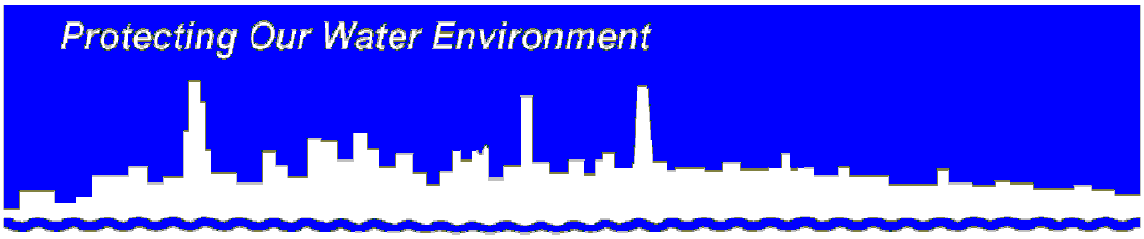

Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 11-62

BIOMONITORING REPORT
2011

ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS
FOR THE LEMONT WATER RECLAMATION PLANT,
LEMONT, ILLINOIS
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT NUMBER IL0028070, OCTOBER 2011

NOVEMBER 2011

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-3154 312.751.5190

Thomas C. Granato, Ph.D.
Director of Monitoring and Research Department
thomas.granato@mwrd.org

November 17, 2011

Ms. Michelle Rousey
Quality Assurance Officer
Illinois Environmental Protection Agency
1021 North Grand Avenue
P.O. Box 19276
Springfield, IL 62794-9276

Dear Ms. Rousey:

Subject: Biomonitoring Report for 2011 – Acute Whole Effluent Toxicity Test Results for the Lemont Water Reclamation Plant, Lemont, Illinois, National Pollutant Discharge Elimination System Permit Number IL0028070, October 2011

The subject Biomonitoring Report is submitted in compliance with the National Pollutant Discharge Elimination System Permit Number IL0028070, Special Condition 12.

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. Geeta Rijal, Supervising Environmental Microbiologist, at (708) 588-4224.

Very truly yours,

Thomas C. Granato, Ph.D.
Director
Monitoring and Research

TCG:GR:ps
Enclosures
cc: M. Sharma/A. Gronski/B. Perkovich/C. O'Connor

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

BIOMONITORING REPORT
2011

ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS FOR THE LEMONT WATER RECLAMATION PLANT LEMONT, ILLINOIS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NUMBER IL0028070, OCTOBER 2011

Monitoring and Research Department
Thomas C. Granato, Director

NOVEMBER 2011

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Special thanks are extended to Section 124 Analytical Microbiology and Biomonitoring staff and Section 126 Aquatic Ecology and Water Quality staff for their assistance in maintaining the test culture organisms. Gratitude is also extended to Ms. Hemangini Shukla and Dr. Geeta Rijal for preparing the report. Ms. Pamela Slaby is acknowledged for typing and formatting 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 LEMONT WATER RECLAMATION PLANT, LEMONT, ILLINOIS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NUMBER IL0028070, OCTOBER 2011

Summary

The acute toxicity test with *Pimephales promelas* (*P. promelas*) (96-hour, static, renewal), was conducted on samples of the Lemont Water Reclamation Plant (WRP) final effluent collected October 3 through October 4, 2011. The results indicated that the test was valid. No acute toxic effect on *P. promelas* was observed. Results of the quality control acute toxicity test with *P. promelas* using the reference toxicant sodium chloride (NaCl) fell within limits prescribed as acceptable by the United States Environmental Protection Agency (USEPA).

The acute toxicity test with *Ceriodaphnia dubia* (*C. dubia*) (48-hour, static, non-renewal) was conducted on samples of the Lemont WRP final effluent collected October 3 through October 4, 2011. The results indicated that the test was valid. No acute toxic effect on *C. dubia* was observed. Results of the quality control acute toxicity test with *C. dubia* using the reference toxicant NaCl fell within limits prescribed as acceptable by the USEPA.

