

Bioassays of

Everglades Stormwater Treatment Area 2

Palm Beach County

NPDES #FL0177946

Sampled November 15, 2004

March 2005

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Quality Manual No. 870346G
NELAC Certification No. E31780

Stormwater Treatment Area 2, The Everglades, Palm Beach County, Florida, NPDES # FL0177946-001. Effluent samples for this facility were collected on November 15, 2004.

Introduction

Stormwater Treatment Area (STA) 2 is a 6,430 acre constructed wetland system that naturally treats water pumped, via the S-6, G-328, and G-337 inflow pump stations, from jurisdictional waters of the East Shore Water Control District, the S-5A and S-6/S-2 Basins, the 715 Farms discharges, and Lake Okeechobee regulatory releases. The treated water is then pumped via the G-335 outflow pump station, a modified L-6 canal, and 6 box culverts into the Class III Fresh Waters of Water Control Area (WCA) 2A, a section of the Everglades. The combined capacity of the G-335 pumping station is 3,040 cubic feet per second (cfs). The sampling location, outfall D-001, is at the G-335 pumping station. There is no toxicity requirement in this facility's permit (facility information provided by Tjerk VanVeen of FDEP Southeast District office).

Methods

Samples were collected from the D-001 NPDES sampling point by Terry Davis (FDEP Southeast 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.

The toxicity tests and algal growth potential test were performed following internal DEP SOP's TA07_01, TA07_02, and TA08_01 through TA08_07. All internal DEP SOP's are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp. The Department uses the 48-hour acute screening toxicity test to provide reasonable assurance that the facility does not adversely affect waters of the state.

Prior to test initiation, bioassay samples were aerated for 20 minutes at approximately 100 bubbles per minute, to decrease the dissolved oxygen concentration from 9.6 mg/L to 7.9 mg/L.

Toxicity Test Results

Tests were performed November 16-18, 2004.

Ceriodaphnia dubia - 48-hr acute screening bioassay –	LC_{50} > 100%, 0%* mortality in 100% sample at 48 hours
Cyprinella leedsi - 48-hr acute screening bioassay –	LC_{50} > 100%, 0%* mortality in 100% sample at 48 hours

Bioassay samples did not show toxicity to the test organisms.

See Appendix 1 for bioassay bench sheets.

*NOTE: In a 48-hr acute screening test of 100% effluent, mortality of <20% provides reasonable assurance that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1)(a)4, F.A.C.). Mortality between 20-50% mortality indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% provides reasonable assurance that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3)(a), F.A.C.).

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 0.884 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 limited by both nitrogen and phosphorus because available forms of these nutrients are so low. The predicted AGP based on inorganic nitrogen concentrations was 2.96 (±20%) mg dry wt/L (Table 1; Miller et al. 1978). Differences between actual and predicted AGP values greater than an order of magnitude are considered sufficient evidence to warrant follow up testing with the algal growth inhibition bioassay.

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine was not detected in the bioassay sample in the laboratory. The total ammonia concentration in the bioassay sample was 0.0325, and was 0.058 mg/L in the sample collected and preserved for chemical analysis. Based on the pH, salinity and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Iron was detected in the effluent at levels that comply with Class III fresh water quality criteria. Atrazine, aluminum, copper, and zinc were detected between the laboratory minimum detection limits (MDL) and practical quantitation limits (PQL).

See Table 2 for results of analytes detected in the effluent, and corresponding limits.

See Appendix 2 for a complete list of chemical analyses performed.

Conclusion

The effluent samples collected from D-001 for STA2 on November 15, 2004, did not show acute toxicity to either test species during the 48-hour bioassays. The effluent AGP result was less than 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) for total soluble nitrogen (TSIN) of Pseudokirchneriella subcapitata *for samples collected from STA 2 on November 15, 2004.*

Location	AGP (measured; mg dry wt/L)	Predicted AGP (TSIN; mg dry wt/L) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent Samples	0.884 AI	2.96 ± 0.592	8.67	> 141

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.

Table 2. Effluent limits, Class III Criteria, and chemical data for samples collected from STA 2 on November 15, 2004.

