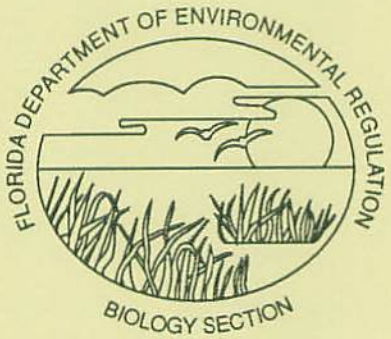


Bioassays of

Adams Packing Association, Inc.

Auburndale, Polk County, Florida

NPDES #FL0002801

Sampled 1/9/89

August 7, 1989

Biology Section
Division of Administrative and Technical Services

Bioassays of

Adams Packing Association, Inc.

Auburndale, Polk County, Florida

NPDES #FL0002801

Biology Section
Bureau of Laboratories
August 7, 1989

Introduction

Adams Packing Association, Inc., NPDES #FL0002801, Auburndale, Polk County, Florida, on 10 to 12 January, 1989.

The Adams Packing Association, Inc. facility is located at 625 Bridgers Avenue in Auburndale, Polk County, Florida. The facility is a citrus processing facility which is permitted to discharge citrus process plant wastewater to Lake Lena Run then to Lake Hancock via outfall #002. The maximum permitted discharge is 2.1 MGD with an average of 1.4 MGD.

The treatment system includes an aeration basin, a clarifier, a series of three polishing ponds and dual media filters. Discharge from outfall #002 includes boiler blowdown water, barometric condenser cooling water, plant and equipment washdown water, fruit washwater, scrubber water from molasses cooking tower blowdown, and sanitary wastewater. Fruit wastes are screened for solids removal and solids are converted into cattle feed.

The toxicity tests discussed in this report were performed in accordance with methods described by Peltier and Weber, 1985, *Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms*, 3rd Edition and by the FDER Biology Section, 1985, *Quality Assurance Manual for Performing Acute Toxicity Tests*, 2nd Edition.

Results and Discussion

The sample of discharge from outfall #002 of the Adams Packing Association, Inc. facility was toxic to the bioassay test organism, *Ceriodaphnia dubia*, producing an LC_{50} of 79%. The sample of discharge also affected the Microtox® assay organism, *Photobacterium phosphoreum*, producing an EC_{50} of 152%. The sample was not toxic to the bioassay test organisms, *Daphnia pulex* and *Notropis leedsi*.

Chemical analyses performed on the sample detected 2,4-Dimethylphenol, several unidentified components sensitive to electron capture detection, trace amounts of unidentified aromatic and aliphatic compounds, and the metal, zinc.

The cause of toxicity to the bioassay test organisms was not determined in this sample. The concentrations of 2,4-Dimethylphenol (< 10 µg/l) and zinc (41 µg/l) were not great enough to cause the observed toxicity.

Conclusions

This facility is not in compliance with State toxicity standards unless moderating provisions (e.g., a permit variance) apply.

Table 1. Concentration Series and Volumes Used for These Static Bioassays.

Ceriodaphnia dubia (water flea)

Control	15.0 ml	0.0 ml	15 ml
10.0%	13.5 ml	1.5 ml	15 ml
30.0%	10.5 ml	4.5 ml	15 ml
50.0%	7.5 ml	7.5 ml	15 ml
70.0%	4.5 ml	10.5 ml	15 ml
85.0%	2.25 ml	12.75 ml	15 ml
100.0%	0.0 ml	15.0 ml	15 ml

Daphnia pulex (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	15.0 ml	0.0ml	15 ml
100.0%	0.0 ml	15.0 ml	15 ml

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 ml	0 ml	500 ml
10.0%	450 ml	50 ml	500 ml
30.0%	350 ml	150 ml	500 ml
50.0%	250 ml	250 ml	500 ml
70.0%	150 ml	350 ml	500 ml
85.0%	75 ml	425 ml	500 ml
100.0%	0 ml	500 ml	500 ml

Table 2. Data recorded during the 48 hour static acute definitive bioassay of a sample of discharge from outfall #002 of the Adams Packing Association, Inc. Plant, NPDES #FL0002801, Auburndale, Polk County, Florida, on 10 to 12 January, 1989.

