


Bioassays of

**S&G Packaging L.L.C.**

Yulee, Nassau County, Florida

NPDES #FL0022306

Sampled 2/22/99

April 1999

**Biology Section**

**Division of Administrative & Technical Services**

Comprehensive Quality Assurance Plan #870346G

Bioassays of

# S&G Packaging L.L.C.

Yulee, Nassau County, Florida

NPDES #FL0022306

**Biology Section**
**Bureau of Laboratories**
**April 1999**

## Introduction

S&G Packaging L.L.C., Highway 17 South, Yulee, Nassau County, Florida, NPDES #FL0022306, tests performed on 23 to 25 February, 1999.

This industrial wastewater treatment facility has a design flow of 8,400 GPD and an average flow of 1,000 GPD. The treatment system influent consists of water-based ink wash-up and cornstarch bonding powder. Wastewater receives treatment in two septic tanks, three sand filters, a chlorination unit, and a dechlorination unit. Effluent flow is variable, depending upon the industrial processes. Effluent is intermittently discharged into a ditch and is usually quickly absorbed into the ground within twenty (20) feet of the discharge point. Effluent sometimes flows from the ditch through an unnamed wetland to the class III waters of Lumber Creek (facility summary prepared by Kathleen Gerard, FDEP, Jacksonville).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

## Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent that was collected from Outfall 001 of this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. Test results did not show toxicity (Table 1).

Total residual chlorine (TRC) was <0.03 mg/L in the laboratory and was <0.01 mg/L in the field. The total ammonia and unionized ammonia concentrations were 0.309 mg/L and 0.002 mg/L, respectively. Further chemical analyses were performed on the sample and several metals were identified (Table 2). The silver concentration (0.32 µg/L) and the iron concentration (2,180 µg/L) both exceeded their respective State of Florida Class III freshwater criterion for silver of ≤0.07 µg/L and for iron of ≤1,000 µg/L (FAC 62–302.530).

## Conclusion

The sample of effluent collected from this facility on February 22, 1999, did not show toxicity. The silver and iron concentrations in the sample exceeded their respective State of Florida Class III freshwater surface water criterion.

**Table 1.** Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the S & G Packaging L.L.C. WWTP, Yulee, Nassau County, Florida, NPDES# FL0022306, performed on 23 to 25 February, 1999.

| | | | | | |
|---|---|---|---|---|---|
| Facility: | S and G Packaging L.L.C. WWTP | NPDES # | FL0022306 | Facility Type: | Wastewater Treatment Plant |
| Location: | Highway 17 South, Yulee | Contact/District: | Kathleen Gerard/Northeast | | |
| County: | Nassau | Test type: | static acute screen | | |
| Sample Collection Date: | 2/22/99 Time: 1150 | # tests: | 2 | Receiving Water: | Unnamed wetland to Lumber Creek |
| Test Beginning Date: | 2/23/99 Time: 1430 | Chlorination Type: | chlorinated | | |
| Test Ending Date: | 2/25/99 Time: 1415 | | sample collected after plant dechlornation unit | | Page 1 of 1 |

| Total Residual CL2 | mg/L | Method |
|---|---|---|
| Field: | <0.01 | - |
| Lab: | <0.03 | DR-100 |

| Ammonia | Total (mg/L) | Unionized (mg/L) |
|---|---|---|
| Control Water (fish): | <0.017 | <0.017 |
| Control Water (20% DMW) (cladocerans): | <0.017 | <0.017 |
| 100% Sample: | 0.309 | 0.002 |

| Alk & Hardness | Alkalinity (mg/L) | Hardness (mg/L) |
|---|---|---|
| Control Water (fish): | 127 | 126 |
| Control Water (20% DMW) (cladocerans): | 75 | 78 |
| 100% Sample: | 152 | 345 |

| Salinity | (ppt) |
|---|---|
| Control Water (fish): | 0 |
| Control Water (20% DMW) (cladocerans): | 0 |
| 100% Sample: | 0 |

