Florida

Department of Environmental Protection

Bioassays of

Florida Bay near
Lower Arsnicker Key

No NPDES Number

Sampled 11/16/93

February 1994

Biology Section
Division of Technical Services

Bioassays of

Florida Bay near Lower Arsnicker Key

No NPDES Number

Biology Section
Bureau of Laboratories
February 1994

Introduction

Florida Bay, Lower Arsnicker Key, Monroe County, Florida, no NPDES #, tests performed on 17 to 19 November, 1993.

The sample was collected about one-half mile south of Lower Arsnicker Key in Florida Bay at 24° 54' 40" N and 80° 49' 44" W by Florida Marine Patrol staff (personal communication, Gus Rios, FDEP Marathon). The bioassays were requested in response to the concern that the recent algae blooms in Florida Bay were contributing to the coral and sponge death in the bay and on the reefs. The bioassays were intended to investigate whether the bay water contained substances produced by indigenous algae which would cause toxicity to marine test organisms.

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027.

Results and Discussion

The FDEP Biology Section performed acute and chronic toxicity bioassays on a sample from Florida Bay. The salinity of the sample was about 39 ppt, therefore, marine test species were used for these bioassays.

Two 48-hour static acute screening bioassays were performed with the mysid shrimp, *Mysidopsis bahia,* and with the inland silverside, *Menidia beryllina.* The control water for the tests was adjusted to a similar salinity using an artificial sea salt mixture (Forty Fathoms®); the salinity of the sample was not altered.

One 48-hour static chronic screening bioassay was performed with the coot clam, *Mulinia lateralis.* Natural sea water was used for the control water in this test; the salinity of the sample was not altered.

Each species was exposed to unfiltered and filtered aliquots of the sample and control waters (Tables 3-5). An aliquot of the sample was filtered through a 0.45 µm filter to remove algae. Filtering removed the algae and this aliquot was tested to see if the filtered bay water was toxic by itself. Aliquots of the two control waters were also filtered and served as filtered controls, to confirm that the filtering process did not cause toxicity.

The test results for the unfiltered sample indicated minimal acute toxicity (one death) in the *Menidia* test and no mortality to the mysids. No mortality occurred in either the *Menidia* or mysid test with the filtered aliquot. The clam test results did not indicate chronic toxicity with either aliquot.

Although the sample collected was ambient bay water, total residual chlorine and total ammonia were measured as standard bioassay practice. The

concentrations measured were < 0.03 mg/L and < 0.017 mg/L, respectively. No further chemical analyses were performed on the sample.

Conclusion

The unfiltered sample of effluent collected from Florida Bay on 16 November, 1993, indicated minimal acute toxicity (one death) in the *Menidia* test and no mortality to the mysids. No mortality occurred in either the *Menidia* or mysid test with the filtered aliquot. The clam test results did not indicate chronic toxicity with either aliquot.

Table 1. Concentration series and volumes used for the 48-hour static acute screening bioassays of the Florida Bay sample performed on 17 to 19 November, 1993.

Mysidopsis bahia (mysid shrimp)

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

Menidia beryllina (inland silverside)

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

Table 2. Concentration series and volumes used for the 48-hour static chronic screening bioassay of the Florida Bay sample performed on 17 to 19 November, 1993.

Mulinia lateralis (coot clam)

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

Table 3. Data recorded during the 48-hour static acute screening bioassays of a sample from Florida Bay, Monroe County, Florida, no NPDES number, performed on 17 to 19 November, 1993.

Facility:	**Florida Bay**		NPDES #	**None**	Facility Type: **Ambient bay water**
Location:	Lower Arsnicker Key		Contact/District:	Gus Rios/S	
County:	Monroe		Test type:	static acute screen	
Sample Collection Date:	**11/16/93**	Time: 1015	# tests:	2	Receiving Water: Florida Bay
Test Beginning Date:	11/17/93	Time: 1415	Chlorination Type:	**None**	
Test Ending Date:	11/19/93	Time: 1415			**Page 1 of 1**

Total Residual Cl2	mg/L	Method
Field:	not measured	
Lab:	< 0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water:	<0.017	0
100% Sample:	<0.017	0

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water :	175	-
100% Sample:	150	-

Salinity	(ppt) *
Control Water:	35.1
100% Sample:	38.7

* Salinity converted from conductivity readings.

