BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	
EFFLUENT LIMITATIONS FOR THE	)	R08-9
CHICAGO AREA WATERWAY SYSTEM	)	(Rulemaking – Water)
AND THE LOWER DES PLAINES RIVER:	)	
PROPOSED AMENDMENTS TO 35 III.	)	Subdocket B
Adm. Code Parts 301, 302, 303 and 304	)	

NOTICE OF FILING

TO: See Attached Service List

PLEASE TAKE NOTICE that on the 3rd day of January, 2011, I filed with the Office of the Clerk of the Illinois Pollution Control Board the attached Comments in Support of Proposed Water Quality Criteria to Protect Existing Recreational Uses of the Chicago Area Waterway System and the Lower Des Plaines River, a copy of which is hereby served upon you.

Respectfully submitted,

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PROPOSED AMENDMENTS TO 35 III.	)	(Subdocket B)
Adm. Code Parts 301, 302, 303 and 304	)	

THE PEOPLE OF THE STATE OF ILLINOIS' COMMENTS IN SUPPORT OF PROPOSED WATER QUALITY CRITERIA TO PROTECT EXISTING RECREATIONAL USES OF THE CHICAGO AREA WATERWAY SYSTEM AND THE LOWER DES PLAINES RIVER

The People of the State of Illinois ("the People"), by and through Illinois Attorney General Lisa Madigan, submit these comments in support of the water quality criteria proposed by the Illinois Environmental Protection Agency ("IEPA") to protect recreational uses of the Chicago Area Waterway System ("CAWS") and Lower Des Plaines River ("LDPR"). As the Board found in its August 5, 2010 Opinion and Order in Subdocket A, the evidence presented in this proceeding is "overwhelming" that these waterways are currently used by the public for incidental contact recreation. (See 8/5/10 Order at 83.) It is long-overdue that the State of Illinois require disinfection for the hundreds of millions of gallons of sewage wastewater effluent discharged into these waterways each and every day, in order to protect the public health and welfare. Accordingly, the People respectfully request that the Board adopt the technology-based effluent disinfection requirement proposed by IEPA in this proceeding.

I. THE CLEAN WATER ACT REQUIRES THIS BOARD TO ADOPT ALL WATER QUALITY CRITERIA NECESSARY TO PROTECT EXISTING RECREATIONAL USES OF THE CAWS AND LDPR

Pursuant to Section 303 of the Clean Water Act, States must adopt "water quality standards" consisting of both "designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." 33 U.S.C. § 1313(c)(2)(A). "Such standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of [the Clean Water Act]." *Id.* Under the Clean Water Act and implementing regulations, State water quality standards are supposed to be reviewed and, as appropriate, modified, at least once every three years. 33 U.S.C. § 1313(c)(1); 40 C.F.R. § 131.20. After a State has designated the uses of a waterway, it then must adopt water quality criteria sufficient to protect those uses. *See* 40 C.F.R. § 131.11. Specifically, the water quality criteria must "contain sufficient parameters or constituents to protect the designated use." 40 C.F.R. § 131.11(a)(1). For waters with multiple use designations, the selected criteria must support the most sensitive use. *Id.*

Under the Illinois Environmental Protection Act, the Board has been given the responsibility of adopting the water quality standards required by the Clean Water Act for the State of Illinois. *See* 415 ILCS 5/5(c) (2010). This rulemaking proceeding represents a comprehensive reexamination of the designated uses and necessary water quality criteria for the CAWS and the LDPR—and it is the first such reexamination in decades. (Sulski 12/21/07 Prefiled Test. at 4.)

On March 18, 2010, the Board severed this rulemaking proceeding into four subdockets. (*See* 3/18/10 Order at 18.) In Subdocket A, the Board has considered the recreational uses of the CAWS and the LDPR, and has proposed for first notice publication rules that designate portions

of the waterways for incidental and non-contact recreation. (*See* 8/5/10 Order at 82-83.) Now, pursuant to the Clean Water Act and federal regulations, the Board must consider what water quality criteria are necessary to protect the public's recreational uses of the CAWS and LDPR.

II. THE PARTIES HAVE PRESENTED CLEAR EVIDENCE THAT THE DISINFECTION OF SEWAGE WASTEWATER EFFLUENT IS NECESSARY TO PROTECT PUBLIC HEALTH AND WELFARE

The criterion proposed by IEPA to protect the existing recreational uses of the CAWS and LDPR is a simple one: effluents discharged to those portions of the waterways that are used for recreation shall not exceed 400 fecal coliforms per 100 ml during the recreational season. (IEPA Statement of Reasons at 92.) This bacterial limit is the same one that is generally applicable to waters of the State designated for General Use. *See* 35 Ill. Adm. Code 304.121(a). The purpose of this technology-based standard is to ensure that disinfection equipment is installed and working properly. (*See* IEPA Statement of Reasons at 92.) In other words, IEPA's proposed criterion simply requires that effluents discharged into the CAWS and LDPR—including, most prominently, the billions of gallons of sewage wastewater effluent that are discharged each year by the Metropolitan Water Reclamation District of Greater Chicago ("MWRDGC") at its North Side, Stickney, and Calumet Water Reclamation plants, and that dominate the CAWS (*see id.* at 17-18, 101-02)—should be disinfected at the times and places in which the public uses those waterways for recreation. During this rulemaking proceeding, the Board has heard ample evidence that this practice is necessary to protect the public health and welfare of the State's residents.

A. There is Overwhelming Evidence That Pathogens Associated with Non-disinfected Sewage Wastewater Effluent Cause Illness in Exposed Individuals

Like IEPA's proposed criterion itself, the basis for the criterion is, ultimately, also quite simple: the pathogens contained in non-disinfected sewage wastewater effluent cause illness to exposed individuals. As witnesses in this proceeding have testified, this proposition is a cornerstone

of modern public health science. (*See* Gorelick 8/4/08 Prefiled Test. at 3 ("It has been well-understood for over a century that pathogens (disease-causing organisms) contained in human sewage can cause illness in humans, sometimes severe and fatal."); Yates 8/4/08 Prefiled Test. at 9 ("Effluents from [wastewater treatment plants] treating human sewage can potentially contain more than 100 different types of waterborne pathogens that can cause illness in humans. These pathogens can include bacteria, viruses, and parasites.") (also including a list of prevalent human pathogens that are associated with fecal material, and the diseases with which they are associated); Orris 8/4/08 Prefiled Test. at 1("It has long been established that waterborne pathogens associated with sewage are hazardous to public health. Perhaps no other area of medicine has been as well established for as long.")). Even Dr. Samuel Dorevitch, M.D., M.P.H., testifying on behalf of the MWRDGC, agreed with the proposition that "greater ingestion of [waterborne] pathogens from recreating increases the risk of illness." (10/19/10 Hearing Trans. at 171.)

