

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 ILL..) (Subdocket B)
 ADM. CODE PARTS 301, 302, 303 and 304)

NOTICE OF FILING

To:

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Persons on the attached service list

Please take notice that on the 31st Day of January, 2011, I filed with the Office of the Clerk of the Illinois Pollution Control Board the attached **Environmental Groups' Response to Comments Submitted by Metropolitan Water Reclamation District Concerning Proposed Effluent Bacteria Standards**, a copy of which is hereby served upon you.



By: _____
 Ann Alexander, Natural Resources Defense Council

Dated: January 31st, 2011

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CERTIFICATE OF SERVICE

I, Ann Alexander, the undersigned attorney, hereby certify that I have served the attached **Environmental Groups' Response to Comments Submitted by Metropolitan Water Reclamation District Concerning Proposed Effluent Bacteria Standards** on all parties of record (Service List attached), by depositing said documents in the United States Mail, postage prepaid, from 227 W. Monroe, Chicago, IL 60606, before the hour of 5:00 p.m., on this 31st Day of January, 2011.

A handwritten signature in blue ink that reads "Ann Alexander". The signature is written in a cursive style.

Ann Alexander, Natural Resources Defense Council

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)	
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WATER QUALITY STANDARDS AND)	
EFFLUENT LIMITATIONS FOR THE)	R08-09B
CHICAGO AREA WATERWAYS SYSTEM)	(Rulemaking- Water)
(CAWS) AND THE LOWER DES PLAINES)	
RIVER: PROPOSED AMENDMENTS TO)	
35 Ill. Adm. Code Parts 301, 302, 303 and 304)	
(Recreational Use Designations))	

**ENVIRONMENTAL GROUPS' RESPONSE TO COMMENTS
 SUBMITTED BY METROPOLITAN WATER RECLAMATION DISTRICT
CONCERNING PROPOSED EFFLUENT BACTERIA STANDARDS**

Natural Resources Defense Council (“NRDC”), Environmental Law & Policy Center, Friends of the Chicago River, Openlands, Alliance for the Great Lakes, Prairie Rivers Network, and Sierra Club-Illinois Chapter (“Environmental Groups”) submit this response to the Final Comments and Responses to Information Requests submitted by the District¹ on January 3, 2011.

The Environmental Groups had moved prior to the comment deadline for an opportunity to respond to the District’s submissions, but withdrew that motion based on their understanding of representations by the District. The Groups did not renew the motion following receipt of the District’s submissions, as the vast majority of the District’s positions and conclusions are fully addressed in the Environmental Groups’ January 3 comments (“EG Final Comment”). However,

¹ Abbreviations used in this response are defined in the Environmental Groups’ January 3, 2011 Comment unless otherwise noted.

in view of the Board's Order dated January 6, 2011 allowing responsive submissions, we have identified the following matters to bring to the Board's attention regarding the District's latest submissions.

A. Inaccurate or Incomplete Statements Regarding the Health Benefits of Disinfection

1. The District misinterprets the testimony regarding CHEERS replication. The District quotes Dr. Gorelick's 10/20/10 testimony stating that a replication of the CHEERS study would likely have a "similar result" as a basis to assert that Dr. Gorelick found the study results "valid." District Final Comment at 12. In fact, as explained at length in the EG Final Comment at 37-38, the entire point of Dr. Gorelick's statement was that a "similar result" in a replication study would be any result within the 95 percent confidence bounds – which would encompass a result in which there were as many as 10 additional illnesses among CAWS recreators versus G UW recreators. The point is not that the CHEERS study is particularly reliable but that, read properly, it does not say very much.

2. The District misinterprets Dr. Dorevich's findings regarding handwashing. The District Final Comment notes that, for CHEERS participants who ate and drank, taking into account handwashing behavior eliminated the statistically significant difference between eye symptoms among CAWS and G UW users (the difference remained for non-eating and drinking participants). District Final Comment at 13. However, the District Final Comment also asserts, "The increased incidence of eye symptoms. . . was likely due to lower rates of hand washing among CAWS recreators who ate or drank." *Id.* This assertion directly misstates the study conclusion, and as a result misses its actual significance. In fact, Dr. Dorevich's supplemental analysis found the CHEERS participants washed their hands *more* often than G UW participants,

not less, after eating or drinking (although G UW participants were more likely to eat or drink). *See* District's Responses to Information Requests at October 19 and 20, 2010 Hearings ("Responses"), Item 2, at 3. The CHEERS analysis showed the statistical difference between CAWS and G UW eye symptoms levels vanishes when more handwashing by CAWS users is taken into account. This illogically suggests that the higher level of CAWS eye symptoms is attributable to CAWS users being more careful to wash, not less. It is thus simply another CHEERS study anomalous result that needs further study. (The results also confirm the repeated testimony that CAWS users take significantly more precautions than G UW users out of concern for pathogen contamination.)

