

Bioassays of

Vero Beach Municipal Power Plant

Indian River County

NPDES #FL0002984

Sampled November 12, 2003

April 2004

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Quality Manual No. 870346G
NELAC Certification No. E31780

Vero Beach Municipal Power Plant, 100 17th Street, Vero Beach, Indian River County, Florida, NPDES #FL0002984. Effluent samples for this facility were collected on November 12, 2003.

Introduction

This municipal power plant consists of five (5) power-generating units. Units #1, #2, and #3 having nameplate ratings, respectively, of 12.5, 16.5, and 24 megawatts (MW), use a total of 217 million gallons per day (MGD) of water from the Indian River as once-through non-contact cooling water which is discharged (without treatment) back to the Indian River, a Class III Marine surface water, via outfalls D-011, D-012, and D-013 (formerly outfalls 001, 002, and 003). Cooling water for the Unit #4 (No Nameplate Rating) cooling tower is treated wastewater obtained from the City of Vero Beach Wastewater Treatment Plant (WWTP). Cooling tower blowdown from Unit #4 is discharged back to the WWTP. Boiler blowdown, from Units #1, #2, #3, and #4, is also discharged to the WWTP. Unit #5 is a combined cycle combustion turbine, with a nameplate rating of 38 MW, equipped with a closed auxiliary cooling water system. Wastewater from Unit #5 is collected in a storage tank, treated, and discharged to the WWTP. There is no discharge from Unit #5 to waters of the State unless otherwise authorized within the permit. The facility has a fuel-oil containment area (D-OB) from which stormwater can be discharged to the Indian River. There are also roof and yard drains (D-OS1 through D-OS6) from which stormwater can be discharged to the Indian River (facility information provided by Dr. Phil Kane, Allen Hubbard and Michael Eckoff, FDEP, Orlando).

Methods

Samples were collected from the NPDES sampling point (fuel oil containment area) by Dr. Phil Kane and Steve Kent (FDEP Central District-Orlando) 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

The toxicity and algal growth potential tests discussed in this report were performed following internal DEP SOP's TA07_01,TA07_02, and TA08_01 through TA08_06. All internal DEP SOP's are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp

Toxicity Test Results

Tests were performed November 13-17, 2003.

Ceriodaphnia dubia 96-hr acute definitive bioassay – Not Toxic; LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

Pimephales promelas 96-hr acute definitive bioassay – Not Toxic; LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

See Table 1 for bioassay bench sheets.

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 0.110 mg dry wt/L of *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 effluent sample value was less than this "problem" threshold. The "problem" threshold for marine receiving waters is 10 mg dry wt/L (personal communication- Raschke, USEPA, 1987). Although an AGP test with a saltwater species was not performed, the presumption is that the result would have also been less than the "problem" threshold of 10 mg dry weight/L in marine waters. The sample value was less than the predicted

AGP values based on the inorganic nitrogen and ortho-phosphate content of the sample (Table 2). The difference between actual and predicted AGP values that are greater than the "problem" threshold can sometimes be used as evidence of inhibition; however, for values below the problem threshold, this tool should be used with caution, as the difference may be attributable to variability in the method rather than actual algal growth inhibition.

See Table 2 for AGP results.

Chemistry Results

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. Total ammonia was also not detected in the sample preserved specifically for ammonia analysis. Aluminum, copper, and zinc were detected in the effluent at levels above the method detection limits, but below the practical quantitation limit.

See Table 3 for results of analytes detected in the effluent.

See Appendix 1 for a complete list of chemical analyses performed.

Conclusion

The effluent samples collected from this facility on November 12, 2003, did not show acute toxicity to either test species during the 96-hour bioassay tests. The effluent AGP result was less than the "problem" threshold for fresh receiving waters.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

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.

Miller et al. 1990. *The Acute and Chronic Toxicity of Ammonia to Marine Fish and Invertebrates*, Archives of Environmental Contamination and Toxicology 19:40-48.

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.

Weber, C. I. 1993. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

USEPA. 2002. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. 4th Edition. EPA-821-R-02-013

Table 1. continued Data recorded during the 96-hour acute definitive bioassays of a sample of effluent from the Vero Beach Municipal Power Plant, 100 17th Street, Vero Beach, Indian River County, Florida, NPDES# FL0002984, performed from 13 to 17 November 2003.

