


Bioassays of

# CF Industries, Inc. – Bartow Phosphate Complex

Polk County

NPDES #FL0000523

Sampled March 13, 15, and 17, 2006

May 2006

**Biology Section**
**Bureau of Laboratories**
**Division of Resource Assessment and Management**

Quality Manual No. 870346G
NELAC Certification No. E31780

CF Industries, Inc. – Bartow Phosphate Complex, 2501 Bonnie Mine Road, Bartow, Polk County, Florida, NPDES #FL0000523. Effluent samples for this facility were collected on March 13, 15, and 17, 2006.

## Introduction

The CF Industries, Inc. – Bartow Phosphate Complex has historically operated as a phosphate fertilizer manufacturing plant but is currently under closure. The facility formerly manufactured sulfuric acid, phosphoric acid and granulated diammonium phosphate. Currently the only activities at the facility involve closure. There are no manufacturing activities. The facility does not have a design flow. Historically, discharge from the facility is intermittent and rainfall dependent; however, discharge during the past year was almost continuous. The monthly average flow through the Southwest Outfall (SWOF) from March 2005 through February 2006 was 6.085 million gallons per day (MGD). The complex consists of a phosphate fertilizer manufacturing plant which is currently being dismantled and a phosphogypsum stack system. The stack system consists of a 709-acre phosphogypsum stack, a seepage collection ditch, and process water cooling ponds. The stack system has been lined and grassed as part of the closure. Residual process water and "pore" water that leeches from the stack as it settles is collected in the cooling ponds. Water in the ponds is treated using double-stage liming with acidulation to adjust the pH of the effluent prior to discharge. The facility is spray-evaporating treated water as much as possible to avoid discharges. Treated process water is discharged as needed through Outfall 001, which was not discharging at the time of sampling. Outfall 001 is discharged via a pipeline just past the compliance point of Outfall 003. Outfall 003 discharges non-process water and stormwater. Additionally, stormwater is discharged from the closed stack to Outfalls 004, 005, 006, 007 and 007A. These Outfalls discharge for short durations after a rainfall event. There is no treatment of stormwater (from these Outfalls) before discharge. The discharges of Outfall 001 and Outfall 003 combine before discharging to waters of the state through Outfall SWOF. Chemistry samples are collected from and monitored at Outfall 001 and Outfall 003. Toxicity samples are collected at the SWOF Outfall. Treated effluent is discharged to the Class III freshwaters of the North Prong of the Alafia River.

The facility has no Administrative Orders (AO) but does have a Consent Order (CO #90-1396) related to groundwater contamination. The facility has a mixing zone for specific conductance at Outfall 001. The combined discharges of Outfalls 001 and 003 cannot exceed 2,000 µmhos/cm at the bottom of the Outfall 003 cascade structure. If Outfall 001 is not discharging, Outfall 003 must comply with the Class III freshwater quality standard. The facility continues to have chronic toxicity failures. The cause of toxicity has not been identified. Current monitoring includes quarterly chronic tests to look for seasonal patterns. Acute bioassay testing is performed twice yearly, once during the wet season and once during the dry season. (Facility information provided by Jacki Champion of FDEP Bureau of Phosphate Management Southwest District.)

## Methods

Bioassay samples were collected from the NPDES sampling point for the Southwest Outfall (SWOF). All other chemical and biological samples were collected at Outfall 003. The samples were collected by Jacki Champion (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOP's are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

See Appendix 1 for the completed chain of custody forms.

The chronic screening toxicity tests and algal growth potential test were performed following internal DEP SOP's TA07_05, TA07_09, and TA08_01 through TA08_09. All internal DEP SOP's are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

Dunnett's procedure (available at Statistical Analysis for Biological Methods http://www.epa.gov/EERD/stat2.htm) and t-tests were used to analyze data from these tests.

## Toxicity Test Results

Tests were performed March 14 - 21, 2006.

*Ceriodaphnia dubia* 7-day chronic screening bioassay – NOEC = 100%, for both survival and reproduction

*Pimephales promelas* 7-day chronic screening bioassay – NOEC < 100%, for survival*

The bioassay samples were not chronically toxic to the *Ceriodaphnia dubia* test organisms but were toxic to the *Pimephales promelas* test organisms, producing 40% mortality during the 7-day exposure period.

*Since the Lowest Observed Effect Concentration (LOEC) was 100% sample, the No Observed Effect Concentration (NOEC) is < 100% sample. By rule, NOEC determination was not made for growth due to significant effect on survival. The cause of toxicity was not determined.

See Appendix 2 for bioassay bench sheets and the statistical analyses of these data. See Appendix 3 for results of the standard reference toxicant (SRT) tests and bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix 4 for purchased organism receipts.

## Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 40.5 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Shultz (1987) found that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited. The predicted AGP based on inorganic nitrogen concentrations was 28.01 (±20%) mg dry wt/L (Table 1; Miller et al. 1978).

See Table 1 for AGP results.

## Chemistry Results

Samples for chemical analyses were only collected during the first of the three sampling events. Total residual chlorine and total ammonia were not detected in any of the bioassay samples received in the toxicology laboratory. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.017 mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Fluoride and iron were detected in the effluent sample at levels that complied with Class III Freshwater Criteria (62-302.530, F.A.C.). Arsenic, copper, lead, and nickel were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Aluminum and chloride were detected in the effluent.

See Table 2 for results of analytes detected in the effluent, and corresponding limits. See Appendix 5 for a complete list of chemical analyses performed.

## Conclusion

The effluent samples collected from Southwest Outfall for this facility on April 13, 15, and 17, 2006 were not toxic to the *Ceriodaphnia dubia* test species but were toxic to the *Pimephales promelas* test species during the 7-day chronic screen bioassays. The effluent AGP result exceeded the "problem" threshold for fresh receiving waters. Effluent water quality samples did not exceed any applicable water quality standards or violate any permit conditions.

## Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

*Table 1. Measured and predicted algal growth potential (AGP; mg dry weight/L) of the freshwater species* Psuedokirchneriella subcapitata *for total soluble nitrogen (TSIN) and total nitrogen (TN) limitation and ratios of nitrogen to phosphorus for samples collected from CF Industries, Inc. Bartow Phosphate Complex on March 13, 2006.*

| Location | AGP (measured) | Predicted AGP (TSIN) ± 20% | Predicted AGP (TN) ± 20% | Inorganic N:P ratio | Total N:P ratio |
|---|---|---|---|---|---|
| Outfall 003 | 40.5 | 28.01 ± 5.602 | 33.44 ± 6.688 | 0.28 | 0.31 |

*Table 2. Effluent limits, Class III Freshwater Criteria, and chemical data for samples collected from CF Industries, Inc. Bartow Phosphate Complex on March 13 and 17, 2006.*

| **CF Industries, Inc.- Bartow Phosphate Complex NPDES# FL0000532** | Class III Freshwater Stds | Effluent Limits Outfall 003 | Outfall 003 03-13-06 | SWOF 03-13-06 | SWOF 03-17-06 |
|---|---|---|---|---|---|
| **Organic Constituents (µg/L)** | | | | | |
| None Detected | - | - | - | - | - |
| **Metals (µg/L unless otherwise noted)** | | | | | |
| Aluminum | - | - | 68 | - | - |
| Arsenic | ≤ 50 | - | 1.9 I | - | - |
| Cadmium | ≤ 2 b | - | 0.05 U | - | - |
| Calcium (mg/L) | - | - | 59 | - | - |
| Chromium-III | ≤ 155.1 b | - | 2 U | - | - |
| Copper | ≤ 17.2 b | - | 0.32 I | - | - |
| Iron | ≤ 1,000 | - | 130 | - | - |
| Lead | ≤ 7.9 b | - | 0.081 I | - | - |
| Magnesium (mg/L) | - | - | 14 | - | - |
| Nickel | ≤ 95.7 b | - | 1.2 I | - | - |
| Selenium | ≤ 5 | - | 0.5 U | - | - |
| Silver | ≤ 0.07 | - | 0.025 U | - | - |
| Zinc | ≤ 220.1 b | - | 3 U | - | - |
| **Nutrients (mg/L)** | | | | | |
| Ortho-phosphate | - | - | 2.6 | - | - |
| Total Phosphorus | - | ≤ 20 d | 2.8 A | - | - |
| Ammonia | - | Report | 0.017 I | - | - |
| Unionized Ammonia | ≤ 0.02 | ≤ 0.02 d | ≤ 0.02 c | - | - |
| Nitrate+Nitrite | - | - | 0.72 | - | - |
| Total Kjeldahl Nitrogen | - | Report | 0.16 I | - | - |
| Organic Nitrogen | - | - | 0.14 c | - | - |
| Total Nitrogen | - | ≤ 25 d | 0.88 c | - | - |
| **General Physical and Chemical Parameters** | | | | | |
| Alpha, Total (pCi/L) | ≤ 15 | ≤ 15 | 1.3 U | - | - |
| Alpha-Counting Error (pCi/L) | - | - | 1 | - | - |
| Radium 226 (pCi/L) | - | - | 0.4 | - | - |
| Radium 226-Counting Error (pCi/L) | - | - | 0.1 | - | - |
| Radium 228 (pCi/L) | - | - | 0.8 U | - | - |
| Radium 228-Counting Error (pCi/L) | - | - | 0.5 | - | - |
| Combined Radium 226+228 (pCi/L) | ≤ 5 | ≤ 5 | 0.4 c | - | - |
| Dissolved Oxygen (mg/L) | ≥ 5 | ≥ 5 | 7.4 | 6.8 | 6.4 |
| pH (S.U.) | - | 6.0-8.5 | 7.2 | 7.2 | 6.8 |
| Conductivity (umhos/cm) | ≤ 1,275 | - | 429 | 437 | 484 |
| Temperature (C) | - | Report | 21.4 | 21 | 18.6 |
| Oil and Grease (mg/L) | ≤ 5 | - | 6.2 Jf | - | - |
| Chlorophyll a (mg/L) | - | - | 0.85 U | - | - |
| Phaeophytin a (mg/L) | - | - | 1.5 U | - | - |
| Hardness (mg/L) | - | - | 205 c | - | - |
| Turbidity (NTU) | ≤ 29 t | - | 1.3 AQ | - | - |
| Color (Pt-Co) | - | - | 10 AQ | - | - |
| Total Dissolved Solids (mg/L) | - | - | 284 | - | - |
| Total Suspended Solids (mg/L) | - | ≤ 150 d | 4 U | - | - |
| Total Fixed Solids (mg/L) | - | ≤ 25 d | - | - | - |
| Chloride (mg/L) | - | - | 13 | - | - |
| Fluoride (mg/L) | ≤ 10 | ≤ 10 d | 0.53 | - | - |
| Sulfate (mg/L) | - | Report | 110 | - | - |
| Flow (MGD) | - | Report | 3.195 a | 6.085 a | - |

Value exceeds the Class III Fresh Water Quality Criteria (62-302, F.A.C.) and/or Effluent Limits

a - Annual average
b - Value is calculated based on hardness
c - Calculated value
d - Daily maximum
f - Oil and grease was detected in the field blank at a concentration of 6.2 mg/L
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
U - Material analyzed for but not detected; value reported is the minimum detection limit

# Florida Department of Environmental Protection

## Central Laboratory Sample Submittal Form

**Request Number: RQ-2006-03-13-21**
CF Industries, Inc.-Bartow Chemical Plant

Event ID *

Requester: Shannan Bogdanov
Field Report Prepared By: Jacki Champion

**Customer: BMR-TAMPA**
Collected By: Jacki Champion / Scott Rose
Send Final Report To Vishwas Sathe

**Project ID: FYI3**
Sampling Agency: FDEP

**PMAS: 1163**

| Lab ID * | Location | Collection (begin) | Collection (end) | Bottle Group(s)** |
|---|---|---|---|---|
| | SWOF | ☒ Comp ☐ Grab; Date 1/2/06 Time 7:00 Eastern Central | Date 3/13/06 Time 7:35 Eastern Central | A |
| | Field ID: Blank - Chronic | Tot Res Chlorine (mg/L): | Diss Oxygen (mg/L): 6.78 | Storet Station Number: |
| | Matrix (Include type e.g. Salt, Fresh, etc): Fresh Water | Temp (C): 20.99 | pH: 7.15 | Sample Depth ☐ m ☐ ft: 437 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) | NPDES Number: FL0000523 |
| | Latitude o ' " | Longitude o ' " | Comments: | |

| Lab ID * | Location | Collection (begin) | Collection (end) | Bottle Group(s)** |
|---|---|---|---|---|
| | [illegible] | ☐ Comp ☒ Grab; Date 3/13/06 Time 8:30 Eastern Central | Date ____ Time ____ Eastern Central | A |
| | Field ID: 003 | Tot Res Chlorine (mg/L): | Diss Oxygen (mg/L): 7.44 | Storet Station Number: |
| | Matrix (Include type e.g. Salt, Fresh, etc): Fresh Water | Temp (C): 21.36 | pH: 7.22 | Sample Depth ☐ m ☐ ft: 429 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) | NPDES Number: FL0000523 |
| | Latitude o ' " | Longitude o ' " | Comments: | |

| Lab ID * | Location | Collection (begin) | Collection (end) | Bottle Group(s)** |
|---|---|---|---|---|
| | [illegible] | ☐ Comp ☒ Grab; Date 3/13/06 Time 8:[illegible] Eastern Central | Date ____ Time ____ Eastern Central | B |
| | Field ID: Blanks | Tot Res Chlorine (mg/L): | Diss Oxygen (mg/L): | Storet Station Number: |
| | Matrix (Include type e.g. Salt, Fresh, etc): Fresh Water | Temp (C): | pH: | Sample Depth ☐ m ☐ ft: ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number: |
| | Latitude o ' " | Longitude o ' " | Comments: Equipment Blk - used Dipper for sample 003. | |

| Lab ID * | Location | Collection (begin) | Collection (end) | Bottle Group(s)** |
|---|---|---|---|---|
| | | ☐ Comp ☐ Grab; Date Time Eastern Central | Date Time Eastern Central | |
| | Field ID | Tot Res Chlorine (mg/L): | Diss Oxygen (mg/L): | Storet Station Number: |
| | Matrix (Include type e.g. Salt, Fresh, etc): | Temp (C): | pH: | Sample Depth ☐ m ☐ ft: ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number: |
| | Latitude o ' " | Longitude o ' " | Comments: | |

| Relinquished By: | Date/Time | Shipping Method: | Received By: | Date/Time | Relinquished By: | Date/Time | Received By: | Date/Time |
|---|---|---|---|---|---|---|---|---|
| Jacki Champion | 3/13/06 13:30 | DHL | Tom E | 3/14/06 8:35 | | | | |

