

Bioassays of

PCS Phosphate

White Springs, Hamilton County, Florida

NPDES #FL0036226

Sampled 8/27/01

November 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

PCS (Swift Creek Chemical Complex and Mine), County Road 137, White Springs, Hamilton County, Florida, NPDES #FL0036226, tests performed on 28 to 30 August 2001.

This industrial wastewater treatment facility has a design flow of 26.9 MGD. The wastewater treatment process consists of chemical precipitation, settling, adsorption on mining waste clay particles, and sedimentation. Wastewater from internal Outfalls 001-2, 001-17, and 001-6 are recycled through the plant by diversion to the Swift Creek Mine clay settling area via Internal Outfall 001-2a. This settling area serves to help remove nutrients from the wastewater. After treatment wastewater is discharged through Outfall 001 and Outfall 002 to the Class III fresh waters of the Suwannee River via Swift Creek and Camp Branch, respectively (facility summary provided by Melissa Long, FDEP, Jacksonville).

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 Outfall 001 of 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 was undetected in the laboratory. Total and unionized 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 27, 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 PCS (Swift Creek Chemical Complex), County Road 137, White Springs, Hamilton County, Florida, NPDES# FL0036226 performed on 28 to 30 August 2001.

Facility:	**PCS (Swift Creek)**		**NPDES #**	**FL0036226**	Facility Type:	**Chemical Complex &**	**Analysts:** Marshall Faircloth
Location:	County Road 137, White Springs		Contact/District:	Pat O'Connor/Northeast		**Phosphate Mine**	Joshua Ayres
County:	Hamilton		Test type:	static acute screen			Della Parker-Hanson
Sample Collection Date:	8/27/01	Time: 1530	# tests:	2	Receiving Water:	Suwannee River	
Test Beginning Date:	8/28/01	Time: 1345	Chlorination Type:	non-chlorinated			**Reviewer:** David Whiting
Test Ending Date:	8/30/01	Time: 1330				**Page 1 of 1**	

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

		SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Sample/Diluent 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	25.5	-	25.5	8.0	-	7.5	170	215
Control B	0/20	5	5	5	-	-	8.3	-	-	25.5	-	-	7.7	-	200
Control C	0/20	5	5	5	-	-	8.3	-	-	25.5	-	-	7.8	-	195
Control D	0/20	5	5	5	-	-	8.4	-	-	25.3	-	-	7.7		210
100% A	20/0	5	5	5	7.5	-	8.2	24.8	-	25.2	8.0	-	7.8	745	855
100% B	20/0	5	5	5	-	-	8.2	-	-	25.1	-	-	7.8	-	900
100% C	20/0	5	5	5	-	-	8.2	-	-	25.0	-	-	7.9	-	900
100% D	20/0	5	5	5	-	-	8.2	-	-	25.0	-	-	8.0	-	855

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0 °C.
Incubator #2 temperature range for the test period was 25.5-26.5 °C.

Organism: ***Cyprinella leedsi*** Life stage: 8 days

		SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Sample/Diluent 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	8.1	8.4	8.5	25.0	23.9	24.4	7.7	7.8	7.9	260	285
Control B	0/500	5	5	5	8.1	8.4	8.5	25.0	24.3	24.4	7.6	7.9	7.8	260	275
Control C	0/500	5	5	5	8.1	8.4	8.5	25.0	24.5	24.4	7.6	7.6	7.8	260	280
Control D	0/500	5	5	5	8.1	8.4	8.5	25.1	24.5	24.1	7.6	7.5	7.7	260	280
100% A	500/0	5	5	5	7.5	8.1	8.1	24.7	24.3	24.2	7.8	7.6	7.9	755	840
100% B	500/0	5	5	5	7.5	8.0	8.1	24.6	24.3	24.0	8.0	7.7	7.7	760	830
100% C	500/0	5	5	5	7.5	8.0	8.1	24.5	24.4	23.9	8.2	7.6	7.8	765	840
100% D	500/0	5	5	5	7.5	8.0	8.2	24.5	24.2	24.2	8.2	7.5	7.8	765	870

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0 °C.
Incubator #3 temperature range for the test period was 25.0-25.5 °C.

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

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	0.04	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):	126	124
20% Dilute Mineral Water (cladocerans):	73	83
100% Sample:	105	239

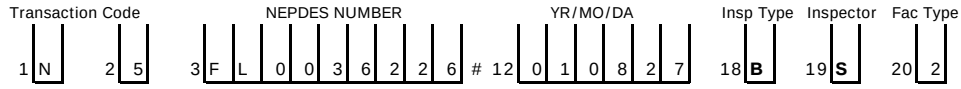
Table 2. Results of chemical analyses on the effluent from PCS (Swift Creek Chemical Complex and Mine) sampled on August 27, 2001.

Metals			
Aluminum	130	µg/L	I
Calcium	47.7	mg/L	
Copper	0.73	µg/L	I
Iron	28	µg/L	I
Magnesium	28	mg/L	
Nickel	3	µg/L	I
Pesticides and Herbicides			
Simazine	0.088	µg/L	I
Base, Neutral, & Acid Extractable Organics			
None detected			
Chloride and Flouride			
Chloride	12	mg Cl/L	A
Fluoride	2	mg F/L	A

[A] Value reported is the mean f two or more determinations.
[I] Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.

The Bioassay of PCS (Swift Creek Chemical Complex and Mine) effluent sampled on August 27, 2001, NPDES #FL0036226.

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

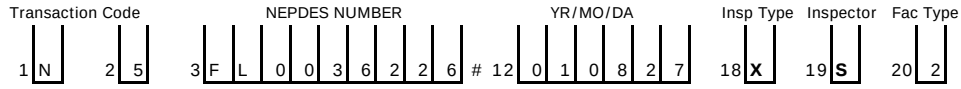


Remarks

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The Priority Pollutants Analysis for Bioassay of PCS (Swift Creek Chemical Complex and Mine) effluent sampled on August 27, 2001, NPDES #FL0036226.

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Remarks

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