Facility:	**Vero Beach Municipal Power Plant**		**NPDES #:**	**FL0002984**	Facility Type: Municipal Power Plant		**Analysts:**	Joshua Ayres
Location:	100 17th Street, Vero Beach		Contact/District:	Phil Kane/Central				James Daniels
County:	Indian River		Test type:	acute definitive 96 hours renewal				Marshall Faircloth
Sample Collection Date:	11/12/2003	Time: 0930	# tests:	2	Receiving Water:	Indian River		Christa Pierini
Test Beginning Date:	11/13/2003	Time: 1430	Chlorination Type:	nonchlorinated		Class III Marine		
Test Ending Date:	11/17/2003	Time: 1330	FDEP SOP#:	TA07_01		**Page 1 of 4**	**Reviewer:**	Julie Espy

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae

0-48 hours Chamber size: 30mL Food Batch #: 3/20

	Sample/Diluent	SURVIVAL # Alive			pH			[B]Temperature			[C]DO (mg/L)			Conductivity Uncorrected 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	5	8.2	-	8.2	24.0	-	24.0	8.1	-	8.2	170	185
Control B	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	7.9	-	180
Control C	0/20	5	5	5	-	-	8.2	-	-	24.1	-	-	7.9	-	182
Control D	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	8.0	-	190
6.25 % A	1.25/18.75	5	5	5	8.2	-	8.3	24.4	-	24.2	8.0	-	8.4	170	195
6.25 % B	1.25/18.75	5	5	5	-	-	8.3	-	-	24.0	-	-	8.5	-	190
6.25 % C	1.25/18.75	5	5	5	-	-	8.3	-	-	24.1	-	-	8.4	-	195
6.25 % D	1.25/18.75	5	5	5	-	-	8.3	-	-	24.0	-	-	8.3	-	207
12.5% A	2.5/17.5	5	5	5	8.2	-	8.3	24.5	-	24.4	7.7	-	8.2	170	190
12.5% B	2.5/17.5	5	5	5	-	-	8.3	-	-	24.3	-	-	8.5	-	190
12.5% C	2.5/17.5	5	3	3	-	-	8.3	-	-	24.0	-	-	8.4	-	198
12.5% D	2.5/17.5	5	5	5	-	-	8.3	-	-	24.2	-	-	8.3	-	206
25% A	5/15	5	5	5	8.3	-	8.4	24.4	-	24.0	7.8	-	8.2	170	195
25% B	5/15	5	5	5	-	-	8.4	-	-	24.0	-	-	8.1	-	192
25% C	5/15	5	5	5	-	-	8.4	-	-	23.9	-	-	8.1	-	194
25% D	5/15	5	5	5	-	-	8.4	-	-	24.1	-	-	8.1	-	208
50% A	10/10	5	5	5	8.3	-	8.3	24.3	-	24.0	7.8	-	8.1	170	180
50% B	10/10	5	5	5	-	-	8.3	-	-	24.0	-	-	8.1	-	187
50% C	10/10	5	5	5	-	-	8.3	-	-	24.2	-	-	8.1	-	182
50% D	10/10	5	5	5	-	-	8.3	-	-	24.1	-	-	8.3	-	205
100% A	20/0	5	5	5	8.4	-	8.3	24.5	-	24.3	7.9	-	8.3	165	180
100% B	20/0	5	5	5	-	-	8.3	-	-	24.2	-	-	8.3	-	171
100% C	20/0	5	5	5	-	-	8.3	-	-	24.0	-	-	8.1	-	183
100% D	20/0	5	5	5	-	-	8.3	-	-	24.1	-	-	8.1	-	179

LIMS

Job number: TLH-2003-11-13-42

sample number: 716209

Data Transcription Verification

date: 1/30/04

by: James Daniels/Josh Ayres

Total Residual CL2	mg/L	Method
Field (100% sample):	-	-
Lab (100% sample):	<0.03	Hach
Control water:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water:	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water:	81	88
100% Sample:	61	61

[D]Salinity	ppt
100% sample:	<1
Control:	<1

[D]Salinity based on conductivity and temperature.

[A]Organisms fed prior to testing and before renewal.

[B]Temperatures of room and test incubator were continuously recorded on a strip chart.

[C]DO = Dissolved Oxygen

Room Temperature range for the test period was 23.0 - 24.5°C.
Incubator #3 temperature range for the test period was 23.0 - 24.5 °C.