Stormwater Treatment Area 2	Class III Freshwater Standards	Effluent Limits	Effluent Samples
Organic Constituents (µg/L)			
Atrazine	-	-	0.11 I
Metals (µg/L unless otherwise noted)			
Aluminum	-	-	17 I
Arsenic	≤ 50	-	6 U
Cadmium	≤ 2.7 b	-	0.075 U
Calcium (mg/L)	-	-	66
Chromium-III	≤ 209.2 b	-	2 U
Copper	≤ 23.5 b	-	0.78 I
Iron	≤ 1000	-	69
Lead	≤ 12.6 b	-	0.075 U
Magnesium (mg/L)	-	-	31.7
Nickel	≤ 130.4 b	-	2 U
Selenium	≤ 5	-	0.5 U
Silver	≤ 0.07	-	0.02 U
Zinc	≤ 299.9 b	-	5.8 I
Nutrients (mg/L)			
Ortho-phosphate	-	-	0.009 I
Total Phosphorus	-	Report	0.02 U
Ammonia	-	-	0.058
Unionized Ammonia	≤ 0.02	-	< 0.02 c
Nitrate+Nitrite	-	-	0.02
Total Kjeldahl Nitrogen	-	-	2.8
Organic Nitrogen	-	-	2.742 c
Total Nitrogen	-	-	2.82 c
General Physical and Chemical Parameters			
pH (S.U.)	6.0 - 8.5	-	7.9
Conductivity (umhos/cm)	≤ 1275	-	1189
Temperature (C)	-	-	22.9
Flow (cfs)	3,040	Report	-
Dissolved Oxygen (mg/L)	≥ 5.0	Report	-
Hardness (mg/L)	-	-	295.3 c

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

b - Value is calculated based on hardness

c - calculated value

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U - Material analyzed for but not detected; value reported is the minimum detection limit

FDEP Biology Section - Acute
Bioassay Bench Sheets

Facility: Stormwater Treatment Area 2

Address: Everglades Agricultural Area

City: N/A County: Palm Beach

Contact/District: Terry Davis / SouthEast

NPDES Permit #: FL 0177946

LIMS Job #: ~~FT583~~ TLH-2004-11-110-33

LIMS Sample #: 795831

Lims Data Entry: MH 11-19-04

Data Entry Verification: 11-19-04 DN

Instructions (for below): Circle appropriate wording. If yes is circled complete blanks.

Test Type: Screening/Definitive

(Static) Static Renewal / Flow-through

Test Duration: (48) 96 Hours.

Light Intensity : 50 - 100 ft. candles.

Photoperiod : 16 hours light 8 hours dark.

Initial sample handling:

PH adjustment : yes (no) Initial pH NaOH N HCl N Drops mL Final pH

Aeration : (yes) no Initial DO: 9.4 mg/L Final DO: 7.9 mg/L Duration: 20 minutes Rate: ~100 bubbles/min

Salinity adjusted (Test 1): yes (no) Initial Salinity: Final Salinity: Salts Hypersaline brine

Salinity adjusted (Test 2): yes (no) Initial Salinity: Final Salinity: Salts Hypersaline brine

Dechlorination: yes (no) mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC

Test 1 validation:

Control survival ≥90%: (Yes) No

Temperature Range ≤3°C: (Yes) No

Test 2 validation:

Control survival ≥90%: (Yes) No

Temperature Range ≤3°C: (Yes) No

Sample Validation:

Temperature: Shipped ≤6°C (Yes) No Hand Delivered: Cooling (received °C < collected °C) Yes No

Holding Time: ≤36 Hours (Yes) No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Sample Collection: Date: 11-15-04 Time: 10:25

Hold time Start: Date: 11-15-04 Time: 10:25

Comments: Sample aerated to reduce DO from 9.6 mg/L DAP

(A) NM = Not Measured - DN

Temperature Range °C

Incubator # 3 Range 25.6 - 25.8

Room B246: 24.0 °C

Waterbath: N/A

Investigators' Signatures

REVIEWER

Water Quality Parameters	20% DMW	Well Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Moderately Hard Water	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	N/A	N/A	N/A	N/A	N/A	(A) NM	—	—	DN
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03				<0.03	HACH	DP	DN
Alkalinity (mg/L as $CaCO_3$):	101	144				365	HACH	DP	DN
Hardness (mg/L as $CaCO_3$):	102	165				316	HACH	DP	DN
Total Ammonia (mg/L as N):	<0.017	<0.017				0.0325	DENVER	MF	DN
Salinity (ppth):	<1	<1				<1	YSI Mettler	DN	MF