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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1 BSY 3/14/06 1040 SR

# Florida Department of Environmental Protection

## Central Laboratory Sample Submittal Form

Event ID *

**Request Number: RQ-2006-03-13-21**
CF Industries, Inc.-Bartow Chemical Plant

Requester: Shannan Bogdanov

Field Report Prepared By: Jackie Champion

**Customer: BMR-TAMPA**

Collected By: Jackie Champion / Scott Rose

Send Final Report To Vishwas Sathe

**Project ID: FYI3**

Sampling Agency: FDEP

**PMAS: 1163**

| Lab ID * | Location | | | Comp / Grab | Collection (begin) Date Time Eastern Central | Collection (end) Date Time Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|---|---|
| | CF Bartow - Blowdown | | | ☒ Comp ☐ Grab | Date 3/14/06 Time 7:00 | Date 3/15/06 Time 7:30 | A |
| | Field ID | | | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | SWMF | | | | | | |
| | Matrix (Include type e.g. Salt, Fresh, etc | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number | |
| | FRESHWATER | | | | | FL0003433 | |
| | Latitude o ' " | Longitude o ' " | | Comments | 2nd day collection for Chronic test - 2 jugs | | |

| Lab ID * | Location | | | Comp / Grab | Collection (begin) Date Time Eastern Central | Collection (end) Date Time Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|---|---|
| | | | | ☐ Comp ☐ Grab | | | |
| | Field ID | | | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number | |
| | Latitude o ' " | Longitude o ' " | | Comments | | | |

| Lab ID * | Location | | | Comp / Grab | Collection (begin) Date Time Eastern Central | Collection (end) Date Time Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|---|---|
| | | | | ☐ Comp ☐ Grab | | | |
| | Field ID | | | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number | |
| | Latitude o ' " | Longitude o ' " | | Comments | | | |

| Lab ID * | Location | | | Comp / Grab | Collection (begin) Date Time Eastern Central | Collection (end) Date Time Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|---|---|
| | | | | ☐ Comp ☐ Grab | | | |
| | Field ID | | | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) | NPDES Number | |
| | Latitude o ' " | Longitude o ' " | | Comments | | | |

| Relinquished By: | Date/Time | Shipping Method: | Received By: | Date/Time | Relinquished By: | Date/Time | Received By: | Date/Time |
|---|---|---|---|---|---|---|---|---|
| Jackie Champion | 3/15/06 10:00 | DHL | Tom E | 3/16/06 9:04 | | | | |

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Bruce Attinger
IBSY 3-16-06
10:43 BA

# Florida Department of Environmental Protection

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**Request Number: RQ-2006-03-13-21**
CF Industries, Inc.-Bartow Chemical Plant

Requester: Shannan Bogdanov
Field Report Prepared By: Jacki Champion

**Customer: BMR-TAMPA**
Collected By: Jacki Champion/Scott Rose
Send Final Report To Vishwas Sathe

**Project ID: FYI3**
Sampling Agency: FDEP

**PMAS: 1163**

| Lab ID* | Location | Comp / Grab | Collection (begin) Eastern Central | Collection (end) Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|
| | CF Bartow | ☒ Comp ☐ Grab | Date 3/17/06 Time 7:00 | Date 3/17/06 Time 7:30 | A |
| | Field ID: SWOF | Tot Res Chlorine (mg/L): — | Diss Oxygen (mg/L): 6.42 | Storet Station Number: — | |
| | Matrix (Include type e.g. Salt, Fresh, etc): Fresh Water | Temp (C): 18.58 | pH: 6.78 | Sample Depth ☐ m ☐ ft: 484 | ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) |
| | Latitude o ' " | Longitude o ' " | Comments | NPDES Number: FL0002623 | |

| Lab ID* | Location | Comp / Grab | Collection (begin) Eastern Central | Collection (end) Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|
| | | ☐ Comp ☐ Grab | Date Time | Date Time | |
| | Field ID | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc) | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) |
| | Latitude o ' " | Longitude o ' " | Comments | NPDES Number | |

| Lab ID* | Location | Comp / Grab | Collection (begin) Eastern Central | Collection (end) Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|
| | | ☐ Comp ☐ Grab | Date Time | Date Time | |
| | Field ID | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc) | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) |
| | Latitude o ' " | Longitude o ' " | Comments | NPDES Number | |

| Lab ID* | Location | Comp / Grab | Collection (begin) Eastern Central | Collection (end) Eastern Central | Bottle Group(s)** |
|---|---|---|---|---|---|
| | | ☐ Comp ☐ Grab | Date Time | Date Time | |
| | Field ID | Tot Res Chlorine (mg/L) | Diss Oxygen (mg/L) | Storet Station Number | |
| | Matrix (Include type e.g. Salt, Fresh, etc) | Temp (C) | pH | Sample Depth ☐ m ☐ ft | ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) |
| | Latitude o ' " | Longitude o ' " | Comments | NPDES Number | |

| Relinquished By: | Date/Time | Shipping Method: | Received By: | Date/Time | Relinquished By: | Date/Time | Received By: | Date/Time |
|---|---|---|---|---|---|---|---|---|
| Jacki Champion | 3/17/06 9:30 | DHL | M. Fairchild 1015 3/14/06 | | | | SK | 3-20-06 8:45 |

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

## Appendix 2. Bench Sheets and Statistical Analyses



**Chronic Screening Bioassay Benchsheet**

**Sample Identification, Test Conditions and Physical Chemistry**

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
*Ceriodaphnia dubia* Bench Sheet

Sample Source: CF Industries - Bartow Phosphate Complex
Address: ~~3723 Maritime Boulevard~~ 2501 Bonnie Mine Rd.
County: ~~Hillsborough~~(A) Polk
NPDES Permit #FL ~~0187313~~ FL0000523
Contact/District Jacki Champion / ~~Dist~~ Southwest Dist.
Start Date ~~3-13-06~~ 3-14-06 Time 1335 End Date: 3-20-06 Time 1400
LIMS entry: ~~MF 3-31-06~~ verified: SP 3-31-06
Incubator # 2 Temperature Range: 23.4 - 26.2
Room B246 Temperature Range: 25.1 - 25.2

SOP#: TA07_05
Light Intensity : 50 - 100 ft. candles - (yes) no
Photoperiod : 16 light 8 dark (yes) no
Chamber size : 30 ml Organism Batch #: 12-06
Sample volume : 20 ml Organism age : <24 hours

Feeding: Daily YCT Batch#: 5-05 0.1 ml
*P. subcapitata* Batch #: 7-06 0.1 ml

Organism: *Ceriodaphnia dubia*

**Water Quality Parameters**

| | Field Chlorine mg/L | | | Lab Chlorine mg/L | | | Alkalinity mg/L as $CaCO_3$ | | | Hardness mg/L as $CaCO_3$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample #: | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Sample: | not measured | | | <0.03 | <0.03 | <0.03 | 121 | 113 | 93.5 | 198 | 202 | 189 |
| Diluent/Control: | [redacted] | | | <0.03 | <0.03 | <0.03 | 83 | 83 | 83 | 97 | 97 | 97 |
| Method: | - | - | - | Hach | Hach | Hach | Hach | Hach | Hach | Hach | Hach | Hach |
| Measured by: | – | – | – | CW | CW/MF | SP | SA/SP | BA/SA | MF/SA | SA/SP | BA/SA | MF/SA |
| Verified by: | SP | SP | SP | SP | SP | MF | CW | SP | SP | CW | SP | SP |

| | Conductivity (circle one) ~~mmhos-cm~~ / mmhos-cm | | | Ammonia mg/L | | | Salinity ‰ | | |
|---|---|---|---|---|---|---|---|---|---|
| Lab Sample#: | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Sample: | 446 | 501 | 505 | <0.017 | <0.017 | <0.017 | – | – | – |
| Diluent/Control: | 171 | 190 | 172 | <0.017 | <0.017 | <0.017 | – | – | – |
| Method: | Mettler | Mettler | Mettler | Denver | Denver | Denver | Mettler | Mettler | Mettler |
| Measured by: | SP | BA | JD | MF | MF | MF | – | – | – |
| Verified by: | MF | SP | SP | SP | SP | SP | – | – | – |

Reproduction
NOEC = 100%
PMSD : 22.05%

conv. = conversion based on conductivity and temperature

| Sample Received | LAB ID # | LIMS SAMPLE # | LIMS JOB # |
|---|---|---|---|
| Test Day 0 | Sample: 1 | 906731 | TLH - 2006-03-14-77 |
| Test Day 2 | Sample: 2 | 907665 | TLH - 2006-03-16-29 |
| Test Day 4 | Sample: 3 | ~~SP 906334~~ 908332 | TLH - 2006-03-20-03 |

| Lab Sample # | Collection Date/Time | Received Date/Time |
|---|---|---|
| 1 | 3-13-06 ~~3-13-06~~ SP 0735 | 3-14-06 1052 |
| 2 | 3-15-06 0730 | 3-16-06 1043 |
| 3 | 3-17-06 0700 | 3-18-06 1240 |

| Diluent / Control Batch #: | Days Used |
|---|---|
| DRW ~~SP~~ 7-06 | 0,1,2,3,4,5,6 |
| | |

Investigators' signatures
Jacki Champion
Brad Alverson
Erin Ivy
Maribell Faircloth
Jason Daniel
Andy Ayers

reviewer Heidi Wellendorf

Comments:
(A) entered information for wrong CF facility SP

revised 6/14/04 JF

Test Page 1 000024



Facility: CF Industries Bartow

**Begin Test:** Date: ~~3-13-06~~ 3-14-06 Time: 1335
**End Test:** Date: 3-20-06 Time: 1400

**State of Florida**
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
*Ceriodaphnia dubia* Bench Sheets - Reproduction
SOP TA07_05

LIMS Sample # 900731 for lab sample #1.

| Conc. | Day | Replicate Number 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | total # young | # original organisms | young per adult |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 0* | | | | | | | | | | | | 10 | |
| | 1 | | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 0 | 4 | 0 | 4 | 0 | 0 | 4 | 5 | 3 | 6 | 26 | 10 | 2.6 |
| | 4 | 4 | 0 | 3 | 0 | 4 | 2 | 0 | 1 | 0 | 0 | 14 | 10 | 1.4 |
| | 5 | 6 | 7 | 0 | 6 | 8 | 7 | 7 | 6 | 2 | 3 | 52 | 10 | 5.2 |
| | 6 | 9 | 8 | 3 | 2 | 10 | 10 | 8 | 13 | 8 | 11 | 82 | 10 | 8.2 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 19 | 19 | 6 | 12 | 22 | 19 | 19 | 25 | 13 | 20 | 174 | 10 | 17.4 |
| 100% | 0* | | | | | | | | | | | | 10 | |
| | 1 | | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 4 | 3 | 0 | 3 | 6 | 4 | 4 | 2 | 2 | 0 | 28 | 10 | 2.8 |
| | 4 | 0 | 0 | 5 | 0 | 4 | 0 | 12 | 0 | 0 | 4 | 25 | 10 | 2.5 |
| | 5 | 6 | 7 | 9 | 7 | 10 | 8 | 0 | 8 | 8 | 7 | 70 | 10 | 7.0 |
| | 6 | 14 | X | 18 | 14 | 12 | 14 | 14 | 13 | 11 | 13 | 133 | 10 | 13.3 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 24 | 20 | 32 | 24 | 32 | 26 | 30 | 23 | 21 | 24 | 256 | 10 | 25.6 |

*Day 0 = equals test initiation day. X = Dead (original organism)

| organisms loaded by: BA | |
|---|---|
| **Day** | ****Counted by:** |
| 0 | mf |
| 1 | SS |
| 2 | SS |
| 3 | mf |
| 4 | mf |
| 5 | mf |
| 6 | mf |
| 7 | |
| 8 | |

**Initials-signatures on Chemistry page.

Comments:
Day 4 Rep 3 100% - 5 neonates mf 3/18
@ mf 10 neonates Day 6 Rep 2 100%. 3-20-06
Test Terminated at Day 6 - mf 3-20-06
Reproduction
PMSD - 22.05%

T-test Value ~~3.1885~~
T-Table Value 1.734 df = 18

| reproduction | |
|---|---|
| LOEC = | NA |
| NOEC = | 100% |

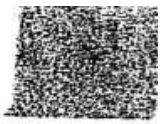
Test acceptability
Mean control reproduction 15/female (yes) no
Third Brood ~~≥8~~ in 60% of surviving females: (yes) no mf miscarriage 3-17-06
Temperature range ≤3°: (yes) no
Control survival ≥80%: (yes) no

revised 7/14/04 JF

000025

Test Page 2

## Appendix 2. (continued)



*Ceriodaphnia dubia* Chronic Bioassay Parameters

SOP TA07_05

Sample Source: CF Industries Bartow

LIMS Sample #: 906731 (for lab sample 1)