Because of the threat that it poses to human health, the bacteria associated with sewage wastewater effluent has long been a subject of regulation in Clean Water Act water quality standards, both in Illinois and nationally. Indeed, Illinois has in the past required disinfection of the effluent discharged from the MWRDGC's North Side, Stickney, and Calumet plants; the impetus for the requirement's discontinuation three decades ago was the environmentally harmful effects of chlorination and the fact that, at the time, chlorination was considered "a *de facto* synonym for disinfection" in the absence of other disinfection alternatives. *See In the Matter of Amendments to Subtitle C: Water Pollution, Fecal Coliform and Seasonal Disinfection*, PCB R85-29, 1986 WL 720532, *6 (November 6, 1986). In the intervening years, not only have alternative disinfection methods, such as ultraviolet ("UV") radiation and ozonation, become widely accepted and implemented, but, also, the recreational use of the CAWS has increased

dramatically. (IEPA Statement of Reasons at 98; *The Chicago Health, Environmental Exposure, and Recreation Study (CHEERS) Supplement* (PC # 556) (December 6, 2010) ("CHEERS Supplement"), at ES-1 ("In recent decades, with improvements in CAWS water quality, recreation on the CAWS has become popular.").) These two developments alone justify a return to the past practice of disinfection.

Nationally, the United States Environmental Protection Agency ("U.S. EPA") has published recommended water quality criteria to protect individuals from illness-causing organisms in recreational waters. (*See* IEPA Statement of Reasons at 42-44 and Attachment Q (*Ambient Water Quality for Bacteria – 1986*, U.S. EPA Office of Water (EPA440/5-84-002) (January 1986)). In a separate 2004 document, U.S. EPA described its 1986 recommended water quality criteria for bacteria as follows:

> This document contains EPA's current recommended water quality criteria for bacteria to protect people from gastrointestinal illness in recreational waters, i.e., waters designated for primary contact recreation or similar full body contact uses. States and Territories typically define primary contact recreation to encompass recreational activities that could be expected to result in the ingestion of, or immersion in, water, such as swimming, water skiing, surfing, ***kayaking, or any other recreational activity where ingestion of, or immersion in, the water is likely.***

Water Quality Standards for Coastal and Great Lakes Recreation Waters, 69 Fed. Reg. 67218, 67220 (November 16, 2004) (emphasis added). As has been noted in this proceeding, U.S. EPA is in the process of developing new recommended criteria for bacteria, with completion projected by October, 2012. (*See* IEPA Statement of Reasons at 42-44; Envt'l Groups 2/3/10 Mtn to Sever at 2-3, n.1.) In light of this ongoing process, IEPA has declined at this time to propose a numeric recreational-based bacterial limit. (*See* IEPA Statement of Reasons at 45.)

As a point of reference, though, it may be noted that U.S. EPA's 1986 recommended standards provide for an *enterococci* geometric mean indicator density criteria of 33 colony-forming units ("CFU") per 100 ml—which USEPA estimated would correlate to an acceptable gastrointestinal illness rate of 0.8% in swimmers exposed in freshwater. (See IEPA Statement of Reasons, Attachment Q (*Ambient Water Quality for Bacteria – 1986*, at 15.) For waters used for "infrequently used full body contact recreation," the recommended standards propose a single sample maximum allowable density of 151 CFU per 100 ml. Also, in its December 27, 2010 public comment filed in this Subdocket B, U.S. EPA cited a recommendation of 8 to 10 gastrointestinal illnesses per 1,000 recreators in fresh waters. (PC #561 at 1, 2.) As discussed in more detail below, the MWRDGC-funded CHEERS study concludes that both *enterococci* levels and gastrointestinal illness rates among recreators in the CAWS significantly exceed U.S. EPA's recommended parameters.

The upshot of U.S. EPA's recommended bacterial standards—and of prevailing scientific knowledge regarding sewage wastewater effluent in general—is that the disinfection of sewage wastewater effluent is a near-universal practice in metropolitan areas across the United States. (See Yates 8/4/08 Prefiled Test. at 9.) The very few remaining outliers—like Kansas City, Missouri, for example—are all coming under pressure to fall into line. (*See* Ex. A, *Kansas City, Missouri Clean Water Act Settlement*, http://epa.gov/compliance/resources/cases/civil/cwa/kansascity.html, accessed December 28, 2010 (describing 2010 Consent Decree requiring the City of Kansas City to undertake improvements to its sewer systems estimated to cost $2.5 billion over twenty-five years, including the installation of disinfection treatment at its wastewater treatment plants between 2011 and 2013).)

In light of the near-ubiquity of the disinfection of sewage wastewater effluent discharged into U.S. waterways used for recreation, the ongoing discharge of billions of gallons a year of non-disinfected sewage wastewater effluent into waterways of the State of Illinois that are commonly used for recreation is both remarkable and disturbing. As stated by Dr. Peter Orris, M.D., M.P.H., "[e]very year in which disinfection does not occur puts users of the CAWS at risk of infection, and discourages additional members of the public from making full use of the waterway out of fear for their health and safety." (Orris 8/4/08 Prefiled Test. at 6.) Given the well-documented correlation between exposure to sewage pathogens and illness, disinfection must be required to protect recreational uses of Illinois waterways.