3. The District's Response confirms the ineffectiveness of filtration as a substitute for disinfection. Dr. Granato made a vague reference at the hearings to the possibility that filtration could serve as an effective means of pathogen removal, without the need for disinfection; and noted that studies were being conducted regarding that matter at the District's suburban plants. *See* EG Final Comment at 25. The results of the District's studies, and others, in fact demonstrate that filtration is largely ineffective as a substitute for disinfection. While disinfection removes nearly all pathogen indicators from the effluent (see EG Final Comment at 17), the District's studies found less than 50 percent removal of fecal coliform using filtration (results were similar for E.Coli). Responses Item 7. When the effluent levels are in the range of 42,000 to 56,000 cfu/100 ml (see EG Final Comment at 25), less than 50 percent removal is simply not an effective solution. The District's analysis also concedes that "[l]iterature information on the removal of indicator microorganisms by biological and chemical nutrient removal processes is scarce." Responses Item 7F.

4. The District's Response and "clarifications" regarding its technical studies fail to adequately address their shortcomings. In response to the USEPA CHEERS Comment (PC # 561), and to USEPA's earlier extensive critique of the Risk Assessment, the District presents a "clarification" regarding the CHEERS study and a response regarding the Risk Assessment (PC # 562). We see no need to evaluate the Risk Assessment response point by point, as it represents the latest in a long series of attempts by Geosyntec and the District to respond to the Agency's heavy criticisms of the study, most of which the Agency found to be utterly inadequate. *See* EG Final Comment at 71. We note as a general matter that the response addresses only a subset of the lengthy list of criticisms leveled at the study by USEPA. Regarding the CHEERS study "clarification," Dr. Dorevich's response falls far short of addressing the serious limitations to the CHEERS study identified in the USEPA CHEERS Comment. Concerning USEPA's point that the G UW waters are an inappropriate comparison to the CAWS because both have elevated indicator levels, Dr. Dorevich offers only a tentative suggestion – contravening long-held scientific understanding – that indicator levels may not signify fecal contamination (citing his own research to conclude that the concern with indicator levels "may be misplaced"). Regarding the baseline 1 in 5 chance of a false negative result, Dr. Dorevich simply reiterates the study's results, without acknowledging the many sources of bias toward the null identified in this proceeding that significantly increase the chance of this type of error. Concerning the anomalous study results showing high risk to boaters, Dr. Dorevich flat-out admits that the reason for these results is unclear, and that they may be attributable to alcohol consumption, an un-addressed confounder. Perhaps most importantly, Dr. Dorevich does not respond at all to USEPA's point that illness rates elevated far above the 8 per 1,000 benchmark are simply unacceptable, regardless of the CAWS/G UW comparison.

5. The District's filings actually confirm that "wet weather" impacts exist for only 24 hours after a CSO event. In the EG Final Comment, the Environmental Groups demonstrated that the District's estimates of annual rainfall days were substantially inflated due to an unsupported assumption of 3 days of lingering impacts; and an assumption of lingering impacts even if rainfall did not even trigger a CSO event. *See* EG Final Comment at 84 et seq. The Environmental Groups presented an adjusted calculation that assumed lingering impacts only following CSO events, and only for 1 day following such events. The study concerning CSO effects on microbial water quality conducted by Dr. Dorevich and others, MWRDGC Response Item 1, effectively confirms the validity of the Environmental Groups' adjusted assumptions. The analysis found that "a starting point for defining wet conditions may be rainfall greater than 0.1 inches or 0.25 inches in the previous 24 h and CSO event for more than 1 h in the previous 24 h." Responses Item 1 at 37.

B. Errors and Omissions Regarding Federal Law, EPA Policy and Illinois Law Regarding Disinfection

1. Failure to take into account CWA regulatory standards. The District continues to ignore the requirements of 40 CFR 131.10(g), which dictate the relevant standard regarding when treatment costs may be considered in determining designated uses. Additionally, it fails to take into account that water quality standards must protect the "most sensitive use," 40 CFR 131.11(a), which in this case includes recreation by children and immune system impaired persons and use by riparian wildlife that may be sensitive to human pathogens. There is abundant testimony in the record that children, pregnant woman and wildlife may be harmed by coming into contact with pathogens that entered the CAWS from the MWRD plants. *See* EG Final Comment at 48, 55-56; Testimony of William Van Bonn (Ex. 240).

