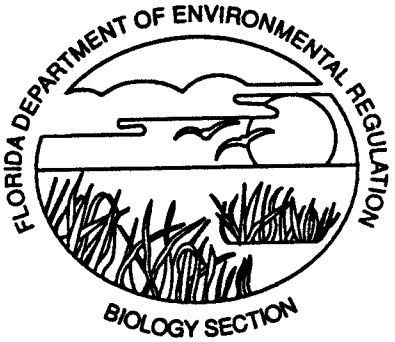
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Bioassays of

Kennedy Space Center Parachute Refurbishing Plant

Kennedy Space Center, Brevard County, Florida

DER #IO 05-120515

Sampled 6/10/91

September 16, 1991

Biology Section
Division of Technical Services

Bioassays of

Kennedy Space Center Parachute Refurbishing Plant

Kennedy Space Center, Brevard County, Florida

DER #IO 05-120515

Biology Section
Bureau of Laboratories
September 16, 1991

Introduction

Kennedy Space Center Parachute Refurbishing plant, Brevard County, Florida, DER #IO 05-120515, on 11 to 13 June, 1991.

This facility is located in the Kennedy Space Center. The parachutes are recovered with the solid fuel rocket boosters following a space shuttle launch, and are washed to remove the ocean water from which they were retrieved. The water used in the refurbishing process is drinking water supplied by the City of Cocoa Beach. The untreated wastewater is discharged intermittently, about 50,000 gallons each time, to the Banana River.

The toxicity tests discussed in this report were performed in accordance with methods described by Peltier and Weber, 1985, *Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms*, 3rd Edition, and by the FDER Biology Section, 1985, *Quality Assurance Manual for Performing Acute Toxicity Tests*, 2nd Edition.

Results and Discussion

The Biology Section performed two static acute screening bioassays on a sample of effluent collected from this facility on 10 June, 1991. The test organisms used were the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. The bioassays indicated that the sample of effluent from this facility was not toxic to *N. leedsi*. The *C. dubia* bioassay results were invalidated due to excessive control mortality

Total residual chlorine and total ammonia were not detected in the samples. No further chemical analyses were performed on the sample.

Conclusion

The sample of effluent from this facility was not toxic to *N. leedsi* on June 10, 1991.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Kennedy Space Center Parachute Refurbishing Plant on 11 to 13 June, 1991.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100 %	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100 %	0 mL	500 mL	500 mL

Table 2. Data recorded during the static acute screening bioassays of a sample of effluent from the Kennedy Space Center Parachute Refurbishing plant, Brevard County, Florida, on 11 to 13 June, 1991.

Facility:	**Kennedy Space Center Parachute Refurbishing plant**	DER#:	**IO 05-120515**	Facility Type:	**Parachute Refurbishing**
Location:	Kennedy Space Center	Contact/District:	Phil Kane / Central		
County:	Brevard	Test type:	Static Acute Screen		
Sample Collection Date:	**6/10/91** Time: 1040	# tests:	2	Receiving Water:	Banana River
Test Beginning Date:	6/11/91 Time: 1245	Chlorination Type:	**source is chlorinated drinking water**		
Test Ending Date:	6/13/91 Time: 1300				**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Lab:	0.0	Hach
Lab Blank:	0.0	Hach

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	110	118
Cond. Control Water (daphnids):	58	75
100% Sample:	42	110

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	3 *	8.2	9.3	8.9	8.2	8.3	8.2	21.5	21.1	21.6	166	182
Control	5	5	3 *	-	-	-	-	-	-	-	-	-	-	-
Control	5	5	4 *	-	-	-	-	-	-	-	-	-	-	-
Control	5	5	5 *	-	-	-	-	-	-	-	-	-	-	-
100%	5	4	1	8.3	9.3	8.9	7.8	8.0	8.1	20.0	21.1	21.6	651	687
100%	5	4	0	-	-	-	-	-	-	-	-	-	-	-
100%	5	5	3	-	-	-	-	-	-	-	-	-	-	-
100%	5	5	2	-	-	-	-	-	-	-	-	-	-	-

* Test invalidated at 48 hours due to excessive control mortality.