Organism: ***Mysidopsis bahia*** Life stage: 5 days

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity (mmhos/cm)	
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	8.3	8.3	23.8	23.5	23.2	6.1	6.8	6.7	51.0	48.1
Control	5	5	5	8.3	8.3	8.3	-	23.4	23.2	6.1	6.8	6.8	51.0	48.3
100%	5	5	5	8.1	8.1	8.0	23.9	23.4	23.1	7.5	6.9	7.0	56.6	52.6
100%	5	5	5	8.1	8.0	8.0	-	23.4	23.1	7.5	6.6	6.9	56.6	52.9

Organism: ***Menidia beryllina*** Age: 8 days

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity (mmhos/cm)	
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	8.3	8.3	23.8	23.5	23.1	6.1	6.8	7.1	51.0	48.4
Control	5	5	5	8.3	8.3	8.3	-	-	23.1	6.1	6.9	7.0	51.0	48.1
100%	5	5	4	8.1	8.1	8.1	24.0	23.5	23.1	7.7	6.6	6.9	56.6	53.0
100%	5	5	5	8.1	8.1	8.1	-	-	23.1	7.6	6.6	7.0	56.6	52.6

Table 4. Data recorded during the 48-hour static acute screening bioassays of a filtered sample from Florida Bay, Monroe County, Florida, no NPDES number, performed on 17 to 19 Novmber, 1993.

Facility:	**Florida Bay**		NPDES #	**None**	Facility Type: **Ambient bay water**
Location:	Lower Arsnicker Key		Contact/District:	Gus Rios / S	
County:	Monroe		Test type:	static acute screen	
Sample Collection Date:	**11/16/93**	Time: 1015	# tests:	2	Receiving Water: Florida Bay
Test Beginning Date:	11/17/93	Time: 1415	Chlorination Type:	**None**	
Test Ending Date:	11/19/93	Time: 1415			**Page 1 of 1**

Total Residual Cl2	mg/L	Method
Field:	not measured	
Lab:	< 0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (filtered):	<0.017	0
100% Sample (filtered):	<0.017	0

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (filtered):	180	-
100% Sample (filtered):	150	-

Salinity	(ppt) *
Control Water (filtered):	35.1
100% Sample (filtered):	39.4

* Salinity converted from conductivity readings.

Organism: ***Mysidopsis bahia*** Life stage: 5 days

Sample filtered in laboratory, 0.45µm.

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity (mmhos/cm)	
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	8.4	8.3	8.3	23.4	23.4	23.3	5.6	6.9	7.2	50.9	47.7
Control	5	5	5	8.4	8.3	8.3	-		23.3	5.6	6.7	7.2	50.9	48.3
100%	5	5	5	8.1	8.1	8.0	23.5	23.5	23.2	5.4	6.5	6.8	55.9	52.4
100%	5	5	5	8.1	8.1	8.1	-		23.3	5.4	6.5	6.8	55.9	53.2

Organism: ***Menidia beryllina*** Age: 8 days

Sample filtered in laboratory, 0.45µm.

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity (mmhos/cm)	
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	8.4	8.3	8.3	23.7	23.4	23.2	5.5	6.8	7.0	51.0	47.8
Control	5	5	5	8.4	8.3	8.3	-	-	23.2	5.6	6.8	7.0	50.9	48.3
100%	5	5	5	8.2	8.1	8.1	23.5	23.5	23.2	5.4	6.8	7.0	55.9	52.9
100%	5	5	5	8.2	8.1	8.1	-	-	23.3	5.4	6.8	7.1	55.9	52.1

Table 5. Data recorded during the 48-hour chronic screening bioassay of a sample from Florida Bay, Monroe County, Florida, performed on 17 to 19 November, 1993.

test began: 11/17/93 test stopped: 11/19/93 test counted: 11/29/93

sample	vial #	#fertilized	unfertilized	vial #	#fertilized	unfertilized	mean
time=0	T01A	108	1	T01B	100	3	98%
fertilized	T02A	105	11	T02B	100	8	91%
egg count	T03A	101	4	T03B	104	5	96%
	T04A	100	5	T04B	107	8	94%
	T05A	117	1	T05B	108	0	100%
					total mean fertilized		96%
					stdev		3%

Normal, D-shaped, shell development counted after test was stopped @ 48 hours.

