

Biological Assessment of

Mosaic Fertilizer, Inc. - South Fort Meade Mine (formerly Cargill Fertilizer)

Polk County

NPDES #FL0037958

Sampled August 23, 2004

January 2005

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger:	Mosaic Fertilizer, Inc., South Fort Meade Mine
County:	Polk
NPDES Number:	FL0037958
Permit Expiration:	March 14, 2005

Toxics Sampling Inspection **(XSI)**

Date Sampled: August 23, 2004

Results: Aluminum was detected in the effluent. Iron and lead were detected in the effluent at levels that complied with Class III Fresh Water Quality Criteria. Bromacil, nickel, and selenium were detected in the effluent between the laboratory minimum detection limit (MDL) and practical quantitation limit (PQL).

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: August 23, 2004

Results: The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 96-hour acute screening bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: August 23, 2004

Results: Effluent conductivity, pH, and dissolved oxygen complied with Class III Water Quality Criteria and facility permit limits. Effluent total nitrogen (0.59 mg/L) and total phosphorus (1.1 mg/L) concentrations complied with the facility's single sample permit limits (5.0 mg/L for both). Effluent AGP (0.673 mg dry weight/L) was below the "problem" threshold (5.0 mg dry weight/L).

Impact Bioassessment Inspection **(IBI)**

Date Sampled: August 23, 2004

Results: Chlorophyll-*a* was not detected in the effluent. The effluent phytoplankton community was dominated by blue-green algae, followed by green algae and diatoms. Forty-one species were identified, and the Shannon Weaver Diversity value was 4. The dominant taxon was *Anabaena*, a genus known to produce toxins that can be harmful to humans and animals, and often considered a nuisance.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions.

Introduction

South Fort Meade Mine is located in Ft. Meade, Polk County, Florida (Appendix 1). Facility operations include phosphate mining and beneficiation facilities, phosphatic clay settling areas, sand tailings disposal areas and a mine water recirculation system. There is no design flow. The mean flow from 5/03 through 4/04 was 11.6 million gallons per day (MGD), there was no flow in May, June, or July 2004, and the flow for August 2004 was 6.6 MGD (PCS DMR data reports, personal communication with Jacki Champion). The activities include the mining and washing of phosphate ore. The mined ore is slurried into a pit and pumped to the beneficiation plant where the fine clays and sand are separated from the phosphate rock (product) by washing, screening and double flotation. The generated wet phosphate rock is transported to another location for further processing. The separated clays are pumped to settling areas. Sand tailings are pumped as a slurry to mined areas for use as reclamation fill or is stored above grade for later use in reclamation. Discharge is intermittent, via a rectangular weir structure, and flows into an unnamed swale and then into the Class III fresh waters of the Peace River (Facility Summary, Appendix 2). The sampled outfall, 001, is located at approximately W -81° 47' 60", N 27° 39' 19".

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports, the plant has not had any permit violations within the past year (Appendix 2).

Methods

The purpose of this investigation was to determine the potential effects of the facility's effluent on the biota of the receiving waters. However, receiving waters were not sampled due to high flow conditions following Hurricane Charlie, which made landfall August 13, 2004. Results of analyses performed on effluent samples taken from the unnamed swale are reported. Detailed methods and their relationship to Florida Administrative Code are in Appendix 3.

All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOPs, see http://www.floridadep.org/labs/qa/2002sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Jacki Champion, Brian Irsch, and Frank Cardinale (DEP Southwest District), and DEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Shannan Gunnoe, and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix 4. Aluminum was detected in the effluent. Iron and lead were detected in the effluent at levels that comply with Class III Fresh Water Quality Criteria (62-302, F.A.C.). Bromacil, nickel, and selenium were detected in the effluent at levels between the MDL and PQL.
- Effluent conductivity, pH, and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1).
- The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi*, or to the water flea, *Ceriodaphnia dubia*, during 96-hour acute screening bioassays (See Table 1 for percent mortality and Appendix 5 for bioassay bench sheets).
- The effluent total nitrogen (0.59 mg/L) and total phosphorus (1.1 mg/L) concentrations complied with the facility's single sample permit limits (5.0 mg/L for both, Table 1).
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al*. 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP value of the effluent was 0.673 mg dry wt/L (Table 2), which is below this threshold. Effluent nutrient ratios suggest that the effluent is nitrogen-limited. There was no evidence of growth inhibition in AGP data (Table 2).
- Chlorophyll-*a* was not detected in the effluent (Table 3). We note that nutrients in the water column may or may not fuel algal production immediately, depending upon the sum of environmental conditions that limit algal growth at the site (e.g. pH, shading, turbidity). Thus it is not necessarily contradictory for ambient nutrient levels to be high and for no chlorophyll to be detected in water samples.
- Effluent phytoplankton community composition data are presented in Table 3 and Appendices 6a and 6b. The Shannon-Weaver Diversity index was 4 and 41 taxa were identified. Blue-green algae made up the greatest percentage of the community (42.3 %), followed by green algae (27.5 %) and diatoms (22.6 %, Table 3). The dominant taxon was *Anabaena*, a genus

Table 1. Effluent limits, Class III Freshwater Criteria, and chemical and toxicological data collected on August 23, 2004.