B. The Evidence is Clear that the MWRDGC's Wastewater Treatment Plants Contribute Dangerously High Levels of Pathogens to the CAWS

The justification for disinfection for the CAWS is simple: human exposure to the pathogens in non-disinfected sewage wastewater effluent causes illness (see Section II.A, *supra*). As one might expect, the MWRDGC's discharge of billions of gallons a year of non-disinfected sewage wastewater effluent into the CAWS contributes extremely high levels of such pathogens. This pathogenic pollution occurs 365 days a year—in dry weather and wet weather.

The evidence presented to the Board demonstrates that, during dry weather, the MWRDGC's wastewater treatment plants are overwhelmingly the dominant cause of the pathogenic contamination of the CAWS. As testified to by Dr. Marilynn V. Yates, Ph.D., the bacterial load of the waterways increases by more than 1000% at the plants' points of discharge. (See Yates 8/4/08 Prefiled Test. at 6-7.) As Dr. Yates stated in her prefiled testimony:

> [M]onitoring data from the North Shore channel and North Branch Chicago River show that the fecal coliform concentrations are lower (<2000 cfu/l00 ml) upstream of the Northside treatment plant, increase to more than 19,000 cfu/100 ml at the discharge point from the plant, then remain above the upstream

> concentrations for at least 6.75 miles. A similar trend is observed in the Little Calumet River and Cal-Sag River: upstream fecal coliform concentrations are below 200 cfu/100 ml, the concentration increases to more than 8,000 cfu/100 ml at the discharge point from the Calumet plant, and the concentration remains above the upstream levels for at least 6.3 miles downstream.

(*Id.* at 6.) This trend also held true for the viral contamination introduced by the MWRDGC's facilities. (*Id.*)

Sampling results from the MWRDGC-funded CHEERS study also demonstrate that the facilities' pathogenic contamination of the CAWS remains prominent, even when wet weather events such as combined sewer overflows are taken into account. The CHEERS study sampled the CAWS for pathogenic concentrations during a variety of precipitation conditions. (*See, e.g.*, *The Chicago Health, Environmental Exposure, and Recreation Study (CHEERS) Final Report* ("CHEERS Final Report") at II-51—II-66 (PC #478) (August 31, 2010).) Table II-6 of the CHEERS Final Report, at page II-46, displays the notable effects of the MWRDGC's facilities throughout both dry and wet weather. The daily mean concentrations of *e. coli* below the MWRDGC's North Side facility were thirteen times the concentrations above the facility, and the daily mean concentrations of *enterococci* below the facility were over five times the concentrations above the facility. In the case of *enterococci*, the daily mean concentrations increased from 140 CFU per 100 ml above the facility, to 750 CFU per 100 ml below. In other words, making reference to U.S. EPA's 1986 bacterial standards and the CHEERS study's reported daily mean concentrations of *enterococci*, the MWRDGC's North Side facility has a transformative effect on the CAWS, in wet weather or dry. Directly above the facility is a waterway that—based on its daily mean concentrations of *enterococci*—is at least below the U.S. EPA's recommended single sample maximum allowable density for "infrequently used full body contact recreation," and directly below the facility is a waterway with concentrations of

enterococci increased more than five-fold, grossly exceeding the U.S. EPA's recommended standards.

The above data demonstrate two facts. First, in wet weather or dry, 365 days a year, the MWRDGC's North Side, Stickney, and Calumet facilities discharge a tremendous amount of pathogenic contamination into the CAWS. Second, the amount of the pathogenic contamination discharged by the facilities ***far*** exceeds the U.S. EPA's recommended standards for primary recreation contact, such that any individual that is unlucky enough to be submerged in or to ingest the contaminated water is put at an unacceptable risk of illness. Based on the levels of pathogenic contamination that are created by the MWRDGC's facilities in their current operating condition, IEPA's disinfection proposal is clearly justified. There is no responsible instream bacterial limit for recreational purposes under which such high levels of pathogen loads could be acceptable. Whatever indicator organism U.S. EPA ultimately selects, and whatever precise level of instream bacteria is ultimately regarded as safe for recreators in the CAWS, the current pathogen load contributed by the MWRDGC's facilities is unsafe, and must be reduced through disinfection.

C. Exposure to the Pathogens Discharged by the MWRDGC is Unavoidable for Recreators in the CAWS

It is clear that the pathogens common in non-disinfected sewage waterwater effluent cause illness in exposed individuals (*see* Section II.A, *supra*). It is also clear that the MWRDGC, by its every-day discharge of hundreds of millions of gallons of non-disinfected wastewater at its North Side, Stickney, and Calumet plants, discharges extremely high levels of such pathogens into the CAWS (*see* Section II.B, *supra*). Finally, the evidence presented during this rulemaking proceeding also makes clear that exposure to these pathogens is unavoidable for

recreators in the CAWS.

As discussed in the following Section III, the CHEERS study, as an unprecedented, non-replicated initial study is not, on its own, a proper basis on which to set public health policy. Even on its own terms, though, the study indicates that recreators in the CAWS are making significant contact with the waters of the CAWS, and therefore with the pathogens discharged by the MWRDGC—even if the recreators' activities are described as "incidental contact." According to the CHEERS study's findings, over 90% of recreators in the CAWS who participated in canoeing, kayaking, or rowing had some contact with the water. (See CHEERS Final Report at II-13, II-15, and II-16.)[1] In the case of kayakers, almost ***97%*** of recreators in the CAWS reportedly had some contact with the water—amply demonstrating why the U.S. EPA has described kayaking as a "recreational activity where ingestion of, or immersion in, the water is likely"—and thus suitable for protection under its 1986 recommended bacteria criteria. *Water Quality Standards for Coastal and Great Lakes Recreation Waters*, 69 Fed. Reg. 67218, 67220 (November 16, 2004). Moreover, the water contact found by the CHEERS study was not limited to a few sprinkles or drops. Indeed, the CHEERS study concluded that over 60% of the participants in the study who recreated in the CAWS reported a "wetness score" of 4—which, under the study's methodology, is equivalent to a full submersion of the head and face—or higher. (*See* CHEERS Supplement at XI-3—XI-4, including explanation of wetness scores at XI-3.)