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Table 1. continued Data recorded during the 96-hour acute definitive bioassays of a sample of effluent from the Vero Beach Municipal Power Plant, 100 17th Street, Vero Beach, Indian River County, Florida, NPDES# FL0002984, performed from 13 to 17 November 2003.

Facility:	**Vero Beach Municipal Power Plant**		**NPDES #:**	**FL0002984**	Facility Type:	Municipal Power Plant	**Analysts:**	Joshua Ayres
Location:	100 17th Street, Vero Beach		Contact/District:	Phil Kane/Central				James Daniels
County:	Indian River		Test type:	acute definitive 96 hours renewal				Marshall Faircloth
Sample Collection Date:	11/12/2003	Time: 0930	# tests:	2	Receiving Water:	Indian River		Christa Pierini
Test Beginning Date:	11/13/2003	Time: 1430	Chlorination Type:	nonchlorinated		Class III Marine		
Test Ending Date:	11/17/2003	Time: 1330	FDEP SOP#:	TA07_01		**Page 2 of 4**	**Reviewer:**	Julie Espy

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours [A]Feeding: YCT/Algae

48 - 96 hours Chamber size: 30mL Food Batch #: 2 / 19

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			[C]DO (mg/L)			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	96 hr
Control A	0/20	5	5	5	8.3	-	8.0	24.0	-	24.1	7.8	-	7.8	165	185
Control B	0/20	5	5	5	-	-	8.1	-	-	24.1	-	-	7.7	-	190
Control C	0/20	5	5	5	-	-	8.1	-	-	24.0	-	-	7.7	-	190
Control D	0/20	5	5	5	-	-	8.1	-	-	24.0	-	-	7.6	-	205
6.25 % A	1.25/18.75	5	5	5	8.4	-	8.2	24.1	-	24.0	7.8	-	7.7	165	210
6.25 % B	1.25/18.75	5	5	5	-	-	8.2	-	-	24.0	-	-	7.6	-	200
6.25 % C	1.25/18.75	5	5	5	-	-	8.2	-	-	24.0	-	-	7.6	-	200
6.25 % D	1.25/18.75	5	5	5	-	-	8.2	-	-	24.0	-	-	7.6	-	205
12.5% A	2.5/17.5	5	5	5	8.4	-	8.2	24.0	-	24.1	7.9	-	7.8	160	210
12.5% B	2.5/17.5	5	5	5	-	-	8.2	-	-	24.1	-	-	7.7	-	200
12.5% C	2.5/17.5	3	3	3	-	-	8.2	-	-	24.0	-	-	7.6	-	200
12.5% D	2.5/17.5	5	5	5	-	-	8.2	-	-	24.0	-	-	7.7	-	205
25% A	5/15	5	5	5	8.4	-	8.3	24.2	-	24.0	8.0	-	7.7	165	200
25% B	5/15	5	5	5	-	-	8.3	-	-	24.0	-	-	7.7	-	195
25% C	5/15	5	5	5	-	-	8.3	-	-	24.0	-	-	7.7	-	195
25% D	5/15	5	5	5	-	-	8.3	-	-	24.0	-	-	7.7	-	205
50% A	10/10	5	5	5	8.4	-	8.3	24.2	-	24.0	8.1	-	7.8	160	200
50% B	10/10	5	5	5	-	-	8.3	-	-	24.1	-	-	7.7	-	190
50% C	10/10	5	5	5	-	-	8.3	-	-	24.0	-	-	7.7	-	195
50% D	10/10	5	5	5	-	-	8.3	-	-	24.0	-	-	7.8	-	210
100% A	20/0	5	5	5	8.4	-	8.2	24.2	-	24.1	8.3	-	7.7	165	190
100% B	20/0	5	5	5	-	-	8.2	-	-	24.1	-	-	7.7	-	195
100% C	20/0	5	5	5	-	-	8.2	-	-	24.0	-	-	7.7	-	200
100% D	20/0	5	5	5	-	-	8.2	-	-	24.0	-	-	7.7	-	220

[A]Organisms fed prior to testing and before renewal.

[B]Temperatures of room and test incubator were continuously recorded on a strip chart.

[C]DO = Dissolved Oxygen

Room Temperature range for the test period was 23.0 - 24.5°C.

Incubator #3 temperature range for the test period was 23.0 - 24.5 °C.

Light Intensity during the test was 50-100 foot candles.

Photoperiod during the test was 16 hours of light : 8 hours of dark.

LIMS

Job number: TLH-2003-11-13-42

sample number: 716209

Data Transcription Verification

date: 1/30/04

by: James Daniels/Josh Ayres

Total Residual CL2	mg/L	Method
Field (100% sample):	-	-
Lab (100% sample):	<0.03	Hach
Control water:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water	81	88
100% Sample:	61	61

Mortality	Percent
Control water (water flea):	0%
100% (water flea):	0%

[D] Salinity	ppt
100% sample:	<1
Control:	<1

[D] Salinity based on conductivity and temperature.

Table 1. continued Data recorded during the 96-hour acute definitive bioassays of a sample of effluent from the Vero Beach Municipal Power Plant, 100 17th Street, Vero Beach, Indian River County, Florida, NPDES# FL0002984, performed from 13 to 17 November 2003.

Facility:	**Vero Beach Municipal Power Plant**		**NPDES #:**	**FL0002984**	Facility Type: Municipal Power Plant	**Analysts:**	Joshua Ayres
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County:	Indian River		Test type:	acute definitive 96 hours renewal			Marshall Faircloth
Sample Collection Date:	11/12/2003	Time: 0930	# tests:	2	Receiving Water: Indian River		Christa Pierini
Test Beginning Date:	11/13/2003	Time: 1430	Chlorination Type:	nonchlorinated	Class III Marine		
Test Ending Date:	11/17/2003	Time: 1330	FDEP SOP#:	TA07_02	**Page 3 of 4**	**Reviewer:**	Julie Espy

Organism: ***Pimephales promelas*** Life stage: 3 days [A]Feeding: *Artemia*
0 - 48 hours Chamber size: 1000 ml Food Batch #: 0194025G

	Sample/Diluent	SURVIVAL # Alive			pH			[B]Temperature			[C]DO (mg/L)			Conductivity Uncorrected 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	10	10	10	8.0	-	8.1	24.0	-	24.4	8.3	-	7.9	274	295
Control B	0/20	10	10	10	-	7.9	-	-	25.4	-	-	7.0	-	-	-
6.25 % A	1.25/18.75	10	10	10	8.1	-	8.1	24.1	-	24.1	7.9	-	7.8	284	290
6.25 % B	1.25/18.75	10	10	10	-	8.0	-	-	24.8	-	-	7.3	-	-	-
12.5% A	2.5/17.5	10	10	10	8.1	-	8.1	24.1	-	24.2	8.0	-	7.8	275	282
12.5% B	2.5/17.5	10	10	10	-	8.0	-	-	24.5	-	-	7.4	-	-	-
25% A	5/15	10	10	10	8.1	-	8.1	24.2	-	24.0	8.1	-	7.8	256	268
25% B	5/15	10	10	10	-	8.0	-	-	24.1	-	-	7.4	-	-	-
50% A	10/10	10	10	10	8.1	-	8.1	24.5	-	24.0	8.0	-	7.8	237	233
50% B	10/10	10	10	10	-	8.0	-	-	24.2	-	-	7.6	-	-	-
100% A	20/0	10	10	10	8.1	-	8.1	24.8	-	24.2	7.9	-	7.7	163	175
100% B	20/0	10	10	10	-	8.0	-	-	24.0	-	-	7.5	-	-	-

LIMS

Job number: TLH-2003-11-13-42
sample number: 716209

Data Transcription Verification

date: 1/30/04
by: James Daniels/Josh Ayres

Total Residual CL2	mg/L	Method
Field (100% sample):	-	-
Lab (100% sample):	<0.03	Hach
Control water:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water:	<0.017	<0.017
100% Sample:	<0.017	<0.017

[A]Organisms fed prior to testing and before renewal.

[B]Temperatures of room and test incubator were continuously recorded

[C]DO = Dissolved Oxygen

Room Temperature range for the test period was 23.0 - 24.5 °C.
Incubator #3 temperature range for the test period was 23.0 - 24.5°C.

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water:	80	90
100% Sample:	61	61

[D] Salinity	ppt
100% sample:	<1
Control:	<1

[D] Salinity based on conductivity and temperature.

Table 1. concluded. Data recorded during the 96-hour acute definitive bioassays of a sample of effluent from the Vero Beach Municipal Power Plant, 100 17th Street, Vero Beach, Indian River County, Florida, NPDES# FL0002984, performed from 13 to 17 November 2003.