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

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[A] | | | Dissolved Oxygen | | | Conductivity µmhos/cm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | Volume(mL) | 0 hr | 24 hr | 48 hr | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 48 hour |
| Control A | 0/20 | 5 | 5 | 4 | 8.1 | - | 8.1 | 24.2 | - | 23.9 | 7.9 | - | 7.8 | 155 | 195 |
| Control B | 0/20 | 5 | 5 | 5 | - | - | 8.1 | - | - | 24.1 | - | - | 7.9 | - | 175 |
| Control C | 0/20 | 5 | 5 | 5 | - | - | 8.1 | - | - | 24.1 | - | - | 7.9 | - | 180 |
| Control D | 0/20 | 5 | 5 | 4 | - | - | 8.1 | - | - | 24.3 | - | - | 7.9 | - | 190 |
| 100% A | 20/0 | 5 | 5 | 5 | 6.9 | - | 8.4 | 24.4 | - | 24.1 | 7.2 | - | 7.6 | 1040 | 1185 |
| 100% B | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.2 | - | - | 7.7 | - | 1165 |
| 100% C | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.2 | - | - | 7.7 | - | 1165 |
| 100% D | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.2 | - | - | 7.6 | - | 1175 |

[A] Temperature of test incubator #2 and the test room were continuously recorded on strip chart recorders.
Incubator #2 temperature range for the test period was 26.5-27.5°C.
Test room temperature range for the test period was 24.0-25.0°C.

Organism: ***Cyprinella leedsi*** Age: 11 days

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[B] | | | Dissolved Oxygen | | | Conductivity µmhos/cm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | Volume(mL) | 0 hr | 24 hr | 48 hr | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 48 hour |
| Control A | 0/500 | 5 | 5 | 5 | 7.8 | 8.2 | 8.4 | 24.2 | 24.6 | 25.8 | 7.7 | 7.3 | 7.5 | 240 | 265 |
| Control B | 0/500 | 5 | 5 | 5 | 7.8 | 8.2 | 8.4 | 24.2 | 24.4 | 25.7 | 7.6 | 7.4 | 7.6 | 245 | 265 |
| Control C | 0/500 | 5 | 5 | 5 | 7.8 | 8.3 | 8.4 | 24.2 | 24.7 | 25.1 | 7.6 | 7.2 | 7.7 | 245 | 265 |
| Control D | 0/500 | 5 | 5 | 5 | 7.8 | 8.3 | 8.4 | 24.1 | 24.5 | 24.9 | 7.6 | 7.3 | 7.8 | 240 | 265 |
| 100% A | 500/0 | 5 | 5 | 5 | 6.9 | 7.8 | 8.2 | 24.1 | 24.5 | 25.4 | 7.2 | 7.0 | 7.3 | 1110 | 1245 |
| 100% B | 500/0 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 24.2 | 25.2 | 7.2 | 6.8 | 7.7 | 1155 | 1270 |
| 100% C | 500/0 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 24.7 | 25.2 | 7.2 | 6.5 | 7.6 | 1160 | 1255 |
| 100% D | 500/0 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 25.3 | 25.1 | 7.2 | 6.4 | 7.7 | 1160 | 1265 |

[B] Temperature of test incubator #3 and the test room were continuously recorded on strip chart recorders.
Incubator #3 temperature range for the test period was 25.8-26.5°C.
Test room temperature range for the test period was 24.0-25.0°C.

**Table 2. Results of chemical analyses on the sample of effluent from the S&G Packaging L. L. C. WWTP sampled on February 22, 1999.**

### Metals

| | | |
|---|---|---|
| Calcium | 85.2 | mg/L |
| Copper | 3.6 | µg/L |
| Iron | 2180 | µg/L |
| Lead | 13.0 | µg/L |
| Magnesium | 30.6 | mg/L |
| Silver | 0.32 | µg/L |
| Zinc | 21 | µg/L[I] |

### Base, Neutral, & Acid Extractable Organics

None Detected

### Pesticides

None Detected

I Value reported is less than the practical quantitation limit and greater than or equal to the minimum detection limit.