sample	vial #	normal	other	vial #	normal	other	mean
control water	C1A	101	4	C1B	105	0	98%
(NSW)	C2A	114	4	C2B	101	1	98%
	C3A	100	2	C3B	120	0	99%
test stopped	C4A	101	3	C4B	112	0	99%
@ 48 hours	C5A	105	2	C5B	106	0	99%

sample	vial #	normal	other	vial #	normal	other	mean
filtered control	fC1A	111	0	fC1B	104	1	100%
(NSW)	fC2A	119	0	fC2B	100	2	99%
	fC3A	131	2	fC3B	104	0	99%
test stopped	fC4A	108	2	fC4B	110	0	99%
@ 48 hours	fC5A	109	1	fC5B	100	0	100%

sample	vial #	normal	other	vial #	normal	other	mean
100% effluent	100-1A	101	0	100-1B	112	0	100%
	100-2A	114	0	100-2B	102	1	100%
	100-3A	101	0	100-3B	109	0	100%
test stopped	100-4A	102	0	100-4B	117	1	100%
@ 48 hours	100-5A	105	0	100-5B	101	1	100%

sample	vial #	normal	other	vial #	normal	other	mean
filtered 100%	f100-1A	762 *	36	f100-1B	685 *	23	96%
effluent	f100-2A	102	2	f100-2B	104	1	99%
	f100-3A	112	0	f100-3B	105	1	100%
test stopped	f100-4A	106	1	f100-4B	103	1	99%
@ 48 hours	f100-5A	103	3	f100-5B	104	0	99%

* Counted on 11/22/93. Rest of test vials counted on 11/29/93 after speaking with George Morrisson (EPA-ERL Narragansett). He said to only count at least 100 clams per replicate vial.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Bay
Location: Lower Arsnicker Key
County:
Contact/District: Gus Rios / South
NPDES Permit #: FL00 Outfall #:
93 NOV 17 08 66004

Sample Collection: Date 11/16/93 Time 10:15
Test Beginning: Date 11/17/93 Time 1415
Test Ending: Date 11/19/93 Time 1415
Organism Batch #: 120 Diluent Batch #: 2
Organism Age: 5 days old
Test Organism: Mysidopsis bahia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 1 of 4

Remarks:

Unfiltered

CONTROL WATER WAS ASW PLUS MORE 40 FATHOMS SALT

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.3	8.4 @ 24.1	975 @ 1,000 9320 @ 10,000 @ 24.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.5 @ 23.2	990 @ 1,000 9450 @ 10,000 @ 24.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.7 @ 25.8	8.3 @ 24.0	990 @ 1,000 9370 @ 10,000 @ 24.1 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) / Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	65	5	5	5	8.3	8.3	8.3	23.8	23.5	24.2	6.1	6.8	6.7	51.0	50.5	48.1
Control B	80	5	5	5	8.3	8.3	8.3		23.4	23.2	6.1	6.8	6.8	51.0	50.7	48.3
100% A	1	5	5	5	8.1	8.1	8.0	23.9	23.4	23.1	7.5	6.9	7.0	56.6	55.4	52.6
100% B	28	5	5	5	8.1	8.0	8.0		23.4	23.1	7.5	6.6	6.9	56.6	55.5	52.9
Measured/Loaded by:		MF	TR	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM
Recorded by:		MF	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina Mikulski
Marshall Fairbanks
Robin C. Rader

Reviewer

form updated 7/8/93

(Salt Water) / Well Water

Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			not measured		—
Lab Total Residual Cl2:	<0.03	N/A	<0.03	DR-100	TM
Alkalinity:	175	N/A	150	Hach	TM
Hardness:	—	N/A	—	Hach	TM
Total Ammonia:	<0.017	N/A	<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -57.0 Ammonia Blank: <0.017 Control Salinity: 35.1 ppt Sample Salinity: 38.7 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Bay
Location: Lower Arsnicker Key
County:
Contact/District: Fwo River South
NPDES Permit #: FL00 Outfall #:
93 NOV 17 08 66004

Sample Collection: Date 11/16/93 Time 1015
Test Beginning: Date 11/17/93 Time 1415
Test Ending: Date 11/19/93 Time 1415
Organism Batch #: 31 Diluent Batch #: 1
Organism Age: 14 days old
Test Organism: Menidia beryllina

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 2 of 4

Remarks:

Unfiltered

CONTROL WATER WAS ASW PLUS 40 F. SALTS

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.3	8.4 @ 24.1	978 @ 1,000 9320 @ 10,000 @ 24.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.5 @ 23.2	990 @ 1,000 9450 @ 10,000 @ 24.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.7 @ 25.8	8.3 @ 24.0	990 @ 1,000 9390 @ 10,000 @ 24.1 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED (Cond. (mmhos/cm) / Cond. (µmhos/cm))		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	13	5	5	5	8.3	8.3	8.3	23.8	23.5	23.1	6.1	6.8	7.1	51.0	50.6	48.4
Control B	153	5	5	5	8.3	8.3	8.3			23.1	6.1	6.9	7.0	51.0	50.7	48.1
100% A	4	5	5	4	8.1	8.1	8.1	24.0	23.5	23.1	7.7	6.6	6.9	56.6	55.9	53.0
100% B	79	5	5	5	8.1	8.1	8.1			23.1	7.0	6.6	7.0	56.6	55.6	52.6
Measured/Loaded by:		MF	TR	TR	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM
Recorded by:		MF	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina Mikulsky
Marshall Faircloth
Tobin Ci-Rader

Reviewer

form updated 7/8/93

(Salt Water) / Well Water | 20% Min Water

Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			Not measured		—
Lab Total Residual Cl2:	<0.03	N/A	<0.03	DR-90	TM
Alkalinity:	175	N/A	150	Hach	TM
Hardness:	—	N/A	—	Hach	TM
Total Ammonia:	<0.017	N/A	<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -57.0 Ammonia Blank: <0.017 Control Salinity: 35.1 ppt Sample Salinity: 38.7 ppt

Sample Source: Florida Bay
Location: Lower Arsnicker Key
County: MONROE
Contact/District: Gus Rios / South
NPDES Permit #: FL00 Outfall #:
93 NOV 17 08 66004

Sample Collection: Date 11/16/93 Time 1015
Test Beginning: Date 11/17/93 Time 1415
Test Ending: Date 11/24/93 Time 1415
Organism Batch #: 120 Diluent Batch #: 1
Organism Age: 5 days old
Test Organism: Mysidopsis bahia

Test Type: ~~Screening~~ | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 3 of 4

Remarks:
CONTROL WATER AND SAMPLE WERE filtered .45µm.
CONTROL WATER WAS ASW PLUS 40 FATHOMS SALTS

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	24.1 @ 24.3	8.4 @ 24.1	975 @ 1,000
	9.0 @ 9.0			9320 @ 10,000 @ 24.1 °C
24 hr	7.0 @ 7.0	23.3 @ 23.4	8.5 @ 23.2	990 @ 1,000
	9.0 @ 9.0			9450 @ 10,000 @ 24.1 °C
48 hr	7.0 @ 7.0	25.7 @ 25.8	8.3 @ 24.0	990 @ 1,000
	9.0 @ 9.0			9390 @ 10,000 @ 24.1 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) ~~Cond. (µmhos/cm)~~		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	44	5	5	5	8.4	8.3	8.3	23.7	23.4	23.3	5.6	6.9	7.2	50.9	50.4	47.7
Control B	69	5	5	5	8.4	8.3	8.3			23.2	5.6	6.7	7.2	50.9	50.2	48.3
100% A	8	5	5	5	8.1	8.1	8.0	23.5	23.5	23.3	5.4	6.5	6.8	~~51.6~~	55.7	52.4
100% B	682	5	5	5	8.1	8.1	8.1			23.3	5.4	6.5	6.8	~~52.4~~	55.7	53.2
													x'	55.9	TM	
														55.9	was high in previously	
Measured/Loaded by:		MF	TR	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM
Recorded by:		MF	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures
Tina M. Kuklis
Marshall Faircloth
Tobin G. Rader

Reviewer

form updated 7/8/93

Salt Water / ~~Well Water~~ | ~~20% Min Water~~

Water Quality Parameters	Sample	Method	Measured by
Field Total Residual Cl2:	Not Measured		—
Lab Total Residual Cl2:	<0.03	DR 700	TM
Alkalinity:	150	Hach	TM
Hardness:	—	Hach	TM
Total Ammonia:	—	—	—

Ammonia Meter #98136 Ammonia Meter Slope: — Ammonia Blank: — Control Salinity: 35.1 ppt Sample Salinity: 39.4 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Bay
Location: Lower Snapper Creek
County: MONROE
Contact/District: Gosnell/South
NPDES Permit #: FL00 93 NOV 17 08 66.004 Outfall #:

Sample Collection: Date 11/16/93 Time 1015
Test Beginning: Date 11/17/93 Time 1415
Test Ending: Date 11/19/93 Time 1415
Organism Batch #: 31 Diluent Batch #: 1
Organism Age: 14 days old
Test Organism: Mysidopsis bahia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 4 of 4

Remarks:

CONTROL WATER AND SAMPLE WERE filtered, 45um.

