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# Regulation of Interbasin Transfers and Consumptive Uses from the Great Lakes\*\*\*

## ABSTRACT

*The Great Lakes were an open access resource with respect to consumptive water use, prior to the promulgation of the Great Lakes Charter and the Water Resource Development Act of 1986. Concern about the open access nature of the lakes was sparked by the Sporhase v. Nebraska ex rel. Douglas Supreme Court Decision, which limited states' power to prevent water transfers. The resulting nonbinding Great Lakes Charter recommends a set of management rules enforced through state water permits. However, not all Great Lakes States have implemented the Charter Provisions, and damages associated with lake water withdrawals are generally not accounted for by the permits. Because the charter recommends management by a standard (permits enforce some standard) without setting the standard, evolution towards a basin wide transferable permit system is recommended. Transferable permits would require the definition of a standard but would result in a cost effective means of managing the lakes.*

## INTRODUCTION

Concern for protecting the Great Lakes Basin from unwanted interbasin transfers was the impetus behind the Great Lakes Charter of 1985,<sup>1</sup> and the Water Resource Development Act of 1986.<sup>2</sup> Both create means to regulate Great Lakes Basin water diversions and consumptive uses. The charter establishes rules of access and conduct between states/provinces for consumptive uses and new or increased diversions.<sup>3</sup> The Water Re-

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1. Council of Great Lakes Governors, Final Report and Recommendations; Great Lakes Governors' Task Force on Water Diversion and Great Lakes Institutions (Jan. 1985) [hereinafter Council of Great Lakes Governors].

2. Water Resources Development Act of 1986, Pub. L. No. 99-662, 100 Stat. 4082, Nov. 17, 1986 42 U.S.C. § 1962d-20 (Supp. V 1987).

3. Task Force on Water Diversion and Great Lakes Institutions, Council of Great Lakes Governors, Great Lakes Governors' Task Force on Water Diversion and Great Lakes Institutions (1985) [hereinafter Task Force].

source Development Act of 1986 assures the Great Lakes states that U.S. federal authority for an interbasin diversion out of the Great Lakes Basin will not be granted without the Great Lakes states' approval.<sup>4</sup>

Historically, water in the Great Lakes has been an open access, free good. However, a sluggish regional economy and a perception of growing demand for Great Lakes water, synergized with recent judicial decisions affecting the legality of interstate water transfers, have acted as a catalyst to encourage management of the Great Lakes.<sup>5</sup> A political climate has been created among the Great Lakes states and provinces for cooperatively managing the Great Lakes, where management implies the desire to regulate and restrict access to Great Lakes water.<sup>6</sup>

This article first describes the institutional constraints imposed on the states by the 1982 *Sporhase v. Nebraska ex rel. Douglas* Supreme Court decision and its implications for Great Lakes water management. This is followed by a brief overview of the goals and management decisions embodied in the Great Lakes Charter. The resulting regulatory program is then evaluated employing simple efficiency and equity criteria to determine whether management goals will be attained. Finally, based on the evaluation of the current management scheme, recommendations are made for a transferable property right system.

## INTERSTATE WATER MANAGEMENT

Historically, states have exercised state police power to prohibit or regulate interstate water transfers.<sup>7</sup> However, recent judicial decisions have challenged this practice. The Supreme Court ruled in *Sporhase v. Nebraska ex rel. Douglas*<sup>8</sup> that groundwater is an article of commerce and subject to the commerce clause of the U.S. Constitution. As a result, Nebraska could not forbid the transfer of groundwater across its state line. The *Sporhase* decision considered protection of the health and welfare of a state's citizenry an appropriate purpose to prohibit interstate transfers of water, but protection solely for economic purposes was not deemed sufficient.<sup>9</sup> Upholding and reinforcing the *Sporhase* decision, the 1983 *El Paso v. New Mexico*<sup>10</sup> decision struck down a New Mexico

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4. Water Resources Development Act of 1986, 42 U.S.C. § 1962d-20.

5. Donahue, Bixby & Siebert, *Great Lakes Diversion and Consumptive Use: The Issue in Perspective*, 18 Case W. Res. J. Int. L. 19, 21 (1986).

6. The eight Great Lakes states are: Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. The Canadian provinces are Quebec and Ontario.

7. Tarlock, *Intra and Interstate Usage of Great Lakes Water: A Legal Overview*, 18 Case W. Res. J. Int. L. 67, 79 (1986).

8. 458 U.S. 941 (1982).

9. *Id.* See also, Massey, *Great Lakes Water Diversion: Legal Issues* (June 10-12, 1985) (paper presented to Water Resources Planning and Management Division Conference, Buffalo, NY).

10. *City of El Paso v. Reynolds*, 563 F. Supp. 379 (D.N.M. 1983).

prohibition of water exports. Thus, any attempt by states to legislatively embargo interstate water transfers strictly for economic reasons will likely be held in conflict with the U.S. commerce clause.

The *Sporhase* decision applied four guidelines to evaluate the constitutionality of a state statute that restricts interstate groundwater transfers.<sup>11</sup> They are: 1) the statute must have a legitimate local purpose, 2) the statute must regulate intra- and interstate diversions "even-handedly," 3) local benefits must exceed the costs imposed on interstate commerce and, 4) no less discriminating alternative against interstate commerce should exist.<sup>12</sup> For the Great Lakes, the "even-handedness" principle plays a crucial role in any attempt to restrict transfers out of the Great Lakes Basin. The principle implies that interbasin transfers within a riparian state must be treated the same as interbasin transfers to non-riparian states.<sup>13</sup>

Decisions in *Sporhase* do allow the opportunity for a state to protect against unwanted diversions through legislative management. To unilaterally protect against undesired withdrawals, states can enact statewide water management programs that make preservation of state waters an integral part of the water management program.<sup>14</sup> To achieve this, a state must:

- 1) develop a comprehensive water allocation plan for a reasonable time period (this can be done under the state's police power);
- 2) link applications for all new major water uses to allocation priorities established in the plan; and,
- 3) use the state's police power to deny any water use allocations which are not consistent with the plan.<sup>15</sup>

A state can then deny a present water use application to reserve the water for future needs.<sup>16</sup> This form of legislative management requires the establishment of a state water planning authority.

### THE GREAT LAKES BASIN

Hydrologically, the Great Lakes are composed of five lakes: Superior, Michigan, Huron, Erie, and Ontario. Large by any standard, the lakes have relatively small outflows. The small outflows combine with vast surface areas and large retention capacities to ameliorate short term lake level fluctuations (on average one to two feet per year).<sup>17</sup> Most lake level

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11. *Sporhase*, 458 U.S. at 954 (quoting *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970)).

12. *Massey*, *supra* note 9, at 6.

13. None of the Great Lakes states is completely within the basin, although Michigan is close.

14. *Tarlock*, *supra* note 7, at 106.

15. *Id.*

16. *Id.*

17. International Joint Commission. Great Lakes Diversions and Consumptive Uses, A Report to the Governments of the United States and Canada under the 1977 Reference (1985) (hereinafter IJC).

fluctuations occur naturally. Only two of the lakes have their outflows regulated: Lake Superior at Sault St. Marie and Lake Ontario at the Moses Saunders Power Dam. Other direct lake level influences occur in the form of consumptive uses and diversions.<sup>18</sup>

Currently, five diversions affect the Great Lakes Basin: two flow into Lake Superior from the James Bay River Basin at Long Lake and Ogoki, Canada; one flows out of Lake Michigan at Chicago down the Chicago River and eventually into the Mississippi River; another, the Welland Canal, diverts water around Niagara Falls from Lake Erie to Lake Ontario; and the final diversion, the New York State Barge Canal, is an intrabasin diversion.

Consumptive uses, unlike diversions, tend to be small and not easily identifiable. They include water for manufacturing, irrigation, mining, and municipal purposes.<sup>19</sup> Impacts on lake levels by individual consumptive uses are small, but when considered cumulatively, they are equivalent to a large scale diversion out of the basin.

Prior to the signing of the Great Lakes Charter, four of the eight Great Lakes states had established individual, state access rules for diversions out of the Great Lakes. Minnesota regulated any surface water appropriation in excess of 10,000 gallons per day (gpd) or 1,000,000 gallons per year (gpy) through its statewide water permitting system.<sup>20</sup> The permits are required for any groundwater or surface water appropriation in excess of these trigger levels. Indiana had a water embargo law prohibiting diversion of Great Lakes water out of the basin, unless the diversion was approved by the governors of each Great Lakes state.<sup>21</sup> Ohio required a permit for any water diversion in excess of 100,000 gpd out of Lake Erie.<sup>22</sup> Illinois regulates the Chicago Diversion, by Supreme Court decree, at 3200 cubic feet per second (cfs).<sup>23</sup> A permit and conservation program exists to allocate the 3200 cfs among Illinois users. Illinois also prohibits water diversions from Lake Michigan for use outside Illinois without prior consent of all other Great Lakes states and the International Joint Commission (IJC).<sup>24</sup>

### NEW RULES FOR COOPERATIVE MANAGEMENT

With the institutional changes required by *Sporhase*, it was felt that the individually fragmented state policies could not legally prohibit any

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18. An interbasin transfer (diversion) is defined as a transfer of water from the Great Lakes Basin into another river basin while a consumptive use is defined as that portion of water withdrawn or withheld from the Great Lakes that is lost or otherwise not returned to the lakes. *Id.* at 5.

19. Task Force, *supra* note 3, at 2.

20. Minn. Stat. Ann. § 105.41 (West 1977 and Cum. Supp. 1984).

21. Ind. Code Ann., § 13-2-1-9(b) (Burns Supp. 1984); Massey, *supra* note 9, at 23.

22. Ohio Rev. Code, § 1501.32 (Page Supp. 1984).

23. *Wisconsin v. Illinois*, 388 U.S. 426 (1967).

24. Level of Lake Michigan Act of 1984, Ill. Rev. Stat. ch. 19 para. 119.2 (Supp. 1989).

unwanted large scale transfers of water out of the Great Lakes.<sup>25</sup> Great Lakes politicians, their states suffering through a recession in the early 1980s, decided to unite to protect their water resource for future economic development.<sup>26</sup> Given the desire to preempt federal water management, which was felt to favor the West, and the legislative constraints imposed by *Sporhase* and *El Paso*, a uniform policy across all Great Lakes political entities, including Canada, was needed.<sup>27</sup> In 1985, the governors/premiers agreed in principle to coordinate water quantity management among all states/provinces across the basin by signing the Great Lakes Charter. The charter's management objectives are:

to conserve the levels and flows of the Great Lakes . . . to protect and conserve . . . the Great Lakes Basin ecosystem . . . to provide for cooperative programs and management of the water resources of the Great Lakes Basin . . . to make secure and protect present developments within the region; and to provide . . . for future investment and development in the region.<sup>28</sup>

The charter is based on five principles: 1) integrity of the Great Lakes Basin, 2) cooperation among jurisdictions, 3) protection of the water resources of the Great Lakes, 4) prior notice and consultation, and 5) cooperative programs and practices.<sup>29</sup>

The first principle, integrity of the Great Lakes Basin, recognizes politically that the Great Lakes Basin must be considered and managed as a unified system. Allowing that the basin transcends political boundaries, the second principle establishes the need for cooperation in management, that is, common management rules. The third principle defines the attitude or orientation of the management approach:

It is the intent of the signatory states and provinces that diversions of Basin water resources will not be allowed if individually or cumulatively they would have any significant adverse impacts on lake levels, in-basin uses, and the Great Lakes Ecosystem.<sup>30</sup>

The fourth and fifth principles establish how the first three are to be accomplished. The Prior Notice and Consultation (PNC) rule requires any state or province to consult and seek consent of all affected states and provinces prior to approving any major new diversion or consumptive use of Great Lakes water.<sup>31</sup> The cooperative programs and practices (principle 5) involve the development of a common data base for basin-wide

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25. Sugarman, *Binding Ties, Tying Bonds: International Options for Constraints on Great Lakes Diversions, Legal Overview*, 18 Case W. Res. J. Int. L. 239 (1986).

26. Donahue, Bixby & Siebert, *supra* note 5, at 21.

27. *Id.*

28. Council of Great Lakes Governors, *supra* note 1, at 22.

29. *Id.* at 23.

30. *Id.*

31. *Id.*

water use and the creation of a Water Resources Management Committee (WRMC) to promulgate a water resources management program for the Great Lakes.<sup>32</sup>

In February of 1987, the WRMC published its recommendation for management. Data collection is to be organized by water use category and aggregated by sub-basin.<sup>33</sup> The committee found a wide variation between states regarding actual data collected and the states' authority to collect data. Few of the states/provinces collected water use data in all nine categories recommended by the WRMC. A trigger level of 100,000 gpd in any 30 day average was set as a minimum sized water withdrawal required for data collection.<sup>34</sup>

The WRMC also established guidelines for state participation in the PNC process. Participation is premised on a state/province having the authority: 1) to register any withdrawal in excess of 100,000 gpd, 2) to regulate any withdrawal in excess of 2 million gpd in any 30 day period, and 3) to notify all other affected states/provinces of a consumptive use or diversion in excess of 5 million gpd in any 30 day period.<sup>35</sup>

While few of the basin states had the capability or authority to register or regulate any water withdrawal at these trigger levels prior to 1983, both provinces did. In order to meet these stipulations, a state had to pass enabling legislation. The intent of the charter's cosigners was for each state/province to legislatively implement the PNC process, making prior notification legally binding through each state/province legislature.<sup>36</sup> However, even when legislatively required to notify and consult, the final withdrawal decision remains with the proposing state/province, that is, the compact is non-binding. Table 1 summarizes legislative changes for the eight Great Lakes states as of August, 1989.<sup>37</sup>

To date, both Canadian provinces and five U.S. states (Illinois, Minnesota, New York, Ohio, and Wisconsin) meet all eligibility requirements for the PNC process. Michigan may propose legislation in 1990 to require reporting of Great Lakes water withdrawals, but no permitting process will be advanced.<sup>38</sup> Indiana had proposed legislation tabled in its 1989

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32. *Id.* The WRMC is composed of representatives appointed by each governor and premier of the Great Lakes states and provinces. The committee was charged with developing and implementing procedures for water use data collection and for prior notice and consultation.

33. Categories are: public water supply, domestic self-supplied, irrigation, industrial, commercial self-supplied, mining, agriculture, thermoelectric, and hydroelectric power. Water Resources Management Committee, *Managing the Water of the Great Lakes Basin: A Report to the Governors and Premiers of the Great Lakes States and Provinces 2* (Feb. 1987).

34. *Id.* at 10.

35. *Id.*

36. Donahue, Bixby & Siebert, *supra* note 5, at 22.

37. Both Canadian provinces met all requirements prior to the charter.

38. Telephone interview with Ronald Van Till, Water Resource Analyst, Office of Water Resources, Michigan Department of Natural Resources, Lansing (Dec. 6, 1989).

Table 1. Summary of Legislative Changes for the Eight Great Lakes States

State Legislation	States															
	Illinois Before 1983	Illinois Present 1989	IND B	IND P	MI B	MI P	MN B	MN P	NY B	NY P	OH B	OH P	PA B	PA P	WI B	WI P
Legislation requiring registration of any water withdrawal from the Great Lakes $\geq$ 100,000 gpd	Yes	Yes	Y <sup>1</sup>	Y	N	N	Y	Y	N	Y <sup>2</sup>	Y	Y <sup>3</sup>	Y <sup>4</sup>	Y <sup>5</sup>	N	Y <sup>6</sup>
Legislation requiring management/regulation of water diversion $\geq$ 2 million gpd	Yes	Yes	N	N	N	N	Y	Y	N	Y	Y	Y	Y <sup>7</sup>	Y <sup>8</sup>	N	Y
Legislation requiring management/regulation of consumptive use $\geq$ 2 million gpd	No	Yes <sup>1</sup>	N	N	N	N	Y	Y	N	Y	N	Y	Y <sup>7</sup>	Y <sup>8</sup>	N	Y
Legislative language requiring notification for a water withdrawal $\geq$ 5 million gpd	No	No <sup>2</sup>	N	N	N	N	N	Y <sup>4</sup>	N	Y	N	Y	N	N	N	Y
Meets charter eligibility requirements for PNC process	No	Yes	N	N	N	N	N	Y	N	Y	N	Y	N	N	N	Y