Facility:	**Vero Beach Municipal Power Plant**		**NPDES #:**	**FL0002984**	Facility Type: Municipal Power Plant	**Analysts:**	Joshua Ayres
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County:	Indian River		Test type:	acute definitive 96 hours renewal			Marshall Faircloth
Sample Collection Date:	11/12/2003	Time: 0930	# tests:	2	Receiving Water: Indian River		Christa Pierini
Test Beginning Date:	11/13/2003	Time: 1430	Chlorination Type:	nonchlorinated	Class III Marine		
Test Ending Date:	11/17/2003	Time: 1330	FDEP SOP#:	TA07_02	**Page 4 of 4**	**Reviewer:**	Julie Espy

Organism: ***Pimephales promelas*** Life stage: 12 days [A]Feeding: *Artemia*
48 - 96 hours Chamber size: 1000 ml Food Batch #: 0194025G

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			DO (mg/L)			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	96 hr
Control A	0/20	10	10	10	-	8.1	8.1	-	24.2	25.3	-	8.0	7.8	-	325
Control B	0/20	10	10	10	8.1	-	8.1	24.5	-	25.9	8.0	-	7.7	290	335
6.25 % A	1.25/18.75	10	10	10	-	8.1	8.0	-	24.4	25.2	-	7.4	7.3	-	310
6.25 % B	1.25/18.75	10	10	10	8.1	-	8.0	24.5	-	24.7	7.7	-	7.1	294	310
12.5% A	2.5/17.5	10	10	10	-	8.1	8.0	-	24.7	24.5	-	7.2	7.2	-	295
12.5% B	2.5/17.5	10	10	10	8.2	-	8.0	24.3	-	24.9	7.7	-	7.1	213	305
25% A	5/15	10	10	10	-	8.1	7.9	-	24.8	24.1	-	7.6	7.1	-	280
25% B	5/15	10	10	10	8.2	-	7.9	24.2	-	25.9	7.8	-	7.1	270	300
50% A	10/10	10	10	10	-	8.1	8.0	-	25.1	25.5	-	7.7	7.1	-	255
50% B	10/10	10	10	10	8.2	-	8.0	24.2	-	24.7	7.8	-	7.1	235	245
100% A	20/0	10	10	10	-	8.1	7.9	-	24.9	24.0	-	7.3	7.2	-	180
100% B	20/0	10	10	10	8.2	-	7.9	24.1	-	24.1	7.9	-	7.4	170	180

[A]Organisms fed prior to testing and before renewal.

[B]Temperatures of room and test incubator were continuously recorded

[C]DO = Dissolved Oxygen

Room Temperature range for the test period was 23.0 - 24.5 °C.
Incubator #3 temperature range for the test period was 23.0 - 24.5°C.

Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

LIMS	
Job number:	TLH-2003-11-13-42
sample number:	716209

Data Transcription Verification
date: 1/30/04
by: James Daniels/Josh Ayres

Total Residual CL2	mg/L	Method
Field (100% sample):	-	-
Lab (100% sample):	<0.03	Hach
Control water:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water:	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water:	80	90
100% Sample:	61	61

Mortality	Percent
Control water:	0%
100%:	0%

[D] Salinity	ppt
100% sample:	<1
Control:	<1

[D] Salinity based on conductivity and temperature.

Table 2. Measured and predicted algal growth potential (AGP) of P.subcapitata for total soluble inorganic nitrogen (TSIN) and ortho phosphate (OP) limitation in the sample of effluent from the Vero Beach Municipal Power Plant.

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Inorganic N:P ratio
Effluent Samples	0.110	0.57 ± 0.114	8.6 ± 1.72	0.75

Table 3. Effluent limits, Class III Criteria and chemical data from samples collected from the Vero Beach Municipal Power Plant on 12 November, 2003.

