Penn State Environmental Law Review

Volume 4 | Number 1 Article 5

9-1-1994

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THE EPA'S PROPOSED WATER QUALITY GUIDANCE FOR THE GREAT LAKES SYSTEM: A UNIFORM AND STRINGENT SOLUTION

I. INTRODUCTION

The Great Lakes[1] are an important resource for the people and wildlife of North America[2] and are one of the largest surface systems of fresh water on earth.[3] The Great Lakes span over 750 miles throughout eight states, parts of the Canadian Province of Ontario and several different Native American tribal territories.[4] Because of the Great Lakes' importance and size, several state, national and international law making efforts and agreements[5] have sought to regulate the environmental aspects of the Lakes.

The latest in a long line of these efforts is the Proposed Water Quality Guidance (Guidance) for the Great Lakes System.[6] The Guidance was developed under §118(c)(2) of the Clean Water Act[7] (CWA), as amended by §101 of the Great Lakes Critical Programs Act of 1990[8] (CPA). Once finalized,[9] the Guidance will establish minimum water quality standards,[10] antidegradation policies,[11] and implementation procedures[12] for waters in the Great Lakes System. Publication of the Guidance satisfies §118(c)(7)(c) of the Clean Water Act,[13] which requires that the Environmental Protection Agency (EPA) publish information concerning the public health and environmental consequences of contaminants in the Great Lakes.

The Guidance is a different approach to regulation of the Great Lakes than what is currently provided for by other national standards. The differences most notable are set forth in section 303(c) of the Clean Water Act[14] and implementing regulations[15] which specify the manner in which the EPA and the states or tribes must review, revise and adopt water quality standards. Specifically, the Guidance differs in that it requires states or

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[1]The Great Lakes include Lakes Superior, Michigan, Huron (including Lake Saint Clair), Erie, and Ontario. The Great Lakes System includes the Saint Mary's River, Saint Clair River, Detroit River, Niagara River, and the Saint Lawrence River to the Canadian Border. There is also the term "Great Lakes Basin Ecosystem" which refers to the interacting components of air, land, water, and living organisms, including humans that live in the drainage basin. This ecosystem supports hundreds of species of aquatic life, wildlife, and plants. Proposed Water Quality Guidance for the Great Lakes System, 58 Fed. Reg. 20806 (1993) (to be codified at 40 C.F.R. §§122, 123, 131, 132 (1993)).

[2]*Id.*

[3]The Great Lakes contain approximately 20% of the world's fresh water supply and 95% of the freshwater in the United States. *Id.* at 20806.

[4]The Great Lakes System spans waters in New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, and Minnesota. These are collectively known as the "Great Lakes States." There are also several different Native American tribal territories in the Great Lakes region. *Id.* at 20806.

[5]Some of these agreements include: The Great Lakes Water Quality Agreement, Nov. 22, 1978, U.S. -Can., 30 U.S.T. §1383; The Governor's Toxics Agreement (1986); and The Great Lakes Water Quality Initiative (1989). *See* 58 Fed. Reg. 20802, 20817-20823 (1993).

[6]40 C.F.R. §132 (1993).

[7]33 U.S.C. §1251 (1987).

[8]Pub. L. 101-596, 104 Stat. 3000 (1990).

[9]The Great Lakes States still must adopt the provisions of the Guidance. 40 C.F.R. §132.3, §132.4 (1993).

[10]This includes the water quality criteria for human health, aquatic life and wildlife. *Id.* at §132.3.

[11]40 C.F.R. §131.12 (1993).

[12]40 C.F.R. §132 app. f (1993).

[13]33 U.S.C. §1251 (1987).

[14]*Id.*

[15]40 C.F.R. §132 app. f (1993).

tribes to apply specific criteria and values derived from the more strict Tier I and Tier II[16] methodologies for human health, wildlife, and aquatic life. More significantly, the application of these criteria, values, and methodologies is required regardless of existing state or tribal use designations.[17]

There is substantial justification for favoring the more restrictive approach of the Guidance over the current national policy. For example, there is wide agreement that the Great Lakes are an integrated ecosystem requiring a consistent approach to pollution control throughout the entire system.[18] The notion of a uniform regulatory system was one of the most important goals of the CPA amendments to §118 of the CWA.[19] Moreover, there is agreement that implementation of uniform water quality standards will avoid costly duplication of research and standardsetting.[20]

This comment will examine the justifications for the proposed Guidance and assess the costs and benefits of implementing the Guidance standards. There is enormous support among members of Congress[21] and the Governors of the Great Lakes States[22] that the uniform standards of the Guidance will be beneficial to the Great Lakes System. This comment endorses this view, but also addresses the limitations of the Guidance and some of the issues that the Guidance leaves undetermined.

II. THE LAW MAKING EFFORTS AND AGREEMENTS LEADING UP TO THE GUIDANCE

The Guidance, as was mentioned, is only the latest in a series of efforts focused on the environmental protection of the Great Lakes.[23] All of these efforts approach the management of the Great Lakes from the concept of an ecosystem.[24] This approach evolved from the better understanding of how environmental damage has resulted from human use of the natural resources of the Great Lakes.[25]

One of the most significant prior efforts was the Great Lakes Water Quality Agreement[26] (GLWQA). The United States and Canadian Governments both signed the GLWQA in 1972 to establish common water quality objectives for the Great Lakes System. The GLWQA was created with the idea that management of the Great Lakes by both countries

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[16]Tier I refers to traditional criteria development methodologies, to enable development of water quality criteria; Tier II refers to methodologies under which water quality values could be calculated with fewer data than the full minimum data required for a Tier I calculation. 58 Fed. Reg. 20802, 20835 (1993).

[17]*Id.* at 20838. There are also some exceptions to this requirement: States may apply more stringent numeric criteria or may apply less stringent criteria in limited circumstances.

[18]The Great Lakes Toxic Substances Control Agreement (1986). Also known as the "Governors Agreement" (as incorporated at 40 C.F.R. §132.4(d) (1993)).