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FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 79531 Test #: 1 Test Started: Date 11/16/04 Time: 1300
Organism: C. leedsi Test Ended: Date 11/18/04 Time: 1300
Organism Batch: 28 Diluent/ Batch: Well 11.01 N/A
Organism Age: 13 days Food: YCT *P. subcapitata* Artemia (circled)
Chamber Size 1000 mL Batch: ___ ___ 4125425G
Test Volume 500 mL Feeding: Prior to test (circled) - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour: 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	B9	5	5	5			
	B	B10	5	5	5			
	C	B11	5	5	5			
	D	B12	5	5	5			
100%	A	B13	5	5	5			
	B	B14	5	5	5			
	C	B15	5	5	5			
	D	B16	5	5	5			
Organisms loaded by: JD		Checked by: (initials)	JD	JD	JD			

Loading Verified by: SP

Comments:

m = missing d = dead BR = before renewal AR = after renewal

Test Results:

% mortality in 100% sample 0

LC_{50}: >100 If Calculated: 95% CI ______ Method: ______

Screening Tests: Report LC50 as >100%, =100%, or <100%.

Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

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FDEP Biology Section - - Bioassay Bench Sheet

Survival

LIMS Sample #: 795831 Test #: 2 Test Started: Date 11/16/04 Time: 1320

Organism: C. dubia Test Ended: Date 11/18/04 Time: 1300

Organism Batch: 42 Diluent/ Batch: 20% DMW 40

Organism Age: < 24hr Food: (YCT) (P. subcapitata) Artemia

Chamber Size 30 mL Batch: 5 41

Test Volume 20 mL Feeding: (Prior to test) - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
100%	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
Organisms loaded by: NKW		Checked by:	MF	JD	JD			

Loading Verified by: MF (initials)

Comments:

m = missing d = dead BR = before renewal AR = after renewal

Test Results:

% mortality in 100% sample 0

LC_{50}: >100 If Calculated: 95% CI ____ Method: ____

Screening Tests: Report LC50 as >100%, =100%, or <100%.

Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

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Bioassay Parameters

LIMS Sample # : 795831 **Test # :** 1 **of** 2

TEST SOP: TA07_ 02 **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

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Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.0	8.0	8.3			
Temperature °C	24.8	25.6	25.1			
Dissolved Oxygen mg/L	8.0	7.9	7.2			
Conductivity (µmhos) mmhos	275	320	325			
(initials) Measured by:	DN	JD	JD			
(initials) Recorded by:	CAP	JD	JD			

Comments:

Concentration 100 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.3	8.5	8.6			
Temperature °C	24.6	25.8	25.1			
Dissolved Oxygen mg/L	7.9	7.6	7.0			
Conductivity (µmhos) mmhos	1165	1230	1300			
(initials) Measured by:	DN	JD	JD			
(initials) Recorded by:	CAP	JD	JD			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

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Bioassay Parameters

LIMS Sample # : 795831 **Test # :** 2 **of** 2

TEST SOP: TA07_ 01 **Test Species:** (*Ceriodaphnia dubia*) *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

V.1 2/24/04

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		B			
pH (S.U.)	8.0		8.0			
Temperature °C	24.5		24.3			
Dissolved Oxygen mg/L	7.7		7.3			
Conductivity (µmhos) mmhos	190		220			
(initials) Measured by:	MF		JD			
(initials) Recorded by:	MF		JD			

Comments:

Concentration 100 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		B			
pH (S.U.)	8.3		8.7			
Temperature °C	24.4		24.3			
Dissolved Oxygen mg/L	7.8		7.4			
Conductivity (µmhos) mmhos	1165		1195			
(initials) Measured by:	MF		JD			
(initials) Recorded by:	MF		JD			

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

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Appendix 2. Chemical Analyses performed on the effluent from the Stormwater Treatment Area 2 Outfall D-001, sampled on November 15, 2004.