In conclusion, the evidence before the Board clearly demonstrates that the technology-based effluent disinfection requirement proposed by IEPA is necessary to protect the public health and welfare. First, it is beyond argument at this point in history that pathogens found in

[1] These references are to the second set of pages marked "II" in the CHEERS Final Report.

non-disinfected sewage wastewater effluent cause illness in exposed individuals. Second, sampling results consistently demonstrate that the MWRDGC's North Side, Stickney, and Calumet facilities introduce extremely high levels of these pathogens into the CAWS every day of the year. In dry weather conditions, these facilities are the only source of such pathogens that is even worth consideration. Third, Illinois citizens making use of the CAWS for recreational purposes are being exposed to these pathogens, in significant amounts. These facts lead to a simple conclusion: the Board should require the MWRDGC to disinfect the effluent from its treatment plants during recreational seasons to protect Illinois' recreators—and those with whom they come into contact—and so that the Chicago metropolitan area can join the rest of the twenty-first-century United States in instituting this scientifically-supported and common-sense public health practice.

III. THE CHEERS STUDY DOES NOT SUPPORT THE ABSENCE OF A DISINFECTION REQUIREMENT FOR THE SEWAGE WASTEWATER EFFLUENT THAT THE MWRDGC DISCHARGES INTO ILLINOIS WATERWAYS

Over the past few years, the MWRDGC has funded an epidemiological study known as the Chicago Health, Environmental Exposure, and Recreation Study ("CHEERS"). According to the CHEERS Final Report, the study's objectives were: "1) [t]o determine rates of acute gastrointestinal and non-gastrointestinal illness attributable to CAWS recreation[;] 2)[t]o characterize the relationship between concentration of microbes in the CAWS and rates of illness among recreators[;] and 3) [t]o identify pathogens responsible for acute infections among recreators and to explore sources of those pathogens on the CAWS." (CHEERS Final Report at I-6 (August 31, 2010).)

Whether or not the CHEERS study was successful in its goals can be debated by the experts. One point is clear, though: this "unprecedented" study, (6/29/10 Hearing Trans. at 26) (testimony of Dr. Dorevitch), with results that the author of the study himself described to the Board as "not obvious," (10/19/10 Hearing Trans. at 177); "not what [he] would have expected from the literature," (*id.*); "problematic" to explain, (*id.* at 182); and "contrary to [his] expectations" (*id.* at 205), does not provide an appropriate basis for rejecting long-accepted scientific knowledge and practice and determining that disinfection is unnecessary to protect public health. Sound science-based policy is based on replicated and well-understood findings, not on anomalies. Moreover, the MWRDGC's argument that the CHEERS study somehow proves that disinfection at its facilities is unnecessary (*see* , *e.g.*, Granato 9/20/10 Prefiled Test. at 5) rests on a false premise—that there is no reason to undertake measures to protect public health in ***any*** water body, if as many people will become ill from recreating on the CAWS as they will from recreating on other Illinois water bodies. Taken to its extreme, this reasoning would encourage a classic "race to the bottom" among regulated parties. The Board should reject the MWRDGC's argument, and adopt the disinfection criteria necessary to protect Illinois' citizens.

First, the People of the State of Illinois join the other parties to this rulemaking who have argued at length that no single epidemiological study can be sufficient to appropriately inform a determination that disinfection is unnecessary to protect public health. (*See*, *e.g.*, Envt'l Groups 2/3/10 Mtn. to Sever at 9-14.) This is especially so in the case of the CHEERS study, which has produced results that are so contrary to accepted public health ideas of infectious diseases. For example, Dr. Dorevitch has conceded that the CHEERS study found that the CAWS-North area had the lowest rates of illness; the highest level of waterborne pathogens; and activities that were among the most exposing to recreators on the water. (10/19/2010 Hearing Trans. at 182.) This

finding—which implies that, in the CAWS, there is an inverse correlation between exposure to waterborne pathogens and illness rates, and that ***more*** exposure to pathogens leads to better health outcomes—would turn a century of public health science on its head.

Ultimately, though, the CHEERS study did not find such an inverse correlation. In the CHEERS Supplement, the authors found the logical association between *enterococci* levels and acute gastrointestinal illness—but inexplicably only for the General Use Waters that were studied (*See* CHEERS Supplement at XI-27.) By contrast, for the CAWS, there was no association between bacterial levels and illness. As the authors of the study stated humbly—and responsibly—about this inconsistent finding, "[t]he basis for this difference between the predictive value of enterococci for CAWS vs. GUW recreation is not known." (*Id.*)

This sensible admission of uncertainty stands in stark contrast to the testimony of Dr. Thomas Granato, Ph.D, chosen by the MWRDGC to be its "closing witness" in opposition to a disinfection requirement. Dr. Granato interpreted the CHEERS study as indicating that illness among CAWS recreators is, in fact, not being caused by pathogens (i.e., disease-causing organisms). (*See* 10/19/10 Hearing Trans. at 259-61.) Instead, Dr. Granato posited that illnesses among CAWS recreators are being caused by some as-yet unidentified chemicals in the CAWS—despite his inability to cite a single epidemiological study in support of his theory. (*Id.*)

Dr. Granato's novel theory could be correct. However, at this point it is only an untested and unproven hypothesis—and, moreover, a hypothesis that, as Dr. Marc H. Gorelick, M.D., testified, is not "consistent with overall clinical experience or what we know about these things in general." (10/20/10 Hearing Trans. at 129.) Until the unexpected, anomalous, and inconsistent findings of the CHEERS study are replicated and better-understood, the CHEERS study cannot serve as a legitimate basis for policy-making.

Second, putting aside the logic-defying nature of the CHEERS study's results, the MWRDGC's attempted use of those results presents an additional concern. Quite simply, the CHEERS study ***has*** found that recreators in the CAWS are becoming ill in significant numbers. The CHEERS study concluded that recreating in the CAWS can be expected to result in about 12.5 cases of acute gastrointestinal illness per 1000 recreators, and about 15.5 cases of eye symptoms per 1000 recreators. (*See* CHEERS Supplement at ES-8, ES-15.) The MWRDGC has attempted to minimize the significance of these illness rates by comparing them to the illness rates that the CHEERS study found among recreators in other Illinois waterways. (*See, e.g.*, Granato 9/20/10 Prefiled Test. at 5.)

