

Bioassays of the City of

Winter Garden Wastewater Treatment Facility

Winter Garden, Orange County, Florida

NPDES #FL0020109

Sampled 8/6/01

November 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

City of Winter Garden Wastewater Treatment Plant, 101 East Crest Avenue, Winter Garden, Orange County, Florida, NPDES #FL0020109, tests performed on 7 to 9 August 2001.

This domestic advanced wastewater treatment plant has a design flow of 2.0 MGD and a mean flow of 1.39 MGD. The wastewater treatment consists of flow equalization, influent screening, grit removal, aeration for nitrification, static-anoxic denitrification, chemical addition for nutrient removal, clarification, filtration, disinfection by chlorination, thickening, and aerobic digestion of residuals. The chemicals used in nutrient removal are methanol and ferric chloride for nitrogen and phosphorus, respectively. Dechlorination of the effluent is achieved naturally by percolation in unlined percolation ponds. After treatment the effluent is discharged via the percolation pond's underdrain system into an unnamed ditch that flows into the Class III fresh waters of Lake Apopka.

Violations for fecal coliform occurred in January, March, September, November, and December of 2000. Violations for total residual chlorine occurred in January and March of 2000 (facility summary provided by John Bowles and Phil Kane, FDEP, Orlando).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent collected from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample, and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on August 6, 2001 did not show acute toxicity to the either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Winter Garden Wastewater Treatment Plant, 101 East Crest Avenue, Winter Garden, Orange County, Florida, NPDES# FL0020109 performed on August 7 to 9 in 2001.

Facility:	**City of Winter Garden WWTP**	**NPDES #**	**FL0020109**	Facility Type:	**Wastewater Treatment Plant**	**Analysts:**	Della Parker-Hanson, Marshall Faircloth, Joshua Ayres, Shannon Gerardi
Location:	101 East Crest Avenue, Winter Garden	Contact/District:	Kane/Central				
County:	Orange	Test type:	static acute screen				
Sample Collection Date:	8/6/01 Time: 0930	# tests:	2	Receiving Water:	Lake Apopka		
Test Beginning Date:	8/7/01 Time: 1330	Chlorination Type:	Chlorinated				
Test Ending Date:	8/9/01 Time: 1330		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:**	David Whiting

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours

	Sample/Diluen	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.4	-	8.4	25.0	-	23.4	7.8	-	8.0	170	185
Control B	0/20	5	5	5	-	-	8.4	-	-	23.1	-	-	8.0	-	180
Control C	0/20	5	5	5	-	-	8.4	-	-	23.0	-	-	8.2	-	180
Control D	0/20	5	5	5	-	-	8.4	-	-	22.9	-	-	8.1		180
100% A	20/0	5	5	5	7.3	-	8.6	24.9	-	23.0	6.8	-	8.2	535	585
100% B	20/0	5	5	5	-	-	8.6	-	-	23.0	-	-	8.1	-	560
100% C	20/0	5	5	5	-	-	8.6	-	-	22.9	-	-	8.3	-	555
100% D	20/0	5	5	5	-	-	8.6	-	-	22.8	-	-	8.2	-	570

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-26.0°C.
Incubator #2 temperature range for the test period was 24.0-25.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 10 days

	Sample/Diluen	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	8.4	8.5	8.5	24.7	24.0	24.5	8.9	7.8	7.4	255	260
Control B	0/500	5	5	5	8.3	8.4	8.6	24.6	24.9	24.3	8.9	7.8	7.4	255	265
Control C	0/500	5	5	5	8.4	8.5	8.6	24.6	23.9	24.3	9.0	7.9	7.5	255	255
Control D	0/500	5	5	5	8.4	8.5	8.6	24.6	24.1	24.8	9.0	7.8	7.5	255	245
100% A	500/0	5	5	5	7.2	7.9	8.2	24.6	24.2	24.3	6.8	7.1	7.0	540	555
100% B	500/0	5	5	5	7.2	7.9	8.2	24.4	24.2	24.3	6.8	7.0	7.0	545	560
100% C	500/0	5	5	5	7.2	7.9	8.2	24.3	24.0	24.3	6.7	7.2	7.0	545	550
100% D	500/0	5	5	5	7.2	7.9	8.2	24.4	23.7	24.5	6.7	7.2	7.0	545	560

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was23.5-26.0°C.
Incubator #3 temperature range for the test period was 24.5-25.5°C.

Data Transcription Verification	
date:	10/29/01
by:	Della Parker-Hanson, Joshua Ayres

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	<0.017
20% Dilute Mineral Water (cladocerans):	< 0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	139	139
20% Dilute Mineral Water (cladocerans):	73	80
100% Sample:	110	127

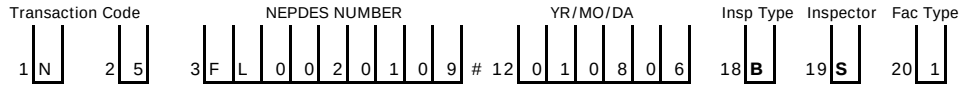
Table 2. Results of chemical analyses on the effluent from City of Winter Garden Wastewater Treatment Plant sampled on August 6, 2001.

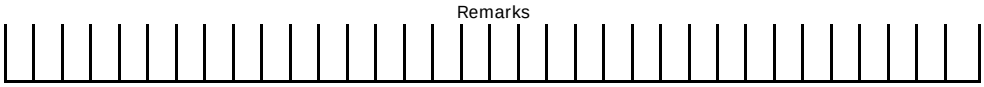
Metals			
Aluminum	130	µg/L	[I]
Cadmium	0.063	µg/L	[I]
Calcium	41.9	mg/L	
Copper	2.3	µg/L	
Iron	342	µg/L	
Magnesium	7.8	mg/L	
Nickel	4.4	µg/L	[I]
Selenium	0.57	µg/L	[I]
Pesticides and Herbicides			
Fonofos	0.17	µg/L	[I]
Base, Neutral, & Acid Extractable Organics			
None detected			
Nutrients			
Ammonia-N	0.27	mg N/L	
Total-Kjeldahl-N	0.81	mg N/L	
Nitrate,Nitrite	1.4	mg N/L	
O-Phosphate-P	0.2	mg P/L	
Total-P	0.2	mg P/L	

[I] Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.

The Bioassay of City of Winter Garden Wastewater Treatment Plant effluent sampled on August 6, 2001, NPDES #FL0020109.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

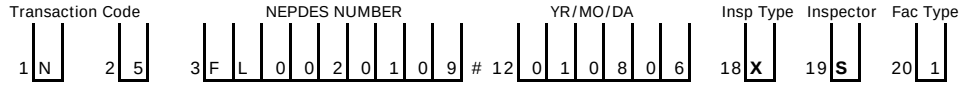


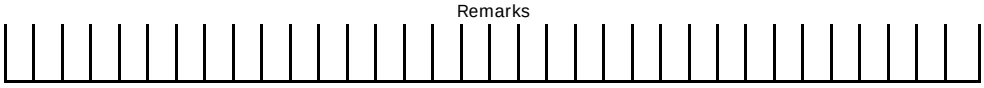


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The Priority Pollutants Analysis for Bioassay of City of Winter Garden Wastewater Treatment Plant effluent sampled on August 6, 2001, NPDES #FL0020109.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)





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