BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

NOTICE OF FILING

To: ALL COUNSEL OF RECORD
(Service List Attached)

PLEASE TAKE NOTICE that on the 20th day of September, 2010, I electronically filed with the Office of the Clerk of the Illinois Pollution Control Board, the **Pre-Filed Testimonies of Thomas Granato and Samuel Dorevitch.**

Dated: September 20, 2010.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

By: */s/ David T. Ballard*
One of Its Attorneys

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PROOF OF SERVICE

The undersigned attorney certifies, under penalties of perjury pursuant to 735 ILCS 5/1-109, that I caused a copy of the foregoing, **Notice of Filing** and **Metropolitan Water Reclamation District of Greater Chicago's Pre-Filed Testimonies of Thomas Granato and Samuel Dorevitch**, to be served via First Class Mail, postage prepaid, from One North Wacker Drive, Chicago, Illinois, on the 20th day of September, 2010, upon the attorneys of record on the attached Service List.

/s/ David T. Ballard
David T. Ballard

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PRE-FILED TESTIMONY OF SAMUEL DOREVITCH

My name is Samuel Dorevitch, and I am an environmental health researcher at the University of Illinois at Chicago School of Public Health. A statement of my personal qualifications, including my curriculum vitae, previously was filed before the Board in this matter.

I am a medical doctor, with training and board certification in Emergency Medicine and also in Preventive Medicine, with specialization in Occupational Medicine. Over the last nine years, I have conducted research on local environmental health issues, such as the effects of public housing demolition and the reconstruction of the Dan Ryan expressway on air quality. In addition to being a scientist, I have been an advocate for reducing pollution and improving the environment. Over the years, I have testified at U.S. EPA hearings in favor of setting more stringent regulatory standards for ozone, particulate matter air pollution, and off-road diesel emissions. I have also spoken out in the media about the impact of coal-fired power plants on local air quality. I have added my name to the National Resources Defense Council's list of those opposed to the U.S. EPA's effort to stop regulating lead as an air pollutant.

In February 2009, I participated in a conference held by the Water Environment Research Foundation entitled "Expert Scientific Workshop on Critical Research and Science Needs for the Development of Recreational Water Criteria for Inland Waters." Thirty-one national and

international experts participated in the meeting, which was supported in part by the U.S. EPA's Office of Water. I served on the planning committee, led the working group on "Health Risks: Epidemiology and Risk Assessment," and participated in the writing of the final report. With the other group leaders, I summarized the state of the science in an article entitled "Knowledge and gaps in developing microbial criteria for inland recreational waters," published in the June 2010 issue of Environmental Health Perspectives.

I directed the epidemiological study of recreation in the Chicago Area Waterway System ("CAWS"), entitled the Chicago Health, Environmental Exposure, and Recreational Study ("CHEERS Study"). This is the first epidemiological study of the health risks of fishing, boating, rowing and paddling in the CAWS. This research used the gold standard of observational epidemiological studies, the prospective cohort design, and followed the study format used for the United States Environmental Protection Agency's National Epidemiological and Environmental Assessment of Recreation ("NEEAR") Water Study, which will generate national microbial water quality criteria for primary contact water. The CHEERS Study design was developed by a multi-disciplinary team of experienced researchers, with backgrounds in infectious disease medicine, environmental medicine, epidemiology, biostatistics, industrial hygiene and environmental science. A panel of recognized leaders in the fields of water microbiology and health from the U.S. Centers for Disease Control and Prevention, the U.S. Environmental Protection Agency, and other universities reviewed and endorsed the designs and protocols of the research, and monitored the quality of the data collected and its analysis and interpretation. A copy of the review panel's endorsement was submitted by Mr. Daniel Woltering of the Water Environment Research Foundation and is Public Comment Number 63 in the docket for this rulemaking.

