Lake Koshkonong for years 1986-1989 average 1.3 feet and are significantly less than reported measurements for other large shallow lakes in Wisconsin's Southeast Glacial Plains.

Water Quality: Due to shallow depths and high nutrient loading, Lake Koshkonong is classified as a hyper-eutrophic lake. In the Lower Rock River Management Plan the Trophic State Index (TSI) for Lake Koshkonong is listed as 57. Lakes with a TSI score above 50 are considered to be eutrophic. Frequent algal blooms and low water clarity dominate the condition of the lake during late spring through late summer each year. The high levels of phosphorus are a direct result from nutrient contribution from the Rock River and its tributaries and the re-suspension of nutrients due to the shallow nature of the lake and rough fish activity.

Fisheries: The fishery is productive. Species composition and dominance varies from decade to decade. Fish species found in the lake include carp, buffalo, panfish, catfish, walleye, largemouth and smallmouth bass, muskellunge, and northern pike. Carp reached nuisance level in the 1920s and began to affect the sport fishery. Carp removal by the Department or Commercial fisherman has been a fixture in the fish management schemes of lake Koshkonong since the 1930s.

Wildlife: The WDNR manages Lake Koshkonong as a multi-use waterbody that includes wildlife, fisheries, recreation and navigation. Historically, Lake Koshkonong contained large beds of persistent submergent macrophytes. Since the late 1950's, these plant beds and waterfowl numbers have been greatly reduced. One reason for the decline of waterfowl may be the reduction of fall food sources such as submerged macrophyte, seeds and tubers. The current local nesting population of waterfowl consists of puddle ducks including mallard, wood duck, teal and other waterfowl.

Historically, Lake Koshkonong has been very important waterfowl production area, as well as a key spot for migratory waterfowl. The lake and its adjacent wetlands provide habitat for herons, double crested cormorants, pelican, gulls, eagles, osprey, shorebirds, other raptors, neotropical migrants, and other species.

Purpose and Need

As stated by the RKLD in their Environmental Impact Report, the district's primary objectives are:

- To collect biological and hydrologic data on the lake to obtain a better understanding of the dynamic lake and wetland system;
- To use that understanding to educate the lake users on the importance of lake and wetland protection so that the lake and wetlands can be a resource for generations to come;
- To provide protection of sensitive shoreland and wetland areas from erosion and continued degradation due to various biologic and hydrologic factors, and
- To modify the current Indianford Dam operating orders to provide improved recreational opportunities on Lake Koshkonong and protect the environment and habitat.

According to the RKLD, "the purpose and need of the proposed (*change in water levels*) Operating Order is to provide a management strategy for Lake Koshkonong that; 1) provides the best compromise between user groups of the resource and, 2) protects or improves the ecological integrity of the waterbody, and 3) provides the lake with a more stable hydrologic environment. RKLD in cooperation with WDNR has undertaken the task of collecting data and modeling hydraulics of the Rock River in order to begin to prepare a Comprehensive Lake Management Plan."

From an examination of the history of water level actions on Lake Koshkonong and the Indianford Dam, water level issues are not new to the Lake. What has changed since the last set of judicial hearings is that there is now a District that purports to speak for the interest of all parties interested in Lake Koshkonong. The RKLD was formed in 1999 to address specific goals and objectives. Some of these goals and objectives are related to the litigation that

occurred during the 1980s and 1990s over water levels which resulted in the addition of a winter drawdown. RKLD was organized with two main objectives since:

1) to maintain the existence of the Indianford Dam to insure that the lake would remain in its current state, and

2) to collect data to determine if, and at what elevation, a water level increase could be proposed that would provide a benefit to the lake users while not negatively impacting the aquatic ecosystem.

RKLD prepared and distributed a survey questionnaire to determine the consensus of opinion about many of the lake related issues. The survey responses were summarized in a Lake Planning Grant Report that was submitted to the Department in 2001.

With respect to water levels, 55% of those responding indicated that there was too much variation and 43% responded that water levels were too low. The survey response to lake management priorities was first water levels followed by water quality.