Vero Beach Municipal Power Plant	Class III Marine Stds	Effluent
Organic Constituents (µg/L)		
None Detected	-	-
Metals (µg/L unless otherwise noted)		
Aluminum	≤ 1500	17 I
Arsenic	≤ 50	9.8 U
Cadmium	≤ 9.3	0.025 U
Calcium (mg/L)	-	21.1
Chromium-III	-	3 U
Copper	≤ 3.7	3.6 I
Iron	≤ 300	15 U
Lead	≤ 8.5	0.05 U
Magnesium (mg/L)	-	1.6
Nickel	≤ 8.3	3 U
Selenium	≤ 7.1	1 U
Silver	-	0.02 U
Zinc	≤ 86	6.5 I
Nutrients (mg/L)		
Ortho-phosphate	-	0.02
Total Phosphorus	-	0.02 U
Ammonia	-	0.01 U
Unionized Ammonia	-	-
Nitrate+Nitrite	-	0.015
Total Kjeldahl Nitrogen	-	0.19 I
Organic Nitrogen	-	0.19 c
Total Nitrogen	-	0.2 c
General Physical and Chemical Parameters		
Hardness (mg/L)	-	59.3 c
AGP (mg DryWt/L)	-	0.11 I
Total Residual Chlorine (Lab)	≤ 0.01	< 0.03 p
Total Residual Chlorine (Field)	≤ 0.01	-

c - calculated value.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
p - Material analyzed for and not detected. Value reported (0.03) is the laboratory minimum detection value.
U - Material was analyzed for but not detected. The value reported is the minimum detection limit.

Appendix 1. Chemical Analyses performed on the effluent from the Vero Beach Municipal Power Plant sampled on November 12, 2003.

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
11/12/2003 9:30	VBP	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	1,4-Naphthoquinone	19	ug/L	U	19	76
11/12/2003 9:30	VBP	BNA-Water	1-Naphthylamine	9.5	ug/L	UJ	9.5	38
11/12/2003 9:30	VBP	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	UJ	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	2,4,5-Trichlorophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
11/12/2003 9:30	VBP	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
11/12/2003 9:30	VBP	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2,6-Dichlorophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Acetylaminofluorene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
11/12/2003 9:30	VBP	BNA-Water	2-Methylnaphthalene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Naphthylamine	9.5	ug/L	U	9.5	38
11/12/2003 9:30	VBP	BNA-Water	2-Nitroaniline	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	2-Picoline	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
11/12/2003 9:30	VBP	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	76
11/12/2003 9:30	VBP	BNA-Water	3-Methylcholanthrene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	3-Nitroaniline	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	4-Aminobiphenyl	3.8	ug/L	UJ	3.8	15
11/12/2003 9:30	VBP	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	4-Chloroaniline	0.95	ug/L	UJ	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	4-Nitroaniline	0.95	ug/L	UJ	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
11/12/2003 9:30	VBP	BNA-Water	5-Nitro-o-toluidine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Acetophenone	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Aldrin	1.4	ug/L	UJ	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Aniline	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzidine	95	ug/L	U	95	380
11/12/2003 9:30	VBP	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Benzyl alcohol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
11/12/2003 9:30	VBP	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19

11/12/2003 9:30	VBP	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
11/12/2003 9:30	VBP	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Dibenzofuran	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
11/12/2003 9:30	VBP	BNA-Water	Dimethylaminoazobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Dinoseb	3.8	ug/L	UJ	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Ethyl methanesulfonate	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Hexachloropropene	1.9	ug/L	UJ	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Isosafrole	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Methyl methanesulfonate	0.95	ug/L	UJ	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosodi-n-butylamine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosodiethylamine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosomorpholine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosopiperidine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	76
11/12/2003 9:30	VBP	BNA-Water	Pentachlorobenzene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
11/12/2003 9:30	VBP	BNA-Water	Pentachloronitrobenzene	0.95	ug/L	UJ	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	11
11/12/2003 9:30	VBP	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	11
11/12/2003 9:30	VBP	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP	BNA-Water	Safrole	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
11/12/2003 9:30	VBP	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.6
11/12/2003 9:30	VBP	BNA-Water	o-Toluidine	0.95	ug/L	U	0.95	3.8
11/12/2003 9:30	VBP	Bio-AGP/LimNut	Algal Growth Potential	0.11	mg DryWt/L	I	0.1	0.3
11/12/2003 9:30	VBP	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/12/2003 9:30	VBP	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
11/12/2003 9:30	VBP	Bio-Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	LC50	L		
11/12/2003 9:30	VBP	Bio-Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	LC50	L		
11/12/2003 9:30	VBP	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.28