Epidemiological studies provide an opportunity to directly measure, rather than model, risk. For this reason, U.S. EPA places considerable weight on epidemiological studies when establishing environmental standards. A well-designed epidemiological study seeks to minimize the possibility that the research will fail to identify a real risk that may exist (a "false negative result") and minimize the possibility that a risk will be identified when none exists (a "false positive result"). Early in the development of the CHEERS Study, the research team evaluated numerous approaches for minimizing the possibility of a false positive or false negative result. In calculating our necessary number of study participants, we used typical values of a 1 in 20 chance of a false positive result and a 1 in 5 chance of a false negative result. We made numerous conservative assumptions in that sample size calculation, and we have more statistical power than originally anticipated because the drop-out rate by study participants was less than a third of the 15% than we had projected. Thus, the chances of failing to identify a real risk are likely less than one in five.

On August 31, 2010, the Metropolitan Water Reclamation District of Greater Chicago (the "District") filed a copy of the CHEERS Study with the Board. The CHEERS Study was designed to investigate the occurrence of illness associated with secondary contact recreation on the CAWS and had three specific aims: (1) to determine the rates of acute gastrointestinal and non-gastrointestinal illness attributable to CAWS recreation; (2) the characterize the relationship between concentrations of microbes in the CAWS and rates of illness among recreators; and (3) to identify pathogens responsible for acute infections among recreators, and to explore sources of those pathogens on the CAWS. The CHEERS Study has met two of these three specific aims – objectives one and three. Study objective number two will be met when a supplement to the CHEERS Study is submitted to the Board by December 6, 2010.

. For the CHEERS Study, people were recruited into one of three study groups. The CAWS Group was composed of people who row, paddle, fish or go boating on the Chicago Area Waterways System. The General Use Waters Group consisted of people who do these same activities on a number of area lakes, rivers and lagoons not including the CAWS. The Unexposed Group included people who do outdoor activities that do not involve water (such as jogging and biking) at about the same time and place as the participants in the other two groups.

Individuals in all three groups underwent interviews on the day of recreation, and then were contacted for three telephone interviews over the following three weeks. All interviews were conducted using computer-assisted methods, which ensure that the participants were asked the same questions in a neutral fashion. Field interviews addressed current health, and for those who engaged in water recreation, the extent of their contact with the water. Telephone interviews addressed changes in health status and additional water exposure since recruitment. While participants were on the water, samples of water were collected and sent for analyses of bacteria, viruses and parasites. Water was sampled for analyses of indicator microbes once every two hours, and once every six hours for pathogen analyses. At CAWS locations, water was sampled upstream and downstream of the nearest upstream water reclamation plant during the time of participant recruitment. If a participant developed an illness, clinical specimens were collected so that the pathogen responsible for illness could be identified. The study used state of the art methods, based on those of the U.S. EPA's ongoing research about primary contact recreation, the NEEAR study.

A total of 11,733 people completed the field interviews and 11,297 (96.4%) participated in a telephone follow-up for the CHEERS Study. We collected data about the use of the CAWS for specific activities at specific locations. The dominant uses on the North Branch and North

Shore Channel are rowing and paddling, and the dominant use on the Cal-Sag Channel is motor boating. Fishing from shore is relatively uncommon outside of special events on the Main Stem of the Chicago River, and jet-skiing is rarer still. Swimming and water skiing were never observed. Data obtained from field interviews of study participants demonstrated that several dozen individuals on rowing teams each use the CAWS more than 100 times per year. Similarly, some boaters on the Worth and Alsip launches use the Cal-Sag Channel dozens of times per season. Thus, a small number of users account for a relatively large proportion of uses.