[19]*See* H.R. 101-704, 101st Cong., 2d Sess. 8 (Sept. 14, 1990); S. 101-339, 101st Cong., 2d Sess. 12, 18 (June 27, 1990).

[20]The Great Lakes Toxic Substances Control Agreement (1986); 58 Fed. Reg. 20802, 20839 (1993).

[21]*Id.*

[22]*Id.* at 20839.

[23]*See supra* note 5.

[24]58 Fed. Reg. 20802, 20817 (1993).

[25]The research, monitoring, and regulatory programs of the United States and Canada illustrate the connections between the use of land, air, and water resources and the need to consider the impact of pollutants on the entire Great Lakes Basin Ecosystem. *Id.*

[26]58 Fed. Reg. 20802, 20818 (1993).

could protect the Lakes from the anticipated adverse effects of continued pollution.[27] Both countries established Great Lakes research programs, which included cooperative and separate efforts.[28] The GLWQA also provided for joint international supervision and monitoring programs, coordinated through the International Joint Commission.[29]

Another GLWQA was signed in 1978 which preserved the basic features of the 1972 Agreement.[30] However, the 1978 Agreement differed in widening the focus of controlling nutrients to also include the control of toxic substances.[31] The new Agreement also set target loadings for phosphorous in each Lake[32] and also expanded the area of focus to include the Great Lakes Basin Ecosystem.[33]

The Great Lakes Water Quality Initiative (GLWQI) of 1989 was the next effort intended to provide a forum for Great Lakes States and the EPA to develop uniform water quality criteria and implementation procedures in the System.[34] The states and the EPA used the results of this effort as a basis for revising state water quality standards.[35] Three committees were formed under the GLWQI as a means to facilitate their efforts. The committees included: A Steering Committee[36], the Technical Work Group[37], and the Public Participation Group.[38]

Next, the U.S. Congress passed the Great Lakes Critical Programs Act[39] (CPA) in 1990. In drafting this piece of legislation, Congress praised the ongoing efforts of the GLWQI to develop guidance on minimum requirements for the Great Lakes States' water quality programs.[40] The CPA was an amendment to §118 of the Clean Water Act (CWA) in an effort to improve the effectiveness of the EPA's existing programs in the Great Lakes.[41] Essentially, the CPA requires the EPA to publish a proposed water quality guidance for the

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[27]The Agreement addressed overall pollution and water deterioration in the five Great Lakes, with an emphasis on controlling excessive nutrient loadings. The chief concern was the reduction of phosphorous levels to a lower level of discharges from large municipal sewage treatment plants. Limits were also placed on industrial discharges. Other goals included the elimination of oil and other solid wastes. *Id.*

[28]The Great Lakes Water Quality Agreement (1972) (as incorporated in The Clean Water Act §118, 33 U.S.C. §125 (1987)).

[29]The International Joint Commission (IJC) was created by the Boundary Waters Treaty of 1909. The Commission is composed of six commissioners, three of which are appointed by the President of the United States and the Prime Minister of Canada. 58 Fed. Reg. 20802, 20819 (1993).

[30]The Agreement called for setting water quality objectives, improving pollution control, and continued monitoring by the IJC. Great Lakes Agreement, Nov. 22, 1978, U.S.-Can., 30 U.S.T. §1383.

[31]*Id.*

[32]*Id.*

[33]*Id. See supra* note 1.

[34]EPA's Region V started the effort. 58 Fed. Reg. 20802, 20820 (1993).

[35]The revision was required by §303(c) of the Clean Water Act, 33 U.S.C. §1251 (1987).

[36]The Steering Committee consisted of directors of water programs from EPA offices, and Great Lakes States' environmental agencies. The Committee discussed environmental policy, scientific, and technical issues and directed the work of the Technical Work Group. 58 Fed. Reg. 20802, 20820 (1993).

[37]The Technical Work Group was made up of staff from the EPA, state environmental agencies, the U.S. Fish and Wildlife Service, and the U.S. National Park Service. Their work consisted of preparing proposals for submission to the Steering Committee. *Id.*

[38]The Public Participation Group was composed of various representatives from academia, environmental groups, municipalities, and industry. The Group observed the deliberations of the other two groups and advised them of the public's concerns. The Group also reported back to their constituents regarding the GLWQI activities. *Id.*

[39]Pub. L. No. 101-596, 104 Stat. 3000 (1990).

[40]136 Cong. Rec. S. 15620, 15623 (Oct. 17, 1990) (remarks of Senator Levin).

[41]Pub. L. No. 101-596, 104 Stat. 3000 (1990). *See also* The Clean Water Act §118(c)(2), 33 U.S.C. §1251 (1987).

Great Lakes System[42] which conforms with the objectives and provisions of the GLWQA.[43] The guidance must be no less restrictive than provisions of the CWA[44] and national water quality criteria and guidance. The CPA amendments require the Great Lakes States to adopt water quality standards, antidegradation policies and implementation procedures for waters within the System which are consistent with the final guidance.[45] If a state fails to adopt consistent provisions within two years of the EPA's publication of the final guidance, then the EPA is required to promulgate any necessary requirements for those states.[46] The CPA's requirements to develop a guidance for the Great Lakes was intended to codify the ongoing efforts of the EPA and the states under the GLWQI.[47] Congress recognized that a major goal of the GLWQI was to establish minimum standards in order make the water quality controls more uniform in the Great Lakes.[48] Congress also intended that the Guidance would help to make the implementation of the GLWQA more uniform among the states.[49]

The 1990 amendments to §118 of the CWA also established requirements for other ongoing EPA programs in the Great Lakes.[50] For example, there were requirements or deadlines for research on contaminated sediments;[51] development of numerical sediment criteria;[52] and development of management plans for confined disposal facilities.[53] And finally in 1991, the GLWQI Steering Committee unanimously recommended that the EPA publish the proposed Guidance as approved by the Committee.[54] The publication was made in the Federal Register for public comment.[55] However, the agreement that the Guidance was ready for public notice did not mean that every Great Lakes state endorsed all of the specific provisions.[56] Each Great Lakes state intended to review the Guidance and submit comments during the comment period.[57]

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[42]*Id.* at §101.