Sample Information

Tests were performed using 24-hour composite samples of the Lemont WRP final effluent collected on October 3 through October 4, 2011, for the acute toxicity tests. The individual grab samples were stored on site at 0.1 - 6°C in a refrigerator. Sample temperatures at the time of receipt were less than or equal to 10ºC. Samples were stored in a dedicated refrigerator in the Biomonitoring Laboratory at 0.1 - 6°C. Sample collection information is shown in Table 1.

Whole Effluent Toxicity Tests

The acute toxicity tests with *P. promelas* and *C. dubia* were conducted on the Lemont WRP effluent samples collected October 3 through October 4, 2011. Acute Whole Effluent Toxicity (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-02-12, Fifth Edition, October 2002. *P. promelas* were exposed to 6.25, 12.5, 25, 50 and 100 percent concentration of final effluent for 96 hours. *C. dubia* were exposed to the same final effluent concentrations for 48 hours.

TABLE 1: SAMPLE COLLECTION INFORMATION

Effluent Collection Point:	Lemont Water Reclamation Plant Effluent Discharge Number 001	
Effluent Collection Method:	Five 2-1/2 gallon grab samples collected over a 24-hour period were combined to make a 24-hour composite sample. The individual grab samples were collected at 6-hour intervals.	
Effluent Collection Times and Dates:	0600	October 3, 2011
	1200	October 3, 2011
	1800	October 3, 2011
	2400	October 3, 2011
	0600	October 4, 2011

The acute fathead minnow test (*P. promelas*) was set up on October 4, 2011, and completed on October 8, 2011. The acute *C. dubia* test was set up on October 4, 2011, and completed on October 6, 2011. Hard synthetic water with selenium (HSW) was used as control and dilution water for both test species.

Statistical analyses were performed using the Comprehensive Environmental Toxicity Information System (CETIS) software program, version 1.7.0 (Tidepool Scientific Software, California).

Concurrent reference toxicant tests (RTT) using NaCl were conducted, and the control charts for the *P. promelas* and *C. dubia* acute RTT were prepared.

Analysts

WET tests were conducted by Ms. Jane Schipma (Laboratory Technician I) and Mr. Richard Schackart (Laboratory Technician II). Ms. Hemangini Shukla (Assistant Environmental Microbiologist) entered the raw data in an Excel and CETIS program. Ms. Hemangini Shukla and Dr. Geeta Rijal (Supervising Environmental Microbiologist) prepared this report.

Results

Results of the acute *P. promelas* WET test are shown in Table 2. The *P. promelas* test results indicated a valid test. No acute toxicity to *P. promelas* was observed. The HSW control water met the test acceptability criteria for the *P. promelas* test. Results of the quality control acute toxicity test with *P. promelas* using the RTT fell within limits prescribed as acceptable by the USEPA, i.e. within $\pm$ 2 standard deviations from the mean.

Results of the acute *C. dubia* WET test are shown in Table 3. The *C. dubia* test results indicated a valid test. No acute toxicity to *C. dubia* was observed. The HSW control water met the test acceptability criteria for the *C. dubia* test. Results of the quality control, acute toxicity test with *C. dubia* using the RTT fell within limits prescribed as acceptable by USEPA, i.e. within $\pm$ 2 standard deviations from the mean.

The WET test results indicated the absence of acute toxicity to *P. promelas* and *C. dubia*. Tabulated summaries of the *P. promelas* and *C. dubia* WET tests are presented in Appendices AI and AII, respectively. Raw data for the *P. promelas* and *C. dubia* WET 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 *P. promelas* and *C. dubia* concurrent RTT are provided in Appendices DI and DII, respectively.

TABLE 2: ACUTE *PIMEPHALES PROMELAS* TEST RESULTS

Acute Test Parameters	Results
96-h LC_{50}	>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

TABLE 3: ACUTE *CERIODAPHNIA DUBIA* TEST RESULTS

Acute Test Parameters	Results
48-h LC_{50}	>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

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 data, 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	Thomas C. Granato, Ph.D. Director Monitoring and Research

If you have any questions concerning this report, please contact Dr. Geeta Rijal, Supervising Environmental Microbiologist, at 708-588-4224.