Facility:	Adams Packing Association, Inc.	NPDES #	FL0002801	Facility Type:	Food Processing
Location:	Auburndale	Contact/District:	D. Demmi / SW		
County:	Polk	Test type:	static definitive		
Sample Collection Date:	1/9/89 Time: 1030	# tests:	3	Receiving Water:	Lake Hancock
Test Beginning Date:	1/10/89 Time: 1000	Chlorination Type:	nonchlorinated		
Test Ending Date:	1/12/89 Time: 1100				Page 1 of 2

Total Residual Cl2	mg/l	Method
Field:	-	-
Lab:	-	-
Lab:	-	-

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

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	118	118
Cond. Control Water (daphnids):	130	120
100% Sample:	170	115

Salinity (ppt)	
Control Water:	0
100% Sample:	0

Organism: *Ceriodaphnia dubia* Life stage: neonate
LC50: 79.40% Binomial: 79.4% Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	4	7.9	-	8.7	8.1	-	8.3	20.8	-	21.5	-	-
Control	5	5	5	7.9	-	8.7	8.4	-	8.3	-	-	-	-	-
Control	5	5	5	8.1	-	8.8	8.2	-	8.3	-	-	-	-	-
Control	5	5	5	8.1	-	8.8	8.2	-	8.3	-	-	-	208	245
10%	5	5	5	8.1	-	8.8	8.2	-	8.4	20.8	-	21.6	-	-
10%	5	5	5	8.2	-	8.9	8.2	-	8.4	-	-	-	-	-
10%	5	5	5	8.0	-	8.9	8.2	-	8.4	-	-	-	-	-
10%	5	5	5	7.9	-	8.9	8.2	-	8.4	-	-	-	243	265
30%	5	5	5	8.1	-	8.8	8.1	-	8.5	21.1	-	21.5	-	-
30%	5	5	5	8.1	-	8.8	8.1	-	8.4	-	-	-	-	-
30%	5	5	5	8.1	-	8.8	8.1	-	8.5	-	-	-	-	-
30%	5	5	5	8.3	-	8.8	8.1	-	8.5	-	-	-	272	330
50%	5	5	5	7.7	-	8.3	8.1	-	8.5	20.5	-	21.5	-	-
50%	5	5	5	7.7	-	8.3	8.1	-	8.5	-	-	-	-	-
50%	5	5	5	7.8	-	8.3	8.1	-	8.5	-	-	-	-	-
50%	5	5	5	8.0	-	8.4	8.1	-	8.5	-	-	-	340	385
70%	5	5	5*	7.8	-	8.5	8.1	-	8.6	20.6	-	21.5	-	-
70%	5	5	5*	7.9	-	8.5	8.1	-	8.6	-	-	-	-	-
70%	5	5	5*	8.0	-	8.5	8.1	-	8.6	-	-	-	-	-
70%	5	5	5*	8.0	-	8.5	8.1	-	8.6	-	-	-	405	455
85%	5	5	1	8.0	-	8.3	8.1	-	8.6	20.5	-	21.5	-	-
85%	5	5	0	7.9	-	8.4	8.1	-	8.6	-	-	-	-	-
85%	5	5	0	7.9	-	8.4	8.1	-	8.6	-	-	-	-	-
85%	5	5	2	8.0	-	8.4	8.1	-	8.6	-	-	-	450	505
100%	5	5*	0	7.9	-	8.4	8.0	-	8.6	21.2	-	21.6	-	-
100%	5	5*	0	7.8	-	8.5	8.0	-	8.6	-	-	-	-	-
100%	5	5*	0	7.9	-	8.4	8.0	-	8.6	-	-	-	-	-
100%	5	5*	0	7.9	-	8.4	8.0	-	8.6	-	-	-	493	555

*stressed

Table 2. Continued.

Facility:	Adams Packing Association, Inc.		NPDES #	FL0002801	Facility Type: Food Processing
Location:	Auburndale		Contact/District:	D. Demmi / SW	
County:	Polk		Test type:	static definitive	
Sample Collection Date:	1/9/89	Time: 1030	# tests:	3	Receiving Water: Lake Hancock
Test Beginning Date:	1/10/89	Time: 1000	Chlorination Type:	nonchlorinated	
Test Ending Date:	1/12/89	Time: 1100			Page 2 of 2

Total Residual Cl2	mg/l	Method
Field:	-	-
Lab:	-	-
Lab:	-	-

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

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	118	118
Cond. Control		
Water (daphnids):	130	120
100% Sample:	170	115

Salinity (ppt)	
Control Water:	0
100% Sample:	0

Organism: *Daphnia pulex* Life stage: neonate
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	7.5	-	8.8	8.2	-	8.4	21.3	-	21.5	-	-
Control	5	5	5	7.5	-	8.8	8.2	-	8.4	-	-	-	-	-
Control	5	5	5	7.8	-	8.8	8.2	-	8.4	-	-	-	-	-
Control	5	5	5	7.9	-	8.8	8.2	-	8.4	-	-	-	200	245
100.0%	5	5	5	7.6	-	8.4	8.0	-	8.6	21.2	-	21.5	-	-
100.0%	5	5	5	7.6	-	8.4	8.0	-	8.6	-	-	-	-	-
100.0%	5	5	5	7.9	-	8.4	8.0	-	8.6	-	-	-	-	-
100.0%	5	5	5	8.0	-	8.4	8.0	-	8.6	-	-	-	493	555

Organism: *Notropis leedsi* Age: 25 days
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	8.2	8.6	8.6	7.9	8.0	8.2	22.0	20.8	20.9	-	-
Control	5	5	5	8.2	8.4	8.2	7.9	8.0	8.1	-	-	-	217	230
10%	5	5	5	8.0	7.9	7.8	7.9	8.0	8.1	20.5	20.6	20.7	-	-
10%	5	4	4	8.1	7.8	7.8	7.9	7.9	8.1	-	-	-	257	260
30%	5	5	5	8.1	7.3	5.9	7.9	7.9	8.0	20.5	20.6	20.6	-	-
30%	5	5	5	8.2	7.5	6.2	7.9	8.0	8.0	-	-	-	319	320
50%	5	5	5	8.1	7.1	4.9	7.9	8.0	8.0	20.5	20.5	20.5	-	-
50%	5	5	5	8.0	6.8	5.0	7.9	8.0	8.0	-	-	-	385	385
70%	5	5	5	7.8	6.3	4.7	7.9	8.0	8.1	20.3	20.5	20.5	-	-
70%	5	5	5	7.8	6.1	4.2	7.9	8.0	8.0	-	-	-	443	440
85%	5	5	5	7.6	6.6	4.9	7.8	8.0	8.1	21.1	20.5	20.6	-	-
85%	5	5	5	7.7	6.6	4.7	7.8	8.0	8.1	-	-	-	488	490
100%	5	5	5	7.9	6.2	4.6	7.8	8.0	8.1	20.9	20.8	20.9	-	-
100%	5	5	5	7.9	6.0	4.1	7.8	8.0	8.1	-	-	-	533	540

Table 3. Microtox test results, Adams Packing Association, Inc., Polk County, NPDES #FL0002801, on 10 January, 1989.

Microtox Test — Culture Lot # M-606

% Sample	Final Reclaimed Water nonchlorinated 5-min	15-min
0	36	24
0	33	22
0	34	25
12.38	40	29
12.38	34	23
12.38	36	26
24.75	35	23
24.75	33	22
24.75	33	23
49.5	32	21
49.5	33	21
49.5	33	20
99	23	14
99	29	19
99	26	15

EC_{50} Nonchlorinated (15 minute, 15 °C) = 152.02% sample

EC_{50} (15 minute, 15 °C) is calculated using the Data Reduction Computer Program developed by Microbics Corporation for the Sharp Model EL-5100 (Microbics) Systems Operating Manual. 1982.

Table 4. LC_{50} Data for Bioassay of Adams Packing Association, Inc.

Organism	Method of Data Analysis	48 Hour LC_{50} (95% Confidence Intervals)
Nonchlorinated discharge		
Ceriodaphnia dubia	Binomial	79.40% (70.00%, 85.00%)
	Moving Average	a
	Probit	a
Daphnia pulex		not toxic
Notropis leedsi		not toxic

[a] Due to an insufficient number of dead organisms, or to the irregular distribution of mortality, an LC_{50} value cannot be calculated using this method of statistical analysis.

Table 5. Results of chemical analyses on the sample of discharge from Adams Packing Association, Inc., Polk County, Florida.

Organics	
Acid Extractables	2,4-Dimethylphenol 10 µg/l [k] Trace amounts of unidentified aromatic and aliphatic compounds
Base Neutral Extractables	None detected
Pesticide Extractables	Several unidentified components sensitive to ECD
Metals	
Zinc	41.0 µg/l

k actual value is known to be less than given value

DER Biology Section — Acute-bioassay Bench Sheet

Sample Source: Adams Packing
Address/City: Auburndale
County: Polk
Contact/District: D. Dennis SW
NPDES Permit #: FL0002801 Outfall #: 002

Sample Collection: Date 1-9-89 Time 1030
Test Beginning: Date 1-10-89 Time 1000
Test Ending: Date 1-12-89 Time 1100
Test Organism: Ceriodaphnia dubia
Life Stage/Age: neonate

Test Number: 1 of 3 Test Type: Screening (Definitive)
(Static) Static Renewal | Flow-through

Remarks: * all organisms alive but stressed; erratic movement.
*a stressed but alive

Instrument Calibrations:

	pH	DO	Cond 1330	Temp
0 hr	7 at 7; 9 at 9	8.8 at 22.3	1324 at 22.2	21.7 at 21.6
24 hr	7 @ 7.9; 9	8.7 @ 23.0°C		
48 hr	7 @ 7.9; 9	8.8 @ 22°C	1335; 225 @ 1340	21.9 @ 21.8

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	1	5	5	4	9.9		8.7	8.1		8.3	20.8	20.3	21.5			
"	2	5	5	5	7.9		8.7	8.1		8.3						
"	3	5	5	5	8.1		8.8	8.2		8.3						
"	4	5	5	5	8.1		8.8	8.2		8.3				208		245
10%	5	5	5	5	8.1		8.8	8.2		8.4	20.8		20.6			
"	6	5	5	5	8.2		8.9	8.2		8.4						
"	7	5	5	5	8.0		8.9	8.2		8.4						
"	8	5	5	5	7.9		8.9	8.2		8.4				243		265
30%	9	5	5	5	8.1		8.8	8.1		8.5	21.1		21.5			
"	10	5	5	5	8.1		8.8	8.1		8.4						
"	11	5	5	5	8.1		8.8	8.1		8.5						
"	12	5	5	5	8.3		8.8	8.1		8.5				272		330
50%	13	5	5	5	7.7		8.3	8.1		8.5	20.5		21.5			
"	14	5	5	5	7.7		8.3	8.1		8.5						
"	15	5	5	5	7.8		8.3	8.1		8.5						
"	16	5	5	5	8.0		8.4	8.1		8.5				340		385
70%	17	5	5	5*a	7.8		8.5	8.1		8.6	20.6		21.5			
"	18	5	5	5*	7.9		8.5	8.1		8.6						
"	19	5	5	5*	8.0		8.5	8.1		8.6						
"	20	5	5	5*	8.0		8.5	8.1		8.6				405		455
85%	21	5	5	0	8.0		8.3	8.1		8.6	20.5		21.5			
"	22	5	5	0	7.9		8.4	8.1		8.6						
"	23	5	5	0	7.9		8.4	8.1		8.6						
"	24	5	5	2	8.0		8.4	8.1		8.6				450		505
100%	25	5	5*	0	7.6		8.4	8.0		8.6	21.2		21.6			
"	26	5	5*	0	7.8		8.5	8.0		8.6						
"	27	5	5*	0	7.9		8.4	8.0		8.4						
"	28	5	5*	0	7.9		8.4	8.0		8.6				493		555
Measured by:		SHW	MF	MF	RBF		SHW	RBF		SHW	RBF		SHW	RBF		SHW
Recorded by:		SHW	MF	MF	KML		MF	KML		MF	KML		MF	KML		MF

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			[illegible]		D. Dennis
Lab Tot. Resid. Cl2:					
Alkalinity:	118	130	170	Hach	SHW
Hardness:	113	120	115	Hach	SHW
Total Ammonia:	0.0	0.0	0.0	Orion Conc. Kit	MF

slope -54.8 MF

DER Biology Section — Acute-bioassay Bench Sheet

Sample Source: Adams Packing
Address/City: Auburndale
County: Polk
Contact/District:
NPDES Permit #: Outfall #: 002

Sample Collection: Date 1-9-89 Time 1030
Test Beginning: Date 1-10-89 Time 1000
Test Ending: Date 1-12-89 Time 1100
Test Organism: Daphnia pulex
Life Stage/Age: neonate

Test Number: 2 of 3 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr				
24 hr				
48 hr				

		Number Live			DO (mg/l)			pH			Temp. (°C)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	29	5	5AF	5	7.5		8.8	8.2		8.4	21.3		21.5			
"	30	5	5AF	5	7.5		8.8	8.2		8.4						
"	31	5	A5	5	7.8		8.8	8.2		8.4						
"	32	5	5	5	7.9		8.8	8.2		8.4				200		245
100%	33	5	5	5	7.6		8.4	8.0		8.6	21.2		21.5			
"	34	5	5	5	7.6		8.4	8.0		8.6						
"	35	5	5	5	7.9		8.4	8.0		8.6						
"	36	5	5	5	8.0		8.4	8.0		8.6				493		555
Measured by:		SHW	MF	MF	RBF		SHW	RBF		SHW	RBF		SHW	RBF		SHW
Recorded by:		SHW	MF	MF	KML		MF	KML		MF	KML		MF	KML		MF

