

Bioassays of

Deland/Wiley M. Nash Water Reclamation Facility

Deland, Volusia County, Florida

NPDES #FL0020303

Sampled 9/10/01

December 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

DeLand/Wiley M. Nash Water Reclamation Facility, 1032 South Amelia Avenue, DeLand, Volusia County, Florida, NPDES #FL0020303, tests performed on 11 to 13 September 2001.

This water reclamation facility has a design flow of 6.0 MGD. The treatment process for wastewater includes influent screening, grit removal, three carrousel-type oxidation basins, secondary clarification, chemical feed, filtration, chlorination, and dechlorination by sulfur dioxide addition. The residuals are thickened, aerobically digested, dewatered using belt filter presses, and aerobically stabilized. The treated effluent is discharged through Outfall D001 into the Class III fresh waters of the St. John's River (facility summary provided by John B. Bowles, 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 by 48 hours (Table 1).

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

Conclusion

The sample of effluent collected from this facility on September 10, 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 DeLand/Wiley M. Nash Water Reclamation Facility, 1032 South Amelia Avenue, DeLand, Volusia County, Florida, NPDES# FL0020303 performed on 11 to 13 Septmeber 2001.

Facility:	**DeLand/Wiley M. Nash WRF**		**NPDES #**	**FL0020303**	Facility Type:	**Water Reclamation**	**Analysts:** Della Parker-Hanson
Location:	1032 South Amelia Avenue		Contact/District:	Kane/Central District		**Facility**	Marshall Faircloth
County:	Volusia		Test type:	static acute screen			Joshua Ayres
Sample Collection Date:	9/10/01	Time: 0945	# tests:	2	Receiving Water:	St. Johns River	
Test Beginning Date:	9/11/01	Time: 1200	Chlorination Type:	Chlorinated			**Reviewer:** David Whiting
Test Ending Date:	9/13/01	Time: 1420		sample collected after dechlorination		**Page 1 of 1**	

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	-	8.3	24.5	-	24.3	8.1	-	7.7	175	220
Control B	0/20	5	5	5	-	-	8.3	-	-	24.6	-	-	7.8	-	205
Control C	0/20	5	5	5	-	-	8.3	-	-	24.7	-	-	7.7	-	205
Control D	0/20	5	5	5	-	-	8.3	-	-	24.4	-	-	7.6		240
100% A	20/0	5	5	5	7.4	-	8.3	25.1	-	24.7	6.6	-	7.7	695	770
100% B	20/0	5	5	5	-	-	8.4	-	-	24.8	-	-	7.7	-	790
100% C	20/0	5	5	5	-	-	8.4	-	-	24.9	-	-	7.7	-	710
100% D	20/0	5	5	5	-	-	8.4	-	-	24.8	-	-	7.7	-	745

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #2 temperature range for the test period was 25.5-27.0°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	8.5	8.5	8.4	25.1	25.0	24.3	8.5	7.5	7.7	240	285
Control B	0/500	5	5	5	8.5	8.5	8.4	25.0	24.9	24.0	8.4	7.6	7.6	240	295
Control C	0/500	5	5	5	8.5	8.5	8.4	24.9	24.7	24.0	8.3	7.5	7.7	240	270
Control D	0/500	5	5	5	8.5	8.5	8.4	24.9	24.1	24.3	8.3	7.5	7.6	240	285
100% A	500/0	5	5	5	7.3	8.1	8.2	25.1	24.7	24.8	6.7	7.3	7.3	690	760
100% B	500/0	5	5	5	7.3	8.0	8.2	25.0	24.8	24.4	6.8	7.4	7.2	705	775
100% C	500/0	5	5	5	7.3	8.0	8.2	24.8	24.8	24.2	6.7	7.3	7.5	700	755
100% D	500/0	5	5	5	7.3	8.0	8.2	24.4	24.7	24.1	6.6	7.3	7.5	705	785

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

Data Transcription Verification	
date:	11/7/01
by:	Joshua Ayres Della Parker-Hanson

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):	138	135
20% Dilute Mineral Water (cladocerans):	79	91
100% Sample:	91	164

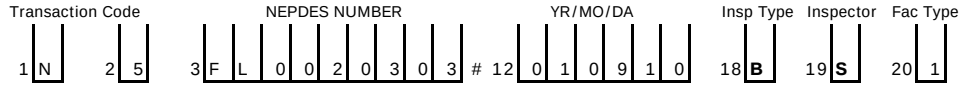
Table 2. Results of chemical analyses on the effluent from Deland/Wiley M. Nash Water Reclamation Facility sampled on September 10, 2001.

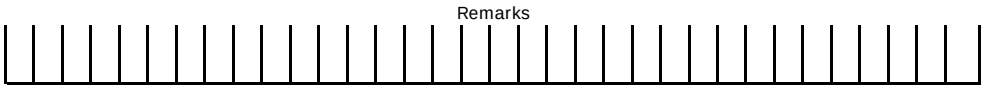
Metals			
Aluminum	80	µg/L	[I]
Cadmium	0.079	µg/L	[I]
Calcium	52.3	mg/L	
Copper	3.26	µg/L	
Iron	43	µg/L	[I]
Lead	0.56	µg/L	[I]
Magnesium	6.6	mg/L	
Silver	0.075	µg/L	[I]
Zinc	74	µg/L	
Pesticides and Herbicides			
Fonofos	0.13	µg/L	[I]
Base, Neutral, & Acid Extractable Organics			
None detected			

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

The Bioassay of DeLand/Wiley M. Nash Water Reclamation Facility effluent sampled on September 10, 2001, NPDES #FL0020303.

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

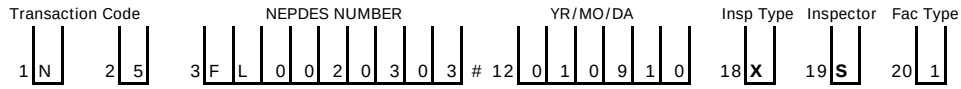


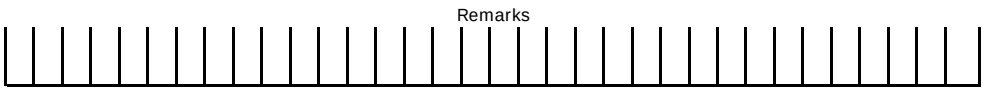


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The Priority Pollutants Analysis for Bioassay of DeLand/Wiley M. Nash Water Reclamation Facility effluent sampled on September 10, 2001, NPDES #FL0020303.

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