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: S & G Packaging
County: Nassau
Contact / District: K. Genard / Northeast
NPDES Permit #: FL0022306
LIMS Sample #: 37516 LIMS Job #: TLH-1999-02-23-01
sample log 3/11/99 CL

Sample Collection: Date 2/22/99 Time 11:50
Test Beginning: Date 2/23/99 Time 14:30
Test Ending: Date 2/25/99 Time 14:15
Organism Batch #: 11 Diluent Batch #: 7
Organism Age: 224hrs. SRT toxicant batch #: N/A
Test organism: Ceriodaphnia dubia

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2
Incubator #2 Temperature Range 24.5-27.5°C
Room Temperature Range 24.0-25.0°C

Remarks: 100% sample slightly cloudy. some particulate matter visible. (FW) 2/23/99

| Conc. | Chamber # | Number Live 0 hr | Number Live 24 h | Number Live 48 h | pH 0 hr | pH 24 h | pH 48 h | Temperature (°C) 0 hr | Temperature (°C) 24 h | Temperature (°C) 48 h | D.O. (mg/L) 0 hr | D.O. (mg/L) 24 h | D.O. (mg/L) 48 h | UNCORRECTED Cond (mmhos/cm) (Cond. (µmhos/cm)) 0 hr | UNCORRECTED Cond (mmhos/cm) (Cond. (µmhos/cm)) 24 h | UNCORRECTED Cond (mmhos/cm) (Cond. (µmhos/cm)) 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ctl | A | 5 | 5 | 4 ID | 8.1 | | 8.1 | 24.2 | | 23.9 | 7.9 | | 7.8 | 155 | | 195 |
| Ctl | B | 5 | 5 | 5 | | | 8.1 | | | 24.1 | | | 7.9 | | | 175 |
| Ctl | C | 5 | 5 | 5 | | | 8.1 | | | 24.1 | | | 7.9 | | | 180 |
| Ctl. | D | 5 | 5 | 4 ID | | | 8.1 | | | 24.3 | | | 7.9 | | | 190 |
| 100% | A | 5 | 5 | 5 | 6.9 | | 8.4 | 24.4 | | 24.1 | 7.2 | | 7.6 | 1040 | | 1185 |
| 100% | B | 5 | 5 | 5 | | | 8.4 | | | 24.2 | | | 7.7 | | | 1165 |
| 100% | C | 5 | 5 | 5 | | | 8.4 | | | 24.2 | | | 7.7 | | | 1165 |
| 100% | D | 5 | 5 | 5 | | | 8.4 | | | 24.2 | | | 7.6 | | | 1175 |
| measured by: | | FW | DW | FW | FW | | FW | FW | | FW | FW | | FW | FW | | FW |
| recorded by: | | DW | DW | FW | AS | | CH | AS | | FW | AS | | FW | AS | | FW |

Investigators' Signatures

Salt Water (Well Water) / Water Quality Parameters

| | 20% Min Water | Sample | Method | Measured by | Verified by |
|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | <0.01 | N/A | KG | FW |
| Lab Total Residual Cl2 (mg/L): | — | <0.03 | <0.03 | DR100 | FW |
| Alkalinity (mg/L as $CaCO_3$): | — | 75 | 152 | Hach | CH |
| Hardness (mg/L as $CaCO_3$): | — | 78 | 345 | Hach | CH |
| Total ammonia (mg/L as N): | — | <0.017 | 0.309 | Denver | MF |
| Salinity: | — | — | 3.3 ppt | YSI | AS |

FW 2/25/99

reviewer form updated 5/22/98

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: S & G Packaging
County: Nassau
Contact / District: K. Gerard / Northeast
NPDES Permit #: FL0022306
LIMS Sample #: 371516 LIMS Job #: TLH-1999-02-2301
sample log 3/11/99 CW
Test Type: (Screening) Definitive
(Static) Static Renewal / Flow-through
Test Number: 2 of 2
Incubator #3 Temperature Range 25.8-26.5°C
Room Temperature Range 24.0-25.0°C

Sample Collection: Date 2/22/99 Time 11:50
Test Beginning: Date 2/23/99 Time 14:00
Test Ending: Date 2/25/99 Time 13:50
Organism Batch #: 12 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: N/A
Test organism: Cyprinella leedsi

Remarks: 100% sample slightly cloudy. Some particulate matter visible. (FW) 2/23/99.