11/12/2003 9:30	VBP	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Azinphos Methyl	0.048	ug/L	UJ	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
11/12/2003 9:30	VBP	GC-Water	Butylate	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Fenamiphos	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP	GC-Water	Fonofos	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
11/12/2003 9:30	VBP	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
11/12/2003 9:30	VBP	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Mevinphos	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP	GC-Water	Naled	0.76	ug/L	U	0.76	3.04
11/12/2003 9:30	VBP	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP	GC-Water	Phorate	0.048	ug/L	UJ	0.048	0.192
11/12/2003 9:30	VBP	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP	Metals-Water	Aluminum	17	ug/L	I	7	28
11/12/2003 9:30	VBP	Metals-Water	Arsenic	9.8	ug/L	U	9.8	39
11/12/2003 9:30	VBP	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
11/12/2003 9:30	VBP	Metals-Water	Calcium	21.1	mg/L		0.05	0.2
11/12/2003 9:30	VBP	Metals-Water	Chromium	3	ug/L	U	3	12
11/12/2003 9:30	VBP	Metals-Water	Copper	3.6	ug/L	I	1	4
11/12/2003 9:30	VBP	Metals-Water	Iron	15	ug/L	U	15	60
11/12/2003 9:30	VBP	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
11/12/2003 9:30	VBP	Metals-Water	Magnesium	1.6	mg/L		0.02	0.08
11/12/2003 9:30	VBP	Metals-Water	Nickel	3	ug/L	U	3	12
11/12/2003 9:30	VBP	Metals-Water	Selenium	1	ug/L	U	1	4
11/12/2003 9:30	VBP	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/12/2003 9:30	VBP	Metals-Water	Zinc	6.5	ug/L	I	4	16
11/12/2003 9:30	VBP	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
11/12/2003 9:30	VBP	Nutrients-Liquid	NO2NO3-N	0.015	mg N/L		0.004	0.01
11/12/2003 9:30	VBP	Nutrients-Liquid	N_KJEL_TOT	0.19	mg N/L	I	0.06	0.2
11/12/2003 9:30	VBP	Nutrients-Liquid	O-Phosphate-P	0.02	mg P/L		0.004	0.01
11/12/2003 9:30	VBP	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
11/12/2003 9:30	VBP BLANK	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	1,2,4-Trichlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	1,2-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	1,3-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	1,4-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	1,4-Naphthoquinone	19	ug/L	U	19	77
11/12/2003 9:30	VBP BLANK	BNA-Water	1-Naphthylamine	9.6	ug/L	UJ	9.6	38
11/12/2003 9:30	VBP BLANK	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	UJ	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4,5-Trichlorophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4,6-Trichlorophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4-Dichlorophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	58
11/12/2003 9:30	VBP BLANK	BNA-Water	2,4-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2,6-Dichlorophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2,6-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Acetylaminofluorene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Chloronaphthalene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Chlorophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Methylnaphthalene	0.96	ug/L	U	0.96	3.8

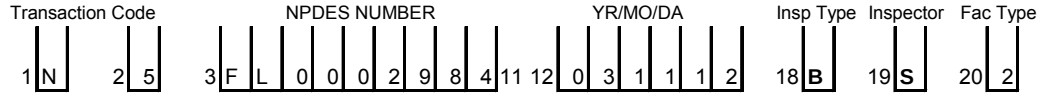
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Naphthylamine	9.6	ug/L	U	9.6	38
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Nitroaniline	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Nitrophenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	2-Picoline	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
11/12/2003 9:30	VBP BLANK	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	U	19	77
11/12/2003 9:30	VBP BLANK	BNA-Water	3-Methylcholanthrene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	3-Nitroaniline	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Aminobiphenyl	3.8	ug/L	UJ	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Bromophenyl phenyl ether	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Chloro-3-methylphenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Chloroaniline	0.96	ug/L	UJ	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Nitroaniline	0.96	ug/L	UJ	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	58
11/12/2003 9:30	VBP BLANK	BNA-Water	5-Nitro-o-toluidine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Acenaphthene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Acenaphthylene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Acetophenone	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Aldrin	1.4	ug/L	UJ	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Aniline	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Anthracene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzidine	96	ug/L	U	96	380
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzo(a)anthracene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzo(a)pyrene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzo(b)fluoranthene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzo(g,h,i)perylene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzo(k)fluoranthene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Benzyl alcohol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Bis(2-chloroethoxy)methane	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Bis(2-chloroethyl)ether	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	58
11/12/2003 9:30	VBP BLANK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
11/12/2003 9:30	VBP BLANK	BNA-Water	Chrysene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
11/12/2003 9:30	VBP BLANK	BNA-Water	Di-n-octyl phthalate	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Dibenzo(a,h)anthracene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Dibenzofuran	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Diethyl phthalate	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
11/12/2003 9:30	VBP BLANK	BNA-Water	Dimethylaminoazobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Dinoseb	3.8	ug/L	UJ	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Ethyl methanesulfonate	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Fluoranthene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Fluorene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Hexachlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Hexachloropropene	1.9	ug/L	UJ	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.96	ug/L	U	0.96	3.8