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
11/15/2004 10:25	51-WMD-1	Bio-AGP/LimNut	Algal Growth Potential	0.884	mg DryWt/L	AI	0.3	0.9
11/15/2004 10:25	51-WMD-1	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	2.1	ug/L	U	2.1	6.4
11/15/2004 10:25	51-WMD-1	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	2.1	ug/L	U	2.1	6.4
11/15/2004 10:25	51-WMD-1	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia	100	LC50	L		
11/15/2004 10:25	51-WMD-1	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish	100	LC50	L		
11/15/2004 10:25	51-WMD-1	BNA-Water	1,2,4-Trichlorobenzene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	1,2-Dichlorobenzene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	1,3-Dichlorobenzene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	1,4-Dichlorobenzene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2,4,6-Trichlorophenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2,4-Dichlorophenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2,4-Dimethylphenol	50	ug/L	U	50	200
11/15/2004 10:25	51-WMD-1	BNA-Water	2,4-Dinitrophenol	15	ug/L	UJ	15	59
11/15/2004 10:25	51-WMD-1	BNA-Water	2,4-Dinitrotoluene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2,6-Dinitrotoluene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2-Chloronaphthalene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2-Chlorophenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	2-Methyl-4,6-dinitrophenol	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	2-Nitrophenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	3,3'-Dichlorobenzidine	40	ug/L	U	40	160
11/15/2004 10:25	51-WMD-1	BNA-Water	4,4'-DDD	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	4,4'-DDE	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	4,4'-DDT	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	4-Bromophenyl phenyl ether	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	4-Chloro-3-methylphenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	4-Chlorophenyl phenyl ether	2	ug/L	U	2	7.9
11/15/2004 10:25	51-WMD-1	BNA-Water	4-Nitrophenol	15	ug/L	U	15	59
11/15/2004 10:25	51-WMD-1	BNA-Water	Acenaphthene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Acenaphthylene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Aldrin	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Anthracene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzidine	99	ug/L	U	99	400
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzo(a)anthracene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzo(a)pyrene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzo(b)fluoranthene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzo(g,h,i)perylene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Benzo(k)fluoranthene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Bis(2-chloroethoxy)methane	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Bis(2-chloroethyl)ether	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Bis(2-chloroisopropyl)ether	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Bis(2-ethylhexyl)phthalate	15	ug/L	U	15	59
11/15/2004 10:25	51-WMD-1	BNA-Water	Butyl benzyl phthalate	5	ug/L	U	5	20
11/15/2004 10:25	51-WMD-1	BNA-Water	Chrysene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Di-n-butyl phthalate	5	ug/L	U	5	20
11/15/2004 10:25	51-WMD-1	BNA-Water	Di-n-octyl phthalate	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Dibenzo(a,h)anthracene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Dieldrin	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Diethyl phthalate	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Dimethyl phthalate	50	ug/L	U	50	200
11/15/2004 10:25	51-WMD-1	BNA-Water	Endosulfan I	4	ug/L	UJ	4	16
11/15/2004 10:25	51-WMD-1	BNA-Water	Endosulfan II	4	ug/L	U	4	16
11/15/2004 10:25	51-WMD-1	BNA-Water	Endosulfan sulfate	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Endrin	1.5	ug/L	UJ	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Endrin aldehyde	4	ug/L	U	4	16
11/15/2004 10:25	51-WMD-1	BNA-Water	Fluoranthene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Fluorene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Heptachlor	1.5	ug/L	U	1.5	5.9