CONTROL WATER WAS ASW PLUS 40 FATHOMS SALTS

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.3	8.4 @ 24.1	978 @ 1,000 9320 @ 10,000 @ 24.1 °
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.5 @ 23.2	990 @ 1,000 9450 @ 10,000 @ 24.1 °
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.7 @ 25.8	8.3 @ 24.0	990 @ 1,000 9390 @ 10,000 @ 24.1 °

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) ~~Cond. (µmhos/cm)~~		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	87	5	5	5	8.4	8.3	8.3	23.7	23.4	23.2	5.5	6.8	7.0	510	50.5	47.8
Control B	858	5	5	5	8.4	8.3	8.3			23.2	5.6	6.8	7.0	509	50.5	48.3
100% A	22	5	5	5	8.2	8.1	8.1	23.5	23.5	23.2	5.4	6.8	7.0	559	55.7	52.9
100% B	260	5	5	5	8.2	8.1	8.1			23.3	5.4	6.8	7.1	559	55.8	52.1
Measured/Loaded by:		MF	TR	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM
Recorded by:		MF	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina Mikulski
Marshall Fairbotty
Robin C. Rader

Reviewer

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			Not Measured		—
Lab Total Residual Cl2:	<0.03	N/A	<0.03	DR-100	TM
Alkalinity:	180	N/A	~~180~~ 150	Hach	TM
Hardness:	—	N/A	—	Hach	TM
Total Ammonia:	—	—	—	—	—

Ammonia Meter #98136 Ammonia Meter Slope: — Ammonia Blank: — Control Salinity: 35.1 ppt Sample Salinity: 39.4 ppt

form updated 7/8/93

* Almost Illegible Black ink on copy Sorry

Mulinia lateralis Data Sheet

Test Date:	11-17-93	Experiment No:	66004
Kill Date:	11-19-93	Project:	FLORIDA BAY
Count Date:	11-29-93		93-NOV-17-03

Sample	Vial #	Initials	Fert	Unfert	Initials	Fert	Unfert	Mean
T=0	1	KP	108	1	KP	100	3	98%
	2	KP	105	11	KP	100	5	91%
	3	KP	101	4	KP	104	5	96%
	4	KP	100	5	KP	107	5	94%
	5	KP	117	1	KP	108	0	99%
							Total Mean Fert	96%
							Standard deviation	

filtered aliquots @ 0.45 µm

@T=0, pH=8.1 T°C=24.0 D.O.=7.6 Sal=38.7 ppt (39.4 ppt filtered) from acute data

Sample	Vial #	Initials	Normal	Other	Initials	Normal	Other	Mean
control NSW	1	KP	101	4		105	0	
	2	KP	114	4		101	1	
	3	KP	100	2		120	0	
	4	KP	101	3		112	0	
	5	KP	105	2		106	0	
filtered control 40F	1	KP	111	0		104	1	
	2	KP	119	0		100	2	
	3	KP	131	2		104	0	
	4	KP	108	2		110	0	
	5	KP	109	1		100	0	
100%	1	KP	101	0		112	0	
	2	KP	114 KP 3	KP 3 0		102	1	
	3	KP	101	0		109	0	
	4	KP	102	0		117	1	
	5	KP	105	0		101	1	
100% filtered	X5	KP	762	36	KP	685	23	RECOUNTED 11-22
	2	KP	102	2		104	1	
	3	KP	112	0		105	1	
	4	KP	106	1		103	1	
	5 1	KP	103	3		104	0	

inoc'd w/ ½ egg conc as others →

* Other = animals that are abnormal or have no shell.

Comments:

100% #2 - recorded count for 100f #1 initially

f100-1A + 1B counted on 11/22/93. Rest of test counted on 11/29/93 after speaking w/ Geo Morrisson (ERL Narragansett) who said to count only a minimum of 100 clams. KP

Kim Pearce