<sup>1</sup>Change occurred under Level of Lake Michigan Act of 1984, Ill. Rev. Stat. ch. 19 para. 119.2 (Supp. 1989).  
<sup>2</sup>Legislative language requires approval of all other Great Lakes states for a diversion only. For approval, notification would be required. *Id.*  
<sup>3</sup>Since 1983 under Indiana Code § 13-2-6.1 (1987 Repl).  
<sup>4</sup>Minnesota Stat. Ann. § 105.405(4) (West Supp. 1990).  
<sup>5</sup>N.Y. Envtl. Conserv. § 1605.1 (McKinney Supp. 1989).  
<sup>6</sup>Ohio Rev. Code Ann. § 1501.32 (Page Supp. 1989).  
<sup>7</sup>Since 1939, for Public Water Supplies only.  
<sup>8</sup>Wis. Stat. Ann. § 144.026(3)(2) (West 1989).  
 B = Before 1983; P = Present (August 1989)



state legislation session. The proposal included a procedure for implementing surface water permits for Great Lakes water.<sup>39</sup> So far, Pennsylvania has not proposed any legislative action.<sup>40</sup>

Concurrently with the state administrative efforts for basin management, basin state congressmen were proposing bills to protect basin interests from interstate diversions. Although language in the bills changed to interbasin diversion, the end result was the Water Resource Development Act of 1986. The act prohibits any sized interbasin water diversion from the Great Lakes, unless such diversion is approved by each Great Lakes state governor.<sup>41</sup>

The goals and objectives of the charter and the act are different. The charter seeks to regulate all water withdrawals out of the Great Lakes within a specified size range, while the Public Law regulates diversions of any size out of the basin.<sup>42</sup> The Public Law does make the charter's non-binding principle of notification binding in the instance of diversions, but not for consumptive uses. Also, the Public Law does not apply to the Canadians nor does it establish a medium for cooperative management such as the PNC process.

In summary, two legal decisions, *Sporhase* and *El Paso*, are the decisive impetus behind the new management rules for the Great Lakes. The rulings establish guidelines for legislative management of state water resources. Of particular importance to Great Lakes management is the "even-handedness principle" which requires all interbasin diversions to be treated alike, whether intra- or interstate.<sup>43</sup> In response to the new institutional constraints, the Great Lakes Charter was developed, which creates a cooperative forum to regulate aggregate water loss out of the Great Lakes Basin resulting from large scale consumptive uses or diversions. The instrument chosen to regulate water use was state water permits.

### THE PERMIT AS A PROPERTY RIGHT

Any system of property rights for a resource will affect allocation and use of the resource. Since state water permits establish property rights,

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39. Telephone interview with James J. Hebenstreit, Assistant Director, Division of Water, Indiana Department of Natural Resources, Indianapolis (Dec. 5, 1989).

40. Telephone interview with Joseph K. Hoffman, Assistant Director, Bureau of Water Resource Management, Pennsylvania Department of Environmental Resource, Harrisburg (June 16, 1987).

41. Water Resources Development Act of 1986. Pub. L. No. 99-662, 100 Stat. 4082, (codified as amended at 42 U.S.C. §§ 1962d-20 10 Supp. V 1987).

42. The term "diversion" was not defined in the bill.

43. Although an interbasin transfer out of the Great Lakes need not be interstate, the interests of the basin states in keeping basin water in their jurisdictions to collect associated secondary benefits could reasonably lead one to expect that unanimous consent under the Public Law will be more readily granted to those interbasin transfers remaining within the riparian states than to those leaving the basin states.

they will affect water use and allocation. The holder of a permit is granted the right to use the resource in specified ways while the grantor or enforcer of the permit can:

- set a standard for environmental quality;
- suspend, modify, grant or deny a permit (access);
- establish withdrawal rates (rate of use);
- require periodic reporting;
- require metering devices and water conservation;
- require a processing fee;
- determine priority of appropriation among users; and
- specify the duration of the permit.<sup>44</sup>

A change in an existing property right system may be advocated for various reasons. Generally in resource management, a change is sought to reduce or modify an activity that generates an adverse externality.<sup>45</sup> In general, permits would limit entry and control use, thereby diminishing the production of the undesired externality. In order for permits to be effective, an acceptable environmental standard or quantity level must be established. Once this desired standard or level is defined, the discrepancy between the current and the desired standard becomes apparent and a system is designed to close or prevent any deviance from the standard. Essentially, the problem is dicotomized to: 1) specify the environmental standard, and 2) create a system to meet the standard.<sup>46</sup> A permitting system may be such a system.

Economists have long argued that setting an arbitrary standard will not result in the optimal allocation of a resource.<sup>47</sup> By association, permits that are implemented to meet some environmental standard will not result in an optimal allocation either. However, the Great Lakes states and provinces have agreed through collective action to regulate water withdrawals by requiring water permits. The usual discussion of Pareto optimality, therefore, will not be revisited. Since a permitting system has been chosen, the focus will be on finding the least-cost method of implementation.

Under traditional permit regulatory approaches, where each individual permit is reviewed and specified on an individual basis by a regulating agency, available empirical evidence suggests that the individual allo-

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44. Maxwell & Waelti, Policies and Procedures Used for Granting Irrigation Permits in Selected Upper Midwestern States 78-12. University of Minnesota Staff Paper 4 (1978).

45. Externalities involve an interdependence of utility or production functions where the utility or production of an individual resource user is influenced by a variety of activities under the individual's control and also by activities under the control of other resource users (noncompensated interdependencies). C. Howe, *Natural Resource Economics* 241-255 (1979).

