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August 29, 2011

VIA FACSIMILE AND UNITED STATES MAIL
Mr. Jeffrey Kuglitsch
Rock County Corporation Counsel
Rock County Courthouse
51 South Main Street
Janesville, WI 53545

Re: Slow-No-Wake Declaration

Dear Mr. Kuglitsch:

Following our earlier phone conversations and email messages, the Rock-Koshkonong Lake District asked hydrological engineers at Montgomery Associates to take a look at the slow-no-wake issue. In particular, we asked that firm to consider the use of a specified water level to trigger a slow-no-wake speed restriction and what water level would be most appropriate for the reach of the Rock River above the Indianford Dam.

I understand the Public Safety and Judiciary Committee tabled discussion of the proposed ordinance at its meeting earlier this month. Now that the boating season is winding down, it may make sense for the Committee to defer action until its second September meeting to assure that Committee members and others have a full opportunity to consider the Montgomery Report. The District would not object to such a delay since the required procedure for County Board action on the ordinance would effectively preclude an amendment that would affect this boating season.

The District requests that you share copies of the Montgomery Report with the members of the Committee and prepare a revised draft Ordinance incorporating the

recommendations presented in the report. This would allow the Committee to consider alternative versions of the revised ordinance and permit them to recommend one for adoption by the County Board.

Very truly yours,

WHEELER, VAN SICKLE & ANDERSON, S.C.

William P. O'Connor

WPO/
Enclosure
cc: County Board Chairman Russ Podzilni
County Board Vice-Chair Sandy Kraft
Rob Montgomery
RKLD Chairman Brian Christianson

Memorandum

To: Rock County Corporation Counsel Jeff Kuglitsch
Rock County Public Safety and Judiciary Committee

From: Rob Montgomery, PE, D.WRE

Date: August 26, 2011

cc: Bill O'Connor

Re: Suggested Standard for Slow-No-Wake declaration on the Rock River

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This memorandum provides a discussion of factors relevant to Slow-No-Wake declarations due to high water level on the Rock River in Rock County, Wisconsin, and provides a recommended approach for defining Slow-No-Wake conditions for the portion of the Rock River upstream of Indianford Dam.

By way of introduction, Montgomery Associates is a water resource engineering firm based in Cottage Grove. I started independent practice as Montgomery Associates in 1998; we now have a dozen engineers on staff. I have attached a short resume for your reference.

Guidance for Slow-No-Wake declaration based on high water level

Slow-No-Wake (SNW) declarations can be applied in several circumstances, such as for public safety during special events, or near navigation hazards. SNW declarations can also be applied during times of high water levels to reduce the potential for shoreline erosion or damage to docks or other shoreline structures. Such a declaration would be for the entire waterbody, extending beyond fixed SNW limits established, for example, near launch ramps or within 100 feet of a lake's shoreline.

The Wisconsin DNR has recognized the need for SNW declarations based on water level, and provides some example language for applying SNW regulation based on water level in their August 2008 publication "Guidelines for Creating Local Boating Ordinances and Placing Waterway Markers in Wisconsin Waters" (available at: http://dnr.wi.gov/org/es/enforcement/docs/WaterwayManual2008.pdf). This example language describes applying and removing SNW orders based on whether the water level exceeds a specified elevation (a "trigger" elevation), referencing a readily-observable water level gauge, such as those maintained by the United States Geological Survey. The suggested language in the DNR publication does not describe using different water levels for "Slow-No-Wake ON" versus "Slow-No-Wake OFF" declarations.

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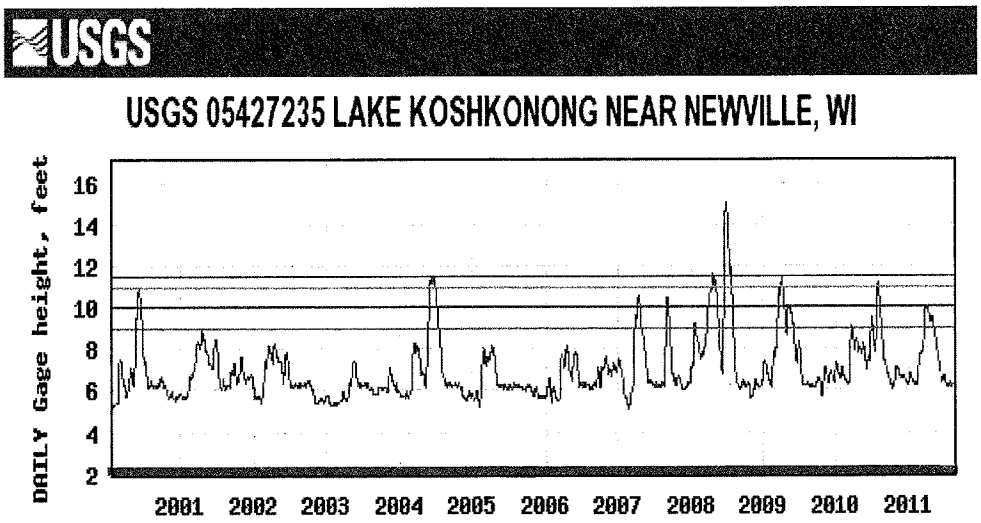
Available data and flood characteristics of the Rock River