[43]*Id.* at §101.

[44]58 Fed. Reg. 20802, 20823 (1993).

[45]The Critical Programs Act §101, Pub. L. No. 101-596, 104 Stat. 3000 (1990).

[46]*Id. See also* 40 C.F.R. §132.5 (1993).

[47]136 Cong. Rec. S. 15620, 15624 (Oct. 17, 1990) (remarks of Sen. Levin and Sen. Glenn).

[48]*Id.*

[49]Congress hoped to address "the topics already under discussion in the region: Minimum water quality standards for selected pollutants, antidegradation policies and implementation procedures." *Id.*

[50]The Great Lakes Critical Programs Act, Pub. L. No. 101-596, 104 Stat. 3000 (1990).

[51]*Id.*

[52]*Id.*

[53]*Id.*

[54]58 Fed. Reg. 20802, 20823 (1993).

[55]*Id.*

[56]Note that the EPA has generally used the December 6, 1991, Steering Committee proposal as the basis for the Guidance. However, the proposed rule contains a number of substantive clarifications, additions, and modifications endorsed by the GLWQI Steering Committee. *Id.*

[57]Following the close of the public comment period, the EPA intends to compile all of the comments and hold a public meeting. The purpose of the meeting is to hear different views on the written comments by the Great Lakes States, Tribes or other members of the public. *Id.*

III. THE TWO-TIERED METHODOLOGICAL APPROACH

The Guidance specifies the minimum water quality standards[58] using numerical limits on pollutants in the Great Lakes waters to protect aquatic life,[59] human health,[60] and wildlife.[61] The Guidance also requires Great Lakes States and Tribes to adopt methodologies for developing numeric water quality criteria.[62] The GLWQI Committees were concerned that traditional criteria development methodologies would not be adequate to address the wide range of pollutants in the Great Lakes System.[63] The Committees also wanted to ensure consistency among Great Lakes States as to how limited data are used to derive values for regulating discharges.[64] Finally, the Committees wanted to develop a methodology that would serve as a translator mechanism common to all states and tribes to set limits for the Great Lakes System.[65]

To address these needs, the Committees developed a two-tiered approach: Tier I and Tier II methodologies.[66] Tier I refers to traditional criteria methodologies, to enable development of water quality criteria.[67] Tier II refers to methodologies under which water quality values could be calculated with fewer data than the full minimum data required for a Tier I criterion calculation.[68] The purpose of Tier II methodologies is to provide Great Lakes States with guidance on evaluating pollutants when there is insufficient data to develop Tier I criteria.[69] The GLWQI Committees intended that a Tier II analysis would be a more conservative value to reflect the increased uncertainty surrounding a more limited database.[70] For example, for aquatic life criteria, this consideration resulted in the development of a methodology which generally produces more stringent values where there are fewer data, and less stringent values as the data base increases.[71]

The EPA believes that the additional protection that the Tier II approach will provide

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[58]40 C.F.R. §132.3, 132.4 (1993).

[59]Aquatic life includes fish, benthic organisms, and other organisms/creatures. 58 Fed. Reg. 20802, 20824 (1993).

[60]Human exposure to pollutants can result from consumption of fish, bioaccumulation in fish, consumption of water, and incidental exposure to water. *Id.*

[61]The mink, the river otter, the eagle, the belted kingfisher, and the osprey have been selected as representative mammalian and avian species for calculating the wildlife criteria. 40 C.F.R. §132 app. d (1993).

[62]The methodologies proposed by the Great Lakes Water Quality Guidance involve a two-tiered approach: Tier I and Tier II water quality values. 40 C.F.R. §132.4 app. a, c, and d (1993).

[63]In order to assure the scientific validity of criteria as protective of designated uses, criteria methodologies include minimum requirements for toxological data that may be hard to meet except for a few of the well-studied pollutants. Often, all of the toxicity data is not available for a certain pollutant even though it is known to be harmful to humans, wildlife, and aquatic life. 58 Fed. Reg. 20802, 20835 (1993).

[64]*Id.*

[65]*Id.*

[66]40 C.F.R. §132.4 (1993).

[67]The Tier I approach is less flexible than approaches previously used by the EPA under 40 C.F.R. §131 (1993), where the Great Lakes States may use the EPA's methodologies under §304(a) of the CWA, or any other scientifically defensible method. The EPA believes that the Tier I approach is in line with congressional intent to achieve more consistent water quality-based controls. 58 Fed. Reg. 20802, 20836 (1993).

[68]Tier II was in response to the fact that Tier I criteria is often costly and time consuming. *Id. See also* 40 C.F.R. §132 app. a, c, and d (1993).

[69]58 Fed. Reg. 20802, 20835 (1993).

[70]*Id.*

[71]*Id.*

is consistent with the objectives of the GLWQA.[72] For instance, Article II of the GLWQA provides that the United States and Canada will make maximum efforts to develop programs, practices, and technology necessary for a better understanding of the Great Lakes System.[73] Article II also seeks to eliminate or deduce the discharge of pollutants into the Great Lakes waters.[74] Finally, Article III provides general narrative objectives which include that the Great Lakes waters should be free from pollutants that are harmful to wildlife, humans, and animals.[75] The EPA believes the more conservative Tier II methodologies will help to achieve these goals.[76] The EPA also believes that the Tier II methodologies are consistent with Congress' goals and objectives. The legislative history of the CPA shows that Congress recognized that the Great Lakes are a unique, interconnected ecosystem that requires stricter protective standards.[77]

IV. ELEMENTS OF THE PROPOSED WATER QUALITY GUIDANCE

A. The New Water Quality Standards

The Guidance establishes water quality standards to protect three groups of living organisms.[78] First, the EPA is authorized by the CWA to develop specific criteria to protect aquatic life in the Great Lakes.[79] This requirement implements portions of the GLWQA of 1978[80] which stated that one of its main goals was to rid the Great Lakes of waste that adversely affects aquatic life.[81] The legislative history of the CWA and the text of the GLWQA also stress the common goal of more uniform numeric criteria across the Great Lakes.[82]

Current evidence documenting the effects on aquatic life, such as population declines and abnormal reproduction shows that the goals and objectives of the CWA and the GLWQA are not being met.[83] The proposed Guidance seeks to remedy this problem by improving water quality and promoting more consistent protection of aquatic life. Some of the criteria in the Guidance are more restrictive than the nationally applicable criteria that the EPA has

[72]The objectives of the Great Lakes Water Quality Agreement are incorporated in the Clean Water Act §118, 33 U.S.C. §1251 (1987).