46. Tietenberg, *Transferable Discharge Permits and the Control of Stationary Source Air Pollution: A Survey and Synthesis*, 56 *Land Econ.* 391, 395 (1980).

47. Baumol & Oates, *The Use of Standards and Prices for Protection of the Environment*, 1971 *Swedish J. Econ.* 42, 43.

cations are significantly more expensive than the possible minimum cost allocation.<sup>48</sup> For example, in the case of air pollution control there is no evidence that the individual emission standards set by control authorities achieve air pollution abatement goals in a least-cost manner.<sup>49</sup>

On the other hand, a transferable permitting scheme, when unrestricted trading is allowed, can achieve the least-cost implementation of an environmental standard.<sup>50</sup> A transferable permit establishes a property right for the permit holder to consume a specific amount of the permitted resource.<sup>51</sup> Once the permit is granted, it can be transferred as property. Depending on transaction restrictions, the transferable permit may be bought, sold, rented, or leased. Examples of transferable permit markets include Biological Oxygen Demand (BOD) discharge permits, taxi cab medallions, and liquor licensing.<sup>52</sup>

Assuming a competitive market for permits, unrestricted transferability results in the necessary first-order-conditions for the least cost solution of attaining a chosen environmental quality standard.<sup>53</sup> Hahn has also shown that even where perfect markets for transferable permits do not exist, lower management costs are attained than under a standard Command and Control (CAC) scheme.<sup>54</sup> Transferability also creates the incentive to conserve the use of the permitted resource as its value increases relative to other inputs. This results in a more efficient use of the resource as an input and facilitates movement of the resource to higher valued uses. As reallocation of the permits transpires, reductions in the amount of resources committed to meeting the environmental standard occur.<sup>55</sup>

Transferable permits are thus preferable over standard control permits as the transferability of the permit leads to a least-cost solution for attaining an environmental quality standard. Evolution from a standard CAC permit scheme to a transferable permit system represents a Pareto improvement (a resource savings) in the allocation of the permitted resource.<sup>56</sup>

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48. Tietenberg, *supra* note 46, at 394.

49. *Id.* at 397.

50. R. Hahn, *Economic Prescriptions for Environmental Problems: Not Exactly What the Doctor ordered* 37 (1987) (mimeograph). (Robert W. Hahn was at Council of Economic Advisers, Executive of the President, when he did the paper. It is an unpublished paper available from Hahn, Carnegie Mellon University, Pittsburgh, Pennsylvania.) McGartland & Oates, *Marketable Permits for the Preservation of Environmental Deterioration*, 12 *J. Env. Econ. & Mgmt.* 207, 208 (1986).

51. Water permits should be defined as a consumptive use, not as a withdrawal, to facilitate the determination of externalities associated with actual water loss. Johnson, Glisser & Werner, *The Definition of a Surface Water Right and Transferability*, 24 *J. Law & Econ.* 273, 274 (1981). To achieve water quality goals, discharge quality could be included in the permits.

52. Hahn, *Designing Markets in Transferable Property Rights: A Practitioners Guide*, in *Buying a Better Environment* 83, 83 (E. Joeres & M. David eds. 1983).

53. McGartland & Oates, *supra* note 50, at 208.

54. Hahn, *supra* note 50, at 29.

55. McGartland & Oates, *supra* note 50, at 208; Tietenberg, *supra* note 46, at 399.

56. McGartland & Oates, *supra* note 50, at 208.

Table 2. Charter Implementation: State Agency in Charge and Registration and Permit Withdrawal Levels

<i>States</i>	<i>Implementing Agency</i>	<i>Regulatory Instrument</i>
Illinois	Illinois Department of Transportation	Permit required for any sized diversion and for any c.u. $\geq$ 2,000,000 gpd.
Minnesota	Minnesota Department of Natural Resources	Permit for any water withdrawal $\geq$ 10,000 gpd or $\geq$ 100,000 gpy.
New York	New York Department of Environmental Conservation	Registration for any water withdrawal $\geq$ 100,000 gpd. Permit for any c.u. $\geq$ 2,000,000 gpd. and a permit for any sized water diversion
Ohio	Ohio Department of Natural Resources	Registration for any water withdrawal $\geq$ 100,000 gpd. Permit for any c.u. or diversion $\geq$ 2,000,000 gpd.
Wisconsin	Wisconsin Department of Natural Resources	Registration for any water withdrawal $\geq$ 100,000 gpd. Permit required for any c.u. or diversion $\geq$ 2,000,000 gpd.

Source: Personal interviews with State Water Policy Personnel.

c.u. = consumptive use

gpd = gallons per day

gpy = gallons per year

### THE GREAT LAKE WATER PERMITS

The selection of the permit as the regulatory instrument for Great lakes water quantity management should be no surprise. Both Minnesota and Illinois employed CAC permits for Great Lakes water prior to the Great Lakes Charter. Also, members of the regulating agencies (Department of Natural Resources, or equivalent agencies) comprise, to a great extent, the Water Resources Management Committee (WRMC) and were familiar with permits based on other responsibilities within their agencies.<sup>57</sup> The success and performance of the permit systems in regulating basin-wide water withdrawals will determine, to a large extent, whether or not the Great Lakes Charter management goals are attained. Table 2 summarizes the withdrawal levels at which permits are required in the five states with permit systems.

