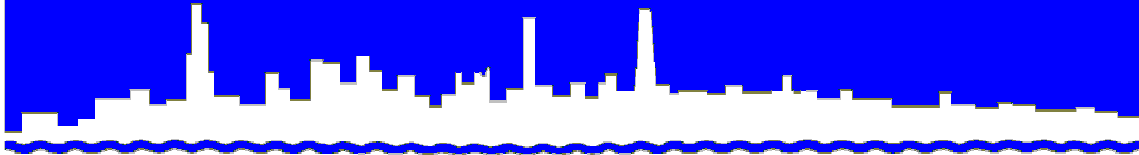


*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

**RESEARCH AND DEVELOPMENT  
DEPARTMENT**

*REPORT NO. 06-14*

**RESULTS OF ACUTE WHOLE EFFLUENT TOXICITY (WET) TESTS  
CONDUCTED ON FINAL EFFLUENT SAMPLES**

**JOHN E. EGAN WATER RECLAMATION PLANT  
SCHAUMBURG, ILLINOIS  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER IL0036340**

**MARCH 2006**

**Metropolitan Water Reclamation District of Greater Chicago**

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312-751-5600

Louis Kollias, P.E., BCEE  
*Director of Research and Development*  
312-751-5190

March 10, 2006

Mr. Jeb McGhee  
Environmental Specialist  
Compliance Assurance Section - 19  
Illinois Environmental Protection Agency  
1021 North Grand Avenue  
Springfield, IL 62794-9276

Dear Mr. McGhee:

Subject: Biomonitoring Report for February 2006 – John E. Egan Water Reclamation  
Plant NPDES Permit Number IL0036340

The subject biomonitoring report is submitted in compliance with the NPDES Permit Number IL0036340, Special Condition 11. Whole effluent toxicity (WET) tests were conducted in accordance with the biomonitoring plan for the John E. Egan Water Reclamation Plant, dated July 7, 2005 (copy attached), which was approved by Mr. Robert Mosher of the Illinois Environmental Protection Agency in a letter to Mr. Lanyon dated July 18, 2005 (copy attached).

The subject report includes copies of all bench sheets, chain-of-custody forms, sample receipt and preparation forms, hard copies of computer generated statistical analyses, control charts, and a certification of accuracy statement.

If you have any questions concerning this report, please contact Dr. James T. Zmuda, Microbiologist IV, at 708-588-4224.

Very truly yours,

Richard Lanyon  
Director  
Research and Development

RL:JTZ:rag  
Attachments  
cc via MWRDGC website:  
Granato/O'Connor/Zmuda/Rijal/Yamanaka  
O'Connell/Carmody/Moe/Nason (Transmittal  
letter and report title page)

**Metropolitan Water Reclamation District of Greater Chicago**

100 East Erie Street

Chicago, IL 60611-2803

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BIOMONITORING REPORT  
2006

RESULTS OF ACUTE WHOLE EFFLUENT TOXICITY (WET) TESTS  
CONDUCTED ON FINAL EFFLUENT SAMPLES

JOHN E. EGAN WATER RECLAMATION PLANT  
SCHAUMBURG, ILLINOIS  
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Research and Development Department  
Richard Lanyon, Director

March 2006

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## ACKNOWLEDGMENTS

Ms. Rhonda Griffith is acknowledged for typing this report.

## DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS FOR THE JOHN E. EGAN  
WATER RECLAMATION PLANT, ILLINOIS  
NPDES PERMIT NUMBER IL0036340, FEBRUARY 2006

Summary

Acute toxicity tests with the fathead minnow, *Pimephales promelas* (96-hour, static, renewal) and the water flea, *Ceriodaphnia dubia* (48-hour, static, non-renewal) were conducted on the samples of John E. Egan WRP final effluent collected on February 6-7, 2006. The results indicated that the tests were valid. No acute toxic effect on *Pimephales promelas* was observed. No acute toxic effect on *Ceriodaphnia dubia* was observed. Results of quality control acute toxicity tests with *Pimephales promelas* and *Ceriodaphnia dubia* using the reference toxicant sodium chloride (NaCl) fell within limits prescribed as acceptable by the United States Environmental Protection Agency (USEPA).