Start Date: ~~3-13-06~~ 3-14-06 End Date: 3-20-06

Time: 1335 Time: 1400

Comment:
(A) transcription error SP
(B) transcription error SP

| Test Day | | | New Sample | | | | | | Old Sample | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cond | | | | | | Cond | |
| | | Conc. | Test Rep. | pH (su) | Temp (°C) | DO (mg/L) | (µmhos/cm) (mmhos/cm) | | Test Rep. | pH (su) | Temp (°C) | DO (mg/L) | (µmhos/cm) (mmhos/cm) | |
| Day 0 | sample: | Control | A | 8.2 | 24.7 | 7.8 | 171 | | | | | | | |
| | 1 | 100% | A | 7.9 | 24.4 | 8.3 | 440 | | | | | | | |
| | Measured by: | | | SP | SP | SP | SP | | | | | | | |
| | Recorded by: | | | SP | SP | SP | SP | | | | | | | |
| Day 1 | sample: | Control | B | 8.1 | ~~24.0~~ 24.2 (A) | 6.1 | 1724 | | B | 8.0 | 24.0 | 5.0 | 189.9 | |
| | 1 | 100% | B | 7.9 | 24.8 | 6.4 | 450 | | B | 8.3 | 24.8 | 6.1 | 459 | |
| | Measured by: | | | BA | SP | BA | BA | | | BA | SP | BA | BA | |
| | Recorded by: | | | BA | SP | BA | BA | | | BA | SP | BA | BA | |
| Day 2 | sample: | Control | C | 8.2 | 24.0 | 7.1 | 195.7 | | C | 8.3 | 24.2 | 7.6 | 1860 | |
| | 2 | 100% | C | 8.4 | 24.0 | 7.3 | 501 | | C | 7.8 | 24.2 | 7.6 | 459 | |
| | Measured by: | | | BA | BA | BA | BA | | | JD | SP | JD | JD | |
| | Recorded by: | | | BA | BA | BA | BA | | | JD | SP | JD | JD | |
| Day 3 | sample: | Control | D | 8.2 | 24.8 | 7.7 | 189 | | D | 8.1 | 25.2 | 7.2 | 191 | |
| | 2 | 100% | D | 7.7 | 24.9 | 7.7 | 469 | | D | 8.2 | 25.1 | 7.0 | 476 | |
| | Measured by: | | | SP | SP | SP | SP | | | MF | MF | MF | MF | |
| | Recorded by: | | | SP | SP | SP | SP | | | MF | MF | MF | MF | |
| Day 4 | sample: | Control | E | 8.2 | 24.0 | 7.3 | 172 | | E | 8.1 | 24.0 | 7.5 | 172 | |
| | 3 | 100% | E | 7.5 | 24.1 | 7.8 | 505 | | E | 7.6 | 24.1 | 7.4 | 492 | |
| | Measured by: | | | JD | JD | JD | JD | | | JD | JD | JD | JD | |
| | Recorded by: | | | JD | JD | JD | JD | | | JD | JD | JD | JD | |
| Day 5 | sample: | Control | F | 8.1 | 24.0 | 7.2 | 190 | | F | 8.2 | 24.0 | 7.2 | 194 | |
| | 3 | 100% | F | 7.6 | 24.0 | 7.1 | 497 | | F | 8.2 | 24.0 | 7.8 | 533 | |
| | Measured by: | | | JD | JD | JD | JD | | | JD | JD | JD | JD | |
| | Recorded by: | | | JD | JD | JD | JD | | | JD | JD | JD | JD | |
| Day 6 | sample: | Control | G | 8.1 | 24.0 | 7.2 | 180 | | G | 8.3 | 24.6 | 7.6 | 197 | |
| | 3 | 100% | G | 7.6 | 24.1 | 7.7 | 513 ~~496~~ (B) | | G | 8.4 | 24.7 | 7.8 | 547 | |
| | Measured by: | | | SP | SP | SP | SP | | | MF | MF | MF | MF | |
| | Recorded by: | | | SP | SP | SP | SP | | | MF | MF | MF | MF | |
| Day 7 | sample: | Control | H | | | | | | H | | | | | |
| | 3 | 100% | H | | | | | | H | | | | | |
| | Measured by: | | | | | | | | | | | | | |
| | Recorded by: | | | | | | | | | | | | | |
| Day 8 | sample: | Control | | | | | | | I | | | | | |
| | 3 | 100% | | | | | | | I | | | | | |
| | Measured by: | | | | | | | | | | | | | |
| | Recorded by: | | | | | | | | | | | | | |

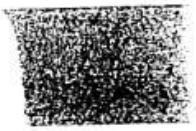
Test Rep. = Replicate Circle µmhos-cm or mmhos-cm

revised 6/24/04 ml

Test Page 3

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## Appendix 2. (continued)



### Chronic Screening Bioassay Benchsheet

**Sample Identification, Test Conditions and Physical Chemistry**

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
*P. promelas* and *M. beryllina* Bench Sheet

Sample Source: CF Industries Bartow Phosphate Complex
Address: ~~3323 Maritime Boulevard~~ 2501 Bonnie Mine Rd.
County: ~~Hillsborough~~ (A) Polk
NPDES Permit #FL ~~0107213~~ FL0000523
Contact/District: Jacki Champion / Southwest Dist.
Start Date: 3-14-06 Time: 1330 End Date: 3-21-06 Time: 1100
LIMS entry: MF 3-31-06 verified: SP 3-31-06
Incubator #: 2 Temperature Range: 23.4 - 26.0
Room B246 Temperature Range: 25.1 - 25.2
Feeding: 2 X Daily Artemia Lot:#: GSL-536-90

*P. promelas* SOP#: TA07_09 *M. beryllina* SOP#: TA07_14
Light Intensity : 50 - 100 ft. candles (yes) no
Photoperiod : 16 light 8 dark - (yes) no
Chamber size : 1 L Organism Batch #: 5-06
Sample volume : 500 ml Organism age : <48 (hours) days
Organism: (*P. promelas*) *M.beryllina* (circle one)

**Water Quality Parameters**

| | Field Chlorine mg/L | | | Lab Chlorine mg/L | | | Alkalinity mg/L as $CaCO_3$ | | | Hardness mg/L as $CaCO_3$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample #: | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Sample: | not measured | | | <0.03 | <0.03 | <0.03 | 121 | 113 | 93.5 | 188 | 202 | 189 |
| Diluent/Control: | | | | <0.03 | <0.03 | <0.03 | 69 | 70 | 70 | 93 | 92 | 92 |
| Method: | - | - | - | Hach | Hach | Hach | Hach | Hach | Hach | Hach | Hach | Hach |
| Measured by: | - | - | - | CW | CW/MF | SP | SA/SP | BA/SA | MF | SA/SP | BA/SA | MF/... |
| Verified by: | SP | SP | SP | SP | SP | MF | CW | SP | SP | CW | SP | SP |

| | Conductivity (circle one) (umhos-cm) | | mmhos-cm | Ammonia mg/L | | | Salinity ‰ | | |
|---|---|---|---|---|---|---|---|---|---|
| Lab Sample#: | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Sample: | 454 | 471 | 50/2 (A) | <0.017 | <0.017 | <0.017 | — | — | — |
| Diluent/Control: | 305 | 322 | 317 | <0.017 | <0.017 | <0.017 | — | — | — |
| Method: | Mettler | Mettler | Mettler | Denver | Denver | Denver | Mettler | Mettler | Mettler |
| Measured by: | SP | BA | MF/SD | MF | MF | MF | — | — | — |
| Verified by: | MF | MF | MF | SP | SP | MF | — | — | — |

conv. = conversion based on conductivity and temperature (A) 502 MF 3/13/06

| Statistics | |
|---|---|
| Control %cv: | ~~5.10~~ 0 % Survival |
| Dunnetts PMSD: | ~~26.25%~~ 14.73% |
| Survival NOEC: | — |
| Survival LOEC: | 100% |
| Growth NOEC: | NA (B) |
| Growth LOEC: | NA |

| Sample Received | LAB ID # | LIMS SAMPLE # | LIMS JOB # |
|---|---|---|---|
| Test Day 0 | Sample: 1 | 906731 | TLH - 20060314-77 |
| Test Day 2 | Sample: 2 | 907605 | TLH - 20060316-29 |
| Test Day 4 | Sample: 3 | SP ~~908334~~ 908332 | TLH - 20060320-03 |

| Lab Sample # | Collection Date/Time | | Received Date/Time |
|---|---|---|---|
| 1 | ~~3-13-06 2:13 pm~~ SP | 0735 | 3-14-06 1052 |
| 2 | 3-15-06 | 0730 | 3-16-06 1043 |
| 3 | 3-17-06 | 0700 | 3-18-06 1040 |

| Diluent / Control Batch #: | Days Used |
|---|---|
| 4-06 MHW | 2,3,4,5 |
| MHW 5-06 | 0,1 |
| MHW 6-06 | 6 |

Investigators' signatures
Sarah Pinchuk
Eric Epp
Marshall Faircloth
Brad Danner
Jason Pond
Glen Ann

reviewer Nicole Wellendorf

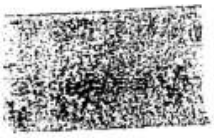
Comments:
(A) entered information for wrong CF facility SP
(B) Sublethal effect analysis inappropriate due to Survival (acute) effect at test concentration MF 3-28

revised 6/14/04 JF



000052

## Appendix 2. (continued)



Chronic Screening Test Survival Benchsheet

Facility: CF Industries Bartow

LIMS Sample Number: 906731
(for Lab Sample # 1)

**State of Florida**
**Department of Environmental Protection**
**Biology Laboratory Chronic Screening Bioassay**
***P. promelas* SOP TA07_09 *M. beryllina* SOP TA07_14**

Organism: (*P. promelas*) *M.beryllina* (circle one)

| | | TEST DAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Concentration | Replicate | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Control | A | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | B | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | C | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | D | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 100 % sample concentration | A | 10 | 10 | 8 20 | 6 2D | 5 10 | 4 10 | 4 | 4 |
| | B | 10 | 10 | 10 | 9 1D | 8 10 | 7 10 | 7 | 7 |
| | C | 10 | 10 | 10 | 6 3D in | 4 26 | 4 | 4 | 4 |
| | D | 10 | 10 | 10 | 10 | 10 | 9 10 | 9 | 9 |
| Control | A | 10 | | | | | | | |
| | B | 10 | | | | | | | |
| | C | 10 | | | | | | | |
| | D | 10 | | | | | | | |
| % sample concentration | A | 10 | | | | | | | |
| | B | 10 | | | | | | | |
| | C | 10 | | | | | | | |
| | D | 10 | | | | | | | |
| Loaded by: MF | Checked by: [redacted] | | JD | JD | BA | JD | JD | JD | JD |
| Verified by: BA | | | | | | | | | |

| Survival | %CV | PMSD |
|---|---|---|
| Control | 0 | 14.73% |

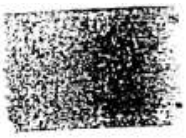
| Survival | Table | Calculated | dF |
|---|---|---|---|
| T-test | 1.9430 | 4.08318 | 6 |

Comments: The No Observed Effect Concentration was < 100% sample since the Lowest observed Effect Concentration was 100% sample. MF 3-31-06

revised 6/24/04 MF

Test Page 2 000053

## Appendix 2. (continued)



**Biology Laboratory Chronic Screening Bioassay Benchsheet**
**Parameters**
***P. promelas* SOP TA-07_09 *M. beryllina* SOP TA-07_14**

Sample Source: CF Industries Bartow
LIMS Sample #: 906731 (for Lab sample #1)
Start Date: 3-14-06 End Date: 3-21-06
Time: 1330 Time: 1100

| Test Day | | | New Sample | | | | | | Old Sample | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cond (µmhos/cm) | | | | | | Cond (µmhos/cm) | |
| | Conc. | | Test Rep. | pH (su) | Temp (°C) | DO (mg/L) | (mmhos/cm) | Salinity ppth | Test Rep. | pH (su) | Temp (°C) | DO (mg/L) | (mmhos/cm) | Salinity ppth |
| Day 0 sample: | Control | A | 8.1 | 24.9 | 7.8 | 305 | <1 | | | | | | | |
| 1 | 100% | A | 7.8 | 24.9 | 8.4 | 454 | <1 | | | | | | | |
| Measured by: | | | [redacted] | | | | | | | | | | | |
| Recorded by: | | | [redacted] | | | | | | | | | | | |
| Day 1 sample: | Control | B | 8.0 | 25.0 | 7.4 | 331 | <1 | B | 7.9 | 25.4 | 6.7 | 356 | <1 | |
| 1 | 100% | B | 7.8 | 25.2 | 7.9 | 470 | <1 | B | 8.0 | 24.8 | 6.4 | 540 | <1 | |
| Measured by: | | | [redacted] | | | | | | | | | | | |
| Recorded by: | | | [redacted] | | | | | | | | | | | |
| Day 2 sample: | Control | C | 8.1 | 24.0 | 7.2 | 322 | <1 | C | 7.8 | 24.7 | 6.5 | 365 | <1 | |
| 2 | 100% | C | 7.8 | 24.1 | 7.0 | 471 | <1 | C | 8.1 | 24.6 | 6.9 | 477 | <1 | |
| Measured by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Recorded by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Day 3 sample: | Control | D | 7.9 | 24.7 | 6.6 | 327 | <1 | D | 7.5 | 25.1 | 5.7 | 352 | <1 | |
| 2 | 100% | D | 7.7 | 24.8 | 7.1 | 471 | <1 | D | 7.8 | 25.0 | 6.0 | 475 | <1 | |
| Measured by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Recorded by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Day 4 sample: | Control | A | 7.9 | 24.1 | 7.3 | 317 | <1 | A | 7.5 | 24.2 | 5.0 | 326 | <1 | |
| 3 | 100% | A | 7.5 | 25.5 | 7.5 | 502 | <1 | A | 7.8 | 24.1 | 5.4 | 478 | <1 | |
| Measured by: | | | [redacted] | JD | JD | JD | JD | JD | | | | | | |
| Recorded by: | | | [redacted] | JD | JD | JD | JD | JD | | | | | | |
| Day 5 sample: | Control | B | 7.9 | 24.0 | 7.4 | 318 | <1 | B | 7.8 | 24.5 | 6.5 | 325 | <1 | |
| 3 | 100% | B | 7.5 | 24.3 | 7.8 | 503 | <1 | B | 7.7 | 24.3 | 6.7 | 495 | <1 | |
| Measured by: | | | [redacted] | JD | JD | JD | JD | JD | | | | | | |
| Recorded by: | | | [redacted] | JD | JD | JD | JD | JD | | | | | | |
| Day 6 sample: | Control | C | 8.0 | 24.0 | 7.3 | 323 | <1 | C | 7.8 | 24.7 | 6.4 | 319 | <1 | |
| 3 | 100% | C | 7.6 | 24.2 | 7.2 | 513 | <1 | C | 7.8 | 24.3 | 6.5 | 507 | <1 | |
| Measured by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Recorded by: | | | [redacted] | BA | BA | BA | BA | BA | | | | | | |
| Day 7 sample: | Control | | [redacted] | | | | | | D | 7.8 | 24.7 | 7.9 | 329 | <1 |
| 3 | 100% | | [redacted] | | | | | | D | 7.7 | 24.5 | 8.1 | 505 | <1 |
| Measured by: | | | [redacted] | | | | | | | JD | JD | JD | JD | JD |
| Recorded by: | | | [redacted] | | | | | | | JD | JD | JD | JD | JD |

Test Rep. = Replicate Record Salinity < 1 if freshwater Circle µmhos-cm or mmhos-cm

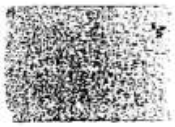
Comments:

revised 6/24/04 ml

Test Page 3 000054

Page 55 not used.