Permits in the five states allow each individual state to control the aggregate level of withdrawals from its state waters. If all eight riparian

57. The designation of the DNR or equivalent agencies as the regulatory agencies instead of the respective Departments of Commerce suggests a resource conservation orientation.

states implement a permit system at the specified trigger levels, then via the PNC process, the total aggregate level of withdrawals from the Great Lakes Basin could be regulated to meet both conservation and development objectives for the states. That is, the Prior Notice and Consultation (PNC) process could be used as a medium to cooperatively settle differences among states regarding water development and the desire to protect the Great Lakes Basin from "adverse impacts on lake levels, in-basin uses, and the Great Lakes Ecosystem."<sup>58</sup>

The current permits are standard CAC permits. Although Illinois permits are transferable following Illinois Department of Transportation approval, they not tradeable. All five state permit systems are somewhat different. The Wisconsin permit system is used as an example. It is employed because Wisconsin had no permitting system for surface water withdrawals prior to the charter and the promulgated permit system best represents the requirements suggested within the charter.

Wisconsin Act 60<sup>59</sup> sets forth the registration and regulation procedures for permits that are enforced by the Wisconsin Department of Natural Resources (WDNR). The act closely follows the language of the charter. The registration and permit requirements set forth in Act 60 are for surface waters state wide.

A registration of any surface water withdrawal averaging more than 100,000 gpd in any 30 day period obligates the registrar to provide: the source of withdrawal, the location of discharge, the location and nature of the water use, the actual or estimated withdrawal quantities, and the actual or estimated rates of water loss from the withdrawal.<sup>60</sup> The information provided in registration is not verified or cross-checked.<sup>61</sup>

The application for a permit is required for any consumptive use greater than 2 million gpd in any 30 day period. Documentation entails: current operating capacity of the withdrawal system; place and source of withdrawal; location of discharge; location and nature of water use; average rate of withdrawal; average rate of water loss; anticipated hydrologic effects; total estimated construction costs; a list of all other needed approvals (permits, licenses, etc.); a statement of complicity with all plans for the use, management, and protection of the state waters and related land resources; a contingency plan in case of drought or other withdrawal modifications; and a description of conservation practices.<sup>62</sup>

An applicant for a permit applies to the WDNR office, which then follows state permit approval criteria (outlined below) to determine ac-

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58. Task Force, *supra* note 3, at 6.

59. Wis. Stat. §§ 30.18-30.21, §§ 144.04-144.977 (1987-1988).

60. *Id.* § 144.026.

61. Interview with Al Shea, Water Quantity Planner, Bureau of Water Resource Management, Wisconsin Department of Natural Resources, Madison (June 8, 1987).

62. Wis. Stat. § 144.026.

ceptability. A public review process exists within the approval process and an appeal is allowed if the permit is denied. Upon approval, a permit is issued specifying the location and amount of water use. Each permit is individually reviewed and renewable on an annual basis. Externalities associated with these withdrawals that accrue outside of Wisconsin state boundaries are not considered by WDNR during the approval process. However, Wisconsin Act 60 does require WDNR to notify the office of the Governor or Premiere and any agencies responsible for management of water resources in each state and/or province in the event of a new water loss to the Great Lakes Basin averaging more than 5 million gpd in any 30 day period.<sup>63</sup> Again, the PNC process is not binding and Wisconsin has final authority over the large scale consumptive use. When determining whether or not to approve a permit, the Wisconsin Department of Natural Resources (WDNR) is not required to limit the aggregate amount of permitted water consumption or diversion nor does the WDNR have to consider total water availability in the Great Lakes relative to existing permitted withdrawals. They or any other state permit granting authority is not bound to consider externalities associated with basin water withdrawals.

The charter agreement does not set limits on the number of permits that can be issued nor on the total permissible quantity of water that is potentially issuable by each state agency. Nor do the states/provinces agree to a desired aggregate amount of water withdrawal from the Great Lakes Basin, that is, no quantity level or any other environmental standard is promulgated for the permits to enforce. Water withdrawal externalities are not recognized by the current permits nor by the permit approval mechanism. The PNC process is designed to address these issues, but it is not binding. A permit issuing state will notify and consult with other states by agreement or as legislatively required. However, given the incongruent nature of conservation and development, the predisposition of elected officials to promote their state's development, and their failure to consider externalities explicitly within the permitting system, it will be difficult to achieve conservation or prevent eventual overuse of the resource with only the PNC process.<sup>64</sup>

For example, Great Lakes water withdrawals lower lake levels which may impose costs on navigation and hydropower interests in the Great Lakes. Both interests prefer to maintain as high a range in lake levels as is technically possible. At lower lake levels, ships are unable to transport full cargo loads and hydropower plants are not able to operate at full

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63. *Id.* § 144.026(5)(b).

64. One may argue that the Public Law which requires unanimous gubernatorial approval should mitigate this problem, at least for diversions. This may be true, since the unanimity certainly increases prohibitively the political costs for a U.S. diversion. But, the law does not apply to consumptive uses, which may be small in scale but in the aggregate could be formidable.

capacity, resulting in increased unit costs in both cases. Currently, these adverse interactions (externalities) are not considered by water withdrawers, nor is it realistic for each small scale withdrawer to do so. The cumulative impacts of all withdrawals on lake levels, however, should be a concern of Great Lakes water managers. A physical limit needs to be recognized where significant economic impacts occur when additional water is withdrawn if permits are to be effective.<sup>65</sup> The charter's espoused management orientation and incorporation of the PNC process recognizes this hydrologic/economic interaction but does not attempt to specifically define it.

Another appealing aspect of the permit scheme is its potential to treat each water withdrawal from any lake within each of the states equally. If implemented, the permitting process would apply to everyone in the state desiring to consume water in excess of the established trigger levels. Also, managing the Great Lakes as a unified system dictates that appropriators filing for permits in Minnesota and in New York have equal chances for approval, that is, all other things equal, the permit approval process should be consistent across states.<sup>66</sup> Table 3 summarizes permit approval criteria for the five states that legislatively meet the PNC requirements.