[73]Great Lakes Water Quality Agreement, Nov. 22, 1978, U.S.-Can., 30 U.S.T. §1383.

[74]*Id.*

[75]*Id.*

[76]58 Fed. Reg. 20802, 20835-20836 (1993).

[77]136 Cong. Rec. S. 1522-23, (Oct. 17, 1990)(remarks of Sen. Kohl); S. Rep. No. 101-339, 101st Cong., 2d Sess. at 7, (June 27, 1990). Also note that the EPA believes that Congress gave the EPA discretion to regulate the Great Lake System more stringently than other waters in the United States. The reasoning is that a more stringent approach would promote a more rapid achievement of water quality. 58 Fed. Reg. 20802, 20836 (1993).

[78]The Clean Water Act §304(a)(1), codified at 33 U.S.C. §1251 (1987).

[79]*Id.* at §118(c)(2)(A).

[80]*Id.* at §118(c)(2)(A).

[81]This goal comes under the heading of "General Objectives" in the GLWQA. Also note that several of the Agreement's "Specific Objectives" are also specifically directed at the protection of aquatic life in the Great Lakes System. Great Lakes Water Quality Agreement, Nov. 22, 1978, 30 U.S.T. §1383.

[82]*See* H.R. 101-704, 101st Cong. 2d Sess. at 8 (Sept. 14, 1990); S. 101-339, 101st Cong., 2d Sess. at 12, 18 (June 27, 1990).

[83]Sixth Biennial Report on Great Lakes Water Quality, (April, 1992). *See* 58 Fed. Reg. 20802, 20849 (1993).

published under the CWA.[84] The EPA is also seeking to promote consistency by requiring Great Lakes States and Tribes to adopt specific criteria and methodologies at least as stringent as those proposed in the Guidance.[85] The EPA believes that the proposed criteria for aquatic life and the requirements for implementing them will meet the goals and objectives of the GLWQA and will be no less restrictive than national water quality criteria.[86]

Second, the Guidance proposes numeric criteria to protect human health for 20 pollutants[87] and a methodology to derive cancer and non-cancer health criteria and values for additional pollutants.[88] The human health criteria establish concentrations of chemicals which, if not exceeded, will protect individuals from the negative effects of those chemicals.[89] These effects may result from the consumption of water, fish, or other organisms.[90] For each chemical, chronic criteria are derived to reflect long-term consumption of food and water from the Great Lakes.[91]

Much like the aquatic life procedure, the human health procedure uses two-tiers of numeric values.[92] With the Tier I criteria, dose-response data are derived from human or animal studies which are associated with no observable toxic effect.[93] The studies are evaluated for both carcinogenic and non-carcinogenic effects.[94] Numeric criteria are calculated by assessing the relationship between the dose of a chemical and the potential for causing an adverse effect.[95] Appropriate exposure assumptions[96] are also factored into the analysis. The intended result of this is to yield a water concentration that is not likely to result in adverse human health effects over the course of a human lifetime.[97] The Tier II values for human health will be established for chemicals with an insufficient database to

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[84]*See* The Clean Water Act §304(a), 33 U.S.C. §1251 (1987).

[85]58 Fed. Reg. 20802, 20849 (1993).

[86]*Id. See also* The Clean Water Act §118, 33 U.S.C. §1251 (1987).

[87]The 20 chemicals chosen for criteria development were selected from the Great Lakes Water Quality Initiative group of chemicals listed in the proposed 40 C.F.R. §132, Table 6 (1993). These chemicals represent a broad cross section of the chemicals found throughout the Great Lakes System. They include: Halogenated and non-halogenated chemicals; bioaccumulative and non-bioaccumulative chemicals; and organic and inorganic compounds. Chemicals were selected to test the proposed methodology against a broad range of chemicals and to show how the criteria development process will be carried out. "Chemical selection from among the chemicals of concern was not made on the basis of health risk priorities, but more from the perspective of demonstrating the proposed methodologies' applicability to all types of chemicals." 58 Fed. Reg. 20802, 20863 (1993).

[88]*Id.* at 20824. Note that once the proposed methodologies have been finalized, the EPA may propose additional Tier I and Tier II criteria for the GLWQI chemicals or for other pollutants on a health priority basis. *Id.*at 20863.

[89]*Id.* at 20824.

[90]These effects may also result from the consumption of other aquatic organisms or even the incidental consumption of water which is related to recreational activities. *Id.*

[91]40 C.F.R. §132 app. c (1993).

[92]*Id.*

[93]With regard to Tier I cancer criteria for example, a long-term or lifetime study (usually one and a half to two years of exposure) of a rodent is a minimum requirement to determine potential carcinogenicity. This extensive database requirement has resulted in a "lack of criteria for many chemicals and a resultant case-by case determination by States in order to permit a particular chemical discharge." 58 Fed. Reg. 20802, 20871 (1993).

[94]*Id.* at 20824.

[95]*Id.* at 20824.

[96]The appropriate exposure assumptions are "based on data from the Great Lakes System for consumption of fish, bioaccumulation in fish, and consumption of water. . . . " *Id.* at 20824.

