


Bioassays of

# Mayport Naval Station
# Bilge Water Treatment Plant

Jacksonville, Duval County, Florida

DER Permit #IC 16-155209

Sampled 12/16 & 17/91

April 1992

**Biology Section**
**Division of Technical Services**

Bioassays of

# Mayport Naval Station
# Bilge Water Treatment Plant

Jacksonville, Duval County, Florida

DER Permit #IC 16-155209

**Biology Section**
**Bureau of Laboratories**
**April 1992**

## Introduction

Mayport Naval Station Bilge Water Treatment Plant, Jacksonville, Duval County, Florida, DER Permit# IC 16-155209, on 18 to 20 December, 1991.

This facility is located at Mayport Naval Station in Jacksonville. Bilge water is pumped from the ships into settling tanks, where it is held for 24 hours to allow separation of oil and grease which are returned to the fuel depot. The water is pumped into another set of holding tanks where lime is added to coagulate more oil. Dissolved air floatation is used to further treat the water and the remaining oil is skimmed. The treated water is pumped to a settling pond which has an overflow pipe. Discharge via overflow is intermittent to the St. John's 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.

## Results and Discussion

The FDER Biology Section performed six static acute screening toxicity bioassays on samples of effluent from this facility. The conductivity of the samples suggested that they were slightly saline (2-3 ppt). Therefore, the saltwater mysid shrimp, *Mysidopsis bahia*, was used in addition to the freshwater bioassay test organisms, the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*.

As shown in Table 3, the test results indicated that the 8-hour *composite* sample was toxic to *C. dubia, N. leedsi* and *M. bahia*, causing 100% mortality within 18 hours of test initiation. Although the salinity of the sample (2 ppt) would have been expected to cause about 50% of the mortality observed in the *C. dubia* test, the mortality observed in the *N. leedsi* test is not attributed to salinity. The salinity of the sample was increased to 19 ppt for the mysid test.

As shown in Table 4, the test results indicated that the *grab* sample was toxic to *N. leedsi* and *M. bahia*, causing 100% mortality within 18 hours. The salinity of 100% effluent was too high for *C. dubia* and that portion of the test was terminated at 18 hours. The *C. dubia* in the 50% test concentration, however, survived the first 24 hours of the test and had 100% mortality at 48 hours. Prior to loading the mysids, the sample salinity was increased to 19-20 ppt.

Total residual chlorine was not detected in the sample. Further chemical analyses were performed on the grab sample only. The organic compounds and metals detected are listed in Table 5. Chlorinated pesticides were not detected.

## Conclusion

The composite and grab samples of effluent from this facility were toxic to *C. dubia*, *N. leedsi*, and *M. bahia* on 16 and 17 December, 1991. Five of the six tests were terminated after 18 hours due to total mortality of the test organisms ($LC_{50}$'s < 100%). Although the exact cause of toxicity was not determined, the chemistry analyses suggest that the various organic constituents found in the sample may be contributors.

The salinity of the samples was too high for *C. dubia*. Some of the mortality observed in these two *C. dubia* tests may be attributed to the salinity. Depending on annual flow conditions, the total polycyclic aromatic hydrocarbons (PAH's) may be in violation of water-quality standards, 17-302.560(36) F.A.C.

**Table 1. Concentration Series and Volumes Used for the Static Acute Bioassays of the Mayport Bilge Water treatment plant effluent on 18 to 20 December, 1991.**

*Ceriodaphnia dubia* (water flea)

| Concentration | Dilution Water | Sample | Total Volume |
|---|---|---|---|
| Control | 20 mL | 0 mL | 20 mL |
| 50 % | 10 mL | 10 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 |

*Mysidopsis bahia* (mysid shrimp)

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

**Table 2. $LC_{50}$ Data for the Bioassays of Mayport Bilge Water treatment plant effluent on 16 and 17 December, 1991.**

| Organism | Method of Data Analysis | 48 Hour $LC_{50}$ (95% Confidence Intervals) |
|---|---|---|
| **8-hour Composite Sample** (collected 12/16/91) | | |
| *Ceriodaphnia dubia* | not calculated | < 100% [a] |
| *Notropis leedsi* | not calculated | < 100% [a] |
| *Mysidopsis bahia* | not calculated | < 100% [a] |
| **Grab Sample** (collected 12/17/91) | | |
| *Ceriodaphnia dubia* | not calculated | < 50% [b] |
| *Notropis leedsi* | not calculated | < 100% [a] |
| *Mysidopsis bahia* | not calculated | < 100% [a] |

[a] The $LC_{50}$ is < 100% since all the organisms died in the lowest test concentration (100%). Test terminated at 18 hours.

[b] The $LC_{50}$ is < 50% since all the organisms died in the lowest test concentration (50%). Test ran full 48 hours.

Table 3. Data recorded during the acute screening bioasssays of a 8-hour composite sample of effluent from the Mayport Naval Station bilge water treatment facility, Jacksonville, Florida, DER# IC 16-155209, on 18 to 19 December, 1991.

| | | | | | |
|---|---|---|---|---|---|
| Facility: | **Mayport USN Bilge Water - Composite Sample** | | **DER #** | **IC 16-155209** | Facility Type: **Industrial Waste,** |
| Location: | Mayport Naval Station, Jacksonville | | Contact/District: | Rita Felton / NE | bilge water |
| County: | Duval | | Test type: | static acute screen | |
| Sample Collection Date: | **12/16/91** | Time: 1025 to 1825 | # tests: | 3 | Receiving Water: St. Johns River |
| Test Beginning Date: | 12/18/91 | Time: 1500 | Chlorination Type: | **not chlorinated** | |
| Test Ending Date: | 12/19/91 | Time: 0915 | | | **Page 1 of 1** |

| Total Residual Cl2 | mg/l | Method |
|---|---|---|
| Field: | not measured | - |
| Lab: | 0.0 | Hach |

| Ammonia | Total (mg/l) | Unionized (mg/l) |
|---|---|---|
| Control Water (fish): | 0.00 | 0.00 |
| Cond. Control Water (daphnids): | 0.00 | 0.00 |
| 100% Sample: | 12.00 | 0.02 |

| Alk & Hardness | Alkalinity (mg/l) | Hardness (mg/l) |
|---|---|---|
| Control Water (fish): | 115 | 119 |
| Cond. Control Water (daphnids): | 65 | 76 |
| 100% Sample: | not measured | not measured |

| Salinity (ppt) | |
|---|---|
| Control Water: | 0 |
| 100% Sample: | 2 |

Organism: ***Ceriodaphnia dubia*** Life stage: neonate
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL * | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 18 hr | Live at 48 hr | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour |
| Control | 5 | 5 | - | 8.0 | 8.0 | - | 22.2 | 22.8 | - | 8.3 | 8.4 | - | 180 | 197 |
| Control | 5 | 5 | - | - | 8.0 | - | - | - | - | - | 8.4 | - | - | - |
| Control | 5 | 4 | - | - | 8.0 | - | - | - | - | - | 8.4 | - | - | - |
| Control | 5 | 5 | - | - | 8.0 | - | - | - | - | - | 8.4 | - | - | - |
| 100% | 5 | 0 | - | 6.6 | 7.6 | - | 22.5 | 22.8 | - | 8.3 | 8.2 | - | 3070 | 3100 |
| 100% | 5 | 0 | - | - | 7.6 | - | - | - | - | - | 8.2 | - | - | - |
| 100% | 5 | 0 | - | - | 7.6 | - | - | - | - | - | 8.2 | - | - | - |
| 100% | 5 | 0 | - | - | 7.6 | - | - | - | - | - | 8.2 | - | - | - |

* test terminated at 18 hours. Sample salinity was near the NaCl LC50 for this test organism (LC50 = 2.2 ppt).
Some of the mortality observed may be attributed to the salinity.

Organism: ***Notropis leedsi*** Age: 12 days
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL * | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 18 hr | Live at 48 hr | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour |
| Control | 5 | 5 | - | 7.7 | 8.1 | - | 22.0 | 21.2 | - | 8.2 | 8.7 | - | - | - |
| Control | 5 | 5 | - | 7.7 | 8.1 | - | - | - | - | 8.2 | 8.7 | - | 236 | 234 |
| 100% | 5 | 0 | - | 6.5 | 7.4 | - | 23.0 | 21.0 | - | 8.8 | 8.8 | - | - | - |
| 100% | 5 | 0 | - | 6.5 | 7.4 | - | - | - | - | 8.8 | 8.8 | - | 3390 | 3170 |

* test terminated at 18 hours.
The mortality observed is not attributed to the salinity (LC50 = 8.8 ppt NaCl).