The approval criteria vary widely. How the agencies will interpret "reasonable" and "consistent," for example, will vary between agency and by state law. The only criteria that is common to all five states is consistency with public health, safety, and welfare. This criteria is a direct outgrowth of the state's police power which is exercised to preclude the creation of public harm. Given the varying criteria used by states and the somewhat ambiguous language of the permits, one would not expect the permit approval process to be consistent among states. Although the discrepancies in the approval process may not be large, the differences could undermine the current ethos of cooperation. If a state suspects another of having "easy" approval criteria and, therefore, not contributing adequately to the conservation goal, it might adjust its own criteria to facilitate "easier" approval. In other words, it could foster negative expectations among states which could cause a breakdown of the permit system.

To summarize, agencies sympathetic to the management goal of conservation have been designated as implementors/administrators of the management rules in five Great Lakes states. The other three states have thus far failed to legislatively implement the charter's rules. As imple-

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65. A necessary condition for efficiency is that the value of water when diverted (or consumed) out of the lakes is equal to the value of water as a stock (in the lake).

66. This may become critical under the even-handedness principle applied with the *Sporhase* decision.

Table 3. Permit Approval Standards

The Consumptive Use or Diversion must:	States				
	ILL.	MN.	NY.	OH.	WI.
1) Be of reasonable and beneficial use.	X		X	X	
2) Incorporate reasonable conservation practices.	X		X	X	X
3) Be consistent with public health, safety and welfare of the state.	X	X	X	X	X
4) Have legislative approval by majority vote.		X <sup>1</sup>			
5) Not conflict with future water resource needs.		X			X
6) Enough available water must be in proposed area.		X		X	
7) Be consistent with State and other water management plans.		X	X	X	X
8) Not conflict with competing users.		X			
9) Not have a significant adverse impact on the environment and ecosystem of the Great Lakes.			X	X	X
10) Not adversely affect public water rights in navigable waters.			X		X

<sup>1</sup>For all c.u. and diversions  $\geq 2,000,000$  gpd except for those pertaining to domestic water supplies, irrigation and agricultural processing.

Source: Personal Interviews of State Water Policy personnel and State documents.

mented, the current permits are inadequate for internalizing externalities associated with water withdrawals in the Great Lakes. The reason lies within the promulgated institutional arrangements of the Charter, as the proposed system is not binding, and does not establish a maximum level of aggregate withdrawals. In addition, the permit criteria adopted are not completely consistent across the five states. The inconsistency may result in negative expectations and undermine cooperation. These defects can be attributed to the desire by states to retain their sovereignty in establishing permit systems and thus maintaining more flexibility for developing their state's economy.

Having recognized that the Great Lakes Basin must be managed as a unified system, water quantity managers must now entertain the idea that permits and permit approval criteria should be uniform across the basin. A uniform regulatory instrument will meet the even-handedness principle established by the *Sporhase* decision. Furthermore, any cooperative management of the Great Lakes must recognize and mitigate the externalities, hydrologic and economic, associated with water withdrawals. As economic impacts accrue at some level of continued withdrawal, tradeoffs must be recognized and managed. This implies that the hydrologic/economic lake level interaction must be well understood to assess tradeoffs



between further development (in the form of water withdrawals) and conservation of the Great Lakes' water resources. Until impacts of this interaction are better known, at least in the case of consumptive uses, conservation goals pursued within the Charter agreement will likely acquiesce to development goals pursued by individual entities who do not consider externalities. For diversions, the reverse is likely to be true, since the existing federal law is very restrictive concerning new Great Lakes diversions.

The current role of the permits is relegated to gathering information about withdrawals. If states/provinces simply desire to collect information, registration would accomplish this goal and would be more cost effective. Since lake levels were high (1980-1986), the fact that permits may not be consistent between states and do not internalize externalities was not a big concern. But the Lakes are dynamic; lake levels fluctuate. In fact, a significant drop in lake levels occurred in 1987 and 1988. The ability to regulate by permit becomes important when lake levels recede or withdrawals increase. As the regulatory role of permits increases, the shortfalls inherent in their structure will become more important. If states/provinces desire to manage the basin with respect to water withdrawals, changes in the permits need to be considered. To this end, evolution towards a transferable and divisible permit would be a positive next step.

### TRANSFERABLE PERMITS

To be effective, cooperative management rules for water withdrawals from the Great Lakes Basin need to recognize:

- the hydrologic interdependencies;
- the political, common property nature of the basin;
- the historical state/province management of water resources;
- the political significance attached to secondary benefits captured by the states/provinces from entities consuming water within their jurisdiction;
- the physical/economic interaction of the lake levels;
- the legal requirement for consistency and fairness among riparian political entities and among riparian and non-riparian users;
- the need to internalize externalities associated with water withdrawals to prevent resource degradation and misallocation of resources.

The current permitting system as implemented in Illinois, Minnesota, New York, Ohio and Wisconsin recognizes the first four of these points. A transferable, divisible permit, if structured properly could accommodate all seven points.

A transferable permit scheme for water withdrawals from the Great Lakes requires the definition of a Minimum Lake Level (MLL). The MLL

would represent the minimum desired physical hydrologic and economic lake level. Creating a MLL standard would remove the ability to continue to issue permits indefinitely since a maximum amount of water for withdrawals would be established.