[97]58 Fed. Reg. 20802, 20824 (1993).

meet Tier I requirements.[98] Tier II values may be established for carcinogenic and non-carcinogenic endpoints depending upon the adequacy of data.[99]

The third and final area of concern for water quality standards focuses on the protection of wildlife.[100] The Guidance establishes numeric criteria for four pollutants[101] and a methodology to derive criteria and values for additional pollutants.[102] The wildlife criteria are derived to establish concentrations of chemicals which, if not exceeded, will protect mammals and birds from the adverse effects of the chemicals.[103] Wildlife exposure to these chemicals comes through consumption of food or water from the Great Lakes.[104] The wildlife criteria are described as the "highest calculated aqueous concentrations of substances which cause no significant reduction in growth, reproduction, viability or usefulness of a population of exposed animals that use Great Lakes Systems waters for food or drinking over several generations."[105] For most of the chemicals, "piscivorous wildlife species"[106] have been identified as most at risk within the Great Lakes System.[107] The representative mammalian and avian species for calculating these criteria include the river otter, the mink, the eagle, belted kingfisher and osprey.[108] The chemicals are subjected to chronic criteria because the adverse effects to wildlife normally take a long period of time to register.[109] The effects only show up after prolonged periods of exposure or consumption of contaminated food or water.[110]

Much like the aquatic and human health procedures mentioned earlier, the wildlife procedures result in the same type of two-tiered protection.[111] Tier I criteria are based on dose response data from birds and mammals.[112] Field studies or laboratory studies are the sources of the data compiled.[113] Tier II values may be based on data from a single toxonomic class, and may come from laboratory studies of more limited scope for mammals.[114] For birds, studies must meet the same requirements as for Tier I.[115]

The EPA believes that establishing wildlife criteria procedures within the Guidance is

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[98]40 C.F.R. §132 app. c (1993).

[99]*Id.*

[100]40 C.F.R. §132 app. d (1993). Also note that "Wildlife" is defined as "species in both Taxonomic Classes, Aves and mammalia (birds and mammals)." 58 Fed. Reg. 20802, 20877 (1993).

[101]The four pollutants are mercury (including Methylmercury); Polychlorinated biphenyls (PCBs), 2, 3, 7, 8-Tetracholorodibenzo-p-dioxin (TCDD), p,p'-dichloro-diphenyltrichloroethane (DDT); and metabolites. 58 Fed. Reg. 20802, 20883 (1993).

[102]The EPA is proposing the same two-tiered approach, hereinafter referred to as Tiers I and II. 40 C.F.R. §132 app. d (1993).

[103]58 Fed. Reg. 20802, 20824 (1993).

[104]*Id.*

[105]*Id.*

[106]Piscivorous species essentially feed on fish. 58 Fed. Reg. 20802, 20824 (1993).

[107]*Id.*

[108]These representative species were selected based on an analysis of body size and foraging behavior for wildlife in the Great Lakes System. The analysis focused on species which are likely to experience significant exposure to contaminants through the aquatic food web. *Id.*

[109]40 C.F.R. §132 app. d (1993).

[110]*Id.*

[111]*Id.*

[112]58 Fed. Reg. 20802, 20824 (1993); 40 C.F.R. §132 app. d (1993).

[113]*Id.*

[114]*Id.*

[115]*Id.*

a significant feature of the proposal[116] because previously, a separate wildlife criteria did not exist at the national level.[117] The criteria proposed for wildlife however, consists of only four numeric criteria.[118] One reason is that field studies from the Great Lakes show that the four pollutants for which wildlife criteria are proposed have had the most serious impacts on wildlife.[119] Another reason is that the proposed criteria are the first set of wildlife criteria ever developed by the EPA.[120] The EPA cannot take advantage of an established and reviewed national methodology to develop wildlife criteria as it can for human health and aquatic life.[121] There is also evidence suggesting that the GLWQI Committees lacked the time and resources to develop additional wildlife criteria.[122]

B. Bioaccumulation Factors

The Guidance also differs dramatically from the current national guidance by using "bioaccumulation factors" to determine criteria for human health and wildlife.[123] These factors are used to estimate the intake of chemicals through the consumption of fish by wildlife and humans.[124] The use of these factors is in response to the tendency of organisms

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[116]The addition of wildlife criteria is significant because there are contaminents which are almost undetectable in lake water that may be magnified "hundreds of thousands" of times within the flesh of fish and magnified even further in a bird or mammal that consumes the fish. With this in mind, the EPA reasoned further:

> Because wildlife species are at the top of the food web, current criteria derived to protect fish, which live in the water, may be inadequate to protect high-level wildlife consumers of contaminated fish. Wildlife are especially at risk from chemicals which biomagnify because they are frequently exposed to very high levels of contaminents since they reside at the apices of aquatic food webs.

58 Fed. Reg. 20802, 20878 (1993).

[117]*Id.* at 20824-20825.

[118]*See supra* note 107.

[119]58 Fed. Reg. 20802, 20824-20825 (1993).

[120]*Id.*

[121]*Id.*

[122]The proposed Guidance relating to wildlife criteria was developed as part of the GLWQI. The Technical Work Group and the Steering Committee looked to the State of Wisconsin for deriving criteria to protect wildlife. The procedure proposed by the Wisconsin Department of Natural Resources was modified through discussions and eventually modified and approved by the EPA. The Federal Register described the procedure used by Wisconsin:

> In developing the methodology for deriving wildlife criteria for the GLWQI, the Wisconsin Department of Natural Resources, Bureau of Water Resources Management, obtained scientific guidance from participants in a one-day workshop held in Madison, Wisconsin, November 8, 1990.

58 Fed. Reg. 20802, 20878 (1993).

[123]A bioaccummulation factor (BAF) is the "ratio (in L/kg) of the substance's concentration in tissue of aquatic organisms resulting from bioaccumulation, versus its concetration in ambient water." 40 C.F.R. §132.2 (1993). The proposed Guidance establishes that bioaccumulation factors (BAFs) are derived in three different ways:

> A. A measured BAF based on a field study, especially if the field study was conducted on the Great Lakes with fish at or near the top of the aquatic food chain.
>
> B. A predicted BAF that is the product of a measured steady-state bioconcentration factor (BCF) from a laboratory study and a food chain multiplier (FCM).
>
> C. A predicted BAF for organic chemicals which is the product of a log Kow and a FCM, where log means logarithm to the base 10.