2. The District does not, in fact, demonstrate that there is “flexibility” on the USEPA 8 per 1,000 risk benchmark. The District presents a brief description of the history of USEPA’s standard setting concerning pathogen indicators, which it describes as information regarding “flexibility from USEPA on acceptable illness rates.” We note that not only does this document not demonstrate any particular flexibility on the part of USEPA concerning the matter, but that USEPA specifically reaffirmed that 8 per 1,000 benchmark in the USEPA CHEERS Comment (PC # 561).

3. The District misstates the law regarding “sensitive waters” under 35 Ill. Adm. Code 302.209. The District claims in Item 4 that for a general use water to be a sensitive water, it must pass a “two part” test which requires that a water body both have “natural characteristics, aesthetic value or significance ...deserving of protection from pathogenic organisms,” and have either the physical characteristics to support primary contact or flow through or adjacent to parks or recreational areas. *See* Responses Item 4 IV. In fact, a plain reading of the provision reveals that “sensitive waters” include all general use waters that have physical characteristics to support primary contact or that flow through or adjacent to parks or residential areas. In other words, all waters that support primary contact or flow adjacent to parks or recreational areas have “natural characteristics, aesthetic value or significance” deserving of protection.

Because much of the CAWS has physical characteristics that would support primary contact or flows through or adjacent to parks or residential areas, there is no doubt that large portions of the CAWS would have to be treated as “sensitive waters” if the CAWS was classified as general use waters.

C. Errors, Omissions and Misleading Statements Regarding the Costs of Disinfection, Controls to Prevent Violations of the Proposed Dissolved Oxygen Standard, and the Costs to Treat Nutrient Pollution

1. The District's January 3, 2011 filings contain no meaningful refutation of SAIC conclusions regarding costs of disinfection. The District presents no new data to contravene the USEPA-commissioned SAIC report conclusion that the District's cost estimates for disinfection are significantly inflated. It merely reprints Dr Zenz's prefiled testimony on the matter. District Final Comment at 22-23. It bears noting that Dr. Zenz's critique was given to USEPA and SAIC, which subsequently produced a revised version of the report, but did not change its ultimate conclusion (*see* 10/27/08 at 122-23). Substantively, Dr. Zenz's testimony essentially confirms the SAIC report's conclusion that filtration – a very costly option associated with UV disinfection that was evaluated by the District – “did not appear to be necessary,” which was the conclusion of the SAIC report. *See* District Final Comment at 24.

Moreover, the District's own estimate for UV disinfection without filtration, while higher than SAIC's estimate, is not enormously higher -- \$2.86 per household per month as opposed to \$1.94 per household per month. The District, once again, makes no attempt to present analysis suggesting that either of these rather modest costs would result in “widespread economic and social impact” per UAA Factor 6 (*see* EG Final Comment at 76). The purported 15% increase in the MWRD fees – a small fraction of a taxpayer's total real estate tax bill – is not inconsistent with these per-household increase estimates.

2. The District's estimate of “present value” costs conflicts with basic financial principles that require that the time value of money be recognized. The District's costs estimates assume “present value costs over 20 years based on 3.0% interest rate and a 3.0 % inflation rate.” *See, e.g.*, Testimony of John Mastracchio (Ex. 159), note to Attachment 1; 10/27/08 at 218-19

(testimony of District witness Thomas Kunetz). Assuming that long run interest rates are equal to inflation makes the math easy, avoids having to take into account that many of the proposed capital construction projects will not take place for over a decade, and papers over the fact that the District is saving millions just by delaying disinfection and other necessary upgrades. But this assumption, convenient for the District as it may be, violates basic economic principles that require that the time value of money be recognized. *See* Office of Management and Budget, Circular A-4, September 17, 2003, Ex. 293 at 31-33. *See also* USEPA, Guidelines for Preparing Economic Analysis pp. 6-1, 6-12. (*available at* <http://yosemite.epa.gov/ee/epa/eed.nsf/pages/Guidelines.html>) In fact, the Office of Management and Budget states that a real discount rate (*i.e.*, after inflation has been taken into account) of 2.7 percent should be assumed in federal analyses for a ten year planning horizon. *See* http://www.whitehouse.gov/omb/circulars_a094_a94_appx-c/.