Organism: ***Notropis leedsi*** Age: 18 days
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	5	8.3	8.6	8.5	7.8	8.2	8.3	21.0	21.0	21.0	-	-
Control	5	5	5	8.3	8.6	8.5	7.8	8.2	8.3	-	-	-	242	245
100%	5	5	5	8.3	8.1	8.3	7.9	7.8	7.7	19.5	21.0	21.1	-	-
100%	5	5	5	8.3	8.1	8.3	7.9	7.8	7.7	-	-	-	668	709

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: KSC-PARACHUTE REFURBISHING
Address/City: KENNEDY SPACE CENTER
County: BREVARD
Contact/District: PHIL KANE / CENTRAL
NPDES Permit #: FL 05-130515 Outfall #: _____

Test Number: 2 of 2 Test Type: Screening | Definitive
Static | Static Renewal | Flow through

Remarks:

Sample Collection: Date 6-10-91 Time 1040
Test Beginning: Date 6-11-91 Time 1245
Test Ending: Date 6-13-91 Time 1140
Test Organism: NOTROPIS LEEDSI
Life Stage/Age: 18 DAYS

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.9 @ 22	8.8 @ 22	1371 @ 23.8	21.0 @ 25
24 hr	7.9 @ 22	8.8 @ 22	1376 @ 24.3 (1334)	21.0 @ 24.1
48 hr	7.9 @ 22	8.8 @ 22	1377 @ 24.1 (1355)	21.9 @ 24.3

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
CONTROL	57	5	5	5	8.3	8.6	8.5	7.8	8.2	8.3	21.0	21.0	21.0			
CONTROL	20	5	5	5	8.2	8.6	8.5	7.8	8.2	8.3				343	343	345
100%	183	5	5	5	8.3	8.1	8.3	7.9	7.8	7.7	19.5	21.0	21.1			
100%	76	5	5	5	8.3	8.1	8.3	7.9	7.8	7.7				892	892	709
Measured/Loaded by		MF	MF	MF	KP	AJ	MF	KP	MF	MF	KP	WJ	MF	KP	MF	MF
Recorded by		MF	MF	MF	WJ	WJ	WJ	WJ	WJ	WJ	AJ	WJ	WJ	WJ	WJ	WJ

Investigators' Signatures

Kim Hiscock
Phil Kane
Ronald Brisk

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.0	Hach	MF
Lab Tot. Resid. Cl2:			0.0	HACH	MF
Alkalinity:	54	58	56	Hach	MF
Hardness:	112	75	96	Hach	MF
Total Ammonia:	0.0	0.0	0.0	Hach	MF

Ammonia meter slope: _____

1ST

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: KSC-PARACHUTE REFURBISHING | Sample Collection: Date [illegible] Time [illegible]
Address/City: KENNEDY SPACE CENTER | Test Beginning: Date [illegible] Time 1245
County: BREVARD | Test Ending: Date [illegible] Time 1320
Contact/District: PHIL KANE / CENTRAL | Test Organism: CERIODAPHNIA DUBIA
NPDES Permit #: IO 05 130515 | Outfall #: | Life Stage/Age: [illegible]
DER

Test Number: 1 of 2 | Test Type: (Screening) | Definitive
Static | Static Renewal | Flow-through

Remarks: 48 hr
Invalidated @ 24 hours - test still exceeds control mortality - low toxicity

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	[illegible]	[illegible]	[illegible]	[illegible]
24 hr	[illegible]	[illegible]	[illegible]	[illegible]
48 hr	[illegible]	[illegible]	[illegible]	[illegible]

		Number Live			DO (mg/l)			pH			Temp. (°C)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
CONTROL	A	5	5	3	8.7	9.3	8.9	8.2	8.3	8.2	21.0	21.1	21.6	[illegible]	[illegible]	[illegible]
CONTROL	B	5	5	3												
CONTROL	C	5	5	4												
CONTROL	D	5	5	5												
100%	A	5	4	1	8.3	9.3	8.9	7.8	8.0	8.1	20.0	21.1	21.6	[illegible]	[illegible]	[illegible]
100%	B	5	4	0												
100%	C	5	5	3												
100%	D	5	5	2												
Measured/Loaded by:		MKH	MH	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF
Recorded by:		KP	MH	MF	AJ	[illegible]	[illegible]	AJ	[illegible]	[illegible]	AJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Investigators' Signatures

Kim Pearce
Alison Jordan
Donald Fairall

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample (Beaker)	Method	Measured by
Field Tot. Resid. Cl2:			0.0	Hach	MF
Lab Tot. Resid. Cl2:			0.0	HACH	MF
Alkalinity:	110	53	[illegible]	[illegible]	[illegible]
Hardness:	114	25	[illegible]	[illegible]	[illegible]
Total Ammonia:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Ammonia meter slope: