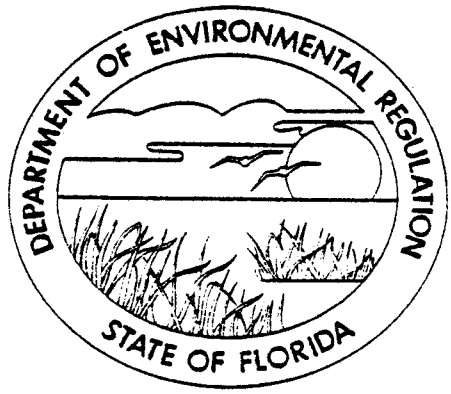


BIOASSAY OF EVANS PACKING COMPANY

DADE CITY, PASCO COUNTY, FLORIDA

NPDES #FL0001929

SAMPLED 2/8/82

Biological Section
Bureau of Water Analysis
February 18, 1982

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DADE CITY, PASCO COUNTY, FLORIDA

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Biological Section
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EXECUTIVE SUMMARY

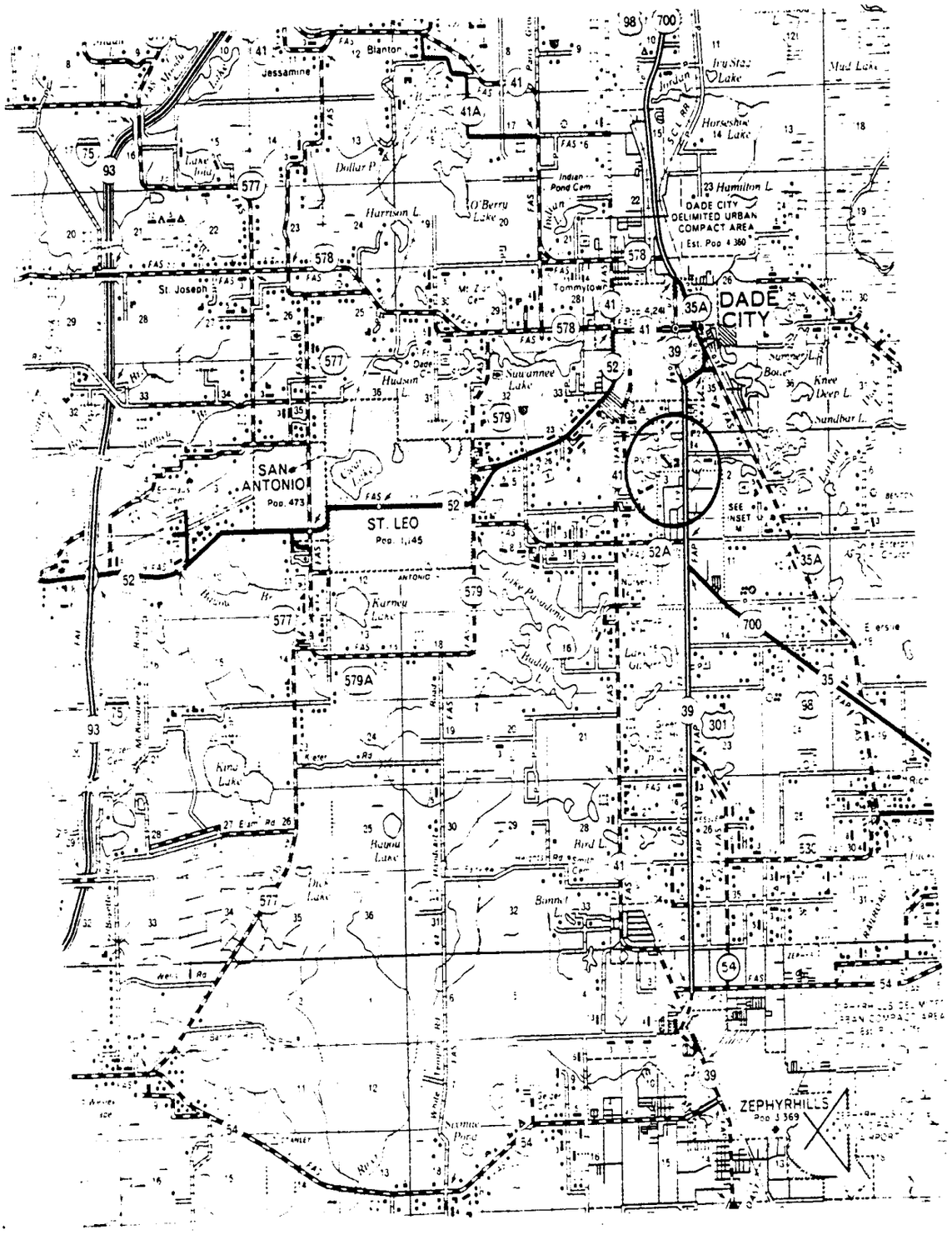
Evans Packing Company, NPDES #FL0001929, on 9 to 11 February, 1982

The grab sample of effluent from Evans Packing Company, a citrus processor located near Dade City, was not acutely toxic to the test organism, *Daphnia pulex*. No organisms died during the 48 hour test.

INTRODUCTION

The Evans Packing Company is located on U.S. Highways 301 and 98, approximately one mile south of Dade City, Pasco County, Florida (Fig. 1). This facility processes and cans citrus concentrate, made from fresh citrus fruit. Additionally, pulp byproducts are dried for cattle feed. During the winter production season, as much as 8 MGD of condenser wastewater from evaporators and refrigeration systems is discharged. Prior to this, strong wastewater is segregated and is disposed of via a sprayfield. A schematic of the water flow is presented in Fig. 2. The weak condenser wastewater is discharged to Tank Lake, an artificial impoundment owned and maintained by Evans Packing Company as part of their treatment system. The outfall from Tank Lake is to the Larkin Canal, which flows to the Withlacoochee River.

To evaluate the existence and extent of toxicity of Evans' discharge from Tank Lake to the biota of the receiving waters, the Biological Section performed a static acute toxicity bioassay on a grab sample of effluent on 9 to 11 February, 1982. The results of this test are presented in this report.



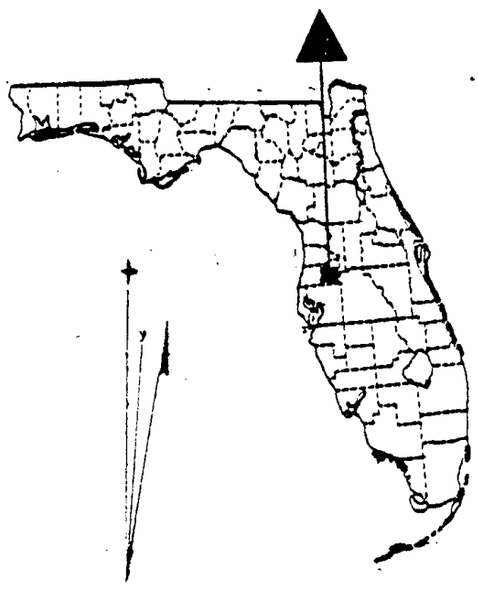


Fig. 1. Portions of Pasco County, Florida, including Dade City and study area.

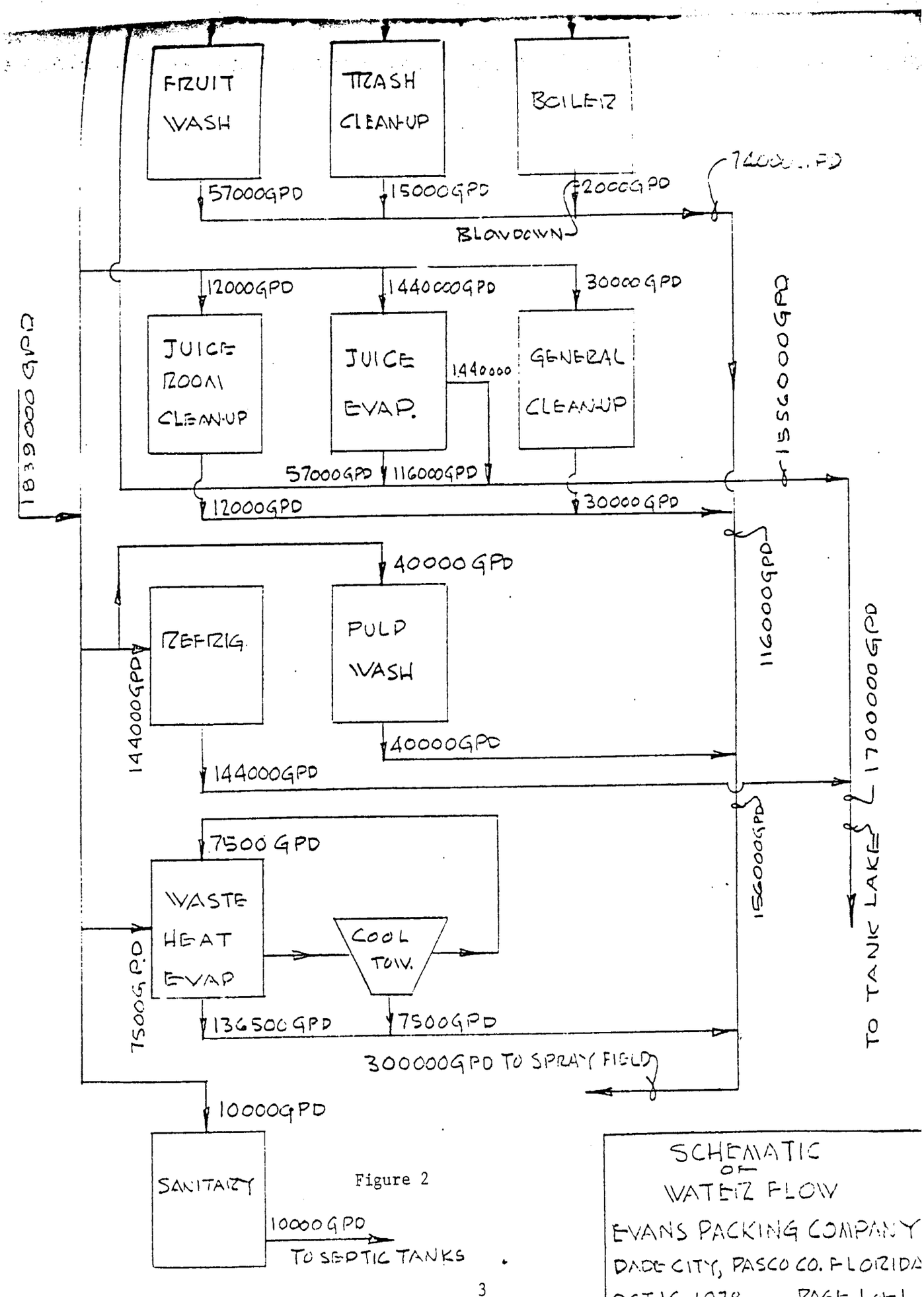


Figure 2

SCHEMATIC OF WATER FLOW
EVANS PACKING COMPANY
DADE CITY, PASCO CO. FLORIDA
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METHODS AND MATERIALS

Test methods used to conduct this static bioassay are extensively described by Peltier (1978). The organism selected for this study is among those recommended by Peltier (1978) and the U.S. EPA (1978). The life history and maintenance procedures used to culture the organism are detailed below.

History and Maintenance of Bioassay Organisms

Daphnia pulex (water flea) - A breeding culture of Daphnia pulex was obtained from the EPA laboratory in Athens, Georgia, in March, 1979. This culture has been maintained since its arrival in 2 1/2 gallon all glass aquaria filled with unchlorinated DER well water, under a 16:8 hour light-dark cycle. Organisms are fed a liquified blend of Purina Trout Chow® and Cerophyl® twice daily, and are kept at a constant temperature of 22° plus or minus 1° C. The aquaria are cleaned weekly by siphoning off half the water along with the detritus and excess organisms. They are then refilled with fresh aerated well water. Additional measures are taken and/or new cultures started in the event of abnormal circumstances such as: declining populations, ephippia formation, or excessive fungal or bacterial growth.

To ensure the uniform sensitivity of these test organisms to toxic substances, the Biological Section conducts monthly standard reference toxicant bioassays using sodium lauryl sulfate as the reference toxicant.

Test Methods

A 48 hour static acute toxic bioassay was performed on a grab sample of effluent collected from the Tank Lake outfall to the Larkin Canal. The test was performed from 1015 hours on 9 February to 1015 hours on 11 February, 1982. The sample was collected by Mr. Matt McCann of DER's Southwest District at 1200 hours on 8 February, 1982 using standard wastewater sampling procedures. The sample was iced and transported to the DER laboratory in Tallahassee for analysis within 24 hours of collection.

Freshwater for dilution of the effluent samples was obtained from the same DER deep well that is used to culture the test organisms. The concentration series selected for this study (Table 1) is that recommended by APHA (1980).