Organism: ***Mysidopsis bahia*** Life stage: 1 - 2 days
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL * | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 18 hr | Live at 48 hr | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour |
| Control | 5 | 5 | - | 8.3 | 8.0 | - | 22.5 | 21.0 | - | 7.9 | 7.5 | - | - | - |
| Control | 5 | 5 | - | 8.3 | 8.0 | - | - | - | - | 8.0 | 7.5 | - | 28,700 | 27,900 |
| 100.0% | 5 | 0 | - | 7.0 | 7.1 | - | 23.3 | 21.0 | - | 7.9 | 6.9 | - | - | - |
| 100.0% | 5 | 0 | - | 7.0 | 7.1 | - | - | - | - | 7.9 | 6.9 | - | 28,700 | 27,700 |

* test terminated at 18 hours.

| Ammonia | Total (mg/l) | Unionized (mg/l) |
|---|---|---|
| Control Water (mysids): | 0.00 | 0.00 |
| 100% Sample: | 12.00 | 0.06 |

| Salinity (ppt) | |
|---|---|
| Control Water: | 19 |
| 100% Sample: | 19 |

Table 4. Data recorded during the acute screening bioasssays of a grab sample of effluent from the Mayport Naval Station bilge water treatment facility, Jacksonville, Florida, DER# IC 16-155209, on 18 to 20 December, 1991.

| | | | | | |
|---|---|---|---|---|---|
| Facility: | **Mayport Bilge Water Treatment - Grab Sample** | | DER # | IC 16-155209 | Facility Type: **Industrial Waste** |
| Location: | Mayport Naval Station, Jacksonville | | Contact/District: | Rita Felton / NE | **bilge water** |
| County: | Duval | | Test type: | static acute screen | |
| Sample Collection Date: | **12/17/91** | Time: 1045 | # tests: | 3 | Receiving Water: St. Johns River |
| Test Beginning Date: | 12/18/91 | Time: 1500 | Chlorination Type: | **not chlorinated** | |
| Test Ending Date: | 12/20/91 | Time: 1100 | | | **Page 1 of 1** |

| **Total Residual Cl2** | mg/l | Method |
|---|---|---|
| Field: | - | not measured |
| Lab: | 0.0 | Hach |

| **Ammonia** | Total (mg/l) | Unionized (mg/l) |
|---|---|---|
| Control Water (fish): | 0.00 | 0.00 |
| Cond. Control Water (daphnids): | 0.00 | 0.00 |
| 100% Sample: | 12.60 | 0.05 |

| **Alk & Hardness** | Alkalinity (mg/l) | Hardness (mg/l) |
|---|---|---|
| Control Water (fish): | 115 | 119 |
| Cond. Control Water (daphnids): | 65 | 76 |
| 100% Sample: | not measured | not measured |