**Appendix 2. (continued)**



## Chronic Screening Test Weighing Benchsheet

State of Florida
Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
*P. promelas* and *M. beryllina* Bench Sheet
SOP TA06_21

Facility: C f Industries Bartow

LIMS Sample Number: 906731
(for Lab Sample # 1)

| | | | mean wt = fish wt divided by 10<br>convert g to mg: move decimal 3 places to right | | | | |
|---|---|---|---|---|---|---|---|
| Concentration | Replicate | Pan # | Pan wt. g | Pan + Fish g | Fish wt. g | Original # Fish | Mean wt. mg |
| Control | A | 201 | 0.02670 | 0.03084 | 0.00414 | 10 | 0.414 |
| | B | 202 | 0.02492 | 0.02869 | 0.00377 | 10 | 0.377 |
| | C | 203 | 0.02526 | 0.02898 | 0.00372 | 10 | 0.372 |
| | D | 204 | 0.02458 | 0.02838 | 0.00380 | 10 | 0.380 |
| 100 % sample | A | 205 | 0.02450 | 0.02569 | 0.00119 | 10 | 0.119 |
| | B | 206 | 0.02566 | 0.02801 | 0.00235 | 10 | 0.235 |
| | C | 207 | 0.02542 | 0.02671 | 0.00125 | 10 | 0.125 |
| | D | 208 | 0.02483 | 0.02818 | 0.00335 | 10 | 0.335 |
| Control | A | | | | | 10 | |
| | B | | | | | 10 | |
| | C | | | | | 10 | |
| | D | | | | | 10 | |
| % sample | A | | | | | 10 | |
| | B | | | | | 10 | |
| | C | | | | | 10 | |
| | D | | | | | 10 | |
| | Weighed by initials: | | MF | MF | | | |

| Growth | %CV | PMSD |
|---|---|---|
| Control | 5 | 26.25% |

| Growth | Table | Calculated | dF |
|---|---|---|---|
| T-test | 1.94300 | 3.19214 | 6 |

| Drying | |
|---|---|
| Temperature °C: | 105°C |
| Hours: | 8 hours |

| Tare Weighing Date: | Final Weighing Date: | | Measured Value | | S-weight Value |
|---|---|---|---|---|---|
| Tare Pan 1 after Pan 5 | 0.02671 @ 0.02670 | S-weights | 0.01999 | @ | 0.02000 |
| Tare Pan 1 after Pan 8 | 0.02671 @ 0.02670 | at tare | 0.02997 | @ | 0.03000 |
| Final Pan 1 after Pan 5 | 0.03084 @ 0.03084 | S-weights | 0.02000 | @ | 0.02000 |
| Final Pan 1 after Pan 8 | 0.03084 @ 0.03084 | at final | 0.02997 | @ | 0.03000 |

Comments: Due to acute effect (survival) in this test, it is inappropriate to analyze/report the sublethal (growth) effect. MF 3-31-06

revised 6/21/04 MF



000056

## Appendix 2. (continued)

**CF Industries *Ceriodaphnia dubia* March 2006**

**Dunnett's**

Summary Statistics and ANOVA

Transformation = None

| Concentration | Replicates | Mean Neonates | s.d. | % cv |
|---|---|---|---|---|
| Control | 10 | 17.4000 | 5.5217 | 31.7 |
| 100% | 10 | 25.6000 | 4.3256 | 16.9 |

*) the mean for this conc. is significantly less than
the control mean at alpha = 0.05 (1-sided) by Dunnett's test

Minimum detectable difference for Dunnett's test = -3.837326
This difference corresponds to -22.05 percent of control

Between concentrations
sum of squares = 336.200000 with 1 degrees of freedom.

Error mean square = 24.600000 with 18 degrees of freedom.

Bartlett's test p-value for equality of variances = .470

## Appendix 2. (continued)

**CF Industries Bartow *P. promelas* chronic March 06**

**Dunnett's**

Summary Statistics for Raw Data

| Concentration | Replicates | Mean Survival | s.d. | cv% |
|---|---|---|---|---|
| control | 4 | 1.0000 | .0000 | .0 |
| 100% | 4 | .6000 | .2449 | 40.8 |

Summary Statistics and ANOVA

Transformation = Arc Sine Square Root

| Concentration | Replicates | Mean Survival | s.d. | cv% |
|---|---|---|---|---|
| control | 4 | 1.4120 | .0000 | .0 |
| 100* | 4 | .9024 | .2725 | 30.2 |

*) the mean for this conc. is significantly less than
the control mean at alpha = 0.05 (1-sided) by Dunnett's test

Minimum detectable difference for Dunnett's test = -.264350
This corresponds to a difference of -.143604 in original units
This difference corresponds to -14.73 percent of control

Between concentrations
sum of squares = .519404 with 1 degrees of freedom.

Error mean square = .037135 with 6 degrees of freedom.

```
**************************************************
*                                                *
* Warning - the test for equality of variances   *
* could not be computed as 1 or more of the      *
* variances is zero.                             *
*                                                *
**************************************************
```

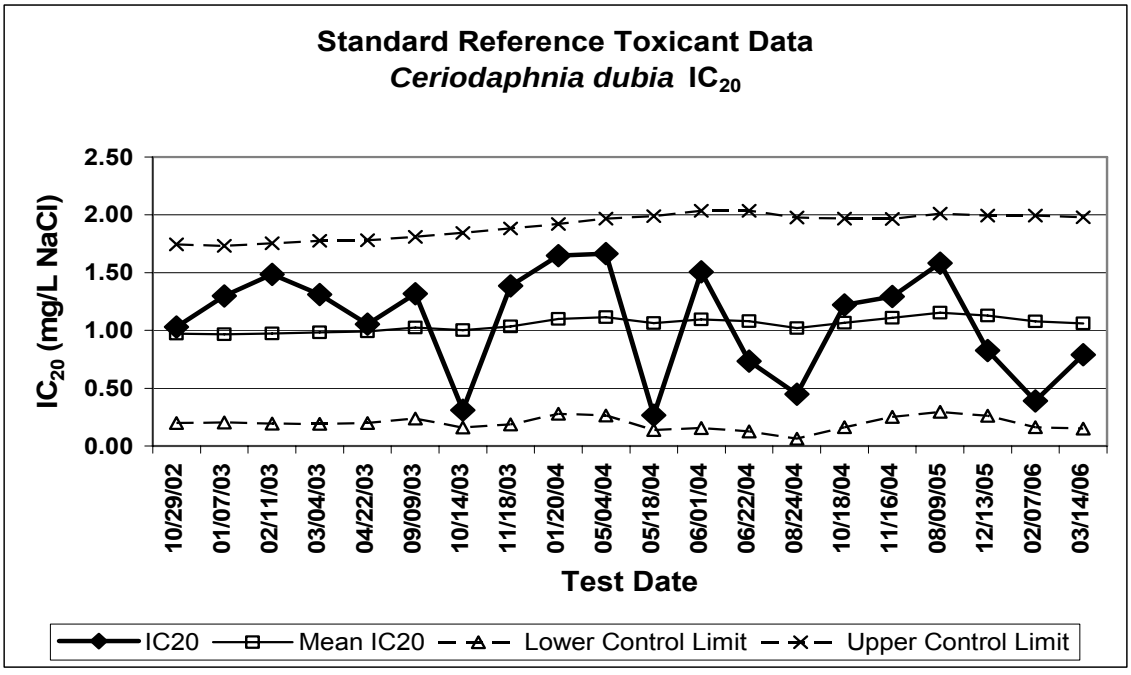
## Appendix 3. SRT Bench Sheets and Statistical Analysis

Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
*Ceriodaphnia dubia* (water flea) - Sodium Chloride (NaCl)

| Date | IC20 | Mean IC20 | Std Dev | Lower Control Limit | Upper Control Limit |
|---|---|---|---|---|---|
| 10/29/02 | 1.03 | 0.97 | 0.39 | 0.20 | 1.74 |
| 01/07/03 | 1.30 | 0.97 | 0.38 | 0.20 | 1.73 |
| 02/11/03 | 1.48 | 0.97 | 0.39 | 0.19 | 1.75 |
| 03/04/03 | 1.31 | 0.98 | 0.40 | 0.19 | 1.78 |
| 04/22/03 | 1.05 | 0.99 | 0.40 | 0.20 | 1.78 |
| 09/09/03 | 1.32 | 1.02 | 0.39 | 0.24 | 1.81 |
| 10/14/03 | 0.31 | 1.00 | 0.42 | 0.16 | 1.84 |
| 11/18/03 | 1.39 | 1.03 | 0.42 | 0.19 | 1.88 |
| 01/20/04 | 1.65 | 1.10 | 0.41 | 0.28 | 1.92 |
| 05/04/04 | 1.66 | 1.12 | 0.43 | 0.26 | 1.97 |
| 05/18/04 | 0.27 | 1.06 | 0.46 | 0.14 | 1.99 |
| 06/01/04 | 1.51 | 1.10 | 0.47 | 0.15 | 2.04 |
| 06/22/04 | 0.73 | 1.08 | 0.48 | 0.13 | 2.03 |
| 08/24/04 | 0.45 | 1.02 | 0.48 | 0.06 | 1.98 |
| 10/18/04 | 1.22 | 1.07 | 0.45 | 0.16 | 1.97 |
| 11/16/04 | 1.29 | 1.11 | 0.43 | 0.25 | 1.96 |
| 08/09/05 | 1.58 | 1.15 | 0.43 | 0.30 | 2.01 |
| 12/13/05 | 0.83 | 1.13 | 0.43 | 0.26 | 1.99 |
| 02/07/06 | 0.39 | 1.08 | 0.46 | 0.16 | 1.99 |
| 03/14/06 | 0.79 | 1.06 | 0.46 | 0.15 | 1.98 |

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev



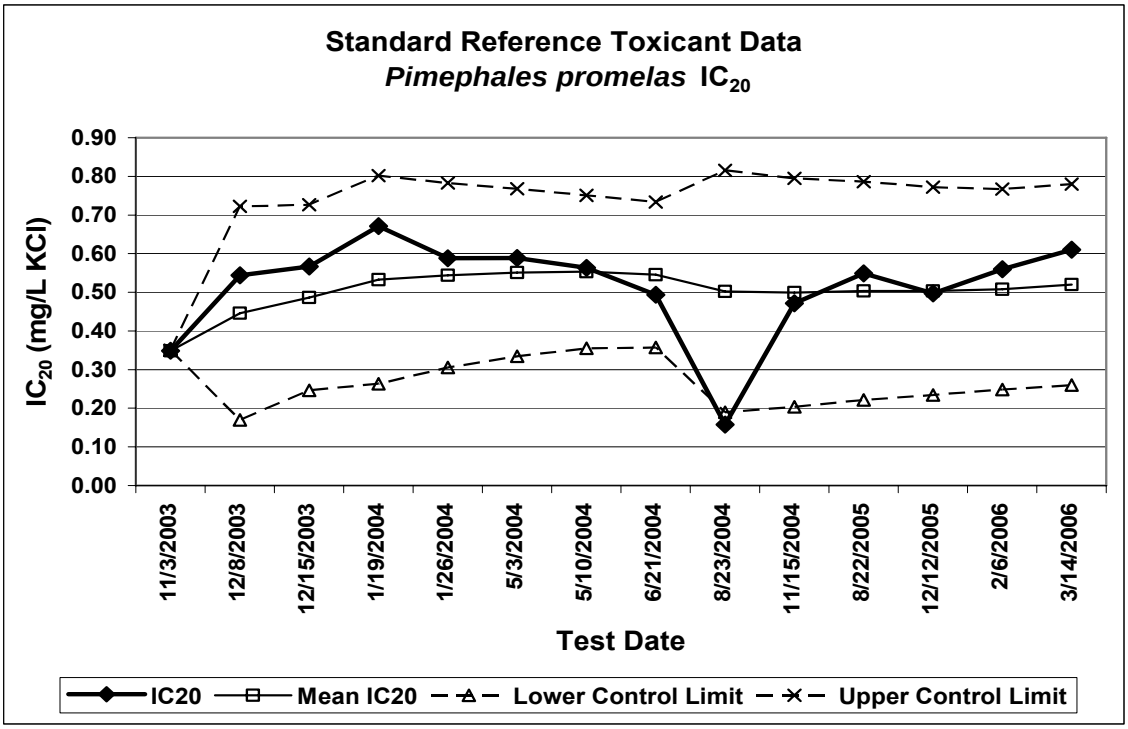
## Appendix 3. (continued)

Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
*Pimephales promelas* (fathead minnow) - Potassium Chloride (KCl)

| Date | IC20 | Mean IC20 | Std Dev | Lower Control Limit | Upper Control Limit |
|---|---|---|---|---|---|
| 11/3/2003 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| 12/8/2003 | 0.54 | 0.45 | 0.14 | 0.17 | 0.72 |
| 12/15/2003 | 0.57 | 0.49 | 0.12 | 0.25 | 0.73 |
| 1/19/2004 | 0.67 | 0.53 | 0.13 | 0.26 | 0.80 |
| 1/26/2004 | 0.59 | 0.54 | 0.12 | 0.31 | 0.78 |
| 5/3/2004 | 0.59 | 0.55 | 0.11 | 0.33 | 0.77 |
| 5/10/2004 | 0.56 | 0.55 | 0.10 | 0.36 | 0.75 |
| 6/21/2004 | 0.49 | 0.55 | 0.09 | 0.36 | 0.73 |
| 8/23/2004 | 0.16 | 0.50 | 0.16 | 0.19 | 0.82 |
| 11/15/2004 | 0.47 | 0.50 | 0.15 | 0.20 | 0.80 |
| 8/22/2005 | 0.55 | 0.50 | 0.14 | 0.22 | 0.79 |
| 12/12/2005 | 0.50 | 0.50 | 0.13 | 0.23 | 0.77 |
| 2/6/2006 | 0.56 | 0.51 | 0.13 | 0.25 | 0.77 |
| 03/14/06 | 0.61 | 0.52 | 0.13 | 0.26 | 0.78 |

Means are from all SRT tests, up to 20 tests..
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev



## Appendix 3. (continued)

[redacted]

*Ceriodaphnia dubia* NaCl Standard Reference Toxicity Test
Sodium chloride is the toxicant.
20% DMW is the diluent.