The definition of a MLL must be an international decision for the Great Lakes made by the eight states and two provinces. The critical component of the MLL is the basis on which it would be defined, that is, what lake level would be used to determine how much water to allocate for withdrawals under the transferable permit system.

For lake levels above the MLL, permits would be issued for the difference between the lake level and the MLL. Once the difference is allocated, any entity desiring to withdraw water would have to buy, rent, or lease permit shares from existing permit holders. Permits would not have to be transferable within the entire basin; transferability within each lake would suffice. For example, a permit issued for Lake Superior withdrawals might be transferable only within Lake Superior.

The permit could include a priority ranking, where the priority rank could be based either on use, or time, or a combination of the two. When lake levels drop below the MLL, the consumptive use right of the permit would be proportionately reduced. The amount of reduction in the use rate for each permit would depend on a relative priority ranking of the permit and the amount that the lakes had fallen below the MLL. For example, a permit issued in 1900 might have priority over a permit issued in 1950, or a municipal use permit may have priority over an industrial use permit. As lake levels fall below the MLL, the price of the permit share would rise as the demand for the remaining water increases. As lake levels rise, the price of a permit would fall and could approach zero if the levels rose above the previous allocated difference between the lake level and the MLL.

We do not attempt to define the MLL, but the following guidelines should be considered. The decision will be hydrologic, economic, and political. The MLL should be set based on the effects of withdrawals on other activities in the basin such as navigation, hydropower, shoreline property, and the basin's ecosystem. The decision should prevent degradation and overuse, that is, it should recognize the physical limits of the Great Lakes and its ecosystem. Finally, the MLL need not be fixed indefinitely once it is established, but should be flexible and reevaluated periodically. For example, assume that the states and provinces decide that the long term average lake level is the appropriate MLL. Suppose that after a few years, the negative externalities caused by such a lake level appear to be excessive. At this point, procedures must be in place to allow a reevaluation of the MLL and to decide if and how it should be changed.

Since permits are transferable, they would have to be consistent among states, particularly the criteria for approval. Indeed, a state or province might have other states or provinces represented on the body approving the states permit, for example, the Minnesota board approving Lake Superior permits might include members from Ontario, Wisconsin, and Michigan. All states and provinces at a minimum should agree on permit approval criteria. Other permit decisions that need to be agreed upon in an international context include: 1) the basis for defining permits, 2) the procedures for allocating and exchanging permits, 3) the duration and number of permits to be issued, 4) the restrictions on exchange, and 5) the organizational arrangements for implementing the permit systems, including who monitors and enforces compliance.<sup>67</sup>

The transferable permit can meet all *Sporhase* requirements for legislative management. Interstate commerce would not be an issue as the permits allow transfers among states, and large scale transfers would be difficult or impossible to get approved once aggregate limits are established for each lake and all surplus water is under permits. States could maintain sovereignty over withdrawals by requiring approval over all exchanges. Finally, the transferable permit facilitates a least cost solution for management and allows freer movement of water resources to higher value uses than is currently the case.

### CONCLUSION

As population pressure and associated demands increase, unregulated open access resources typically suffer from over-investment, over-exploitation, and eventual degradation. To correct this situation, institutional arrangements need to be developed which facilitate either a "private" or a "public" solution. The Great Lakes provide a good example of this open access problem. Damages associated with water withdrawals from the lakes are, generally, not accounted for by those withdrawing the water.

The Great Lakes Basin is an enormous, complexly integrated, inter-jurisdictional commons. With respect to consumptive water use, the basin was essentially an open access resource prior to the promulgation of the Great Lakes Charter and the Water Resources Management Act of 1986. Changes in institutional arrangements and the *Sporhase* and *El Paso* court decisions, combined with changing socioeconomic conditions, forced state political leaders to promulgate and implement rules to manage the Great Lakes Basin with respect to water withdrawals.

Undoubtedly, the intent of political leaders from the basin states and provinces is not to manage all withdrawals but only to protect the basin

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67. Eheart, Brill & Lyon. Transferable Discharge Permits for Control of BOD: An Overview, in *Buying a Better Environment* 163 (E. Joeres & M. David eds. 1983).

against unwanted interstate diversions. However, given the constraints placed on legislative water management by the *Sporhase* and *El Paso* court decisions, management rules have to be broadened to include all withdrawals from the basin.

The Great Lakes Charter is a positive first step towards basin management. The political, common property nature of the Great Lakes is recognized within the charter. All commons' members should be involved in management decisions that significantly alter lake levels or water quality. The recognition by political leaders in the Great Lakes region that the Great Lakes are an interdependent resource implies that it should be managed as such. Management of an interdependent resource requires management rules to be applied consistently to all users to develop expectations of reciprocity and assurance concerning the actions of others. On this count, the Great Lakes Charter, as promulgated and implemented, fails.

The implementation tool, the permit, is not consistent between or among states. Approval criteria vary between states. Also, the permit system as designed does not internalize externalities; permits do not take into account lake level fluctuations. Because of the inherent goal conflicts within the charter between conservation and development, no incentive exists within the permit system or the prior notice and consultation process for a state to discontinue issuing permits.

Because the charter recommends management by environmental standard (permits to enforce some standard) without setting the standard, evolution towards a basin wide transferable permit system is recommended. Transferable permits that are uniform across the basin would force an international, collective decision regarding an environmental or lake level standard. They also would achieve the least-cost solution for management while allowing free movement of water resources to higher valued uses. The current permits are either too costly for simple data collection or inadequate for basin wide management. Finally, given the cooperative spirit that appears to exist among the states and provinces, it is time for public officials in the Great Lakes to push for a consistent system of transferable permits.