Use of even a 2 percent real interest rate in calculating the costs of the capital improvements would substantially sedate the “sticker shock” that the District has sought to create through its presentation. For example, MWRDGC claims that it might cost \$5 billion to make all the capital improvements needed to disinfect, prevent dissolved oxygen problems and remove nitrogen and phosphorus pollution. This estimate appears to be grossly inflated for a number of reasons, but even assuming it is a correct figure in terms of nominal construction costs, adjusting for a 2 percent real interest rate takes a billion dollars out of the number, given that much of the work is proposed for 2023.

3. The District presents no meaningful cost estimate for DO compliance, and fails to separate out costs of remediating current non-compliance. It is impossible to understand how MWRDGC calculates the costs of meeting the proposed DO standard from the documents

currently in the record. Perhaps in Subdocket D, the District will actually set forth more than unsupported guestimates as to the cost of meeting the proposed DO standards. This should also take into account that the CSO events might also be addressed with steps that cost the District less money than supplemental aeration. For example, passage and implementation of a strong stormwater ordinance could reduce the amount of water that enters the CAWS during precipitation events. If the District intends to try to prove that meeting the proposed DO standard would cause “widespread social and economic impact,” it should explain why Cincinnati, Cleveland, Indianapolis, Kansas City, Evansville and other Midwest cities have agreed to take the necessary steps to control their combined sewer overflows. Particularly given that completion of the Deep Tunnel project is only part of the solution, and that the District has not even been willing to commit to a date on which the Deep Tunnel project will be completed, a number of low-tech approaches to the problem of stormwater should also be studied and implemented.

In any event, when the District presents an intelligible estimate of the cost of meeting the proposed DO standard, it should subtract the cost of meeting the existing DO standard, which it has failed to do in the guestimate it presented to the Board. As the District freely admits, CSOs now cause frequent violation of the current 4 mg/L DO standard. *See, e.g.,* Testimony of Adrienne Nemura (Ex. 116), Attachments 4 and 5. Certainly, the cost of the meeting the existing standard cannot be charged against the current IEPA proposal. It may be that the incremental cost of addressing the proposed standard is not very large.

4. The District’s cost estimates for nitrogen and phosphorus control are seriously inflated. It is impossible from the current record to understand many of MWRDGC’s cost estimates for treating nitrogen and phosphorus pollution. In future proceedings specifically

concerning proposed nutrient controls, careful estimates of the likely net costs of nutrient removal may become necessary. That said, it is clear that the figures advanced in Item 7 of the District's Responses concerning still-hypothetical nutrient control requirements appear to be grossly inflated projections based on studies that have little or no relevance to the likely cost of the District's treatment for nutrients.

The District presents two estimates of nutrient removal cost in its Responses Item 7B. The first of these purports to provide capital costs and operation and maintenance costs for "Scenario #1," with total phosphorus ("TP") limits of 0.5 mg/L and total nitrogen ("TN") limits of 6-8.0 mg/L. We do not believe that anything has been placed in the record or is otherwise readily available that allows us to check those cost estimates, which were characterized as "order of magnitude" estimates by the District. *See* Testimony of John Mastracchio (Ex. 159) at 5. However, on their face they appear to be exaggerated in view of the two cost studies that were relied on by the District in developing "Scenario #2," which are the USEPA "Municipal Nutrient Removal Reference Document" (September 2008), *available at* <http://water.epa.gov/scitech/wastetech/upload/mnrt-volume1.pdf> and a study developed by a consultant for POTW operators, O'Brien & Gere (Ex. 166), based on the experience of generally small municipalities in the Chesapeake Bay watershed. These studies, although actually germane to plants that would be expected to have far higher per gallon costs than MWRDGC, contain examples of nutrient removal efforts that compare favorably in costs with the "order of magnitude" estimate given by the District.

There are multiple analytical flaws that caused the inflated result. First, the nutrient removal task that the District would undertake is not, on a per gallon basis, comparable to most of the plants considered in the EPA Municipal Nutrient Removal study or the Chesapeake Bay

study. The District's facilities, which are larger, should have cheaper per-gallon removal costs than the smaller facilities considered in these studies. As USEPA states, the "size of the system is a significant cost factor: Higher unit costs are associated with smaller facilities compared to larger facilities because of economies of scale." USEPA Municipal Nutrient Removal Reference Document at ES-14. It would appear, then, that the District's costs should be at the extreme low end of the scale reflected in these studies, or much lower than any of the plants studied, given that most of the District's discharge is from plants many times larger than the plants considered in the studies; but the District has chosen to compare itself to the average costs given in the studies.

Second, any comparisons with the historical experience of the relatively small plants covered in the USEPA and O'Brien & Gere studies should be considered in light of the fact that the District does not plan to begin construction of nutrient removal facilities until 2023 after completion of prototype works. It would be surprising, if not scandalous, if the District – given 12 years and huge economies of scale – cannot do better than small plants in Maryland and elsewhere that were racing to meet permit limits that had been imposed on them.