| **Salinity (ppt)** | |
|---|---|
| Control Water: | 0 |
| 100% Sample: | 3 |

Organism: ***Ceriodaphnia dubia*** Life stage: neonate
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL | | | pH | | | Temperature | | | Dissolved Oxygen | | | 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 | 7.9 | - | 8.0 | 22.1 | - | 23.5 | 8.5 | - | 8.5 | 148 | 190 |
| Control | 5 | 5 | 5 | - | - | 8.0 | - | - | - | - | - | 8.5 | - | - |
| Control | 5 | 5 | 5 | - | - | 8.1 | - | - | - | - | - | 8.5 | - | - |
| Control | 5 | 5 | 5 | - | - | 8.1 | - | - | - | - | - | 8.5 | - | - |
| 50% | 5 | 2 | 0 | 7.2 | - | 7.9 | 22.5 | - | 23.5 | 8.3 | - | 8.4 | 2040 | 2070 |
| 50% | 5 | 3 | 0 | - | - | 7.9 | - | - | - | - | - | 8.4 | - | - |
| 50% | 5 | 2 | 0 | - | - | 8.0 | - | - | - | - | - | 8.4 | - | - |
| 50% | 5 | 4 | 0 | - | - | 8.0 | - | - | - | - | - | 8.4 | - | - |
| 100% | 5 | 0 | 0 * | 7.0 | - | 7.8 | 23.0 | - | 23.5 | 7.8 | - | 8.2 | 3860 | 3020 |
| 100% | 5 | 0 | 0 * | - | - | 7.8 | - | - | - | - | - | 8.2 | - | - |
| 100% | 5 | 1 | 0 * | - | - | 7.8 | - | - | - | - | - | 8.2 | - | - |
| 100% | 5 | 1 | 0 * | - | - | 7.8 | - | - | - | - | - | 8.2 | - | - |

* Sample salinity was too high for this test organism. The mortality observed at 100% may be attributed to the salinity. However, the mortality observed at 50% effluent was not attributed to salinity.

Organism: ***Notropis leedsi*** Age: 12 days
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL * | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 18 hr | Live at 48 hr | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour |
| Control | 5 | 5 | - | 7.8 | 8.2 | - | 22.1 | 20.8 | - | 8.3 | 8.5 | - | - | - |
| Control | 5 | 5 | - | 7.8 | 8.2 | - | - | - | - | 8.3 | 8.5 | - | 236 | 233 |
| 100% | 5 | 0 | - | 6.8 | 7.6 | - | 25.0 | 20.8 | - | 7.4 | 8.6 | - | - | - |
| 100% | 5 | 0 | - | 6.8 | 7.6 | - | - | - | - | 7.4 | 8.6 | - | 4310 | 3890 |

* test terminated at 18 hours.

Organism: ***Mysidopsis bahia*** Life stage: 1 - 2 days
**LC50:** < 100% Binomial: - Moving Average: - Probit: -

| | SURVIVAL * | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 18 hr | Live at 48 hr | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour | 48 hour | 0 hour | 18 hour |
| Control | 5 | 5 | - | 8.3 | 8.0 | - | 22.8 | 20.8 | - | 9.0 | 7.7 | - | - | - |
| Control | 5 | 5 | - | 8.3 | 8.0 | - | - | - | - | 9.1 | 7.7 | - | 28,800 | 28,000 |
| 100.0% | 5 | 0 | - | 7.1 | 7.8 | - | 22.0 | 20.8 | - | 6.6 | 7.3 | - | - | - |
| 100.0% | 5 | 0 | - | 7.1 | 7.8 | - | - | - | - | 6.6 | 7.3 | - | 30,700 | 28,600 |

* test terminated at 18 hours.

| **Ammonia** | Total (mg/l) | Unionized (mg/l) |
|---|---|---|
| Control Water (mysids): | 0.00 | 0.00 |
| 100% Sample: | 12.60 | 0.08 |

| **Salinity (ppt)** | |
|---|---|
| Control Water: | 19 |
| 100% Sample: | 20 |

**Table 5. Results of chemical analyses on a grab sample of effluent from the Mayport Naval Station Bilge Water Treatment Plant, Duval County, on 17 December, 1991.**

| Base-Neutral & Acid Extractables | | | 17-302.560 WQ standards |
|---|---|---|---|
| Acenaphthene | 2.8 | µg/L [T] | ≤ 20 µg/L |
| Bis(2-ethylhexyl)phthalate | < 5.0 | µg/L | |
| Di-n-butyl phthalate | < 5.0 | µg/L | |
| Diethylphthalate | < 5.0 | µg/L | |
| Fluoranthene | < 0.80 | µg/L | ≤ 54 µg/L |
| Fluorene | 7.5 | µg/L | ≤ 0.031 µg/L [A] |
| Naphthalene | 120.0 | µg/L [J] | |
| Phenathrene | 5.7 | µg/L | ≤ 0.031 µg/L [A] |