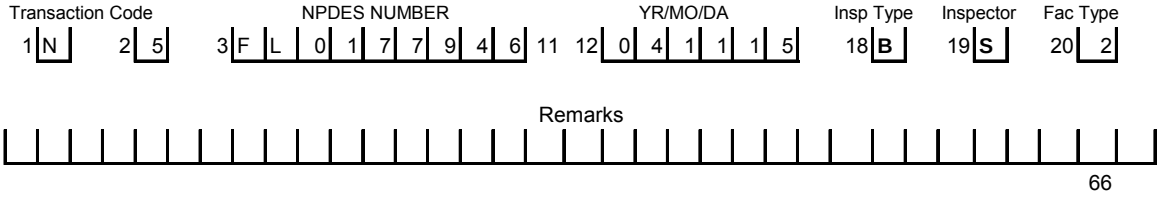
Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
11/15/2004 10:25	51-WMD-1	BNA-Water	Heptachlor epoxide	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Hexachlorobenzene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Hexachlorobutadiene	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Hexachlorocyclopentadiene	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Hexachloroethane	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Indeno(1,2,3-cd)pyrene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Isophorone	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	N-Nitrosodi-n-propylamine	2	ug/L	U	2	7.9
11/15/2004 10:25	51-WMD-1	BNA-Water	N-Nitrosodimethylamine	2	ug/L	U	2	7.9
11/15/2004 10:25	51-WMD-1	BNA-Water	N-Nitrosodiphenylamine	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Naphthalene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Nitrobenzene	2	ug/L	U	2	7.9
11/15/2004 10:25	51-WMD-1	BNA-Water	Pentachlorophenol	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	BNA-Water	Phenanthrene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Phenol	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	Pyrene	0.99	ug/L	U	0.99	4
11/15/2004 10:25	51-WMD-1	BNA-Water	alpha-BHC	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	beta-BHC	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	delta-BHC	1.5	ug/L	U	1.5	5.9
11/15/2004 10:25	51-WMD-1	BNA-Water	gamma-BHC	1.5	ug/L	U	1.5	5.9
11/15/2004 10:50	51-WMD-2	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
11/15/2004 10:50	51-WMD-2	BNA-Water	2,4-Dinitrophenol	14	ug/L	UJ	14	57
11/15/2004 10:50	51-WMD-2	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
11/15/2004 10:50	51-WMD-2	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
11/15/2004 10:50	51-WMD-2	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
11/15/2004 10:50	51-WMD-2	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzidine	95	ug/L	U	95	380
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
11/15/2004 10:50	51-WMD-2	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
11/15/2004 10:50	51-WMD-2	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
11/15/2004 10:50	51-WMD-2	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
11/15/2004 10:50	51-WMD-2	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
11/15/2004 10:50	51-WMD-2	BNA-Water	Endosulfan I	3.8	ug/L	UJ	3.8	15
11/15/2004 10:50	51-WMD-2	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
11/15/2004 10:50	51-WMD-2	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
11/15/2004 10:50	51-WMD-2	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
11/15/2004 10:50	51-WMD-2	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
11/15/2004 10:50	51-WMD-2	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
11/15/2004 10:50	51-WMD-2	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
11/15/2004 10:50	51-WMD-2	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
11/15/2004 10:50	51-WMD-2	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
11/15/2004 10:50	51-WMD-2	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
11/15/2004 10:25	51-WMD-1	GC-Water	Alachlor	0.6	ug/L	U	0.6	2.4
11/15/2004 10:25	51-WMD-1	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Atrazine	0.11	ug/L	I	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
11/15/2004 10:25	51-WMD-1	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
11/15/2004 10:25	51-WMD-1	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Diazinon	0.05	ug/L	UJ	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
11/15/2004 10:25	51-WMD-1	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
11/15/2004 10:25	51-WMD-1	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
11/15/2004 10:25	51-WMD-1	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
11/15/2004 10:25	51-WMD-1	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
11/15/2004 10:25	51-WMD-1	GC-Water	Naled	0.8	ug/L	UJ	0.8	3.2
11/15/2004 10:25	51-WMD-1	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
11/15/2004 10:25	51-WMD-1	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
11/15/2004 10:25	51-WMD-1	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
11/15/2004 10:25	51-WMD-1	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
11/15/2004 10:25	51-WMD-1	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.3
11/15/2004 10:50	51-WMD-2	GC-Water	Ametryn	0.049	ug/L	U	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Atrazine	0.049	ug/L	U	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Azinphos Methyl	0.049	ug/L	U	0.049	0.2