That is not an appropriate comparison, though. As noted by U.S. EPA in its December 27, 2010 public comment, the level of gastrointestinal illness found by the CHEERS study in the CAWS exceeds U.S. EPA's recommendation of 8 to 10 illnesses per 1000 recreators in fresh waters. (PC #561 at 1, 2.) More protective criteria for the CAWS are clearly necessary. Under the Clean Water Act, it is not sufficient to say that excessive illness rates on the CAWS are acceptable because recreators on some other Illinois waterways that also are affected by sewage contamination have to run similar risks. Following that logic, public health improvements could conceivably be limited to what is achievable in a state's most polluted waterways. Instead, the Clean Water Act requires the State of Illinois to adopt criteria that will in fact be protective of the public health and welfare.

The illnesses identified by the CHEERS study are not inevitable. The less that recreators come into contact with pathogens, the less illness there will be both for recreators and for those with whom the recreators come into contact. The implementation of disinfection at the MWRDGC's North Side, Stickney, and Calumet facilities will greatly reduce pathogenic

pollution of the CAWS, 365 days a year. Disinfection is necessary to protect public health, and the contradictory and often inexplicable results of the CHEERS study do not prove otherwise.

IV. THE PROPOSED EFFLUENT DISINFECTION CRITERION IS BOTH TECHNICALLY FEASIBLE AND ECONOMICALLY REASONABLE

In this rulemaking proceeding, the Board has heard evidence relating to how much the installation and operation of disinfection equipment at the MWRDGC's North Side, Stickney, and Calumet facilities would cost. (*See* IEPA Statement of Reasons at 100 (referencing 2005 MWRDGC estimate of total present worth of capital and operation and maintenance costs for disinfection of between $963 million and $2,702 million over twenty years); Mastracchio Prefiled Test. at 7 (referencing 2008 MWRDGC estimate of total present worth of capital and operation and maintenance costs for UV disinfection of $919.6 million over twenty years); *but see* Ex. 148, *Review of "Technical Memorandum 1WQ – Disinfection Evaluation Prepared on Behalf of the Metropolitan Water Reclamation District of Greater Chicago" – Final Report* at 9, 15 (October 26, 2006) (U.S. EPA-commissioned study independently estimating total capital costs for installation of UV disinfection equipment at all three plants as ranging from $118 to $242 million, and estimating a total household cost of $1.94 per household, per month, for disinfection).) At various points throughout this proceeding, the MWRDGC has presented testimony implying that the potential costs of installing disinfection equipment could be a basis for the Board's declining to promulgate water quality criteria that would require disinfection. (See, *e.g.*, Granato 9/20/10 Prefiled Test. at 5.)

The MWRDGC's testimony has fallen far short of showing an economic impact that could justify the rejection of water quality standards to protect the public health and welfare. Pursuant to the Clean Water Act and implementing regulations, this Board should promulgate all

water quality criteria that are necessary to protect the designated uses of the waterways at issue. While the Board is required by the Illinois Environmental Protection Act to ***consider*** the technical feasibility and economic reasonableness of proposed rules, the evidence presented in this rulemaking proceeding demonstrates that disinfection is without a doubt technically feasible and economically reasonable, and would be valued very highly by the citizens of Illinois.

A. Federal Law Creates a High Bar for Economic Arguments to Avoid More Stringent Water Quality Standards

Under the Clean Water Act and its implementing regulations, the consideration of how much pollution control technology costs is to play only a minor role in setting water quality standards. Instead, the overriding concern of the Clean Water Act and its implementing regulations is to protect attainable uses—including all existing uses—of the nation's waters. Specifically, in 40 C.F.R. § 131.10(h)(1), U.S. EPA specifies that existing uses may not be removed in a use attainability analysis. In 40 C.F.R. § 131.10(g), U.S. EPA does set forth several factors that a State may consider in removing non-existing uses, or to establish sub-categories of a use, for a waterway. One such factor that may affect the designation of uses is the following:

> (6) Controls more stringent than those required by Sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

40 C.F.R. § 131.10(g)(6). U.S. EPA has provided additional guidance relating to this factor in Appendix M to the *Water Quality Standards Handbook—Second Edition* (EPA-823-B-94-005a), EPA-823-B-95-002 (March 1995), which was included as Attachment C to IEPA's Statement of Reasons. Pursuant to this guidance, a discharger hoping to avoid compliance with water quality

standards faces a steep hurdle. Specifically, the discharger must show, *inter alia*, "that there will be widespread adverse impacts to the community if it is required to meet standards." *Id.* at 4-7.

As discussed above, the evidence is overwhelming that incidental contact recreation is an ***existing*** use of the CAWS, so 40 C.F.R. § 131.10(g)(6) is of limited relevance. In any case, though, the MWRDGC has made no showing that installing and operating disinfection equipment at its North Side, Stickney, and Calumet facilities would cause "widespread adverse impacts to the community"—such as by increasing regional unemployment rates or dragging households below the poverty line. The estimated costs of disinfection are, under any interpretation, significant. However, as pointed out in the U.S. EPA-commissioned cost review submitted as Exhibit 148 in this rulemaking proceeding, the magnitude of these costs must be kept in perspective:

> The cost of UV disinfection will be several hundred million dollars. While clearly a significant amount of money, it represents a cost of 8 to 12 cents per 1,000 gallons treated. [The authors] would note that any treatment process applied to almost 2 billion gallons of wastewater a day will be expensive in absolute dollars.

Ex. 148, *Review of "Technical Memorandum 1WQ – Disinfection Evaluation Prepared on Behalf of the Metropolitan Water Reclamation District of Greater Chicago" – Final Report* at 16 (October 26, 2006). A consideration of how much disinfection might cost in the context of the MWRDGC's annual budget, as a whole, also helps to put the magnitude of the costs into perspective. The MWRDGC's 2008 estimate of the costs of disinfection—including capital costs and operations and maintenance costs—was $919.6 million over twenty years, or around $46 million a year when spread out over the course of those twenty years. (*See* Mastracchio Prefiled Test. at 7.) Meanwhile, the MWRDGC's total budget for 2008 alone was over ***$1.4 billion***—over thirty times the MWRDGC's estimated annual cost of disinfection when spread

out over twenty years. (*See* Ex. 161, MWRDGC 2008 Budget Book at 16.) It is not possible to make a good-faith argument that the costs of disinfection, as significant as they are, could create the sort of widespread adverse economic impacts with which 40 C.F.R. § 131.10(g)(6) is concerned, when the costs are viewed in the perspective of the MWRDGC's comparatively massive overall budget.