**State of Florida**
Department of Environmental Protection
Biology Laboratory Chronic Bioassay
*Ceriodaphnia dubia* Bench Sheets - Reproduction

| Conc. | Day | Replicate Number 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # young | # adults | young adults |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 0 | 4 | 3 | 4 | 0 | 5 | 3 | 5 | 5 | 6 | 35 | 10 | 3.5 |
| | 4 (B) | ~~03~~ | ~~02~~ | ~~30~~ | ~~50~~ | ~~04~~ | ~~050~~ | 6 | ~~40~~ | ~~30~~ | ~~50~~ | 14 | 10 | 1.4 |
| | 5 | 7 | 9 | 6 | 7 | 8 | 7 | 9 | 5 | 7 | 9 | 74 | 10 | 7.4 |
| | 6 | 11 | 12 | 12 | 13 | 8 | 17 | 12 | 12 | 11 | 15 | 123 | 10 | 12.3 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 21 | 27 | 21 | 24 | 20 | 34 | 24 | 22 | 23 | 30 | 246 | 10 | 24.6 |
| 0.59 ppt | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 0 | 0 | 3 | 5 | 0 | 0 | 6 | 6 | 3 | 5 | 28 | 10 | 2.8 |
| | 4 | 2 | 3 | 0 | 0 | 2 | 6 | 0 | 1 | 0 | 0 | 14 | 10 | 1.4 |
| | 5 | 5 | 7 | 4 | 9 | 8 | 9 | 10 | 8 | 7 | 8 | 75 | 10 | 7.5 |
| wrong counts Day 5 | 6 (D) | ~~7~~ | ~~10~~ | 12 | 10 | 11 | 14 | 10 | 13 | 12 | 13 | 111 | 10 | 11.1 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 13 | 20 | 19 | 24 | 21 | 29 | 26 | 28 | 22 | 26 | 228 | 10 | 22.8 |
| 0.89 ppt | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 (A) | 0 | ~~30~~ | ~~53~~ | ~~05~~ | 40 | 64 | 5 | 3 | 4 | 7 | 35 | 10 | 3.5 |
| | 4 | 5 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 9 | 10 | 0.9 |
| | 5 | 8 | 0 | 6 | 6 | 6 | 0 | 7 | 6 | 6 | 4 | 49 | 10 | 4.9 |
| | 6 | 7 | 8 | 11 | 10 | 14 | 0 | 12 | 11 | 10 | 9 | 92 | 10 | 9.2 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 20 | 10 | 20 | 21 | ~~28~~ | 4 | 24 | 20 | 20 | 20 | 185 | 10 | 18.5 |
| 1.3 ppt | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 5 | 0 | 1 | 2 | 11 | 10 | 1.1 |
| | 4 (C) | 2 | 2 | 0 | 0 | ~~23~~ | ~~05~~ | 0 | 3 | 0 | 0 | 15 | 10 | 1.5 |
| | 5 | 4 | 7 | 7 | 6 | 8 | 6 | 7 | 5 | 4 | 7 | 61 | 10 | 6.1 |
| | 6 | 10 | 10 | 14 | 7 | 0 | 10 | 12 | 6 | 8 | 11 | 88 | 10 | 8.8 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 16 | 19 | 24 | 13 | 11 | 21 | 24 | 14 | 13 | 20 | 175 | 10 | 17.5 |
| 2.0 ppt | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | | | | | 10 | |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| | 3 | 0 | 0 | 2 | 0 | X0 | 0 | 0 | 1 | 0 | 0 | 3 | ~~10~~ 9 | 0.3 |
| | 4 | 0 | 1 | 0 | 0 | \| | 1 | 0 | 0 | 0 | 0 | 2 | 9(10) | 0.2 |
| | 5 | 2 | 1 | 5 | 4 | \| | 2 | 4 | 0 | 4 | 1 | 23 | 9(10) | 2.3 |
| | 6 | 7 | 3 | 6 | 0 | \| | 0 | 9 | 0 | 5 | 0 | 30 | 9(10) | 3.0 |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | Total | 9 | 5 | 13 | 4 | \| | 3 | 13 | 1 | 9 | 1 | 58 | 9(10) | 5.8 |
| 3.0 ppt | 0 | [redacted] | | | | | | | | | | | 10 | |
| | 1 | [redacted] | | | | | | | X | | | | 9 | |
| | 2 | X | X | X | X | X | X | X | \| | 0 | 0 | 0 | 2 | 0 |
| | 3 | \| | \| | \| | \| | \| | \| | \| | \| | X | X | 0 | 0 | 0 |
| | 4 | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | 0 | \| | 0 |
| | 5 | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | 0 | \| | 0 |
| | 6 | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | 0 | \| | 0 |
| | 7 | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | 0 | \| | \| |
| | 8 | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | 0 | \| | \| |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Begin Test:**
Date: 3-14-06 Time: 1030
**End Test:**
Date: 3-20-06 Time: 1315
Loading verified by: BA

| Day | Counted by: |
|---|---|
| 1 | BA/SP |
| 2 | SP |
| 3 | SP |
| 4 | SP |
| 5 | MF |
| 6 | MF |
| 7 | — |
| 8 | — |

Loaded by: MF

**Remarks:**
Organism batch 12-06
Vials used
A7, A11, A15, A18, A26
B2, B15, B21, B27 MF 3/17/06

(A) replicates 2-6 corrected 2-17-06 SP transcription error
(B) wrote in wrong days values corrected SP
(C) replicates 5 & 6 transcription error SP
(D) wrote 0.89 Days Rep 1 + Rep 2 in 0.59 Day 6 approx MF 3/18/06
DAY 6 0.59 Rep 1 = 10 Rep 2 = 10

Control %CV = 18.2%
LOEC = 0.89 g/L
NOEC = 0.59 g/L
PMSD = 20.49%
IC p20 = 0.7891 g/L
95% CI (0.5130 - 2.326)
IC p25 = 0.8677 g/L
95% CI (0.6893 - 1.3928)

Investigators' Signatures
3-17-06 Rep 5 + 6 NOT INCLUDED MF

[redacted]
Marshall Faircloth
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
reviewer

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form updated 11/03/03 JA

## Appendix 3. (continued)

*Ceriodaphnia dubia* NaCl Standard Reference Toxicant Test

**State of Florida**
**Department of Environmental Protection**
Biology Laboratory Chronic Bioassay
*Ceriodaphnia dubia* Bench Sheet - Chemistry

Sodium Chloride is the Toxicant
20% DMW is the Diluent
TEST START: 3-14-06 1630
TEST END: 3-20-06 1315

Incubator #2
Temperature Range - 23.4-26.0°C
Room 8246 25.1-25.2°C

| | | New Sample | | | | Old Sample | |
|---|---|---|---|---|---|---|---|
| | Conc. | pH (su) | Temp (°C) | DO (mg/L) | Cond (µmhos/cm) | pH (su) | DO (mg/L) |
| Day 0 | Control | 8.0 | 24.4 | 7.7 | 170 | | |
| Day: | 0.59 ‰ | 8.0 | | | 1294 | | |
| Measured | 0.89 ‰ | 8.0 | | | 1838 | | |
| by: SP | 1.3 ‰ | 8.0 | | | 2620 | | |
| Recorded | 2.0 ‰ | 8.0 | | | 3780 | | |
| by: SP | 3.0 ‰ | 8.1 | 25.0 | 7.5 | 5430 | | |
| Day 1 | Control | 8.0 | 24.6 | 7.4 | 174 | 8.0 | 7.3 |
| Day: | 0.59 ‰ | 8.1 | | | 1301 | 8.0 | 7.1 |
| Measured | 0.89 ‰ | 8.1 | | | 1849 | 8.0 | 7.2 |
| by: TMF | 1.3 ‰ | 8.1 | | | 2640 | 8.0 | 7.1 |
| Recorded | 2.0 ‰ | 8.1 | | | 3780 | 8.0 | 7.1 |
| by: MF | 3.0 ‰ | 8.1 | 25.0 | 7.2 | 5480 | 7.9 | 7.0 |
| Day 2 | Control | 8.0 | 24.5 | 6.0 | 1922 | 8.0 | 5.1 |
| Day: | 0.59 ‰ | 8.1 | | | 1284 | 8.0 | 5.2 |
| Measured | 0.89 ‰ | 8.1 | | | 1818 | 8.0 | 5.2 |
| by: BA | 1.3 ‰ | 8.1 | | | 2560 | 8.1 | 5.3 |
| Recorded | 2.0 ‰ | 8.1 | 24.7 | 6.3 | 3750 | 8.1 | 5.2 |
| by: BA | 3.0 ‰ | 8.1 | 24.3 | 6.2 | 5440 | 8.1 | 5.2 |
| Day 3 | Control | 8.1 | 24.5 (A) | 6.0 (B) | 178 | 8.0 | 7.6 |
| Day: | 0.59 ‰ | 8.1 | | | 1300 | 8.0 | 7.4 |
| Measured | 0.89 ‰ | 8.1 | | | 1823 | 8.0 | 7.5 |
| by: SP | 1.3 ‰ | 8.1 | (B) | | 2570 | 8.0 | 7.5 |
| Recorded | 2.0 ‰ | 8.1 | 24.7 | 6.3 (B) | 3820 | 8.0 | 7.3 |
| by: SP | 3.0 ‰ | — | ~~24.8~~ BA | ~~6.2~~ BA | — | 8.0 | 7.4 |

| | | New Sample | | | | Old Sample | |
|---|---|---|---|---|---|---|---|
| | Conc. | pH (su) | Temp (°C) | DO (mg/L) | Cond (µmhos/cm) | pH (su) | DO (mg/L) |
| Day 4 | Control | 8.2 | 24.4 | 7.7 | 161 | 8.1 | 7.4 |
| Day: | 0.59 ‰ | 8.1 | | | 1267 | 8.1 | 7.3 |
| Measured | 0.89 ‰ | 8.1 | | | 1805 | 8.1 | 7.4 |
| by: SP | 1.3 ‰ | 8.1 | | | 2580 | 8.1 | 7.3 |
| Recorded | 2.0 ‰ | 8.0 | 24.7 | 7.5 | 3790 | 8.1 | 7.3 |
| by: SP | 3.0 ‰ | — | — | — | — | — | — |
| Day 5 | Control | 8.0 | 24.0 | 7.7 | 217 | 8.1 | 7.3 |
| Day: | 0.59 ‰ | 8.0 | | | 1261 | 8.1 | 7.5 |
| Measured | 0.89 ‰ | 8.0 | | | 1790 | 8.1 | 7.3 |
| by: JD | 1.3 ‰ | 8.0 | | | 2540 | 8.1 | 7.5 |
| Recorded | 2.0 ‰ | 8.1 | 24.0 | 7.6 | 3760 | 8.1 | 7.5 |
| by: JD | 3.0 ‰ | — | — | — | — | — | — |
| Day 6 | Control | 8.1 | 24.5 | 7.6 | 1616 | 8.1 | 7.6 |
| Day: | 0.59 ‰ | 8.1 | | | 1278 | 8.1 | 7.6 |
| Measured | 0.89 ‰ | 8.0 | | | 1820 | 8.1 | 7.6 |
| by: SP | 1.3 ‰ | 8.1 | | | 2600 | 8.1 | 7.5 |
| Recorded | 2.0 ‰ | 8.1 | 24.7 | 7.7 | 3850 | 8.1 | 7.4 |
| by: BA | 3.0 ‰ | — | — | — | — | — | — |
| Day 7 | Control | | | | | | |
| Day: | 0.59 ‰ | | | | | | |
| Measured | 0.89 ‰ | | | | | | |
| by: | 1.3 ‰ | | | | | | |
| Recorded | 2.0 ‰ | | | | | | |
| by: | 3.0 ‰ | | | | | | |
| Day 8 | Control | | | | | | |
| Day: | 0.59 ‰ | | | | | | |
| Measured | 0.89 ‰ | | | | | | |
| by: | 1.3 ‰ | | | | | | |
| Recorded | 2.0 ‰ | | | | | | |
| by: | 3.0 ‰ | | | | | | |

Remarks: Record 2.0 ‰ data when all organisms in 3.0 ‰ are dead.
(A) Bruce [redacted] MF crossed out with wide tip and wrote it in the wrong boxes. Nutrafin remover (fan) Tip pan.