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
11/15/2004 10:50	51-WMD-2	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
11/15/2004 10:50	51-WMD-2	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
11/15/2004 10:50	51-WMD-2	GC-Water	Chlorpyrifos Ethyl	0.049	ug/L	U	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Chlorpyrifos Methyl	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Diazinon	0.049	ug/L	UJ	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Ethion	0.049	ug/L	U	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Ethoprop	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
11/15/2004 10:50	51-WMD-2	GC-Water	Fonofos	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Hexazinone	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
11/15/2004 10:50	51-WMD-2	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
11/15/2004 10:50	51-WMD-2	GC-Water	Metolachlor	0.49	ug/L	U	0.49	2
11/15/2004 10:50	51-WMD-2	GC-Water	Metribuzin	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
11/15/2004 10:50	51-WMD-2	GC-Water	Naled	0.78	ug/L	UJ	0.78	3.1
11/15/2004 10:50	51-WMD-2	GC-Water	Norflurazon	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
11/15/2004 10:50	51-WMD-2	GC-Water	Parathion Methyl	0.097	ug/L	U	0.097	0.39
11/15/2004 10:50	51-WMD-2	GC-Water	Phorate	0.049	ug/L	U	0.049	0.2
11/15/2004 10:50	51-WMD-2	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
11/15/2004 10:50	51-WMD-2	GC-Water	Simazine	0.049	ug/L	U	0.049	0.2
11/15/2004 10:25	51-WMD-1	Metals-Water	Aluminum	17	ug/L	I	5	20
11/15/2004 10:25	51-WMD-1	Metals-Water	Arsenic	6	ug/L	U	6	24
11/15/2004 10:25	51-WMD-1	Metals-Water	Cadmium	0.075	ug/L	U	0.075	0.3
11/15/2004 10:25	51-WMD-1	Metals-Water	Calcium	66	mg/L		0.05	0.2
11/15/2004 10:25	51-WMD-1	Metals-Water	Chromium	2	ug/L	U	2	8
11/15/2004 10:25	51-WMD-1	Metals-Water	Copper	0.78	ug/L	I	0.75	3
11/15/2004 10:25	51-WMD-1	Metals-Water	Iron	69	ug/L		10	40
11/15/2004 10:25	51-WMD-1	Metals-Water	Lead	0.075	ug/L	U	0.075	0.3
11/15/2004 10:25	51-WMD-1	Metals-Water	Magnesium	31.7	mg/L		0.02	0.08
11/15/2004 10:25	51-WMD-1	Metals-Water	Nickel	2	ug/L	U	2	8
11/15/2004 10:25	51-WMD-1	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
11/15/2004 10:25	51-WMD-1	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/15/2004 10:25	51-WMD-1	Metals-Water	Zinc	5.8	ug/L	I	3	12
11/15/2004 10:50	51-WMD-2	Metals-Water	Aluminum	5	ug/L	U	5	20
11/15/2004 10:50	51-WMD-2	Metals-Water	Arsenic	6	ug/L	U	6	24
11/15/2004 10:50	51-WMD-2	Metals-Water	Cadmium	0.075	ug/L	U	0.075	0.3
11/15/2004 10:50	51-WMD-2	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
11/15/2004 10:50	51-WMD-2	Metals-Water	Chromium	2	ug/L	U	2	8
11/15/2004 10:50	51-WMD-2	Metals-Water	Copper	0.75	ug/L	U	0.75	3
11/15/2004 10:50	51-WMD-2	Metals-Water	Iron	10	ug/L	U	10	40
11/15/2004 10:50	51-WMD-2	Metals-Water	Lead	0.075	ug/L	U	0.075	0.3
11/15/2004 10:50	51-WMD-2	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
11/15/2004 10:50	51-WMD-2	Metals-Water	Nickel	2	ug/L	U	2	8
11/15/2004 10:50	51-WMD-2	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
11/15/2004 10:50	51-WMD-2	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
11/15/2004 10:50	51-WMD-2	Metals-Water	Zinc	3	ug/L	U	3	12
11/15/2004 10:25	51-WMD-1	Nutrients-Liquid	Ammonia-N	0.058	mg N/L		0.01	0.02
11/15/2004 10:25	51-WMD-1	Nutrients-Liquid	Kjeldahl Nitrogen	2.8	mg N/L		0.06	0.2
11/15/2004 10:25	51-WMD-1	Nutrients-Liquid	NO2NO3-N	0.02	mg N/L		0.004	0.01
11/15/2004 10:25	51-WMD-1	Nutrients-Liquid	O-Phosphate-P	0.009	mg P/L	I	0.004	0.01
11/15/2004 10:25	51-WMD-1	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
11/15/2004 10:50	51-WMD-2	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
11/15/2004 10:50	51-WMD-2	Nutrients-Liquid	Kjeldahl Nitrogen	0.06	mg N/L	U	0.06	0.2
11/15/2004 10:50	51-WMD-2	Nutrients-Liquid	NO2NO3-N	0.005	mg N/L	I	0.004	0.01
11/15/2004 10:50	51-WMD-2	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
11/15/2004 10:50	51-WMD-2	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06

The Bioassay of Stormwater Treatment Area 2 effluent sampled on November 15, 2004, NPDES #FL0177946.

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



The Priority Pollutants Analysis for Bioassay of Stormwater Treatment Area 2 effluent sampled on November 15, 2004, NPDES #FL0177946.

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