Two replicates, each with six concentrations and a control, were used to test with the water flea, Daphnia pulex. Flint glass jars of 250 ml capacity were used as test chambers, and 200 ml of the appropriate test concentration was placed in each chamber. Daphnia were siphoned into a large culture dish to isolate the proper size and age organisms (neonates). To accomplish this, the Daphnia were siphoned through a stainless steel screen. The trapped

adults were then discarded. These neonates were then transferred by glass pipette, examined for injury, and were loaded 10 per chamber, resulting in 20 per test concentration. Water fleas were not fed during this test.

Dissolved oxygen, pH, temperature, and the number of live organisms were recorded for each test chamber at 0 hours, 24 hours, and 48 hours. Total alkalinity and total hardness were recorded at the beginning of the test for the control and the 100% effluent concentration. The specific conductance of each test concentration was recorded at the beginning and end of the test. Ammonia concentrations, including total and unionized fractions (expressed in mg/l as N and as NH_3, respectively), were recorded in the control and the 100% effluent test concentration at the beginning of the test. Total ammonia concentrations were determined using an Orion® specific ion probe and a Corning® ph/millivolt meter. The unionized fraction was then determined based on the total ammonia concentration, and the pH, temperature, and salinity of the sample. These values were recorded on the bioassay data form and are presented in Table 2.

Table 1. Concentration Series and Volumes Used for This Static Bioassay

Daphnia pulex (water fleas)

Concentration	Dilution Water	Effluent	Total Volume
Control	200 ml	--	200 ml
5.6%	188.8 ml	11.2 ml	200 ml
10.0%	180 ml	20 ml	200 ml
18.0%	164 ml	36 ml	200 ml
32.0%	136 ml	64 ml	200 ml
56.0%	88 ml	112 ml	200 ml
100.0%	--	200 ml	200 ml

Table 2. Data recorded during 48 hour, Daphnia pulex, static acute toxicity bioassay of Evans Packing Company, Dade City, Pasco County, Florida, NPDES #FL0001929, on 9 to 11 February, 1982.

Conc. or %	Number of Live Organisms			Dissolved Oxygen (mg/ℓ)			pH			Total Alkalinity (mg/ℓ as $CaCO_3$)		Total Hardness (mg/ℓ as $CaCO_3$)		Temperature (°C)			NH_3/NH_3+NH_4 (mg/ℓ)		Conductivity (µmhos)	
	0	24	48	0	24	48	0	24	48	0	48	0	48	0	24	48	0	48	0	48
Control	10	10	10	8.7	8.6	8.9	7.8	8.2	8.3	121		117		21.0	20.2	20.2	0/.28	---		
Control	10	10	7[a]	8.7	8.6	8.9	7.8	8.2	8.3										205	195
5.6%	10	10	10	8.6	8.5	8.9	7.8	8.2	8.2					20.8	20.0	20.0				
5.6%	10	10	10	8.6	8.5	8.9	7.8	8.2	8.2										210	200
10.0%	10	10	10	8.6	8.5	8.9	7.8	8.2	8.2					20.5	20.0	19.9				
10.0%	10	10	10	8.5	8.5	8.8	7.7	8.2	8.2										212	205
18.0%	10	10	10	8.4	8.5	8.8	7.7	8.2	8.2					20.5	20.0	19.9				
18.0%	10	10	10	8.4	8.4	8.8	7.7	8.2	8.2										220	215
32.0%	10	10	10	8.1	8.6	8.7	7.6	8.1	8.2					20.5	20.0	19.8				
32.0%	10	10	10	8.2	8.6	8.7	7.7	8.1	8.2										230	230
56.0%	10	10	10	7.6	8.5	8.7	7.6	8.1	8.2					19.5	20.0	19.8				
56.0%	10	10	10	7.7	8.5	8.6	7.6	8.1	8.2										250	250
100.0%	10	10	10	7.0	8.2	8.3	7.5	8.0	8.1	154		168		19.0	20.0	19.8	0/.22	---		
100.0%	10	10	10	6.9	8.2	8.3	7.5	8.0	8.1										275	285

Remarks:

[a] Dead organism not found

Results and Discussion

The grab sample of effluent collected from the Evans' Tank Lake outfall to the Larkin Canal was not toxic to the test organism, Daphnia pulex. No organisms died during the 48 hour test.

LITERATURE CITED

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Peltier, W. 1978. Methods for measuring the acute toxicity of effluents to aquatic oranisms. Environmental Research Laboratory. Athens, Georgia. EPA-600/4-78-012 (Revised July 1978). 51 p.

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