*Tentative identification and estimated concentrations:*

| | | | |
|---|---|---|---|
| Alkyl sub. benzene | 450 | µg/L | |
| Alkyl sub. phenols | 93 | µg/L | |
| Alkyl sub. naphthalenes | 250 | µg/L | |
| PAH's | 170 | µg/L | ≤ 0.031 µg/L [A] |
| Aliphatics | 82 | µg/L | |

**Chlorinated Pesticides**

none detected

**Metals**

| | | |
|---|---|---|
| Aluminum | | trip blank was contaminated |
| Copper | 10 | µg/L |
| Iron | 122 | µg/L |

[T] - Value reported is less than the practical quantitation limit.
[J] - Estimated value.
[A] - Total polycyclic aromatic hydrocarbons (PAH's) shall not exceed 0.031 µg/L at annual average flow conditions.

# DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Composite
Address/City:
County: Duval
Contact/District: Rita Felton / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 12/16/91 Time 625pm (1025am to)
Test Beginning: Date 12/18/91 Time 300pm
Test Ending: Date 12/19/91 Time 9:15
Test Organism: C. dubia
Life Stage/Age: <24 hours

Test Number: 4 of 6 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: A 5:1 dilution to measure HACH ammonia * read DO w/out adjusting salinity AJ 12-18-91
terminated at 18 hours

Instrument Calibrations:

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7@9@9 | 8.6@23.5 | 23.1@23.1 | 1355@23.2 |
| 24 hr | 7@9@9 | 8.7@23.0° | 21.5@21.6 | 1340@22.6° |
| 48 hr | | | | |

| Conc. | Chamber # | Number Live 0 | 24 | 48 | pH 0 | 24 | 48 | Temp. (°C) 0 | 24 | 48 | DO (mg/L) 0 | 24 | 48 | Cond. (µmhos/cm) 0 | 24 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | | 5 | 5 | | 8.0 | 8.0 | | 22.2 | 22.8 | | 7.5* | 8.4 | | 180 | 197 | |
| Control | | 5 | 5 | | | 8.0 | | | | | 8.3 | 8.4 | | | | |
| Control | | 5 | 4 | | | 8.0 | | | | | | 8.4 | | | | |
| Control | | 5 | 5 | | | 8.0 | | | | | | 8.4 | | | | |
| 100% | | 5 | 0 | | 6.6 | 7.6 | | 22.5 | 22.8 | | 7.8 | 8.2 | | 3,070 | 3100 | |
| 100% | | 5 | 0 | | | 7.6 | | | | | 8.3 | 8.2 | | | | |
| 100% | | 5 | 0 | | | 7.6 | | | | | | 8.2 | | | | |
| 100% | | 5 | 0 | | | 7.6 | | | | | | 8.2 | | | | |
| Measured/Loaded by: | | AD | AD | | AD | MF | | AD | MF | | AD | MK | | AD | MK | |
| Recorded by: | | AD | AJ | | AH | AJ | | AH | AJ | | AH | AJ | | AH | AJ | |

Investigators' Signatures

Andrea Summerlin
Alison Doyle
Marbell Faucett

Reviewer

Water-quality Parameters

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | not measured | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | HACH | AJ |
| Alkalinity: | 115 | 65 | n/m | Hach | AJ |
| Hardness: | 119 | 76 | n/m | Hach | AJ |
| Total Ammonia: | 0.0 | 0.0 | 120 | HACH | AJ |

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt

# DEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Composite (8 hour) 1025am to
Address/City: _____
County: Duval
Contact/District: Rita Felton/NE
NPDES Permit #: FL00 Outfall #: _____

Sample Collection: Date 12/16/91 Time 6:25 pm
Test Beginning: Date 12/18/91 Time 1500
Test Ending: Date 12/19/91 Time 900
Test Organism: N. Arcolai
Life Stage/Age: 12 days

Test Number: 5 of 6 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Remarks:
Test terminated at 18 hrs

Instrument Calibrations:

