

**CORRESPONDENCE / MEMORANDUM**

**State of Wisconsin**

DATE: September 21, 2011

FILE REF: 3200

TO: File

FROM: Pat Oldenburg - WCR



SUBJECT: Classification of Lake Wissota under NR 102.06.

Lake Wissota is an impoundment of the Chippewa River in Chippewa County. Reservoirs are defined in s NR 102.06(2)(f) thusly:

“Reservoir” means a waterbody with a constructed outlet structure intended to impound water and raise the depth of the water by more than two times relative to the conditions prior to construction of the dam, and that has a mean water residence time of 14 days or more under summer mean flow conditions using information collected over or derived for a 30 year period.

The Wissota dam has a hydraulic height of 56 ft. Therefore it clearly qualifies under the first criteria. Qualification under the second criteria is less clear. Since the code does not specify “summer” the analysis was performed for the May 1 to September 30 time period.

According to the recent bathometric map produced by Sean Hartnett of UW-Eau Claire, the gross storage of Lake Wissota at normal pool is 161,246 acre-ft.

Long-term flow records are available at from the USGS gage on the Chippewa River at Chippewa Falls. Based on data collected from 1980-2009 the average flow from May 1 – September 30 at this sites is 8,990 acre-ft/day. Dividing the summer pool gross storage of 161,246 acre-ft by this figure yielded an estimated hydraulic retention time of 17.9 days.

Based on this evaluation, Lake Wissota meets the definition of a reservoir under s. NR 102.06(2)(f). With a maximum depth of 64 ft and an area of 6,149 acres, Lake Wissota meets the definition of a stratified reservoir under s. NR 102.06(2)(g) as the mix-to-stratify ratio is 5.7 (note that the English version of the equation given in that section of code is incorrect).

Therefore, Lake Wissota would be classified as a stratified reservoir, which carries with it a total phosphorus criterion of 30 µg/L under s NR 102.06(4)(a).

cc: Buzz Sorge - WCR  
Tim Asplund – WT/3 (via e-mail)

## Appendix

### Monthly Mean Flows from USGS:

#### Chippewa River @ Chippewa Falls (cfs)

Year	May	June	July	August	September
1980	2,311	4,969	2,001	4,261	12,500
1981	9,700	9,317	4,226	3,355	1,779
1982	11,560	3,446	3,540	3,031	6,472
1983	6,928	4,176	3,427	3,838	7,340
1987	1,688	2,198	2,547	1,560	1,583
1988	2,505	1,162	1,172	1,598	1,634
1989	5,664	4,551	2,858	1,893	1,778
1990	8,497	7,221	2,721	4,972	8,514
1991	9,484	8,556	4,754	3,420	5,741
1992	5,335	2,316	5,052	2,164	3,277
1993	9,328	17,300	5,145	3,048	2,997
1994	4,773	2,860	3,593	2,412	12,090
1995	7,060	3,337	2,875	9,132	3,759
1996	10,860	5,744	6,392	3,804	3,652
1997	4,614	4,018	5,072	2,922	4,785
1998	2,260	3,342	2,139	1,478	1,211
1999	10,870	4,086	5,737	5,477	2,587
2000	3,412	8,020	7,118	4,662	4,149
2001	8,643	8,308	3,326	3,989	1,999
2002	12,870	7,904	4,600	5,431	9,097
2003	16,010	5,730	2,729	1,645	1,431
2004	8,693	9,075	1,795	2,034	2,244
2005	4,268	4,390	2,124	1,361	1,329
2006	4,677	1,649	1,249	3,465	1,691
2007	2,620	1,911	1,812	1,133	1,462
2008	7,520	6,203	1,826	1,271	1,208
2009	3,715	2,305	1,033	1,514	1,193