In addition, the near-ubiquity of disinfection in other metropolitan areas across the country demonstrates that disinfection can be implemented without causing an adverse economic impact to the Chicago metropolitan area. This point is brought home by the operating costs of the MWRDGC relative to other wastewater agencies serving populations greater than 1 million. (See *id.* at 15 (attached hereto as Exhibit B).) As shown by the chart attached hereto, MWRDGC's 2005 operating costs were the lowest per million gallons of sewage treated of any of the other comparable agencies. While it is commendable that the MWRDGC has kept its treatment costs low, the people of the State of Illinois are not getting a bargain if these savings come from the MWRDGC's avoidance of standards necessary to protect the public health and welfare. There is no reason that to believe that the MWRDGC's institution of an industry-standard treatment process would cause widespread adverse economic impacts for the population it serves.

Even if the MWRDGC's estimates of the costs of disinfection were accepted, those costs would not rise to the level of creating "widespread adverse impacts to the community." Therefore, the MWRDGC's cost estimates do not present any rationale from departing from the Clean Water Act's mandate to establish criteria to protect the use of the CAWS for incidental recreational purposes.

B. The Evidence Demonstrates that Disinfection is Both Technically Feasible and Economically Reasonable

Pursuant to Section 27(a) of the Act, 415 ILCS 5/27(a) (2010), the Board is asked to take into account several factors when promulgating regulations under the Act, including, "the technical feasibility and economic reasonableness of measuring and reducing the particular type of pollution." The Illinois Supreme Court has rejected the argument that this provision requires the Board to determine, "based on evidence in the record, that compliance with the proposed regulations is technically feasible and economically reasonable before promulgating them." *Granite City Div. of Nat'l Steel Co. v. Illinois Pollution Control Bd.*, 155 Ill. 2d 149, 181 (1993). Instead, the Board need only "'consider' or 'weigh carefully' the technical feasibility and economic reasonableness of compliance with proposed regulations in the rulemaking process." *Id.* This modest requirement cannot justify a departure from the State of Illinois' responsibility to implement all water quality standards required by the Clean Water Act—including all water quality criteria necessary to protect designated uses. In this case, if the Board finds that disinfection is necessary to protect recreational use of the CAWS, then it should not be dissuaded from imposing that requirement by any economic arguments that have been raised by the MWRDGC.

In any case, the technical feasibility and economic reasonableness of disinfection are long-established. As to its technical feasibility, the effluent disinfection standard proposed by IEPA has been in place for Illinois' General Use waters since 1972. *See generally* In the Matter of Effluent Criteria (R70-8); In the Matter of Water Quality Standards Revision (R71-4); In the Matter of Water Quality Standards Revisions for Intrastate Waters (R71-20) *consolidated* (March 7, 1972). As noted above, effluent disinfection is practiced almost universally among

metropolitan wastewater treatment plants across the country. Disinfection is not some exotic, untested, and novel technology; it is the industry standard. And even if disinfection were an exotic, untested, and novel technology, that fact would not prevent the Board from requiring its adoption. *See Granite City*, 155 Ill. 2d at 183 (discussing the Board's authority to "adopt technology-forcing standards which are beyond the reach of existing technology," if such standards are necessary to carry out the purposes of the Illinois Environmental Protection Act).

The MWRDGC has presented evidence regarding the amount of electricity that meeting IEPA's proposed criteria would require. (*See*, *generally*, McGowan 8/4/08 Prefiled Test.) That testimony is not relevant to this rulemaking proceeding. There is no *caveat* to the Clean Water Act or the Illinois Environmental Protection Act that says that the Board should adopt water quality standards to protect the public health and welfare—unless such standards would require more electricity. Progress on environmental issues can proceed on multiple fronts simultaneously. As demonstrated by Illinois' renewable portfolio standard, which will require 25% of utilities' supplies to be generated from renewable energy resources by 2025, such progress is taking place in Illinois' electrical supply. *See* 20 ILCS 3855/1-75 (submitted as Exhibit 136 in this rulemaking proceeding). Progress also must take place in Illinois' wastewater management practices. In addition, the MWRDGC's testimony is not credible, because it did not take into account Illinois' renewable portfolio standard—or indeed, ***any*** available state- or utility-specific information about the MWRDGC's electricity usage. (*See* 9/25/08 Hearing Trans. at 98, 103-105).

As for the economic reasonableness of wastewater effluent disinfection, that too, is not an arguable proposition. Putting aside the precise cost estimates of installing disinfection equipment, how could one argue that disinfection is economically unreasonable when nearly

every other major metropolitan area in the country has found the financial wherewithal to support the practice? As discussed above in Section IV.A, the cost estimates for disinfection are significant. However, "any treatment process applied to almost 2 billion gallons of wastewater a day will be expensive in absolute dollars." Ex. 148, *Review of "Technical Memorandum 1WQ – Disinfection Evaluation Prepared on Behalf of the Metropolitan Water Reclamation District of Greater Chicago" – Final Report* at 16 (October 26, 2006). The economic reasonableness of disinfection's costs must be viewed in the context of the number of years over which those costs have been estimated, and in relation to the MWRDGC's comparatively massive overall budget.