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7.7@9 | 8.6@23.5 | 23.1@23.1 | 1355@23.2 |
| 24 hr | | | | |
| 48 hr | | | | |

| Conc. | Chamber # | Number Live 0 | 24 | 48 | pH 0 | 24 | 48 | Temp. (°C) 0 | 24 | 48 | DO (mg/L) 0 | 24 | 48 | Cond. (µmhos/cm) 0 | 24 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 20 | 5 | 5 | | 7.7 | 8.1 | | 22.0 | 22.8 | | 8.6 | 8.7 | | | | |
| Control | 46 | 5 | 5 | | 7.7 | 8.1 | | | | | 8.8 | 8.7 | | 236 | 234 | |
| 100% | 37 | 5 | 0 | | 6.5 | 7.4 | | 23.0 | 22.8 | | 8.8 | 8.8 | | | | |
| 100% | 33 | 5 | 0 | | 6.5 | 7.4 | | | | | 8.8 | 8.8 | | 3390 | 3170 | |
| Measured/Loaded by: | | MF | MF | | AB | MF | | AB | MF | | AB | MF | | AB | MF | |
| Recorded by: | | AB | MF | | AH | AJ | | AH | AJ | | AH | AJ | | AH | AJ | |

Investigators' Signatures
Andrea Ammerman
Shawn Lewis
Marshall Faircloth
Reviewer

Water-quality Parameters

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | ITRCH | AJ |
| Alkalinity: | | | | | |
| Hardness: | | | | | |
| Total Ammonia: | 0.0 | 0.0 | 12.0 | ITRCH | AJ |

Ammonia Meter Slope: _____
Ammonia Blank: 0.0
Salinity Sample: _____ ppt

# DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Composite
Address/City:
County: Duval
Contact/District: Rita Felton / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 12/16/91 Time 625pm 1025 am to
Test Beginning: Date 12/18/91 Time 1500
Test Ending: Date 12/19(4) Time 900
Test Organism: M. bahia
Life Stage/Age: 1-2 d a p

Test Number: 6 of 6 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: test terminated at 18 hours

**Instrument Calibrations:**

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7@7@9 | 8.6@23.5 | 23.1@23.1 | 1355@23.2 |
| 24 hr | 7@7@9 | 8.7@23.0 | 21.5@21.6 | 1340@22.6 |
| 48 hr | | | | |

| | | Number Live | | | pH | | | Temp. (°C) | | | DO (mg/L) | | | Cond. (µmhos/cm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conc. | Chamber # | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 |
| control | 147 | 5 | 5 | | 8.3 | 8.0 | | 22.5 | 21.0 | | 7.9 | 7.5 | | | | |
| control | 65 | 5 | 5 | | 8.3 | 8.0 | | | | | 8.0 | 7.5 | | 28,700 | 27900 | |
| 100% | 62 | 5 | 0 | | 7.0 | 7.7 | | 23.3 | 21.0 | | 7.9 | 6.9 | | | | |
| 100% | 48 | 5 | 0 | | 7.0 | 7.7 | | | | | 7.9 | 6.9 | | 28,700 | 27700 | |
| Measured/Loaded by: | | MF | MF | | AJ | MF | | AJ | MF | | AJ | MF | | AJ | MF | |
| Recorded by: | | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ | AJ | |

Investigators' Signatures

Andrea Hemmerick
Sharon Jarden
Marshall Faircloth

Reviewer

**Water-quality Parameters**

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | HACH | AJ |
| Alkalinity: | | | | | |
| Hardness: | | | | | |
| Total Ammonia: | 0.0 | 0.0 | 12.0 | HACH | AJ |

Ammonia Meter Slope: _____
Ammonia Blank: 0.0
Salinity Sample: _____ ppt

# DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Grab
Address/City:
County: Duval
Contact/District: Rita Felton/NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 12/17/91 Time 1045
Test Beginning: Date 12/18/91 Time 1500
Test Ending: Date 12/20/91 Time 1100
Test Organism: C. dubia
Life Stage/Age: <24 hrs

Test Number: 1 of 6 **Test Type:** Screening | Definitive
Static | Static Renewal | Flow-through