A multi-step process was used to evaluate the risks of canoeing, fishing, kayaking, motor boating and rowing. First, a conceptual model was developed that linked water recreation to illness. Second, time periods of interest for evaluating the occurrence of each type of illness were defined. Third, statistical analyses were conducted to identify associations between the study group – meaning CAWS, general use waters, and unexposed - and the risk of illness, after taking into account other differences between study groups (such as age composition or baseline health status). Fourth, the frequency of illness attributable to CAWS recreation was estimated. Finally, the finding were carefully reviewed to ensure they were not the result of specific choices of statistical methods or definitions used. In other words, the research team re-analyzed the data using a variety of approaches to make sure that our results were solid. In addition, the severity of illness was evaluated by asking study participants whether their symptoms resulted in the use of over-the-counter medication, evaluation by a healthcare provider, interference with daily activities, and emergency room visit, and/or hospitalization. Measures of illness severity were summarized for each type of illness, for all three study groups. Statistical testing evaluated whether differences in severity existed among the groups.

With respect to the first specific aim of the CHEERS Study, the study concluded that rates of gastrointestinal illness are not higher among CAWS recreators as compared to recreators doing the same activities on waters that do not receive undisinfected wastewater treatment plant effluent. Over 5,000 water samples were analyzed and 750 stool samples were obtained for analysis by the UIC laboratory and the Illinois Department of Public Health. About 12-13 cases of gastrointestinal illness per 1,000 uses can be attributed to limited contact recreation on the CAWS. This rate is statistically indistinguishable from the rate of gastrointestinal illness attributable to limited contact recreation on general use waters. After taking into account differences among the groups, the CHEERS Study found that the odds of developing acute gastrointestinal illness were 41% higher in the CAWS Group as compared to the Unexposed Group. Similarly, the odds were 44% higher in the General Use Waters Group as compared to the Unexposed Group.

The CHEERS Study also concluded that 15-16 cases of eye symptoms per 1,000 uses can be attributed to limited contact recreation on the CAWS. This is higher than the rate of eye symptoms among limited contact users of general use waters. The eye symptoms were relatively mild, as participants with only eye symptoms generally reported no indicator of severity, only using over-the-counter medication in less than 20% of the cases. Respiratory, skin and ear symptoms were not attributable to limited contact recreation on the CAWS or general use waters.

With respect to the third aim of the CHEERS Study, pathogens responsible for illness, the vast majority of pathogens identified from stool samples from study participants with gastrointestinal symptoms were viruses. The most commonly identified pathogens were viruses, including rotavirus, norovirus, and other enteric viruses (echovirus and adenovirus). Protozoan and bacterial pathogens were also identified in a few samples. The detection of pathogens in

stool samples of participants with gastrointestinal symptoms was just as common for all three study groups. Pathogen presence was not associated with self-reported water ingestion. These two observations are not consistent with the assumption that CAWS use would be associated with the presence of waterborne pathogens in stool samples of study participants with gastrointestinal symptoms, and there was no suggestion that water recreation, CAWS use, or water ingestion was associated with gastrointestinal illness. Pathogens such as Salmonella, Shigella, and E. coli O157:H7, which have been associated with severe waterborne outbreaks of gastrointestinal illness elsewhere, were not identified in stool samples.

The CHEERS Study also contains information concerning development of a relationship between microbial water quality parameters and the incidence of illness for recreational uses proposed for the CAWS, which will eventually be needed to develop scientifically-based bacterial water quality standards for the CAWS. As was noted above, a supplemental report reflecting completed analysis of the water-quality-illness relationship will be submitted to the Board by December 6, 2010.

I favor strong, science-based environmental regulation as a means of protecting public health. Reducing the potential risks of limited contact recreation on the CAWS is an important and complex public health goal. From a policy perspective, one would want to know what the benefits and risks are of current wastewater management and recreation practices, and what the benefits and risks are of various alternative approaches. The CHEERS Study has defined the risks that limited contact recreators face under current wastewater management practices. I believe this research should be useful to the Illinois Pollution Control Board in the development of sound, science-based environmental policy.

Respectfully submitted,

By: Samuel Dorevitch, MD, MPH
University of Illinois at Chicago
School of Public Health

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PRE-FILED TESTIMONY OF THOMAS GRANATO

RECREATIONAL USES AND STANDARDS

My name is Thomas Granato, and I am the Deputy Director of Monitoring and Research at the Metropolitan Water Reclamation District of Greater Chicago ("District"). A statement of my qualifications, including my curriculum vitae, previously has been filed with the Board in this proceeding.