Third, the District's estimates do not take into account the fact that nutrient standards could be met through retrofits, rather than construction of expansion plants. Retrofits of existing plants are clearly cheaper than building new plants, and it is cheaper to retrofit plants to remove nitrogen that are already nitrifying. (ES 17, 4-1) However, in the estimates for Scenario #2 (TO = 0.1 and TN =3 mg/L), the District inexplicably based its estimates on the projected costs for 10 MGD expansion plants (USEPA Municipal Nutrient Reference figures 4-21 and 4-22) rather than the lower figure for retrofit plants (figures 4-7 and 4-8). In any event, projections based on plants of a scale of 10 MGD or less that have already been built are hardly a reasonable

basis for estimating costs of 800 MGD plants that it is proposed to build in the future after years of design and research.

Of course, all of these numbers are highly speculative and depend on guesses as to what treatment levels will be required in 2023 and what technologies may be developed or improved in the meantime. Further, improved regulation of fertilizer, improved stormwater controls and wetlands restoration may reduce the costs of nitrogen and phosphorus treatment at the plant. Still further, the District's calculation makes no allowance for the fact that in 12 years or less it should be possible to harvest nutrients from sewage and sell them. Indeed, progressive wastewater treatment agencies are already developing plans to harvest nutrients and some plants doing this have been built. *See* Gardner, John, Turning Wastewater into a Revenue Stream, Matter Network, <http://featured.matternetwork.com/2010/11/wastewater-diverted-become-revenue-stream.cfm>. *See also* Vaccari, David M., Phosphorus a Looming Crisis, Scientific American, June 2009, pp.54-8. Treatment for phosphorus may also yield additional benefits in that enhanced biological nutrient removal also reduces the amount of pharmaceutical and health care products in the water and increases the efficiency of UV disinfection. USEPA, Advanced Wastewater Treatment to Achieve Low Concentrations of Phosphorus, EPA-910-R-07-002 (April 2007) p. 9. available at <http://yosemite.epa.gov/r10/water.nsf/Water+Quality+Standards/AWT-Phosphorus>.

Most importantly for this proceeding, the District presents no basis to conclude that even the highest of its estimates for collectively addressing disinfection, low dissolved oxygen levels and nitrogen and phosphorus pollution come close to causing “widespread economic and social impact” (which would not, in any event, be the relevant test, as Factor 6 should be applied only to the measures proposed in this proceeding and not hypothetical future nutrient requirements).

It appears that, leaving aside exemptions, the highest and most absurd of the District's estimates would lead to an total tax for sewage treatment of approximately \$615 on a \$200,000 residential property (Item 7D, p. 5) (\$200,000 market value = \$74,020 Cook County assessed value, multiplied by District high estimate of \$0.8288/\$100 of Equalized Assessed Value). According to the U.S Census Bureau the median value of an owner-occupied housing unit in 2000 was \$157,000 while median household income was \$54,559.

<http://quickfacts.census.gov/qfd/states/17/17031.html>. Thus, even the District's worst case exaggerated figure does not appear to be an intolerable burden.

While none of us want to pay more real estate taxes or fees, the District's guestimates of the future costs of nutrient removal are certainly no basis for allowing it, almost alone among major American POTWs, to discharge undisinfected sewage.

CONCLUSION

As an overall matter, the District has simply not presented a credible alternative proposal for making the CAWS safer for recreation. The District's proposed "alternative approach" is a regulation stating that it must continue to comply with its permit requirements. *See* Response Item 8. In other words, the status quo. The requirements of the Clean Water Act, the ongoing risk to recreators, and the reasonable cost of a solution militate in favor of the regulatory remedy proposed by IEPA, not the do-nothing stance of the District.

Dated: January 31, 2011

Respectfully submitted,

NATURAL RESOURCES DEFENSE
COUNCIL

ENVIRONMENTAL LAW AND POLICY
CENTER

OPENLANDS

SIERRA CLUB—ILLINOIS CHAPTER

PRAIRIE RIVERS NETWORK

FRIENDS OF THE CHICAGO RIVER

ALLIANCE FOR THE GREAT LAKES

By: _

A rectangular box containing a handwritten signature in blue ink that reads "Ann Alexander".

NRDC Senior Attorney and authorized to
represent all of the above parties with regard
to this comment

A rectangular box containing a handwritten signature in blue ink that reads "Albert Estroff".

One of the Counsel for Prairie Rivers
Network and Sierra Club