**Remarks:**
+ omitted 50% concentration initially 12/18/91 AJ
a 5:1 dilution to measure HACH ammonia

**Instrument Calibrations:**

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7.0 7.9 @ 9 | 8.6 @ 23.5 | 23.1 @ 23.1 | 1355 @ 23.2 |
| 24 hr | 7.0 7.9 @ 9 | 8.7 @ 23.0 | 21.5° @ 21.6° | 1340 @ 22.6° |
| 48 hr | 7.0 7.9 @ 9 | 8.8 @ 22.0 | 22.0 @ 22.0 | 1326 @ 22.5 |

| Conc. | Chamber # | Number Live 0 | 24 | 48 | pH 0 | 24 | 48 | Temp. (°C) 0 | 24 | 48 | DO (mg/L) 0 | 24 | 48 | Cond. (µmhos/cm) 0 | 24 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | | 5 | 5 | 5 | 7.9 | | 8.0 | 22.1 | | 23.5 | 8.3 | | 8.5 | 148 | | 190 |
| Control | | 5 | 5 | 5 | | | 8.0 | | | | | | 8.5 | | | |
| Control | | 5 | 5 | 5 | | | 8.1 | | | | | | 8.5 | | | |
| Control | | 5 | 5 | 5 | | | 8.1 | | | | | | 8.5 | | | |
| ~~50%~~ + | | 5 | 2 | 0 | 7.2 | | 7.9 | 22.5 | | 23.5 | 8.3 | | 8.4 | 2040 | | 2070 |
| ~~50%~~ + | | 5 | 3 | 0 | | | 7.9 | | | | | | 8.4 | | | |
| ~~50%~~ + | | 5 | 2 | 0 | | | 8.0 | | | | | | 8.4 | | | |
| ~~50%~~ + | | 5 | 4 | 0 | | | 8.0 | | | | | | 8.4 | | | |
| 100% | | 5 | 0 | — | 7.0 | | 7.8 | 23.0 | | 23.5 | 7.8 | | 8.2 | 3860 | | 3820 |
| 100% | | 5 | 0 | — | | | 7.8 | | | | | | 8.2 | | | |
| 100% | | 5 | 1 | 0 | | | 7.8 | | | | | | 8.2 | | | |
| 100% | | 5 | 1 | 0 | | | 7.8 | | | | | | 8.2 | | | |
| Measured/Loaded by: | | AJ | AJ | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ |
| Recorded by: | | AJ | AJ | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ | AJ | | AJ |

Investigators' Signatures

Reviewer

**Water-quality Parameters**

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | not measured | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | HACH | AJ |
| Alkalinity: | 115 | 65 | n/m | Hach | AJ |
| Hardness: | 114 | 76 | n/m | Hach | AJ |
| Total Ammonia: | 0.0 | 0.0 | 12.6 | HACH | AJ |

Ammonia Meter Slope: _____
Ammonia Blank: _____
Salinity Sample: _____ ppt

# DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Grab
Address/City: _____
County: Duval
Contact/District: Rita Felton/NE
NPDES Permit #: FL00 _____ Outfall #: _____

Sample Collection: Date 12/17/91 Time 1045
Test Beginning: Date 12/18/91 Time 1500
Test Ending: Date 12/19/91 Time 900
Test Organism: N. seedsi
Life Stage/Age: 12 day

Test Number: 2 of 6 **Test Type:** Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: test terminated at 18 hours

**Instrument Calibrations:**

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7@7 9@9 | 8.6@23.5 | 23.1@23.1 | 1355@23.2 |
| 24 hr | 7@7 9@9 | 8.7@23.0 | 21.5@21.6 | 1340 @22.6 |
| 48 hr | | | | |

| Conc. | Chamber # | Number Live 0 | 24 | 48 | pH 0 | 24 | 48 | Temp. (°C) 0 | 24 | 48 | DO (mg/L) 0 | 24 | 48 | Cond. (µmhos/cm) 0 | 24 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 92 | 5 | 5 | | 7.8 | 8.2 | | 22 | 20.8 | | 8.3 | 8.5 | | 0 | | |
| Control | — | 5 | 5 | | 7.8 | 8.2 | | ~~22~~ | — | | 8.3 | 8.5 | | 236 | 233 | |
| 100% | 3 | 5 | 0 | | 6.8 | 7.6 | | 25.0 | 20.9 | | 7.4 | 8.6 | | | | |
| 100% | 4 | 5 | 0 | | 6.8 | 7.6 | | | | | 7.4 | 8.6 | | 430 | 382 | |
| Measured/Loaded by: | | MF | MF | | AJ | MF | | AJ | MK | | AJ | MK | | AJ | MF | |
| Recorded by: | | AJ | MF | | AH | AJ | | AH | AJ | | AH | AJ | | AH | AJ | |