40 C.F.R. §132 app. b (1993).

[124]Also note that BAFs for chemicals should be "calculated by as many as of the three methods as available data allow for comparative purposes. The BAF selected is based on the stated preferences unless there is a valid reason for selecting an alternative BAF. *Id.*

to accumulate certain chemicals in their tissues many times greater than the concentration of certain chemicals in the water body.[125]

With certain chemicals,[126] this tendency to bioaccumulate becomes intensified with every level of the food chain through which the chemical passes.[127] Strict criteria for those chemicals which have the tendency to bioaccumulate are required to protect organisms at every level of the food chain.[128] Bioaccumulation factors are for the most part higher than the bioconcentration factors currently used by the Great Lakes States and the EPA in deriving water quality criteria for human health.[129] The reason for the disparity is that bioconcentration accounts only for uptake by aquatic organisms from water alone, while bioaccumulation factors account for accumulation through the food chain.[130] There are different bioaccumulation factors used in determining human health criteria and wildlife criteria due to the type and form of food eaten by wildlife.[131] Typically, wildlife eats whole body food whereas people may eat muscle tissue alone.[132] Several of the dangerous chemicals tend to bioaccumulate more in fat than in other tissues.[133] Thus, the bioaccumulation factor used in calculating human health is often lower than the one used to calculate wildlife criteria.[134] Another consideration is that there are significant differences in the types of species consumed by wildlife when compared with those consumed by humans.[135] These differences justify the varying bioaccumulation factors applied to the two groups.[136]

C. Antidegradation Policy

The antidegradation policy is another broad consideration addressed by the proposed Guidance.[137] This policy is intended to protect and maintain existing water quality.[138] The idea was first developed by the Department of Interior in 1968[139] and also exists in the

[125]58 Fed. Reg. 20802, 20858 (1993). The Guidance also uses BAFs to identify chemicals of greatest concern within the Great Lakes Basin. Chemicals identified as bioaccumulative chemicals of concern (BCCs) are those for which extra controls are specified in the antidegradation procedures. 40 C.F.R. §132 app. e (1993).

[126]*Id.*

[127]This is true even if the exposure concentration in the environment is too low to affect the lowest level organisms. *Id.*

[128]*Id.*

[129]A steady-state bioconcentration factor (BCF) is the uptake and retension of a substance by an aquatic organism from the surrounding water only. This uptake occurs through the gill membranes or other external body surfaces. Laboratory measured BCFs are the result of laboratory experiments using aquatic organisms. 40 C.F.R. §132 app. b (1993).

[130]58 Fed. Reg. 20802, 20825 (1993).

[131]*Id.*

[132]*Id.*

[133]58 Fed. Reg. 20802, 20825 (1993).

[134]*Id.*

[135]*Id.*

[136]*Id.*

[137]40 C.F.R. §132.12 app. e (1993).

[138]58 Fed. Reg. 20802, 20885 (1993).

[139]Secretary of the Interior Udall defined antidegradation policy when he said that each state was to include a statement similar to the following in their water quality standards:

> Waters whose existing quality is better than the established standards as of the date on which such standards became effective will be maintained at their existing high quality. These and other waters of a State will not be lowered in water quality unless and until it has been affirmatively demonstrated to the State Water pollution control agency and the Department of the Interior that such change is justifiable as a result of necessary economic or social development. . . .

Id.

CWA.[140] However, a specific national implementation of an antidegradation policy has never been developed, resulting in several different state approaches.[141] The Guidance approach is intended to ensure that all of the Great Lakes States and Tribes carry out a consistent policy.[142]

Antidegradation provides three different levels of protection, depending on the water quality of the lake.[143] First, for all water bodies, water quality cannot be degraded below the level protecting existing uses, which are defined as any uses that a water body has supported since 1975.[144] For example, if a fishery has been supported at any time since 1975,[145] no chemical can be discharged at a level that would impact the water quality need for a fishery, even if allowing the discharge would be socially and economically advantageous to the community.[146] Second, if the water body is not an Outstanding National Resource Water,[147] but the water quality is better than the quality needed for fishable or swimmable uses for any given chemical, then significant increased loadings are allowed.[148] However, the loadings are allowed only if the state or tribe determines that it is necessary for important social and economic development in the area where the increase is proposed.[149] The Guidance specifies how a state or tribe will determine when a proposed action will result in a lowering of water quality, whether it is necessary for that action to significantly lower water quality, and how the socio-economic significance of such an action will be evaluated.[150] Third, the Guidance provides that if a Great Lakes State or Tribe has designated a water body as an Outstanding National Resource Water, then no permanent degradation is allowed under any circumstances.[151]

D. Implementation Procedures

The final major element of the proposed Guidance establishes procedures to convert water quality criteria and values into specific controls on sources of pollutants in the Great

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[140]The 1987 Water Quality Act Amendments to the Clean Water Act §303(d)(4)(B), 33 U.S. C. §1251 (1987) explicity incorporate reference to antidegradation policies.

[141]58 Fed. Reg. 20802, 20825 (1993).

[142]*Id.*

[143]40 C.F.R. §132.12 app. e (1993).

[144]*Id.*

[145]For this example, it does not matter whether the fishery is still in existence. 58 Fed. Reg. 20802, 20825 (1993).

[146]*Id.*

[147]Outstanding National Resource Waters (ONRWs) are defined by the Guidance as:

> [T]hose designated as such by the States. The State ONRW designation shall describe the quality of such waters to serve as a benchmark of the water quality that shall be maintained and protected. Categories of waters which are eligible for designation include but are not limited to the following five categories, which are waters recognized as:
> -Important because of protection through official action, such as Federal or State law, Presidential or Secretarial action, international treaty, or interstate compact;
> -Having exceptional recreational significance;
> -Having other special environmental, recreational, or ecological attributes; or
> -Waters whose designation as ONRW is reasonably necessary for the protection of waters identified in above.