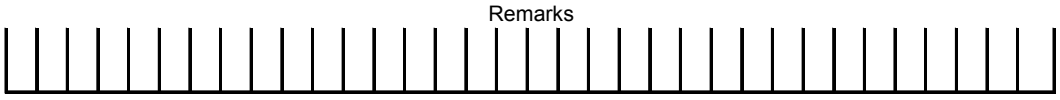
11/12/2003 9:30	VBP BLANK	BNA-Water	Isophorone	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Isosafrole	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Methyl methanesulfonate	0.96	ug/L	UJ	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosodi-n-butylamine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosodiethylamine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosomorpholine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosopiperidine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	Naphthalene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	77
11/12/2003 9:30	VBP BLANK	BNA-Water	Pentachlorobenzene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
11/12/2003 9:30	VBP BLANK	BNA-Water	Pentachloronitrobenzene	0.96	ug/L	UJ	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	12
11/12/2003 9:30	VBP BLANK	BNA-Water	Phenanthrene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Phenol	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Pyrene	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	Pyridine	3.8	ug/L	U	3.8	15
11/12/2003 9:30	VBP BLANK	BNA-Water	Safrole	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.8
11/12/2003 9:30	VBP BLANK	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.7
11/12/2003 9:30	VBP BLANK	BNA-Water	o-Toluidine	0.96	ug/L	U	0.96	3.8
11/12/2003 9:30	VBP BLANK	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.28
11/12/2003 9:30	VBP BLANK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Azinphos Methyl	0.048	ug/L	UJ	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
11/12/2003 9:30	VBP BLANK	GC-Water	Butylate	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP BLANK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Diazinon	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Fenamiphos	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP BLANK	GC-Water	Fonofos	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP BLANK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
11/12/2003 9:30	VBP BLANK	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
11/12/2003 9:30	VBP BLANK	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Mevinphos	0.19	ug/L	UJ	0.19	0.76
11/12/2003 9:30	VBP BLANK	GC-Water	Naled	0.76	ug/L	U	0.76	3.04
11/12/2003 9:30	VBP BLANK	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP BLANK	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
11/12/2003 9:30	VBP BLANK	GC-Water	Phorate	0.048	ug/L	UJ	0.048	0.192
11/12/2003 9:30	VBP BLANK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
11/12/2003 9:30	VBP BLANK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
11/12/2003 9:30	VBP BLANK	Metals-Water	Aluminum	7	ug/L	U	7	28
11/12/2003 9:30	VBP BLANK	Metals-Water	Arsenic	9.8	ug/L	U	9.8	39
11/12/2003 9:30	VBP BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
11/12/2003 9:30	VBP BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
11/12/2003 9:30	VBP BLANK	Metals-Water	Chromium	3	ug/L	U	3	12
11/12/2003 9:30	VBP BLANK	Metals-Water	Copper	1	ug/L	U	1	4
11/12/2003 9:30	VBP BLANK	Metals-Water	Iron	15	ug/L	U	15	60

11/12/2003 9:30	VBP BLANK	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
11/12/2003 9:30	VBP BLANK	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
11/12/2003 9:30	VBP BLANK	Metals-Water	Nickel	3	ug/L	U	3	12
11/12/2003 9:30	VBP BLANK	Metals-Water	Selenium	1	ug/L	U	1	4
11/12/2003 9:30	VBP BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/12/2003 9:30	VBP BLANK	Metals-Water	Zinc	4	ug/L	U	4	16
11/12/2003 9:30	VBP BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
11/12/2003 9:30	VBP BLANK	Nutrients-Liquid	NO2NO3-N	0.01	mg N/L	I	0.004	0.01
11/12/2003 9:30	VBP BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
11/12/2003 9:30	VBP BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
11/12/2003 9:30	VBP BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06

The Bioassay of Vero Beach Municipal Power Plant effluent sampled on November 12, 2003, NPDES #FL0002984.

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





The Priority Pollutants Analysis for Bioassay of Vero Beach Municipal Power Plant effluent sampled on November 12, 2003, NPDES #FL0002984.

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