Investigators' Signatures

Andrea L Summerlot
Sharon Ford
Mark H Sanchez
Reviewer

**Water-quality Parameters**

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | HACH | AJ |
| Alkalinity: | | | | | |
| Hardness: | | | | | |
| Total Ammonia: | 0.0 | 0.0 | 12.6 | HACH | AJ |

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt

# DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Mayport Grabs
Address/City:
County: Duval
Contact/District: Rita Felton /NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 12/17/91 Time 1045
Test Beginning: Date 12/18/91 Time 300 pm
Test Ending: Date 12/19/91 Time 900
Test Organism: M. bahia
Life Stage/Age: 1-2 day

Test Number: 3 of 6 **Test Type:** Screening | Definitive
Static | Static Renewal | Flow-through

**Remarks:**

Terminated at 18 hours

**Instrument Calibrations:**

| | pH | DO | Temp | Cond |
|---|---|---|---|---|
| 0 hr | 7@7@9 | 8.6@23.5 | 23.1@23.1 | 1355@23.2 |
| 24 hr | 7@7@9 | 8.7@23.0 | 21.5@21.6 | 1340@22.6 |
| 48 hr | | | | |

| Conc. | Chamber # | Number Live 0 | 24 | 48 | pH 0 | 24 | 48 | Temp. (°C) 0 | 24 | 48 | DO (mg/L) 0 | 24 | 48 | Cond. (µmhos/cm) 0 | 24 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 67 | 5 | 5 | | 8.3 | 8.2 | | 22.8 | | | 9.0 | 7.7 | | 28800 | | |
| Control | 74 | 5 | 5 | | 8.3 | 8.0 | | | | | 9.1 | 7.7 | | ↓ | 28000 | |
| 100% | 120 | 5 | 0 | | 7.1 | 7.8 | | 22.0 | 20.8 | | 6.6 | 7.3 | | | | |
| 100% | 57 | 5 | 0 | | 7.1 | 7.8 | | | | | 6.6 | 7.3 | | 30,700 | 28600 | |
| Measured/Loaded by: | | MF | MF | | AJ | MF | | AJ | MF | | AJ | MF | | AJ | MF | |
| Recorded by: | | AJ | MF | | AJ | AJ | | AJ | AJ | | AJ | MF | | AJ | AJ | |

Investigators' Signatures

Reviewer

**Water-quality Parameters**

| | Well Water | Cond. Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Tot. Resid. Cl2: | | | | | |
| Lab Tot. Resid. Cl2: | | | 0.0 | HACH | AJ |
| Alkalinity: | | | | | |
| Hardness: | | | | | |
| Total Ammonia: | 0.0 | 0.0 | 12.6 | HACH | AJ |

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt

The Bioassays of Mayport Bilge Water effluent, DER# IC 16-155209, sampled on December 16, 1991, 8-hour composite sample.

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

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 FL 00 | 11 12 91121 | 16 17 18 B | 19 S | 20 4 |

Remarks

TOXIC TO 3 SPECIES. 8-HR COMPOSITE SAMPLE.

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The Priority Pollutants Analysis for the Bioassays of Mayport Bilge Water effluent, DER# IC 16-155209, sampled on December 16, 1991, 8-hour composite sample.

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

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 FL 00 | 11 12 91121 | 16 17 18 X | 19 S | 20 4 |

Remarks

ORGANICS

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The Bioassays of Mayport Bilge Water effluent, DER# IC 16-155209, sampled on December 17, 1991, grab sample.

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

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 FL 00 | 11 12 91127 | 16 17 18 B | 19 S | 20 4 |

Remarks

TOXIC TO 3 SPECIES. GRAB SAMPLE.

66

The Priority Pollutants Analysis for the Bioassays of Mayport Bilge Water effluent, DER# IC 16-155209, sampled on December 17, 1991, grab sample.

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

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 FL 00 | 11 12 91127 | 16 17 18 X | 19 S | 20 4 |

Remarks

ORGANICS

66