The value of the results from the survey is questionable, because the survey achieved an extremely low (8%) response rate. With 92% non-responding the likelihood of large non-response bias is great. Non-response to mail surveys is not a problem in itself; the problem is that non-response induces a non-response bias in the estimates. This happens because non-respondents usually differ in important characteristics from respondents. Non-response bias in mail surveys can be a major problem because non-response can be substantial. Even when a survey and its instrument have been well designed and three mailings have been made (Dillman Method 1978); the response rate may only reach 50-75%. Response rates >60% for statewide surveys are commonly deemed reasonable. Surveys achieving <50% response rate are typified as low (Pollock et. al 1994.) While RKLD uses this survey as an indicated of what the users want on Lake Koshkonong, the Survey Instrument was critically flawed and statistically indefensible. Further, the survey as conducted, cannot measure preferences of Lake Koshkonong recreationalists by sampling only RKLD members.

RKLD also justifies its proposal from a vote taken at its annual meeting. During the 2002 Annual Meeting a proposal was passed by an overwhelming majority of those attending the meeting to request a change in the Operating Order.

PROPOSED PHYSICAL CHANGES

The existing Indianford Dam/Lake Koshkonong water level order 3-SD-82-809 is dated April 25, 1991. A copy of the existing order is included as Attachment 1. The order sets summer and winter water levels and minimum flows as well as dam gate operations that are controlled by the Indianford Dam. Gate operations are determined by the impoundment level measured on the lake at Bingham Point Estates, about 10 miles upstream of the dam, and the incoming flow as measured on the Crawfish River at Milford and the Rock River at Watertown.

RKLD proposes to eliminate any level reductions in the winter and to raise the summer levels for year-round use. The District's proposal doesn't address dam operation dependent on inflow to the lake.

	Current **MSL**	**Proposed** **MSL**	**Increase** **Feet**
Summer (May 1-Oct. 31) target level	776.2	776.8	0.6' (7.2")
Summer maximum when all gates must be open	776.33	777.0	0.67' (8")
Summer - when all gates can be closed	776.10	776.4	0.3' (3.6")
Winter maximum level (Nov. 1- Apr. 30)	775.77	777.0	1.23' (14.8")

Winter minimum level	775.00	776.4	1.4' (16.8")

No change is being proposed to the minimum flow release of 64 cubic feet per second.

The existing order requires that the dam operator monitor the incoming flow to the lake by adding the flows from the Crawfish River at Milford and the Rock River at Watertown. The intent of this section of the order is to establish minimum performance standards to enable the operator of the dam to keep lake levels within the established limits. Specifically, the order requires:

> "(1) Whenever the lake level is above 776.20 feet, MSL, and the combined average daily flow of the Crawfish and Rock Rivers has increased more than 200 cubic feet per second from the previous day, the operator shall release at least 1.5 times the latest combined average daily flow measured at the Milford and Watertown gages.
>
> (2) Whenever the lake level falls below 776.20 feet, MSL, and the combined averaged daily flow of the Crawfish and Rock Rivers has declined over the four previous consecutive days, the operator shall release no more than 1.5 times the latest combined average daily flow measured at the Milford and Watertown gages."

A rating table for the slide and wicket gates is included within the existing order (Attachment 1). The table shows the flow that is released for different gate settings at lake stages between 776.1 to 776.3 msl.

The drainage area of the Crawfish River gage at Milford is 762 square miles and the drainage area of the Rock River at Watertown is 969 square miles. The combined drainage area of these gages at 1731 square miles is about 66% of the 2630 square mile drainage area at the Indianford Dam.

Since the existing water level order was written, a new gage has been installed on the Rock River at Fort Atkinson. The department has proposed to change the upstream gage monitoring stations from Milford and Watertown to the Fort Atkinson gage (Attachment 2).

No change to the minimum flow release is proposed in the District's request. No physical changes to the dam are being proposed. No direct manipulation of terrestrial resources (Agricultural Lands, Park Lands, State Natural Areas, Upland Forest, Recreational Areas,) are being proposed. No direct manipulation of aquatic flora and fauna are being proposed.

No construction or modification of buildings, treatment units, (wells, septic systems) and other structures (erosion control structures, piers, boat lifts, marinas, and boat landings are being proposed. Air quality and water quality discharges will not be directly affected by this proposal. The petitioner proposes no physical change (direct or indirect) that would alter the ordinary high water mark (OHWM) or any alteration of the private or public rights that would be affected by a change in the OHWM.