I have been employed by the District for over 22 years and have held progressively responsible positions, including head of the Biosolids Utilization and Soil Science Section, Coordinator of Technical Services, and Assistant Director of Monitoring and Research. I have been the Deputy Director of M&R for one year. Over the past five years, I have been directly involved in the planning, development, management and administration of the many research studies that the District has undertaken to support the Chicago Area Waterways Use Attainability Analysis ("UAA").

I hold a Bachelor of Science degree in Agricultural Science and a Master of Science degree in Soil Chemistry from the University of Illinois at Urbana-Champaign and a Doctor of Philosophy degree in Environmental Soil Science from North Carolina State University. I am a member of the Water Environment Federation, the American Chemical Society, the Soil Science Society of America and the American Society of Agronomy. I have been a managing editor of

Water Environment Research for the past four years, a member of the Water Environment Research Foundation's Research Council for nearly two years, and Vice-Chair of the Water Environment Federation's Microconstituents Community of Practice. I have published over 50 research articles and reports pertaining to biosolids management, risk assessment, water quality, and other areas of environmental science.

In my prior testimony in this proceeding, I summarized the District's testimony on recreational use issues for the Chicago Area Waterways System ("CAWS"). The District believes that the Illinois Environmental Protection Agency ("IEPA") has relied upon incorrect assumptions and incomplete information to reach faulty conclusions regarding recreational use designations and associated standards for the CAWS.

As I stated in my prior testimony, instead of pursuing this rulemaking when it did, the District believes that the IEPA should have waited for the completion of the Chicago Health, Environmental Exposure, and Recreation Study ("CHEERS Study"), which was conducted by Dr. Samuel Dorevitch at the University of Illinois at Chicago, because the CHEERS Study provides essential information to make scientifically supported decisions regarding the appropriate water quality standards for the CAWS. Testimony of Thomas Granato, at 125 (Oct. 28, 2008). The District funded the CHEERS Study in part at the request of IEPA, and believes that the agency should use the results of that study to develop appropriate, science-based recreational criteria for the CAWS.

My prior testimony also stated that, based upon the expert testimony and documents presented during the rulemaking, the District does not believe there is significant risk of gastrointestinal illness associated with incidental and non-contact recreational use of the CAWS in either dry or wet weather conditions. As a result, disinfection of the effluent from the water

reclamation plants will have minimal effects on overall illness rates. Pre-Filed Testimony of Thomas Granato, at 4-8 (Aug. 4, 2008).

The CHEERS Report was filed with the Board on August 31, 2010. This is the first epidemiological study of the health risks of fishing, boating, rowing and paddling in the CAWS. The CHEERS Study design was developed by a multi-disciplinary team of experienced researchers, with backgrounds in infectious disease medicine, environmental medicine, epidemiology, biostatistics, industrial hygiene and environmental science. A panel of recognized leaders in the fields of water microbiology and health from the U.S. Centers for Disease Control and Prevention, the U.S. Environmental Protection Agency, and several universities reviewed and endorsed the designs and protocols of the research, and monitored the quality of the data collected and its analysis and interpretation.

The CHEERS Study was designed to investigate the occurrence of illness associated with secondary contact recreation on the CAWS and presented two findings. The first objective was to determine the rates of acute gastrointestinal and non-gastrointestinal illness attributable to CAWS recreation. The second objective was to identify pathogens responsible for acute infections among recreators, and to explore sources of those pathogens on the CAWS. A third objective – to characterize the relationship between concentrations of microbes in the CAWS and rates of illness among recreators – will be addressed in a supplement to the CHEERS Report that will be submitted to the Board in December of 2010.