40 C.F.R. §132.12 app. e (1993).

[148]58 Fed. Reg. 20802, 20825 (1993).

[149]*Id.*

[150]*Id.*

[151]40 C.F.R. §132.12 app. e (1993).

Lakes.[152] Currently, there are several different procedures to implement state water quality criteria.[153] One of the most important goals of the 1990 amendments to §118 of the CWA, was the establishment of a more uniform level of control of water pollution by the Great Lakes States and Tribes.[154] The EPA believes that consistent procedures to translate water quality criteria into specific controls on pollutant sources are essential to this goal.[155]

The Guidance specifies the minimum requirements for procedures to implement water quality criteria in the following areas: 1) Site specific modifications to criteria/ values;[156] 2) variances from water quality standards;[157] 3) total maximum daily load/wasteload allocation procedures/mixing zones for point sources;[158] 4) additivity;[159] 5) reasonable potential to exceed numeric water quality standards;[160] 6) whole effluent toxicity requirements;[161] 7) loading limits;[162] 8) water quality-based effluent limitations below the levels of detection;[163] and 9) compliance schedules.[164]

V. THE BENEFITS AND PROBLEM AREAS OF THE PROPOSED GUIDANCE

As comprehensive and exhaustive as the Proposed Guidance is, there are some unresolved issues that the Guidance does not specifically address. For instance, there are several other regulatory programs currently being implemented addressing water quality standards in the Great Lakes System.[165] Clearly, when there are other procedures addressing the same issues, the potential for conflict arises. The EPA acknowledges the potential for confusion[166] but nothing included in the Proposed Guidance reconciles these inevitable problems. Perhaps a supplementary document should be affixed to the Guidance reconciling the many existing state and federal procedures in an effort to alleviate confusion and

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[152]These procedures are generally referred to as "Implementation Procedures." 40 C.F.R. §132 app. f (1993).

[153]These state water quality standards are authorized under The Clean Water Act §402, 33 U.S.C. §1251 (1987).

[154]This theme appears in both the House and Senate Committee reports. *See* H.R. 101-704, 101st Cong., 2d Sess. at 8 (Sept. 14, 1990); S. 101-339, 101st Cong., 2d Sess. at 12, 18 (June 27, 1990).

[155]58 Fed. Reg. 20802, 20839 (1993).

[156]Criteria or values may be modified on a site-specific basis to reflect local environmental conditions as restricted by the specific provisions of the Guidance. Any such modifications must be protective of designated uses and aquatic life, wildlife and human health, and submitted to EPA for approval/disapproval. Any less stringent criteria must be based on sound scientific rationale. 40 C.F.R. §132 app. f (1993).

[157]The Great Lakes States or Tribes may adopt water quality standards (WQS) variance procedures and may grant WQS variances for point sources in compliance with such procedures. *Id.*

[158]These conditions are subject to the exceptions listed in 40 C.F.R. §132.4 (1993).

[159]If a permitting authority determines that a pollutant is or may be discharged into the Great Lakes System at a level which will cause or contribute to an excursion above any tier I criterion or Tier II value, the authority shall incorporate a water quality-based effluent limitation for the discharge of that pollutant. *Id.*

[160]The procedures for this are listed at 58 Fed. Reg. 20802, 21041 (1993); 40 C.F.R. §132, app. f (1993).

[161]The procedures for this are listed at 58 Fed. Reg. 20802, 21042-21043 (1993); 40 C.F.R. §132 app. f (1993).

[162]58 Fed. Reg. 20802, 21044 (1993).

[163]When a water quality-based effluent limitation for a pollutant is determined to be less than the minimum level of the most sensitive analytical technique specified in or approved under 40 C.F.R. §136 (1993), the permitting authority shall regulate the source of the pollutant. The procedure is outlined at 58 Fed. Reg. 20802, 21044 (1993).

[164]*Id.*

[165]These programs include: The Great Lakes Five Year Strategy, the Great Lakes Pollution Prevention Action Plan, Lakewide Management Plans, Remedial Action Plans, Contaminated Sediments, Atmospheric Deposition, Storm Water, Combined Sewer Overflows, Discharges of Oil and Hazardous Polluting Substances, Nonpoint Sources of Pollution, Great Lakes Fish Advisories, Environmental Monitoring and Data management Programs for the Great Lakes and Great Lakes Toxic Reductions Initiative Multi-media Management Committee. *See* 58 Fed. Reg. 20802, 20826-20832 (1993).

[166]*Id.* at 20826.

litigation. One of the main goals of the Guidance is uniformity in an effort to reduce confusion and inconsistency among the States. Because of this, the EPA should be especially conscious of the problem that more confusion may result unless the roles of these remaining procedures are not addressed.

Another problem is the extent to which the Great Lakes States must adopt the Guidance.[167] The EPA strongly encourages verbatim adoption in an effort to ensure uniformity of the provisions and their implementation.[168] However, the states will undoubtedly not agree completely with all of the provisions and may wish to supplement or modify the Guidance. Upon closer examination, the Guidance does not appear to require verbatim adoption as long as the state or tribe can show that any such modification will not be less restrictive than the final guidance. What is "less restrictive" may prove to be problematical unless the EPA specifically clarifies the acceptable range of state modifications.

Third, the Guidance excludes several pollutants from the application of the criteria development methodologies for different reasons.[169] The EPA or a state may want to consider inclusion of these pollutants in the future. Anticipating this possibility, the Guidance should specify minimum requirements for the use of any of these excluded pollutants. This would assist and encourage any state that wishes to enact regulations that are more restrictive than the Guidance. Moreover, the EPA should adopt procedures to review any submissions by states or tribes to use any of the excluded pollutants. Such procedures would give the states or tribes the ability to incorporate their modifications on this issue or any other issue that differs from the final Guidance.