The United States Geological Survey (USGS) maintains water level and discharge monitoring gaging stations on the Rock River at Fort Atkinson, at Bingham Point on Lake Koshkonong, at the STH 59 bridge in Newville, at Indianford dam, at Afton, and at Rockton, Illinois, as well as other locations further upstream or downstream. Most of these gauges have been in operation for many years, so that a long period of record is available to evaluate water level fluctuations. Water level data (both current conditions and long-term data) are available for each of these gaging stations on the USGS website: http://waterdata.usgs.gov/wi/nwis/sw . An example of the water level data that can be obtained from the website is shown below, which shows the fluctuation in water levels on Lake Koshkonong since year 2000. The multiple high floods of 2008 stand out on this graph.



Floods on the Rock River typically occur in the spring of the year, due to snowmelt and spring runoff. However floods also occur during the summer boating season due to heavy rainfall events. A characteristic of floods on the Rock River is that they typically rise more quickly than they fall. This is the typical observation of most residents on the Rock River, and is illustrated in the plot of water level from the USGS Lake Koshkonong gage during the boating season of 2010, below:

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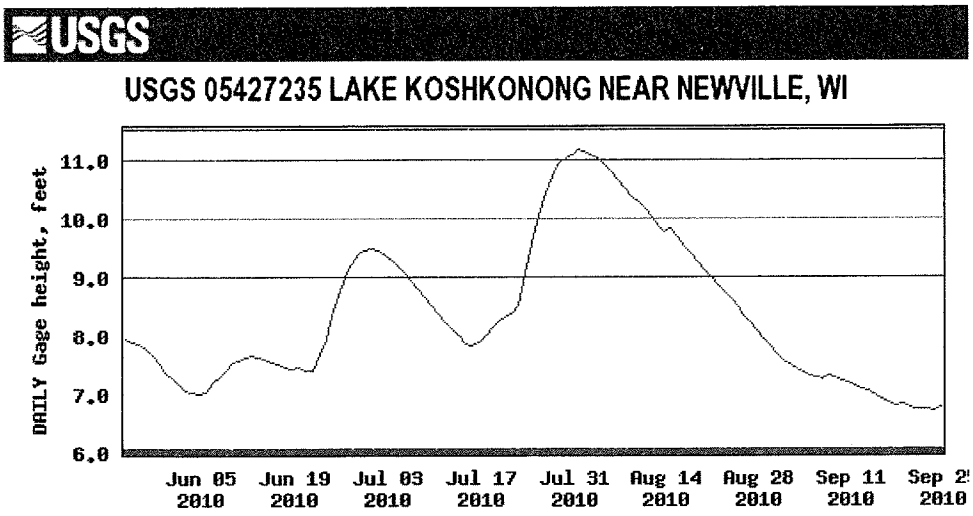

For example, the flood that peaked at approximately gauge water level 11.2 feet on July 31 took approximately one week to reach its peak, but more than three weeks to recede. The significance of this characteristic of flood rise and fall is that if SNW declarations are made and the canceled at the same water surface elevation, the duration of SNW after the flood peak occurs will typically be several times longer than the time during which the flood was rising after the declaration was made. However, if SNW declarations are canceled at a stage lower than the one they are initiated at, a very long "wait time" will be imposed on the boating public.

Objective standard for high water levels that could cause shoreline damage

Water level elevations that produce flooding conditions are defined at multiple points along the Rock River by the United States Weather Bureau, a branch of the National Oceanographic and Atmospheric Administration (NOAA). The Weather Bureau uses the water level and discharge data provided by the USGS at their gaging stations to provide flood warning data that is widely used in public safety announcements. The Weather Bureau provides this flood warning data for four locations relevant to the Rock River in Rock County: Lake Koshkonong, upstream of Indianford dam, Afton, and Rockton, Illinois. For example, water level and flood action level data for Lake Koshkonong is displayed on the Weather Bureau website: http://water.weather.gov/ahps2/hydrograph.php?wfo=mkx&gage=nvlw3&view=1,1,1,1,1,1,1,1%22 . The image below provides an example of the information obtainable from this website:

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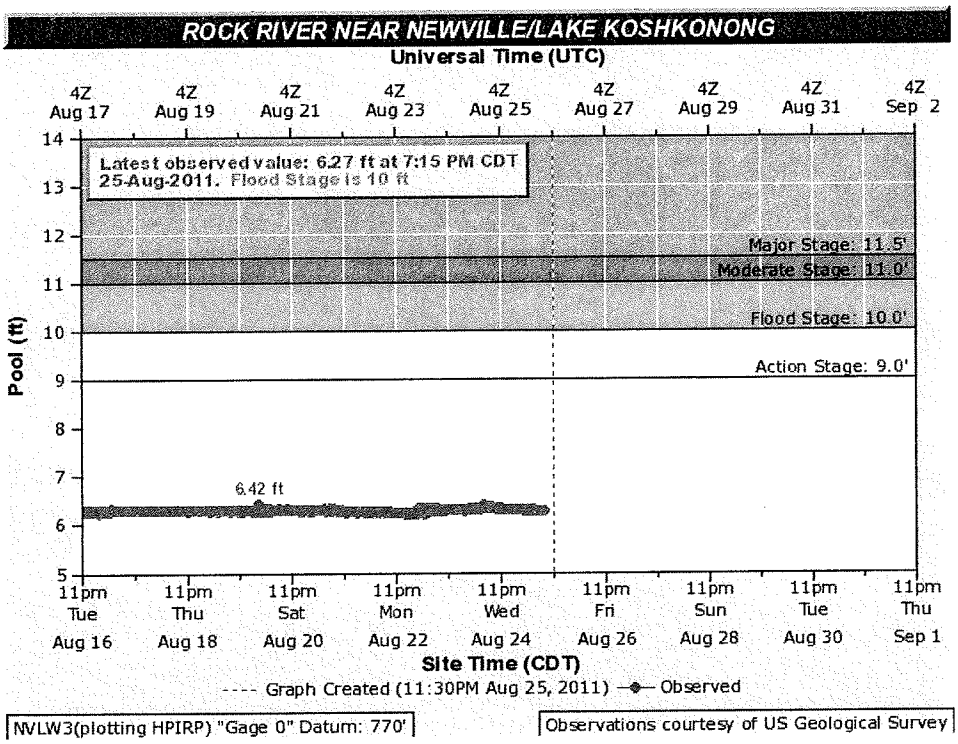

Similar data is available for each of the gauges described above. The website also provides statistical projections of flood height exceedance and descriptive information areas subject to inundation at flood stage, moderate stage and major stage.

The water level definitions developed by the Weather Bureau also include definition of an "Action Stage", set below the stage that begins to create flooding conditions. The action stage is defined as the water level that should initiate monitoring for potential flood mitigation that could be required if water levels rise significantly higher. On the Rock River in Rock County, the Action Stage is one foot lower than the lowest of the three defined flood stages.

In our view, the Weather Bureau Action Stage is an appropriate elevation for declaration of SNW conditions on the Rock River. We say this because:

1. The Weather Bureau has defined flood warning stages based on specific inundation observations near the relevant USGS Gage;

2. The Weather Bureau defines the Action Stage as being below –1 foot below – the lowest of the three defined flood stages; and

3. The water surface elevation of the river and the Weather Bureau Action Stage information is easily accessible by both officials and the general public at the Weather Bureau website.

We evaluated the expected results of use of the Weather Bureau Action Stage for SNW declarations using water level records of the Rock River upstream of Indianford Dam, at the Lake Koshkonong gage. We used the years 2003 through 2010 for this analysis, because the Indianford Dam

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powerhouse wicket gates were repaired to be fully operable in 2003, which has allowed the District to operate the dam to more effectively control water levels to comply with the DNR Operating Orders. The attached Stage Duration graph indicates the percentage of time when lake level is higher than a particular gage height. Approximately 17% of the days of the typical May-October boating season would be subject to SNW declaration if the Action Stage if gage height 9.0 is used for declaring and cancelling SNW. In contrast, if SNW was declared and cancelled at gage height 7.5, approximately 32% of the boating season would be subject to SNW.

Recommendation

Based on our review, we recommend that:

1. SNW declarations on the Rock River between Lake Koshkonong and the Indianford Dam should be based on the Weather Bureau Action Stage (gage height 9.0 feet) defined for the USGS Gage on Lake Koshkonong.

2. SNW declarations and cancellations should be based on the same water level, the Action Stage.

Please contact me with any questions at 608-839-4422.

Attachments: **Stage Duration graph**
Resume for Rob Montgomery

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