With respect to the first specific aim of the CHEERS Study, the study concluded that rates of gastrointestinal illness are not higher among CAWS recreators as compared to recreators doing the same activities on general use waters that do not receive undisinfected wastewater treatment plant effluent. About 12-13 cases of gastrointestinal illness per 1,000 uses can be

attributed to limited contact recreation on the CAWS. This rate is statistically indistinguishable from the rate of gastrointestinal illness attributable to limited contact recreation on general use waters. After taking into account differences among the groups, the CHEERS Study found that the odds of developing acute gastrointestinal illness were 41% higher in the CAWS group as compared to the unexposed group. However, the odds were 44% higher in the general use waters group as compared to the unexposed group.

Although the CHEERS Study did find a significantly different incidence of eye symptoms among CAWS recreators than those on general use waters, the symptoms reportedly were very minor in most cases, generally not requiring any medication or requiring only the use of over-the-counter medications. The study could not discern whether the eye symptoms were the result of infection, chemical irritation, or allergic reaction. The incidence of more severe eye symptom that did require medical attention, prescription medication, or hospitalization, occurred more frequently in the general use waters or unexposed group than the CAWS. Finally, the CHEERS Study found that there is no difference among recreators on the CAWS, recreators on the general use waters, and the unexposed group for respiratory, skin and ear symptoms.

With respect to the third aim of the CHEERS Study, pathogens responsible for illness, the vast majority of pathogens identified from stool samples from study participants in all of the study groups with gastrointestinal symptoms were viruses. Pathogens that often result in severe water borne disease were not identified in stool samples. There was no suggestion that water recreation, CAWS use, or water ingestion was associated with gastrointestinal illness.

The CHEERS Study also contains information concerning development of a relationship between microbial water quality parameters and the incidence of illness for recreational uses proposed for the CAWS, which will eventually be needed to develop scientifically-based

bacterial water quality standards for the CAWS. As was noted above, a supplemental report reflecting a completed analysis of the water-quality-illness relationship will be submitted to the Board by December 6, 2010.

The CHEERS Study makes it clear that disinfection is not necessary for the District's wastewater treatment plant effluent discharged into the CAWS. The risk to recreators in the CAWS, where effluents are not disinfected, are no greater than the risks to recreators in other nearby waters where effluents are disinfected or where no effluent is discharged. The District has concluded that disinfection will not provide a public health benefit.

The total costs associated with disinfection are extraordinary, particularly considering the lack of benefit. For example, installation and operation of UV disinfection technology, which currently represents the most likely choice for implementation at the District's North Side, Calumet and Stickney plants, is estimated at a 20-year total present worth cost of $919.6 million. Chlorination/dechlorination would result in similar costs to the District. Based upon the District's limitations and restrictions on generating revenues to fund programs, funding such an expenditure would require legislative action, a voter referendum, or significantly reducing funding of the District's existing capital improvement plan which is designed to maintain and upgrade the District's aging infrastructure.

Finally, effluent disinfection would result in substantial environmental impacts in the form of energy usage, air emissions from power generation and transportation of raw and waste materials, and land usage. These environmental impacts must be weighed when considering the appropriateness of disinfection requirements.

As established by the preceding testimony and in light of the CHEERS Study, IEPA's conclusions are not supported by sound science and are arbitrary, speculative, and not rationally

related to the information necessary to establish appropriate recreational uses and supporting criteria. For these reasons, the District strongly recommends that, after appropriate recreational uses are established through Subdocket A, the Board direct IEPA to use the results of the CHEERS Study, including the supplemental report that will be filed shortly concerning the statistical link between microbe concentration in the CAWS and actual illness rates, to establish appropriate, science-based criteria to support recreational uses. At the October 28, 2008 hearing, the IEPA specifically asked me if CHEERS would provide information that would enable them to identify an appropriate indicator organism and set ambient criteria that would be protective of incidental contact and non-contact recreation and I informed them that it would. Testimony of Thomas Granato, at 186 & 189. If, despite this recommendation, the District recommends that the requirement to disinfect be removed as unsupported.

Dated: September 20, 2010

Respectfully submitted,

By: Thomas Granato
Metropolitan Water Reclamation District of
Greater Chicago