That disinfection is economically reasonable is further underscored by the testimony of Dr. Kevin Boyle, Ph.D., in this proceeding. As Dr. Boyle stated in his August 4, 2008 prefiled testimony, he conducted an analysis of the economic benefits of water quality improvements associated with IEPA's proposed recreational use designations. (See Boyle 8/4/08 Prefiled Test. at 1.) Using a "benefit-transfer" analysis, in which information from existing economic studies is combined with local, site-specific information, Dr. Boyle calculated what households in Cook County, Illinois would be willing to pay for the water quality benefits associated with the IEPA's proposed water quality standards. (*Id.* at 3-4.) This method of calculating economic benefits is established in the field of economics, and is recognized by U.S. EPA in its 1995 *Interim Economic Guidance for Water Quality Standards*, submitted as Attachment C to IEPA's Statement of Reasons. (*Id.*)

Dr. Boyle estimated, "conservatively," that the proposed changes would have a present value of ***$1.05 billion over 20 years, or $47 per household per year***. (*Id.* at 4.) As Dr. Boyle also testified, his analysis likely understated the benefits of the proposed standards, because, *inter alia*, the benefits of improved water quality are likely to extend well beyond 20 years, and

because Dr. Boyle's analysis took account only of households within Cook County, while households outside of Cook County also might be willing to pay for improved water quality in the CAWS. (*Id.* at 11.) While the MWRDGC might quibble about the precise level of bacterial reduction that disinfection can lead to in the CAWS, the MWRDGC presented no evidence that would refute the conclusion that the people of Illinois place an extremely high value on even modest improvements to the waterways that run through their cities and parks. This conclusion is further bolstered by studies cited by Dr. Boyle indicating that improvements in water quality increase property values of waterfront properties—not to mention the hundreds of public comments submitted by Illinois citizens in favor of IEPA's proposed standards. (*See id.* at 12.)

The evidence before the Board demonstrates that disinfection of sewage wastewater effluent is necessary to protect the existing recreational uses of the CAWS. The people of the State of Illinois should not have to wait another several decades for the Board to require the adoption of this scientifically defensible and already long-overdue practice.

WHEREFORE, for all of the reasons stated herein, the People respectfully request that the Board adopt the technology-based effluent disinfection requirement proposed by IEPA.

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DATE: January 3, 2011

EXHIBIT A

http://epa.gov/compliance/resources/cases/civil/cwa/kansascity.html
Last updated on Tuesday, July 27, 2010

Civil Enforcement

Kansas City, Missouri Clean Water Act Settlement

(Kansas City, Kan., - May 18, 2010) The City of Kansas City, Mo., has agreed to make extensive improvements to its sewer systems, at a cost estimated to exceed $2.5 billion over 25 years, to eliminate unauthorized overflows of untreated raw sewage and to reduce pollution levels in urban stormwater, the Justice Department and U.S. Environmental Protection Agency announced today.

Kansas City, Missouri Clean Water Act Settlement Resources

- Press Release (05/18/10)
- Consent Decree (PDF) 106pp, 2M, About PDF)

"This is a landmark day in the history of Kansas City, Mo., This agreement charts a course for the largest infrastructure project in the city's history, and what we believe to be one of the largest municipal green infrastructure projects undertaken anywhere in the nation." **- Karl Brooks, EPA Regional Administrator.**

On this page:

Overview of Facility

Kansas City, Missouri's publicly owned treatment works (POTW) includes seven wastewater treatment plants and associated collection systems. The POTW collects and receives domestic, commercial, and industrial wastewater from residential household customers within the City, as well as 27 neighboring satellite communities.

Violations

EPA took enforcement action against the City for Clean Water Act (CWA) violations involving discharges of untreated sewage from the City's sewage collection system, including combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), to waters of the United States.

Since 2002, the City has experienced approximately 1,300 illegal overflows, including CSOs, SSOs, and private property backups, from its POTW, resulting in violations of the City's National Pollutant Discharge Elimination System (NPDES) permit and Sections 301 and 402 of the CWA. These overflows have caused an annual discharge of approximately 6.5 billion gallons of untreated sewage into waters of the United States.

Injunctive Relief

The City will implement overflow remedial measures intended to eliminate a substantial percentage of CSOs and SSOs from the City's sewer systems. The City estimates that the injunctive relief will cost $2.5 billion. The consent decree requires completion of the construction and full implementation of all remedial and control measures no later than December 31, 2035.

- **Combined Sewer System**: The City will implement CSO control measures that, when combined with existing controls, will eliminate or capture for treatment approximately 88 percent of the typical wet weather flows in the City's combined sewer system, including up to 96 percent capture in many neighborhood streams. The settlement includes specific requirements for sewer separation projects, construction of a high rate treatment facility, installation of high rate treatment at several existing wastewater treatment plants, development of diversion structures to reroute wet weather flows, construction of tunnels and storage tanks to provide additional capacity for wet weather flows, improvements to gate control systems, and small sewer rehabilitation projects.

- **Separate Sewer System**: To substantially eliminate SSOs, the City will engage in 30 percent to 45 percent targeted infiltration and inflow reductions, expand treatment capacity at its wastewater treatment plants, construct tunnels and storage tanks to provide additional support for wet weather flows, improve its pump stations, and construct relief sewers where insufficient hydraulic capacity currently exists.

- **Green Infrastructure**: The consent decree requires Kansas City to use green infrastructure, such as rain gardens, permeable pavement, and green roofs, in lieu of and in addition to structural controls, in its implementation of overflow control measures. The City will initiate a pilot project to implement green infrastructure technologies to control wet weather flows throughout a 100-acre basin served by the City's POTW. The City will use the results of the pilot project to develop a plan for implementing green infrastructure projects across at least a 744-acre basin served by the City's POTW. The City may then develop and submit to EPA for approval a green infrastructure project proposal for its entire combined sewer system to achieve its overflow reductions.

- **Installation of Disinfection Treatment at Wastewater Treatment Plants**: The City will install disinfection treatment at its wastewater treatment plants between 2011 and 2013.

Pollutant Reductions

Through implementation of the consent decree, the City will eliminate or treat at least 5.4 billion gallons of the 6.4 billion gallons currently discharged as a result of CSOs from the City's wastewater treatment plants, as well as eliminate the entire 100 million gallons of monitored SSOs discharged from the City's sewer system.

The settlement also requires disinfection treatment of approximately 275 million gallons per day at its wastewater treatment plants. EPA estimates that the City will reduce 39 million pounds of total suspended solids and 10 million pounds of biological oxygen demand annually.