Sample Information

Five grab samples of final effluent were collected from the John E. Egan WRP. A grab sample was collected at 0600, 1200, 1800, and 2400 on Monday, 2/6/06 and 0600 on Tuesday, 2/7/06. The individual grab samples were stored on-site at 0.1-6°C in a refrigerator. These samples were received in the laboratory within 4 hours of the final grab sample collection. Sample temperatures at the time of receipt were below 8°C. The five grab samples were combined in the laboratory to make a 24-hour composite sample. Samples were stored in a locked refrigerator in the laboratory at  $4 \pm 1^\circ\text{C}$ . Sample collection information is shown in Table 1.

Whole Effluent Toxicity (WET) Tests

Acute *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (*C. dubia*) WET tests were conducted on the John E. Egan WRP effluent samples collected on February 6-7, 2006.



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

SAMPLE COLLECTION INFORMATION

Effluent Collection Point:	John E. Egan WRP Effluent Discharge Number 001
Effluent Collection Method:	Composite sample of five grab samples collected in a 24-h period
Effluent Water Collection Date and Sample Times:	February 6, 2006 0600, 1200, 1800, 2400 February 7, 2006 0600

Acute WET test methods and procedures were followed in accordance with *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, EPA/821-R-02-012, Fifth Edition, October 2002. All WET Tests were conducted in a locked environmental chamber. Fathead minnows were exposed to 6.25, 12.5, 25, 50, and 100 percent effluent concentrations for 96 hours. *C. dubia* were exposed to the same concentrations of effluent for 48 hours. The acute fathead minnow test was set up on February 7, 2006 and completed on February 11, 2006. The acute *C. dubia* test was set up on February 7, 2006 and completed on February 9, 2006. Hard synthetic water with selenium (HSW) was used as control and dilution water. Statistical analyses were performed using the CETIS™ Software program version 1.1.1 (Tidepool Scientific Software, California).

Concurrent reference toxicant tests (RTT) using sodium chloride (NaCl) were conducted, and HSW was used as control and dilution water. The control charts for the *C. dubia* and fathead minnow acute tests were prepared (Appendix DI and DII).

### Analysts

Vince Billett (Laboratory Technician II) conducted the WET tests. Jon Yamanaka (Biologist I) entered the raw data in an Excel program. Jon Yamanaka, Geeta Rijal (Microbiologist III), and James Zmuda (Microbiologist IV) prepared this report.

### Results

Results of the acute fathead minnow and *C. dubia* WET tests are shown in Tables 2 and 3, respectively. No acute toxicity to fathead minnows or *C. dubia* was observed. The HSW control met USEPA test acceptability criteria. Results of concurrent reference toxicant tests using sodium chloride (NaCl) were within the prescribed limits, i.e. within  $\pm 2$  standard deviations from the mean.

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TABLE 2

ACUTE FATHEAD MINNOW TEST RESULTS

96-h LC <sub>50</sub>	> 100%
Toxicity Observed	No
Mean Percent Survival in Laboratory Water Control (HSW)	100%
Mean Percent Survival in 100% Final Effluent	100%
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ACUTE *C. DUBIA* TEST RESULTS

48-h LC <sub>50</sub>	>100%
Toxicity Observed	No
Mean Percent Survival in Laboratory Water Control (HSW)	90%
Mean Percent Survival in 100% Final Effluent	100%
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

Tabulated summaries of the fathead minnow and *C. dubia* WET tests are presented in Appendices AI and AII, respectively. Raw data for the fathead minnow and *C. dubia* tests are presented in Appendices BI and BII, respectively. Chain-of Custody documentation is provided in Appendix CI. Raw data, statistical calculations, culture data, and control charts for the fathead minnow and *C. dubia* concurrent reference toxicant tests are provided in Appendices DI and DII, respectively.

Certification of Accuracy

I certify under penalty of law that this document and all appendices were prepared under my supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations 40 C.F.R. 122.22 (d).

\_\_\_\_\_  
Date

\_\_\_\_\_  
Richard Lanyon  
Director  
Research and Development

If you have any questions concerning this report, telephone Dr. James T. Zmuda, Microbiologist IV, at 708-588-4224.