(B) Day 3 New Sample
Control 25.2°C 7.5 mg/L DO
2.0‰ 25.5°C 7.5 mg/L DO

Test Terminated at Day 6.
Control requirements of
1) 80% Survival (minimum)
2) 60% of surviving females producing 3rd brood
3) average of 15 neonates
were met. MF 3-31-06

**Water Quality Parameters**

| | Chlorine | Alkalinity | Hardness | Ammonia |
|---|---|---|---|---|
| 20 % DMW | <0.03 | 83 | 97 | <0.01 |
| NaCl | <0.03 | 88 | — | <0.01 |
| Measured by: | MF | SA by MF | SA by MF | MF |
| Verified by: | MF | MF | MF | MF |

(A) MF ammonia recorded in Chlorine space MF. Chlorine is <0.03 for Both Measured by EW, MF 3/31/06

Investigators' signatures
Sarah Pinchak
Marshall Faircloth
Daniel Acebes
Erin Lujo
Jean Dark
Bruce Gunn
Nicole Wellendorf
reviewer

Chlorine blank: <0.03
Ammonia meter slope: -52.478
Ammonia blank: <0.01

NaCl batch #: 2-06
YCT batch #: 5-05
Algae batch #: 1-06
Diluent batch #: 7-06 Days Used: 6
Diluent batch #: — Days Used: —

form updated 11/03/03 JA

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## Appendix 3. (continued)



**FDEP Biology Section—Chronic SRT Bench Sheet**

Survival

Test Type: Screening (Definitive)
Temperature range: room 25.1-25.2
incubator 24.2-24.9
Test Number: 1
D=Dead M=Missing

Test Beginning: Date 3-14-06 Time 1150
Test Ending: Date 3-21-06 Time 1030
Organism Batch#: 5-06 Diluent Batch #: 4.00 2.00
Organism age: ≤48 hrs

Comments: Test organism: P. promelas
Toxicant batch -- 2-06 KCl

| (g/L) Concentration | | Replicate/ Chamber # | Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTRL | A | B1 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | B | B2 | 10 | 10 | 10 | 10 | 10 | 10 | 9 10 | 9 | |
| | C | B3 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | D | B4 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| 0.125 | A | B5 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | B | B6 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | C | B7 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | D | B8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| 0.250 | A | B9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | B | B10 | 10 | 10 | 10 | 9 10 | 9 | 9 | 9 | 9 | |
| | C | B11 | 10 | 9 10 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | D | B12 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| 0.500 | A | B13 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | B | B14 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | C | B15 | 10 | 10 | 10 | 10 | 9 10 | 9 | 9 10 | 8 | |
| | D | B16 | 10 | 10 | 10 | 9 10 | 9 | 9 | 9 | 9 | |
| 1.00 | A | B17 | 10 | 4 6D | +3 7D | 2 | 2 | 2 | 1 11 | 1 | |
| | B | B18 | 10 | 5 5D | 0 5D | – | – | – | – | – | |
| | C | B19 | 10 | 8 2D | 3 5D | 3 | 3 | 3 | 3 | 3 | |
| | D | B20 | 10 | 7 3D | 0 7D | – | – | – | – | – | |
| 2.00 | A | B21 | 10 | 3 7D | 0 3D | – | – | – | – | – | |
| | B | B22 | 10 | 2 8D | 0 2D | – | – | – | – | – | |
| | C | B23 | 10 | 0 10D | – | – | – | – | – | – | |
| | D | B24 | 10 | 10 Dup | 0 1D | – | – | – | – | – | |
| Loaded by: MF Renewed by: | | | BA | MF/BA | BA | BA | JD | JD | JD | JD | |
| Concentrations Prepared by: | | | SP | MF/BA | BA | BA | JD | JD | JD | JD | |

Investigators' signatures

Reviewer (sign above)

(A) Tested below mf 3-15-06

**Water Quality Parameters**

Verified by: BA

| | Diluent | Sample | Method | Measured by |
|---|---|---|---|---|
| Field total residual $Cl_2$: | NA | NA | NA | NA |
| Lab total residual $Cl_2$: | <0.03 | <0.03 | Hach | EW + NW by MF |
| Alkalinity (mg/L as $CaCO_3$): | 67 | 76 | Hach | SA |
| Hardness (mg/L as $CaCO_3$): | 92.5 | — | Hach | SA |
| Ammonia (mg/L as N): | <0.017 | <0.017 | Denver | MF |

Ammonia blank: <0.017 TRC blank: <0.03 Salinity: <1 Control <1 Sample 2 (conductivity) and Temperature

revised 08/14/02

Page of

000132

Survival
Control CV = 5.96
NOEC 0.50 g/L
LOEC 1.00 g/L
PMSD = 11.11 %

Page 133 not used.

**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P. promelas | | | | | | Organism Batch # 5-06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | Date: 3-14-06 | | | Hour of test: 0 | | | Dilution H20 Batch # 5-06 | | | | |
| | Before Renewal | | | Time: 1130 | | | After Renewal | | | Time: | |
| Concentrations (g/L) | Rep | pH | Temp.C | D.O. | Cond.(m) | Rep | pH | Temp.C | D.O. | Cond. | |
| CTRL | A | 8.1 | 24.9 | 7.8 | 0.323 | | | | | | |
| 0.125 | A | 8.0 | 25.0 | 7.9 | 0.530 | | | | | | |
| 0.250 | A | 8.0 | 25.0 | 7.9 | 0.763 | | | | | | |
| 0.500 | A | 8.0 | 24.9 | 7.8 | 1.21 | | | | | | |
| 1.00 | A | 8.1 | 24.9 | 7.7 | 2.08 | | | | | | |
| 2.00 | A | 8.1 | 24.8 | 7.8 | 3.79 | | | | | | |
| | | | | | | | | | | | |
| ^ Measured by: | | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | |
| ^ Recorded by: | | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | |

revised 8/14/02

^ See first test page for investigator signatures

**Appendix 3. (continued)**

**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | | Test Organism: P. promelas | | | | | Organism Batch # 5-06 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | | Date: 3-15-06 | | Hour of test: 34 | | | Dilution H20 Batch # 5-06 | | | | | |
| | | Before Renewal | | | | | After Renewal | | | Time: 1100 | | |
| Concentrations g/L | Rep | pH | Temp.C | D.O. | Cond.(m) | Rep | pH | Temp.C | D.O. | Cond. (m) | | |
| Control | B | 8.0 | 25.1 | 6.9 | 0.354 | B | 8.0 | 24.7 | 7.2 | 0.320 | | |
| 0.125 | B | 7.9 | 25.2 | 7.0 | 0.576 | B | 8.0 | 24.7 | 7.4 | 0.546 | | |
| 0.250 | B | 7.9 | 24.8 | 7.2 | 0.816 | B | 8.0 | 24.5 | 7.4 | 0.778 | | |
| 0.500 | B | 7.9 | 24.9 | 6.9 | 1.277 | B | 8.0 | 24.5 | 7.5 | 1.226 | | |
| 1.0 | B | 7.9 | 24.7 | 6.7 | 2.17 | B | 8.0 | 24.4 | 7.4 | 2.11 | | |
| 2.0 | B | 7.8 | 24.6 | 6.5 | 3.84 | B | 7.9 | 24.5 | 7.3 | 3.83 | | |
| | | | | | | | | | | | | |
| ^ Measured by: | | mf | mf | mf | mf | | mf | mf | mf | mf | | |
| ^ Recorded by: | | mf | mf | mf | mf | | mf | mf | mf | mf | | |

m = millimhos/cm

revised 8/14/02

^ See first test page for investigator signatures

00115

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**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P promelas | | | | | | Organism Batch # 5-06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | Date: 3-16-06 | | | Hour of test: 48 | | | Dilution H20 Batch # ~~5-06~~ 4-06 | | | | |
| | Before Renewal | | | Time: 10 20 | | | After Renewal | | | Time: 11 15 | |
| Concentrations g/L | Rep | pH | Temp.C | D.O. | Cond(µ) | Rep | pH | Temp.C | D.O. | Cond.(µ) |
| Control | C | 7.8 | 25.4 | 5.9 | 327 | C | 8.0 | 24.0 | 6.4 | 333 |
| 0.125 | C | 7.8 | ~~25.9~~ 25.4 BA | 6.3 | 567 | C | 7.9 | 24.1 | 7.1 | 556 |
| 0.250 | C | 7.8 | 25.5 | 6.6 | 789 | C | 8.0 | 24.1 | 6.9 | 794 |
| 0.500 | C | 7.8 | 24.5 | 6.5 | 1262 | C | 8.0 | 24.5 | 6.9 | 1261 |
| 1.0 | C | 7.8 | 25.8 | 5.8 | 2170 | C | 8.0 | 24.5 | 6.6 | 2100 |
| 2.0 | (A) D | 7.9 ~~7.8~~ BA | 24.5 | 6.4 | 3910 | — | — | — | — | — |
| | | | | | | | | | | |
| ^ Measured by: | | BA | BA | BA | BA | BA | BA | BA | BA | BA |
| ^ Recorded by: | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA |

revised 8/14/02

(A) Rep 2.0 "C" data, parameters taken on "D"

^ See first test page for investigator signatures

ml = milliohm-cm

µ = microohm-cm

**Appendix 3. (continued)**

**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P. promelas | Organism Batch # 5-06 |
|---|---|---|
| Test Number: 1 | Date: 3-17-06 | Hour of Test: 72 | Dilution H20 Batch # 5* 4-00 |

| Concentrations g/L | Before Renewal | | | | | | | After Renewal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rep | pH | Temp.C | D.O. | Time: ≈10:00 Cond.(µ) | Rep | pH | Temp.C | D.O. | Time: 16.58 Cond(µ) |
| Control | D | 7.9 | 25.0 | 6.4 | 330 | D | 8.0 | 24.9 | 5.2 | 322 |
| 0.125 | D | 7.8 | 25.0 | 6.7 | 558 | D | 8.0 | 25.1 | 5.8 | 553 |
| 0.250 | D | 7.7 | 24.8 | 5.8 | 796 | D | 8.0 | 25.0 | 5.3 | 783 |
| 0.500 | D | 7.7 | 24.8 | 5.6 | 1131 | D | 8.0 | 25.0 | 6.0 | 1206 |
| 1.0 | D | 7.7 | 24.7 | 5.8 | 2040 | C | 8.0 | 25.0 | 6.0 | 2070 |
| 2.0 | — | — | — | — | — | — | — | — | — | — |
| | | | | | | | | | | |
| ^ Measured by: | | BA | BA | BA | BA | BA | BA | BA | BA | BA |
| ^ Recorded by: | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA |

^ See first test page for investigator signatures

revised 8/14/02

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**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P promelas | | | | | Organism Batch # S-06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | Date: 3-18-06 | | | Hour of test: 96 | | Dilution H20 Batch # ~~5-06~~ 406 | | | | |
| | Before Renewal | | | Time: 0945 | | After Renewal | | | Time: 1000 | |
| Concentrations g/L | Rep | pH | Temp.C | D.O. | Cond(µ) | Rep | pH | Temp.C | D.O. | Cond(µ) |
| Control | A | 7.6 | 24.4 | 6.4 | 330 | A | 7.9 | 24.1 | 7.3 | 318 |
| 0.125 | A | 7.6 | 25.9 | 6.1 | 560 | A | 7.9 | 24.5 | 7.5 | 554 |
| 0.250 | A | 7.5 | 25.5 | 5.7 | 787 | A | 8.0 | 24.8 | 7.5 | 787 |
| 0.500 | A | 7.5 | 25.3 | 5.7 | 1230 | A | 7.9 | 24.9 | 7.6 | 1232 |
| 1.0 | A | 7.6 | 24.5 | 6.2 | 2060 | A | 7.9 | 24.9 | 7.5 | 2070 |
| 2.0 | – | – | – | – | – | – | – | – | – | – |
| | | | | | | | | | | |
| ^ Measured by: | | JD | JD | JD | JD | | JD | JD | JD | JD |
| ^ Recorded by: | | JD | JD | JD | JD | | JD | JD | JD | JD |

m = mill.
µs = microsiemens

revised 8/14/02

^ See first test page for investigator signatures



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**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P promelas | | | | | | Organism Batch # 5-06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | Date: 3-17-06 | | | Hour of test: 120 | | | Dilution H20 Batch # ~~56-020~~ 446 | | | | |
| | Before Renewal | | | Time: 0930 | | | After Renewal | | | Time: 0945 | |
| Concentrations g/L | Rep | pH | Temp.C | D.O. | Cond(µ) | Rep | pH | Temp.C | D.O. | Cond(µ) |
| Control | B | 7.7 | 24.9 | 6.9 | 320 | B | 8.0 | 24.1 | 7.5 | 321 |
| 0.125 | B | 7.9 | 25.4 | 6.8 | 560 | B | 8.1 | 24.9 | 7.4 | 544 |
| 0.250 | B | 7.8 | 25.0 | 6.9 | 770 | B | 8.0 | 24.9 | 7.6 | 769 |
| 0.500 | B | 7.8 | 24.8 | 7.0 | 1279 | B | 8.0 | 24.9 | 7.5 | 1219 |
| 1.0 | C | 7.8 | 25.8 | 7.1 | 2120 | C | 8.0 | 25.0 | 7.5 | 2070 |
| 2.0 | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | |
| ^ Measured by: | | JD | JD | JD | JD | | JD | JD | JD | JD |
| ^ Recorded by: | | JD | JD | JD | JD | | JD | JD | JD | JD |

u = microMhos-cm

revised 8/14/02

^ See first test page for investigator signatures

000139

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**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P. Promelas | | | | | | Organism Batch # 5-06 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Number: 1 | Date: 3-20-06 | | Hour of test: 144 | | | | Dilution H20 Batch # 6-06 | | | |
| | Before Renewal | | Time: 1215 | | | | After Renewal | | Time: 1230 | |
| Concentrations g/L | Rep | pH | ~~Temp.C~~ DO. | ~~D.O.~~ Temp | Cond(µ) | Rep | pH | Temp.C | D.O. | Cond(µ) |
| Control | C | 7.6 | 6.0 | 24.6 | 329 | C | 8.0 | 24.0 | 7.4 | 333 |
| 0.125 | C | 7.6 | 6.9 | 24.5 | 565 | C | 8.0 | 24.0 | 7.2 | 569 |
| 0.250 | C | 7.6 | 7.0 | 24.5 | 801 | C | 8.1 | 24.1 | 7.1 | 761 |
| 0.500 | C | 7.7 | 6.9 | 24.9 | 1285 | C | 8.0 | 24.1 | 7.1 | 1238 |
| 1.0 | C | 7.7 | 6.9 | 24.7 | 2140 | C | 8.0 | 24.4 | 7.0 | 2110 |
| 2.0 | C | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | |
| ^ Measured by: | | BA | BA | BA | BA | BA | BA | BA | BA | BA |
| ^ Recorded by: | | BA | BA | BA | BA | BA | BA | BA | BA | BA |

da = microohm-cm

revised 8/14/02

^ See first test page for investigator signatures

**Appendix 3. (continued)**



**Chronic SRT Bench Sheet**

Physical-Chemistry Parameters

| Toxicant: KCl | Test Organism: P promelas | Organism Batch # 5-06 |
|---|---|---|
| Test Number: 1 | Date: 3/21/06 | Hour of test: 168 | Dilution H20 Batch # 2-06 |

| | | Before Renewal | | | | | | After Renewal | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Time: 1030 | | | | Time: | | | |
| Concentrations g/L | Rep | pH | Temp.C | D.O. | Cond.m | Rep | pH | Temp.C | D.O. | Cond. |
| Control | D | 7.9 | 25.2 | 7.4 | 0.352 | | | | | |
| 0.125 | D | 7.9 | 24.9 | 7.2 | 0.587 | | | | | |
| 0.250 | D | 7.9 | 24.7 | 7.2 | 0.778 | | | | | |
| 0.500 | D | 7.8 | 24.7 | 7.1 | 1.01 | | | | | |
| 1.0 | D | 7.9 | 25.0 | 7.1 | 2.15 | | | | | |
| 2.0 | | | | | | | | | | |
| | | | | | | | | | | |
| ^ Measured by: | | JD | JD | JD | JD | | | | | |
| ^ Recorded by: | | JD | JD | JD | JD | | | | | |

^ See first test page for investigator signatures

revised 8/14/02

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## Weight Data for SRT, larval survival and growth test.