Health and Environmental Effects

The above mentioned reductions will substantially reduce releases of the following pollutants:

- Microbial pathogens
- Total Suspended Solids (TSS) - TSS indicates the measure of suspended solids in wastewater, effluent or water bodies. High levels of TSS in a water body can diminish the amount of light that penetrates the water column and reduce photosynthesis and the production of oxygen.
- Toxics
- Nutrients
- Biological oxygen demand (BOD) - BOD is an indirect measure of the biologically degradable material present in organic wastes. High BOD means there is an abundance of biologically degradable material that will consume oxygen from the water during the degradation process. It may take away oxygen that is needed for aquatic organisms to survive.

Supplemental Environmental Projects

The City will perform a supplemental environmental project (SEP), at a cost of at least $1.6 million, within five years of the settlement effective date, to implement a sewer connection and septic tank closure program for income eligible property owners. The City anticipates that the SEP will eliminate septic tanks in approximately 533 households.

Civil Penalty

The settlement agreement requires payment of $600,000 to the U.S. Treasury within 30 days of the effective date of the settlement.

State Partners

The State of Missouri is not a party to the Consent Decree. The City and State plan to enter into a separate settlement agreement that resolves a number of the City's recent SSO violations.

For more information, contact:

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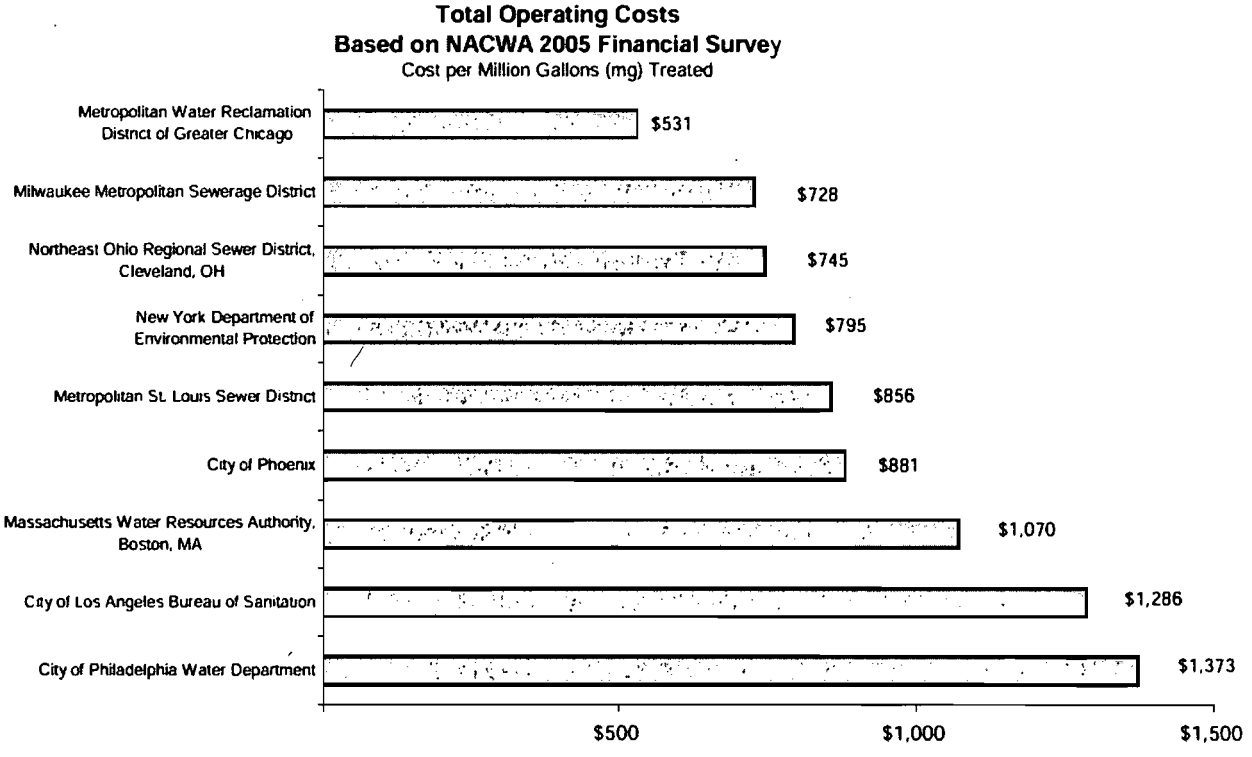
EXHIBIT B

Outputs (continued):	Budgeted 2008	Budgeted 2007	Actual 2006	% Change 2007-2008
Dry tons of biosolids utilized by area:				
North Service Area	6,000	5,200	7,506	15.4%
Calumet Service Area	30,600	31,000	23,442	(1.3)%
Stickney Service Area	97,000	106,950	74,169	(9.3)%

Outcomes:	2006	2005	2004	2003
Achievement of wastewater plant purification permit standards by plant:				
North Side WRP	100.00%	99.99%	100.00%	100.00%
Calumet WRP	100.00%	100.00%	100.00%	100.00%
Stickney WRP	100.00%	100.00%	100.00%	100.00%
Kirie WRP	100.00%	100.00%	100.00%	100.00%
Lemont WRP	100.00%	100.00%	100.00%	100.00%
Hanover Park WRP	100.00%	100.00%	99.97%	100.00%
Egan WRP	100.00%	99.99%	99.96%	100.00%

In 2006, the National Association of Clean Water Agencies (NACWA) released the results of its biennial survey of 198 wastewater agencies. Among reporting agencies serving populations greater than 1 million, the Metropolitan Water Reclamation District of Greater Chicago has the lowest average cost for collection and treatment of sewage. The costs listed next to these major agencies in the chart are the 2005 Total Operating Costs per million gallons of sewage treated.



CERTIFICATE OF SERVICE

I, ANDREW ARMSTRONG, do certify that I filed electronically with the Office of the Clerk of the Illinois Pollution Control Board the foregoing Notice of Filing and Comments in Support of Proposed Water Quality Criteria to Protect Existing Recreational Uses of the Chicago Area Waterway System and the Lower Des Plaines River and caused them to be served this 3rd day of January, 2011 upon the persons listed on the attached Service List by depositing true and correct copies of same in an envelope, first class postage prepaid, with the United States Postal Service at 69 West Washington Street, Chicago, Illinois, unless otherwise noted on the Service List.

Andrew Armstrong

ANDREW ARMSTRONG