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

DER Biology Section — Acute-bioassay Bench Sheet

Sample Source: Adams Packing
Address/City: Auburndale
County: Polk
Contact/District:
NPDES Permit #: Outfall #:

Sample Collection: Date 1-9-89 Time 1030
Test Beginning: Date 1-10-89 Time 1000
Test Ending: Date 1-12-89 Time 1100
Test Organism: Ceriodaphnia dubia
Life Stage/Age: <24 hrs

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

Remarks:

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7at7;9at9			
24 hr				
48 hr				

		Number Live			DO (mg/l)			pH			Temp. (°C)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	68	5	5	5	8.2	8.4	8.6	7.9	8.0	8.2	22.0	20.8	20.9			
"	52	5	5	5	8.2	8.4	8.2	7.9	8.0	8.1				217		230
10%	16	5	5	5	8.0	7.9	7.8	7.9	8.0	8.1	20.5	20.6	20.7			
"	4	5	4	5	8.1	7.8	7.8	7.9	7.9	8.1				257		260
30%	18	5	5	5	8.1	7.3	5.9	7.9	7.9	8.0	20.5	20.6	20.6			
"	21	5	5	5	8.2	7.5	6.2	7.9	8.0	8.0				319		320
50%	37	5	5	5	8.1	7.1	4.9	7.9	8.0	8.0	20.5	20.5	20.5			
"	22	5	5	5	8.0	6.8	5.0	7.9	8.0	8.0				385		385
70%	19	5	5	5	7.8	6.3	4.7	7.9	8.0	8.1	20.3	20.5	20.5			
"	25	5	5	5	7.8	6.1	4.2	7.9	8.0	8.0				443		440
85%	27	5	5	5	7.6	6.6	4.9	7.8	8.0	8.1	21.1	20.5	20.6			
"	40	5	5	5	7.7	6.6	4.7	7.8	8.0	8.1				488		490
100%	113	5	5	5	7.9	6.2	4.6	7.8	8.0	8.1	20.9	20.8	20.9			
"	234	5	5	5	7.9	6.2	4.1	7.8	8.0	8.1				533		540
				control	~~DO~~	24hr DO										
				control	68	8.6										
					52	8.4										
				10%	16	7.9										
					4	7.8										
				30%	18	7.3										
					21	7.5										
				50%	37	7.1										
					22	6.8										
				70%	19	6.3										
					25	6.1										
				85%	27	6.6										
					40	6.6										
				100%	113	6.2										
					234	6.0										
Measured by:		MF	MF	MF	RBF	SHW	SHW	RBF	SHW	SHW	RBF	SHW	SHW	RBF		SHW
Recorded by:		MF	MF	MF	KML	SHW	MF	KML	MF	MF	KML	MF	MF	KML		MF

D.O 7.3 100% test @ 1500 1-10-89

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

MICROTOX™ [illegible]

SOURCE: Adams Packing Company.

GRAPH CALC EC 50 (15 MIN: 15 °C) = 152.02 %SAMPLE ~~N/A~~

SAMPLE DATA:

SAMPLE TYPE (EFFLUENT, LEACHATE, ETC.): Effluent

DATE ASSAYED: 1-10-89 TIME:

VISUAL COLOR: lt amber. CORRECTION REQUIRED: YES (NO)

VISUAL TURBIDITY: SEPARATION REQUIRED: YES (NO)

INITIAL pH: pH ADJUSTED TO: WITH:

OSMOTICALLY ADJUSTED WITH: MOAS (DRY NaCl) OTHER

PRIMARY DILUTION OF SAMPLE:

OPERATOR: M. Faircloth REAGENT VIAL LOT NO. M-606

REMARKS:

MICROTOX™ 99% TEST

SAMPLE CUVETTE	% SAMPLE	READINGS 5 MIN	READINGS 15 MIN	I5	I 15	NOTES
A1	0	36	24	X	X	
B1		33	22	-.0		
C1		34	25			
A2	12.38	40	29	-.064	-.090	
B2		34	23			
C2		36	26			
A3	24.75	35	23	0.020	0.044	
B3		33	22			
C3		33	23			
A4	49.5	32	21	0.051	0.145	
B4		33	21			
C4		33	20			
A5	99	28	14	0.321	0.479	
B5		29	19			
C5		26	15			
EC_{50} (MIN, °C)				179.828	152.018	

REVIEWED BY:

DATE: 5/3/89