| Conc. | Chamber # | Number Live 0 hr | 24 h | 48 h | pH 0 hr | 24 h | 48 h | Temperature (°C) 0 hr | 24 h | 48 h | (A) D.O. (mg/L) 0 hr | 24 h | 48 h | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr | 24 h | 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ctl A | D1 | 5 | 5 | 5 | 7.8 | 8.2 | 8.4 | 24.2 | 24.6 | 25.8 | 7.7 | 7.3 | 7.5 | 240 | 250 | 265 |
| Ctl B | D2 | 5 | 5 | 5 | 7.8 | 8.2 | 8.4 | 24.2 | 24.4 | 25.7 | 7.6 | 7.4 | 7.6 | 245 | 250 | 265 |
| Ctl C | D3 | 5 | 5 | 5 | 7.8 | 8.3 | 8.4 | 24.2 | 24.7 | 25.1 | 7.6 | 7.2 | 7.7 | 245 | 260 | 265 |
| Ctl D | D4 | 5 | 5 | 5 | 7.8 | 8.3 | 8.4 | 24.1 | 24.5 | 24.9 | 7.6 | 7.3 | 7.8 | 240 | 250 | 265 |
| 100% A | D5 | 5 | 5 | 5 | 6.9 | 7.8 | 8.2 | 24.1 | 24.5 | 25.4 | ~~7.8~~ 7.2 | 7.0 | 7.3 | 1110 | 1170 | 1245 |
| 100% B | D6 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 24.2 | 25.2 | 7.2 | 6.8 | 7.7 | 1155 | 1195 | 1270 |
| 100% C | D7 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 24.7 | 25.2 | 7.2 | 6.5 | 7.6 | 1160 | 1200 | 1255 |
| 100% D | D8 | 5 | 5 | 5 | 6.9 | 7.9 | 8.2 | 24.1 | 25.3 | 25.1 | 7.2 | 6.4 | 7.7 | 1160 | 1225 | 1265 |
| measured by: | | FW | CW | FW | FW | CH | FW | FW | CH | FW | FW | CH | FW | FW | CH | FW |
| recorded by: | | CH | CW | FW | AS | CW | FW | AS | CW | FW | AS | CW | FW | AS | CW | FW |

(A) 0 hr 100% D.O. reading is 7.2. meter had not properly acclimated. (FW) 2/23/99.

Investigators' Signatures

| Water Quality Parameters | Salt Water: Well Water | 20% Min Water | Sample | Method | Measured by | Verified by |
|---|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | <0.01 | N/A | KG | FW |
| Lab Total Residual Cl2 (mg/L): | <0.03 | — | <0.03 | DR/100 | FW | FW |
| Alkalinity (mg/L as $CaCO_3$): | 127 | — | 152 | Hach | CH | FW |
| Hardness (mg/L as $CaCO_3$): | 126 | — | 345 | Hach | CH | FW |
| Total ammonia (mg/L as N): | <0.017 | — | 0.309 | Denver | MF | FW |
| Salinity: | — | — | 3.3 ppt | YSI | AS | FW |

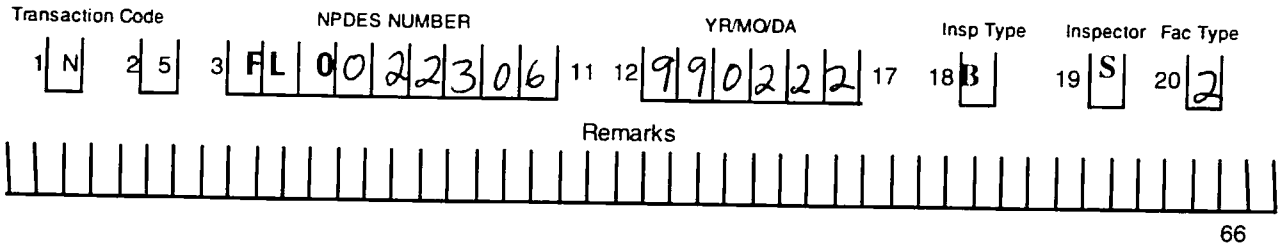
reviewer form updated 5/22/98



FW 2/25/99

**The Bioassay of the S & G Packaging L. L. C. WWTP effluent sampled on February 22, 1999, NPDES #FL0022306.**

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




**The Priority Pollutants Analysis for the Bioassay of the S & G Packaging L. L. C. WWTP effluent sampled on February 22, 1999, NPDES #FL0022306.**

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

