Comments on Preliminary Draft of Great Lakes Water Resources Compact
(an act to create 281.343 of statutes)

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Comments are tied to text with page and line numbers, abbreviated as page/line.

Section 1 - Definitions

There are a number of terms used in the text which are either not defined or which may have unclear or multiple meanings. In the case of the latter, some of the possible interpretations will be listed as examples of the ambiguity.

Page 4/Line 12 **Sustainable** - means widely different things to different people, so a working definition needs to be provided. For example, does it mean economically, socially, ecologically or hydrologically sustainable, or something entirely different?

4/16 **Watershed** - Is it intended to be synonymous for basin? If so, this should be stated. Also there is a watershed associated with every scale of surface water body. Is any particular scale intended?

4/22 & 8/23 **Incorporated** - This term probably means different things in different states and provinces. In Wisconsin, towns are by definition unincorporated. Is the intent of the definition to exclude unincorporated entities from being considered as communities?

5/22 **Diversion** - Why does this term not include the transfers of water *into* the basin (including ballast water)?

6/6 **Water loss and waste** - Is water that infiltrates from irrigation or pipeline breaks but returns to the original source as ground water really to be considered a loss or waste? Water loss and waste is clearly not ONLY consumptive use, but is all consumptive use water loss and waste?

7/17, 18 Item o, sub 3 - Water used to transport materials is not a product. What's the point of this definition?

8/11 to 19 **Source watershed** (as noted above, watershed needs clarification). How does ground water fit into this definition? Is water withdrawn from an aquifer that is presently flowing directly into the basin covered? Is water withdrawn from an aquifer that used to flow into the basin (but no longer does) covered? Unlike river systems, ground water flow boundaries are transient on a human time scale. If the answer to the latter query is yes, then what point in time is to be used as the demarcation? Any point in the past? Today? The effective date of the compact?...

9/7 **Water** includes ground water "contained within the basin". Given the previous comment, this definition needs clarification. Ground water divides can be transient, do not always coincide with surface water divides, and can actually be divides between pumping centers and not natural watersheds. So what is the extent of the basin relevant to ground water?

Some terms that are used and should be defined for clarity, but are not included:

9/12 **Tributary ground water** - What does this mean? It is not a commonly used hydrologic term and is being interpreted many different ways by different parties in Wisconsin.

Significant adverse impacts - Is this intended to include water quality as well as quantity? What is significant and who will decide that?

Conservation - This is a term that means different things to different people. Is it intended to mean efficient use of water? (from what perspective - humans, plants?), less use of water? reuse of water? reduction of losses to the basin? something else?

Water resources - this needs a clear definition. That definition should incorporate water quality as well as quantity. Management of those resources should include avoiding actions which damage quality and which protect the overall quality of water.

Section 4 - Water Management and Regulation

This section needs to specify water quality (in addition to water quantity) under water resources inventory and information.

18/7 to 20 4 c. When a person registers a withdrawal or diversion, the information provided should include at least the amount of the withdrawal, the source from which it is to be withdrawn, the quality of the withdrawn water, the use, and the location, quantity and quality of the return.

27/4 4. n. "Less an allowance for consumptive use" Some reasonable upper limit on consumptive use ought to be included.

29/24 & 25 4. n. "ground water that is hydrologically interconnected to waters of the basin" What does this mean? Does it mean water that is flowing into the basin today, or which used to flow in at some time in the past, or which might flow into the basin in the future if human actions alter the flow paths? Or does it mean that the water replacing ground water extracted from aquifers is coming from within the basin?

31/13 to 15 & 32/11 to 14 4. p. "Significant impacts" and "significant individual or cumulative adverse impacts" The term needs clarification and a mechanism to decide on the "significance" needs to be provided.

34/19 to 21 4.t. "Ground water" Using the basin surface water divide as the surrogate ground water demarcation line is an excellent idea. Ground water divides move through time and with seasons, and as human pumping patterns change, so they are very difficult to build into rigid laws.

I'm not quite sure where this fits, but from a scientific perspective I think it is important to clarify.

Adequate monitoring of water resources is absolutely essential. It must include, at least:

1. regular collection of ground water levels and samples for quality analysis in all aquifers,

2. continuous monitoring of streamflows, lake and wetland levels and precipitation

3. regular sampling of the quality of surface waters, and

4. measurement of the quantity and quality of diversions, withdrawals and returns.

Without this information, there is no way to assess if "conservation" is working or if the system is impacted by human actions or management decisions.

Background Information: Cherkauer is a hydrogeologist by specialty, with 34 years of experience in Wisconsin. He is a registered Professional Hydrologist and Professional Geologist in Wisconsin. He is currently serving on the Southeastern Wisconsin Regional Planning Commission's (SEWRPC) Water Supply Advisory Committee and is part of a group of four hydrogeologists working with SEWRPC to assess the ground-water system of southeastern Wisconsin. He has previously served on SEWRPC's Technical Advisory Committee on Regional Water Supply Planning and is a long-standing member of the University of Wisconsin Graoundwater Research Advisory Committee.