Test Date(s): 3-14-06 - 3-21-06
Tare weighing Date: 3-20-06
Final weighing Date: 3-22-06

Drying Temperature (°C): 105°C
Drying Time (h): 8 hours

| Concentration | Rep # | A (g) Wgt. of Tare | B (grams) Dry Wgt. | (grams) B-A Total Dry Wgt. | Original C Number of | milligrams (B-A)/C Mean Dry Wgt. | Comments |
|---|---|---|---|---|---|---|---|
| | | — | tare and larve | of larve | larve | of Larve | |
| Control Pan# 96 | A | 0.02522 | 0.02810 | 0.00288 | 10 | 0.288 | |
| 97 | B | 0.02555 | 0.02811 | 0.00256 | 10 | 0.256 | |
| 98 | C | 0.02451 | 0.02745 | 0.00294 | 10 | 0.294 | |
| 99 | D | 0.02427 | 0.02722 | 0.00295 | 10 | 0.295 | |
| Concentration 100 | A | 0.02495 | 0.02716 | 0.00221 | 10 | 0.221 | |
| 0.125 g/L 101 | B | 0.02496 | 0.02794 | 0.00298 | 10 | 0.298 | |
| 102 | C | 0.02439 | 0.02732 | 0.00293 | 10 | 0.293 | |
| 150 | D | 0.02494 | 0.02775 | 0.00281 | 10 | 0.281 | |
| Concentration 151 | A | 0.02614 | 0.02892 | 0.00278 | 10 | 0.278 | |
| 0.250 g/L 155 | B | 0.02424 | 0.02762 | 0.00338 | 10 | 0.338 | |
| 157 | C | 0.02438 | 0.02718 | 0.00280 | 10 | 0.280 | |
| 160 | D | 0.02525 | 0.02767 | 0.00242 | 10 | 0.242 | |
| Concentration 161 | A | 0.02474 | 0.02731 | 0.00257 | 10 | 0.257 | |
| 0.500 g/L 162 | B | 0.02506 | 0.02825 | 0.00319 | 10 | 0.319 | |
| 164 | C | 0.02567 | 0.02860 | 0.00293 | 10 | 0.293 | |
| 165 | D | 0.02492 | 0.02760 | 0.00268 | 10 | 0.268 | |
| Concentration 166 | A | 0.02452 | 0.02474 | 0.00022 | 10 | 0.022 | |
| | | — | — | ✓ | — | — | |
| 1.0 g/L 167 | C | 0.02540 | 0.02624 | 0.00084 | 10 | 0.084 | |
| | | — | | | | | |
| Concentration | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Concentration | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Weighed by | | MF | MF | | | | |

Weigh Boats prepared by: DN by MF

Dunnett's
Control CV: 6.5%
PMSD = 17.95%
NOEC = 0.500 g/L
ICp20 WT = 0.6065
95% CI (0.5618 - 0.6523)
ICp25 WT = 0.6343
95% CI (0.5932 - 0.6477)

S weights at Tare
1 0.01999 @ 0.02000
2 0.02997 @ 0.03000

S weights at Final
1 0.02000 @ 0.02000
2 0.02997 @ 0.03000

at tare
Pan 96 after 100 - 0.02523
start 0.02522 157 - 0.02524
161 - 0.02525
167 - 0.02522

at final
Pan 96 after 100 - 0.02810
start 0.02810 157 - 0.02812
161 - 0.02810
167 - 0.02810

revised 5/21/98

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## Appendix 3. (continued)

**FDEP Bureau of Laboratories**
**Chronic Standard Reference Toxicant Bioassay Inhibition Concentration Calculation**

Test Species: *Ceriodaphnia dubia* Test Duration: 7 days
Toxicant: NaCl Concentration: g/L
Test Start Date: 3/14/06 Test Ending Date: 3/20/06
DATA FILE: cdrep306.icp **$IC_{20}$ calculation**

| Conc. ID | Number Replicates | Response Means | Std. Dev. | Pooled Response Means |
|---|---|---|---|---|
| Control | 10 | 24.6 | 4.477 | 24.6 |
| 0.59 | 10 | 22.8 | 4.826 | 22.8 |
| 0.89 | 10 | 18.1 | 6.154 | 18.1 |
| 1.3 | 10 | 17.5 | 4.743 | 17.5 |
| 2.0 | 10 | 5.8 | 4.894 | 5.8 |
| 3.0 | 10 | 0.0 | 0.000 | 0.0 |

The Linear Interpolation Estimate: 0.7891 Entered P Value: 20

Number of Resamplings: 80 80 Resamples Generated
The Bootstrap Estimates Mean: 0.8222 Standard Deviation: 0.1669
Original Confidence Limits: Lower: 0.5130 Upper: 1.2326
Resampling time in Seconds: 0.00 Random_Seed: 977453110

**$IC_{20}$ = 0.7891**

Test Species: *Ceriodaphnia dubia* Test Duration: 7 days
Toxicant: NaCl Concentration: g/L
Test Start Date: 3/14/06 Test Ending Date: 3/20/06
DATA FILE: cdrep306.icp **$IC_{25}$ calculation**

| Conc. ID | Number Replicates | Response Means | Std. Dev. | Pooled Response Means |
|---|---|---|---|---|
| Control | 10 | 24.6 | 4.477 | 24.6 |
| 0.59 | 10 | 22.8 | 4.826 | 22.8 |
| 0.89 | 10 | 18.1 | 6.154 | 18.1 |
| 1.3 | 10 | 17.5 | 4.743 | 17.5 |
| 2.0 | 10 | 5.8 | 4.894 | 5.8 |
| 3.0 | 10 | 0.0 | 0.000 | 0.0 |

The Linear Interpolation Estimate: 0.8677 Entered P Value: 25

Number of Resamplings: 80 80 Resamples Generated
The Bootstrap Estimates Mean: 0.9769 Standard Deviation: 0.2207
Original Confidence Limits: Lower: 0.6893 Upper: 1.3928
Resampling time in Seconds: 0.00 Random_Seed: 2101293942

**$IC_{25}$ = 0.8677**

## Appendix 3. (continued)

**FDEP Bureau of Laboratories**
**Chronic Standard Reference Toxicant Bioassay Inhibition Concentration Calculation**

Test Species: *Pimephales promelas* Test Duration: 7 days
Toxicant: KCl Concentration: g/L
Test Start Date: 3/14/06 Test Ending Date: 3/21/06
DATA FILE: ppwt306.icp $IC_{20}$ calculation

| Conc. ID | Number Replicates | Response Means | Std. Dev. | Pooled Response Means |
|---|---|---|---|---|
| Control | 4 | 0.283 | 0.018 | 0.283 |
| 0.125 | 4 | 0.273 | 0.036 | 0.281 |
| 0.25 | 4 | 0.285 | 0.040 | 0.281 |
| 0.5 | 4 | 0.285 | 0.027 | 0.281 |
| 1.0 | 4 | 0.027 | 0.040 | 0.027 |
| 2.0 | 4 | 0.000 | 0.000 | 0.000 |

The Linear Interpolation Estimate: 0.6065 Entered P Value: 20

Number of Resamplings: 80 80 Resamples Generated
The Bootstrap Estimates Mean: 0.5974 Standard Deviation: 0.0164
Original Confidence Limits: Lower: 0.5618 Upper: 0.6228
Expanded Confidence Limits: Lower: 0.5351 Upper: 0.6326
Resampling time in Seconds: 0.05 Random_Seed: 42363676

**$IC_{20}$ = 0.6065**

Test Species: *Pimephales promelas* Test Duration: 7 days
Toxicant: KCl Concentration: g/L
Test Start Date: 3/14/06 Test Ending Date: 3/21/06
DATA FILE: ppwt306.icp $IC_{25}$ calculation

| Conc. ID | Number Replicates | Response Means | Std. Dev. | Pooled Response Means |
|---|---|---|---|---|
| Control | 4 | 0.283 | 0.018 | 0.283 |
| 0.125 | 4 | 0.273 | 0.036 | 0.281 |
| 0.25 | 4 | 0.285 | 0.040 | 0.281 |
| 0.5 | 4 | 0.285 | 0.027 | 0.281 |
| 1.0 | 4 | 0.027 | 0.040 | 0.027 |
| 2.0 | 4 | 0.000 | 0.000 | 0.000 |

The Linear Interpolation Estimate: 0.6343 Entered P Value: 25

Number of Resamplings: 80 80 Resamples Generated
The Bootstrap Estimates Mean: 0.6231 Standard Deviation: 0.0160
Original Confidence Limits: Lower: 0.5932 Upper: 0.6477
Expanded Confidence Limits: Lower: 0.5686 Upper: 0.6567
Resampling time in Seconds: 0.06 Random_Seed: -1006646372

**$IC_{25}$ = 0.5909**

## Appendix 4. Test Organism Receipt

11842 Research Circle
Alachua, FL 32615
T: (386) 462-7889
F: (386) 462-7264
www.hydrosphere.net

HYDROSPHERE
research

# Packaging List

| Date | Customer Number | Order Shipped Via |
|---|---|---|
| 3/13/2006 | NA | Hydrosphere Research |
| **Customer** | | **Order Prepared By** |
| FDEP<br>Marshall Faircloth<br>Biology Mail Stop 6515<br>2600 Blair Stone Road<br>Tallahassee, Fl 32399-2400 | | D. Onash |

| Quantity | Description |
|---|---|
| 450 | P. promelas, FM#978, Hatched 3/13/06 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**Appendix 5. Chemical Analyses performed on the effluent from the CF Industries, Inc. Bartow Phosphate Complex Outfall 003 and Southwest Outfall, sampled on March 13, 15, and 17, 2006.**