Overall, these problems are seemingly minor in view of the breadth of the Guidance's reach and scope. On the whole, the Proposed Guidance appears to be a logical solution to the problem of regulating the unique and vital Great Lakes System. The Guidance recognizes that the Great Lakes are an interconnected ecosystem.[170] Because of this makeup, a uniform regulatory procedure is greatly needed to replace the patchwork of state and tribal procedures.[171] Uniform water quality standards also should avoid the "costly duplication of research and standardsetting."[172]

The "new," more conservative Tier II analysis also appears to be a sound procedure in light of the growing uncertainty surrounding a more limited database.[173] The more stringent

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[167]The Clean Water Act §118(c)(2)(C), 33 U.S.C. §1251 (1987) requires the Great Lakes States and Tribes to adopt water quality standards, antidegradation policies, and implementation procedures which are "consistent with" the final Guidance.

[168]58 Fed. Reg. 20802, 20847 (1993). *See also* 40 C.F.R. §132.5(e) (1993).

[169]The excluded pollutants are listed in Table 5 to Appendix F of 40 C.F.R. §132 (1993). They include: Alkalinity, ammonia, bacteria, biochemical oxygen demand (BOD), chlorine, color, dissolved oxygen, dissolved solids, , hydrogen sulfide, pH, phosphorous, salinity, sulfide, temperature, total and suspended solids, and turbidity.

These pollutants are excluded because the states and the EPA have had years of experience controlling these pollutants. Also, all of the Great Lakes States have adopted, and the EPA has approved numeric water quality criteria for these pollutants. *Id.* at 20843.

[170]40 C.F.R. §132.1 (1993).

[171]Prior to the CPA amendments, there was no uniform water quality standard which could apply to the Great Lakes System as a whole. *See,* 58 Fed. Reg. 20802, 20817-20823 (1993).

[172]These concerns were expressed by the Great Lakes States Governors in the Great Lakes Toxic Substances Control Agreement. 40 C.F.R. §132.4(d) (1993) implements the principles of the "Governor's Agreement."

[173]*See infra* note 16.

standards of the Tier II analysis are an appropriate response to the unique nature of the Great Lakes. Congress believed that such an interconnected ecosystem might require unusual measures to protect.[174] Thus, the strict Tier II methodologies were established. The more stringent approach would also promote a quicker achievement of higher water quality.[175] The Governors of the Great Lakes States agreed that such a goal will "sustain water supply systems and commercial, manufacturing and recreation industries, while creating new economic development opportunities."[176]

Finally, cost issues related to the implementation of the Guidance need to be addressed. Clearly, complying with the Guidance will take a financial toll on the Great Lakes States, Municipalities and Tribes. The EPA anticipates that such costs could come in the form of construction of treatment facilities and process changes, including pollution prevention and waste reduction programs.[177] Costs will also affect industries that will be required to expand their own pollution controls, train workers and make changes in the physical plant.[178] Monitoring programs will be another cost to both industries and regulatory agencies.[179]

The EPA studied the cost effects on various municipalities and industries in the Great Lakes System.[180] After careful review, the EPA determined that the largest cost impact would fall on "major direct dischargers."[181] There may not be a convenient method for determining the costs that will be incurred by both major and minor dischargers, although the Guidance does provide for a cost-effectiveness analysis.[182] Accepting this limitation, it is difficult to properly assess whether or not the benefits of uniform water quality standards outweigh a purely speculative cost. However, in light of the political implications of the Guidance, it is significant that pursuant to the Governor's Toxics Agreement,[183] the Governors of the Great Lakes States fully recognize the need for a uniform guidance. Presumably, in order to reach this conclusion, the governors had to weigh the anticipated costs of implementing such a guidance. Deference to the governors' judgment seems reasonable if we assume that each governor acts selfishly for the interests of his or her state. If this is true, it is reasonable to assume that the speculative costs are outweighed by the sweeping benefits that the Guidance can offer. Remembering of course, that implementation of the Guidance should result in a significant cost savings from the elimination of duplicative research and application procedures of all the Great Lakes States.

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[174]The legislative history of the CPA amendments to the Clean Water Act support this assertion. *See* 136 Cong. Rec. S. 15622-23, Oct. 17, 1990 (remarks of Sen. Kohl); S. Rep. No. 101-339, 101st Cong., 2d Sess. at 7, (June 27, 1990).

[175]58 Fed. Reg. 20802, 20836 (1993).

[176]The "Governor's Agreement of 1986" made this assertion which has been incorporated in 40 C.F.R. §132.4(d) (1993).

[177]58 Fed. Reg. 20802, 20982 (1993).

[178]*Id.*

[179]*Id.*

[180]*Id.*

[181]The EPA defines major municipal dischargers as those that serve over 20,000 persons and have flows in excess of 1,000,000 gallons per day; there are 316 major dischargers in the Great Lakes System. 58 Fed. Reg. 20802, 20982 (1993).

[182]*Id.* at 20994.

[183]"The Governor's Agreement of 1986" is incorporated at 40 C.F.R. §132.4(d) (1993).

VI. CONCLUSION

The Proposed Water Quality Guidance for the Great Lakes System represents a much needed regulatory tool in order to control the System's pollutants on a more uniform level. The Great Lakes are a unique resource whose protection and maintenance is essential to the viability of the Great Lakes States and Tribes, the entire United States and Canada. The urgency and importance of this protection is warranted by the strict standards and Tier II methodology of the Guidance. The Guidance also seeks to take a much more comprehensive approach to pollution measurement and control. This is reflected in the use of bioaccumulation factors and a uniform antidegradation policy. Additionally, the Guidance addresses for the first time, the adverse effects that pollution in the Great Lakes can have on wildlife.

State compliance with the Guidance may be confusing and conflicting in light of other current regulatory procedures. Plus, the ultimate costs to be borne by the states, tribes, municipalities and industries remain speculative. However, in line with the Great Lakes State Governors endorsement and a resounding approval by Congress, the benefits of uniformity, more stringent controls and more comprehensive procedures outweigh the problems and costs.

John Knox

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