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:30 | Outfall 003 | Bio-AGP/LimNut | Algal Growth Potential | 40.5 | mg DryWt/L | | 0.3 | 0.9 |
| 3/13/06 8:30 | Outfall 003 | Bio-Chl-a | Chlorophyll-A, Monochromatic, Water | 0.85 | ug/L | U | 0.85 | 2.6 |
| 3/13/06 8:30 | Outfall 003 | Bio-Chl-a | Phaeophytin-A, Monochromatic, Water | 1.5 | ug/L | U | 1.5 | 4.5 |
| 3/13/06 7:35 | SWOF | Bio-Toxicology | Bioassay-Chronic-Scrn-FW-C.dubia, NOEC | 100 | NOEC | | | |
| 3/13/06 7:35 | SWOF | Bio-Toxicology | Bioassay-Chronic-Scrn-FW-Fish, NOEC | 100 | NOEC | K | | |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 1,2,4-Trichlorobenzene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 1,2-Dichlorobenzene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 1,3-Dichlorobenzene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 1,4-Dichlorobenzene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,4,6-Trichlorophenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,4-Dichlorophenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,4-Dimethylphenol | 51 | ug/L | U | 51 | 200 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,4-Dinitrophenol | 15 | ug/L | U | 15 | 61 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,4-Dinitrotoluene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2,6-Dinitrotoluene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2-Chloronaphthalene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2-Chlorophenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2-Methyl-4,6-dinitrophenol | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 2-Nitrophenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 3,3'-Dichlorobenzidine | 41 | ug/L | U | 41 | 160 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4,4'-DDD | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4,4'-DDE | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4,4'-DDT | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4-Bromophenyl phenyl ether | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4-Chloro-3-methylphenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4-Chlorophenyl phenyl ether | 2 | ug/L | U | 2 | 8.2 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | 4-Nitrophenol | 15 | ug/L | U | 15 | 61 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Acenaphthene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Acenaphthylene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Aldrin | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | alpha-BHC | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Anthracene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzidine | 100 | ug/L | U | 100 | 410 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzo(a)anthracene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzo(a)pyrene | 1 | ug/L | UJ | 1 | 4.1 |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzo(b)fluoranthene | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzo(g,h,i)perylene | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Benzo(k)fluoranthene | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | beta-BHC | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Bis(2-chloroethoxy)methane | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Bis(2-chloroethyl)ether | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Bis(2-chloroisopropyl)ether | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Bis(2-ethylhexyl)phthalate | 15 | ug/L | U | 15 | 61 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Butyl benzyl phthalate | 5.1 | ug/L | U | 5.1 | 20 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Chrysene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | delta-BHC | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Dibenzo(a,h)anthracene | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Dieldrin | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Diethyl phthalate | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Dimethyl phthalate | 51 | ug/L | U | 51 | 200 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Di-n-butyl phthalate | 5.1 | ug/L | U | 5.1 | 20 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Di-n-octyl phthalate | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Endosulfan I | 4.1 | ug/L | U | 4.1 | 16 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Endosulfan II | 4.1 | ug/L | U | 4.1 | 16 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Endosulfan sulfate | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Endrin | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Endrin aldehyde | 4.1 | ug/L | U | 4.1 | 16 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Fluoranthene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Fluorene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | gamma-BHC | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Heptachlor | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Heptachlor epoxide | 1.5 | ug/L | U | 1.5 | 6.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Hexachlorobenzene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Hexachlorobutadiene | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Hexachlorocyclopentadiene | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Hexachloroethane | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Indeno(1,2,3-cd)pyrene | 1 | ug/L | UJ | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Isophorone | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Naphthalene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Nitrobenzene | 2 | ug/L | U | 2 | 8.2 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | N-Nitrosodimethylamine | 2 | ug/L | U | 2 | 8.2 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | N-Nitrosodi-n-propylamine | 2 | ug/L | U | 2 | 8.2 |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:30 | Outfall 003 | BNA-Water | N-Nitrosodiphenylamine | 3.1 | ug/L | UJ | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Pentachlorophenol | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Phenanthrene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Phenol | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:30 | Outfall 003 | BNA-Water | Pyrene | 1 | ug/L | U | 1 | 4.1 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 1,2,4-Trichlorobenzene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 1,2-Dichlorobenzene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 1,3-Dichlorobenzene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 1,4-Dichlorobenzene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,4,6-Trichlorophenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,4-Dichlorophenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,4-Dimethylphenol | 52 | ug/L | U | 52 | 210 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,4-Dinitrophenol | 16 | ug/L | U | 16 | 62 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,4-Dinitrotoluene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2,6-Dinitrotoluene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2-Chloronaphthalene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2-Chlorophenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2-Methyl-4,6-dinitrophenol | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 2-Nitrophenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 3,3'-Dichlorobenzidine | 42 | ug/L | U | 42 | 170 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4,4'-DDD | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4,4'-DDE | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4,4'-DDT | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4-Bromophenyl phenyl ether | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4-Chloro-3-methylphenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4-Chlorophenyl phenyl ether | 2.1 | ug/L | U | 2.1 | 8.3 |
| 3/13/06 8:00 | BLANKS | BNA-Water | 4-Nitrophenol | 16 | ug/L | U | 16 | 62 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Acenaphthene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Acenaphthylene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Aldrin | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | alpha-BHC | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Anthracene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzidine | 100 | ug/L | U | 100 | 420 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzo(a)anthracene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzo(a)pyrene | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzo(b)fluoranthene | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzo(g,h,i)perylene | 1 | ug/L | UJ | 1 | 4.2 |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:00 | BLANKS | BNA-Water | Benzo(k)fluoranthene | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | beta-BHC | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Bis(2-chloroethoxy)methane | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Bis(2-chloroethyl)ether | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Bis(2-chloroisopropyl)ether | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Bis(2-ethylhexyl)phthalate | 16 | ug/L | U | 16 | 62 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Butyl benzyl phthalate | 5.2 | ug/L | U | 5.2 | 21 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Chrysene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | delta-BHC | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Dibenzo(a,h)anthracene | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Dieldrin | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Diethyl phthalate | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Dimethyl phthalate | 52 | ug/L | U | 52 | 210 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Di-n-butyl phthalate | 5.2 | ug/L | U | 5.2 | 21 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Di-n-octyl phthalate | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Endosulfan I | 4.2 | ug/L | U | 4.2 | 17 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Endosulfan II | 4.2 | ug/L | U | 4.2 | 17 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Endosulfan sulfate | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Endrin | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Endrin aldehyde | 4.2 | ug/L | U | 4.2 | 17 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Fluoranthene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Fluorene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | gamma-BHC | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Heptachlor | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Heptachlor epoxide | 1.6 | ug/L | U | 1.6 | 6.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Hexachlorobenzene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Hexachlorobutadiene | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Hexachlorocyclopentadiene | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Hexachloroethane | 3.1 | ug/L | U | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Indeno(1,2,3-cd)pyrene | 1 | ug/L | UJ | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Isophorone | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Naphthalene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Nitrobenzene | 2.1 | ug/L | U | 2.1 | 8.3 |
| 3/13/06 8:00 | BLANKS | BNA-Water | N-Nitrosodimethylamine | 2.1 | ug/L | U | 2.1 | 8.3 |
| 3/13/06 8:00 | BLANKS | BNA-Water | N-Nitrosodi-n-propylamine | 2.1 | ug/L | U | 2.1 | 8.3 |
| 3/13/06 8:00 | BLANKS | BNA-Water | N-Nitrosodiphenylamine | 3.1 | ug/L | UJ | 3.1 | 12 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Pentachlorophenol | 3.1 | ug/L | U | 3.1 | 12 |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:00 | BLANKS | BNA-Water | Phenanthrene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Phenol | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:00 | BLANKS | BNA-Water | Pyrene | 1 | ug/L | U | 1 | 4.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Alachlor | 0.6 | ug/L | U | 0.6 | 2.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Ametryn | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Atrazine | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Azinphos Methyl | 0.2 | ug/L | U | 0.2 | 0.8 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Bromacil | 0.2 | ug/L | U | 0.2 | 0.8 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Butylate | 0.2 | ug/L | U | 0.2 | 0.8 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Chlorpyrifos Ethyl | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Chlorpyrifos Methyl | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Diazinon | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Ethion | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Ethoprop | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Fenamiphos | 0.2 | ug/L | U | 0.2 | 0.8 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Fonofos | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Hexazinone | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Malathion | 0.15 | ug/L | UJ | 0.15 | 0.6 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Metalaxyl | 0.25 | ug/L | U | 0.25 | 1 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Metolachlor | 0.5 | ug/L | U | 0.5 | 2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Metribuzin | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Mevinphos | 0.2 | ug/L | UJ | 0.2 | 0.8 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Naled | 0.8 | ug/L | U | 0.8 | 3.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Norflurazon | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Parathion Ethyl | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Parathion Methyl | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Phorate | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Prometryn | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:30 | Outfall 003 | GC-Water | Simazine | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:00 | BLANKS | GC-Water | Alachlor | 0.62 | ug/L | U | 0.62 | 2.5 |
| 3/13/06 8:00 | BLANKS | GC-Water | Ametryn | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Atrazine | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Azinphos Methyl | 0.21 | ug/L | U | 0.21 | 0.84 |
| 3/13/06 8:00 | BLANKS | GC-Water | Bromacil | 0.21 | ug/L | U | 0.21 | 0.84 |
| 3/13/06 8:00 | BLANKS | GC-Water | Butylate | 0.21 | ug/L | U | 0.21 | 0.84 |
| 3/13/06 8:00 | BLANKS | GC-Water | Chlorpyrifos Ethyl | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Chlorpyrifos Methyl | 0.1 | ug/L | U | 0.1 | 0.4 |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:00 | BLANKS | GC-Water | Diazinon | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Ethion | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Ethoprop | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:00 | BLANKS | GC-Water | Fenamiphos | 0.21 | ug/L | U | 0.21 | 0.84 |
| 3/13/06 8:00 | BLANKS | GC-Water | Fonofos | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:00 | BLANKS | GC-Water | Hexazinone | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:00 | BLANKS | GC-Water | Malathion | 0.15 | ug/L | UJ | 0.15 | 0.6 |
| 3/13/06 8:00 | BLANKS | GC-Water | Metalaxyl | 0.26 | ug/L | U | 0.26 | 1 |
| 3/13/06 8:00 | BLANKS | GC-Water | Metolachlor | 0.52 | ug/L | U | 0.52 | 2.1 |
| 3/13/06 8:00 | BLANKS | GC-Water | Metribuzin | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:00 | BLANKS | GC-Water | Mevinphos | 0.21 | ug/L | UJ | 0.21 | 0.84 |
| 3/13/06 8:00 | BLANKS | GC-Water | Naled | 0.82 | ug/L | U | 0.82 | 3.3 |
| 3/13/06 8:00 | BLANKS | GC-Water | Norflurazon | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:00 | BLANKS | GC-Water | Parathion Ethyl | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:00 | BLANKS | GC-Water | Parathion Methyl | 0.1 | ug/L | U | 0.1 | 0.4 |
| 3/13/06 8:00 | BLANKS | GC-Water | Phorate | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:00 | BLANKS | GC-Water | Prometryn | 0.15 | ug/L | U | 0.15 | 0.6 |
| 3/13/06 8:00 | BLANKS | GC-Water | Simazine | 0.052 | ug/L | U | 0.052 | 0.21 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Aluminum | 68 | ug/L | | 5 | 20 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Arsenic | 1.9 | ug/L | I | 0.5 | 2 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Cadmium | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Calcium | 59 | mg/L | | 0.05 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Chromium | 2 | ug/L | U | 2 | 8 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Copper | 0.32 | ug/L | I | 0.25 | 1 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Iron | 130 | ug/L | | 10 | 40 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Lead | 0.081 | ug/L | I | 0.075 | 0.3 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Magnesium | 14 | mg/L | | 0.01 | 0.04 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Nickel | 1.2 | ug/L | I | 1 | 4 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Selenium | 0.5 | ug/L | U | 0.5 | 2 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Silver | 0.025 | ug/L | U | 0.025 | 0.1 |
| 3/13/06 8:30 | Outfall 003 | Metals-Water | Zinc | 3 | ug/L | U | 3 | 12 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Aluminum | 11 | ug/L | I | 5 | 20 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Arsenic | 0.5 | ug/L | U | 0.5 | 2 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Cadmium | 0.05 | ug/L | U | 0.05 | 0.2 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Calcium | 0.05 | mg/L | U | 0.05 | 0.2 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Chromium | 2 | ug/L | U | 2 | 8 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Copper | 0.25 | ug/L | U | 0.25 | 1 |

## Appendix 5. (continued)

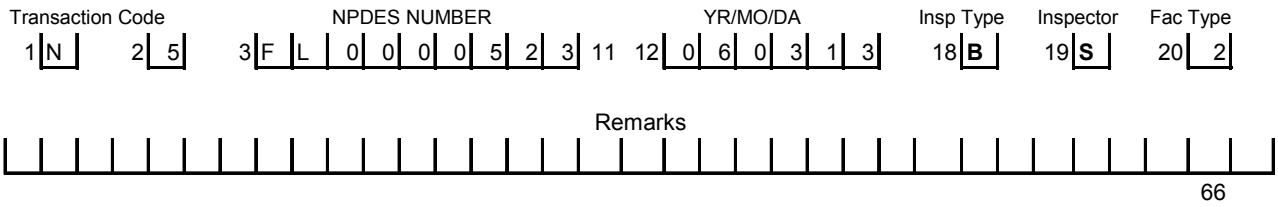
| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:00 | BLANKS | Metals-Water | Iron | 10 | ug/L | U | 10 | 40 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Lead | 0.075 | ug/L | U | 0.075 | 0.3 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Magnesium | 0.01 | mg/L | U | 0.01 | 0.04 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Nickel | 1 | ug/L | U | 1 | 4 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Selenium | 0.5 | ug/L | U | 0.5 | 2 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Silver | 0.025 | ug/L | U | 0.025 | 0.1 |
| 3/13/06 8:00 | BLANKS | Metals-Water | Zinc | 3 | ug/L | U | 3 | 12 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Ammonia-N | 0.017 | mg N/L | I | 0.01 | 0.02 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Chloride | 13 | mg Cl/L | | 0.4 | 1 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Color | 10 | PCU | AQ | 5 | 5 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Fluoride | 0.53 | mg F/L | | 0.05 | 0.1 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Kjeldahl Nitrogen | 0.16 | mg N/L | I | 0.08 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | NO2NO3-N | 0.72 | mg N/L | | 0.004 | 0.01 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | O-Phosphate-P | 2.6 | mg P/L | | 0.08 | 0.2 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Sulfate | 110 | mg SO4/L | | 0.4 | 1 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | TDS | 284 | mg/L | | 15 | 60 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Total-P | 2.8 | mg P/L | A | 0.1 | 0.3 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | TSS | 4 | mg/L | U | 4 | 16 |
| 3/13/06 8:30 | Outfall 003 | Nutrients-Liquid | Turbidity | 1.3 | NTU | AQ | 0.05 | 0.05 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | Ammonia-N | 0.01 | mg N/L | U | 0.01 | 0.02 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | Fluoride | 0.05 | mg F/L | U | 0.05 | 0.1 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | Kjeldahl Nitrogen | 0.08 | mg N/L | U | 0.08 | 0.2 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | NO2NO3-N | 0.004 | mg N/L | U | 0.004 | 0.01 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | O-Phosphate-P | 0.007 | mg P/L | I | 0.004 | 0.01 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | Sulfate | 0.2 | mg SO4/L | U | 0.2 | 0.5 |
| 3/13/06 8:00 | BLANKS | Nutrients-Liquid | Total-P | 0.02 | mg P/L | U | 0.02 | 0.06 |
| 3/13/06 8:30 | Outfall 003 | Overflow | Alpha, Total | 1.3 | pCi/L | U | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Alpha-Counting Error | 1 | pCi/L | | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Oil and Grease | 6.2 | mg/L | J | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Radium 226 | 0.4 | pCi/L | | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Radium 226-Counting Error | 0.1 | pCi/L | | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Radium 228 | 0.8 | pCi/L | U | | |
| 3/13/06 8:30 | Outfall 003 | Overflow | Radium 228-Counting Error | 0.5 | pCi/L | | | |
| 3/13/06 8:00 | BLANKS | Overflow | Alpha, Total | 0.7 | pCi/L | U | | |
| 3/13/06 8:00 | BLANKS | Overflow | Alpha-Counting Error | 0.5 | pCi/L | | | |
| 3/13/06 8:00 | BLANKS | Overflow | Oil and Grease | 6.2 | mg/L | | | |
| 3/13/06 8:00 | BLANKS | Overflow | Radium 226 | 0.2 | pCi/L | U | | |

## Appendix 5. (continued)

| Date Sampled | Field ID | Analysis | Component | Result | Units | Remark | MDL | PQL |
|---|---|---|---|---|---|---|---|---|
| 3/13/06 8:00 | BLANKS | Overflow | Radium 226-Counting Error | 0.1 | pCi/L | | | |
| 3/13/06 8:00 | BLANKS | Overflow | Radium 228 | 0.7 | pCi/L | U | | |
| 3/13/06 8:00 | BLANKS | Overflow | Radium 228-Counting Error | 0.5 | pCi/L | | | |

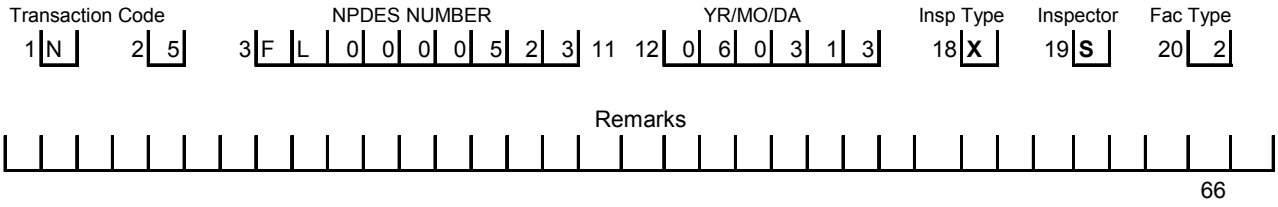
## The Bioassay of CF Industries, Inc. Bartow Phosphate Complex effluent sampled on March 13, 15, and 17, 2006. NPDES #FL0000532.

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




## The Priority Pollutants Analysis of CF Industries, Inc. Bartow Phosphate Complex effluent sampled on March 13, 2006. NPDES #FL0000532.

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




## Biological Analyses of CF Industries, Inc. Bartow Phosphate Complex effluent sampled on March 13, 2006. NPDES #FL0000532.

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