Mosaic Fertilizer, Inc. - South Ft. Meade Mine	Class III Standards	Effluent Limits	Effluent Samples
Organic Constituents (µg/L)			
Bromacil	-	-	0.28 I
Metals (µg/L unless otherwise noted)			
Aluminum	-	-	494
Arsenic	≤ 50	-	6 U
Cadmium	≤ 1.7 b	-	0.025 U
Calcium (mg/L)	-	-	42.2
Chromium-III	≤ 131 b	-	2 U
Copper	≤ 14.4 b	-	1 U
Iron	≤ 1000	-	131
Lead	≤ 6.1 b	-	0.47
Magnesium (mg/L)	-	-	14.9
Nickel	≤ 80.4 b	-	2.5 I
Selenium	≤ 5	-	0.73 I
Silver	≤ 0.07	-	0.01 U
Zinc	≤ 184.8 b	-	3 U
Nutrients (mg/L)			
Ortho-phosphate	-	-	0.93
Total Phosphorus	-	≤ 5.0 s	1.1
Ammonia	-	-	0.014 I
Unionized Ammonia	≤ 0.02	-	< 0.02 c
Nitrate+Nitrite	-	-	0.004 U
Total Kjeldahl Nitrogen	-	-	0.59
Organic Nitrogen	-	-	0.576 c
Total Nitrogen	-	≤ 5.0 s	0.592 c
General Physical and Chemical Parameters			
Alpha, Total (pCi/L)	≤ 15	≤ 15	2.3
Alpha-Counting Error (pCi/L)	-	-	0.9
Radium 226 (pCi/L)	-	-	0.5
Radium 226-Counting Error (pCi/L)	-	-	0.1
Radium 228 (pCi/L)	-	-	0.9 U
Radium 228-Counting Error (pCi/L)	-	-	0.5
Radium 226 + 288 (pCi/L)	≤ 5	≤ 5	0.95 c
Dissolved Oxygen (mg/L)	≥ 5	≥ 5	10
pH (S.U.)	6.0 - 8.5	6.0 - 8.5	7.5
Conductivity (umhos/cm)	≤ 1275	≤ 1275	556
Temperature (C)	-	Report	30
Chloride (mg/L)	-	-	9.8
Total dissolved solids (mg/L)	-	-	368 AQ
Total suspended solids (mg/L)	-	≤ 60 s	9 IQ
Color (PCU)	-	-	20
Turbidity (NTU)	t	-	5.2
Fluoride (mg F/L)	≤ 10	≤ 10	1.3
Sulfate (mg SO_4/L)	-	Report	190
Non-volitile, non-filterable residue (FS)	-	≤ 25.0 s	-
Oil and Grease (mg/l)	≤ 5	-	0.69 U
Hardness (mg/L)	-	-	166.7 c
Total Residual Chlorine (mg/L) (lab)	≤ 0.01	-	< 0.03 U
Toxicology Bioassays (96-hr acute screening toxicity tests, Percent Mortality)			
Fish (*Cyprinella leedsi*)	-	≤ 20	5
Water flea (*Ceriodaphnia dubia*)	-	≤ 20	0

Value exceeds the Class III Fresh Water Quality Criteria (62-302, F.A.C.)

b - Value is calculated based on hardness
c - calculated value
s - Single sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range
I - The reported value is between the laboratory method detection limit and the practical quantitation limit.
J - Estimated value
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the minimum detection limit

known to produce toxins that can be harmful to humans and animals, and often considered a nuisance.

Summary

Effluent physical and analytical chemistry complied with permit limits and water quality standards (62-302, F.A.C.). The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi*, or to the water flea, *Ceriodaphnia dubia*, during 96-hour acute screening bioassays. Chlorophyll-*a* was not detected in the effluent, and AGP levels were below the "problem" threshold. The effluent algal community was dominated by the toxin-producing blue-green algae, *Anabaena.*

Literature Cited

Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.

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.

Ross, L. T. 1990. Methods for aquatic biology. Florida Department of Environmental Regulation Technical Series 10(1): 1-47.

Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protec-

Table 2. Measured and predicted algal growth potential (AGP) for total soluble nitrogen (TSIN) limitation to Pseudokirchneriella subcapitata *for samples collected from Mosaic Fertilizer, Inc., South Fort Meade Mine, on August 23, 2004.*

Location	AGP (mg dry weight/L; measured)	Predicted AGP (mg dry weight/L; TSIN) ± 20%	Inorganic N:P ratio
Effluent Samples	0.673 AJ	0.53 ± 0.106	0.02

A - Value reported is the mean of two or more determinations
J - Estimated value

tion Agency, Office of Water, Washington, D. C.

Stevenson, R. J. and J. P. Smol. 2003. Use of algae in environmental assessments, pp. 775-803, in: Freshwater algae of North America, edited by J. D. Wehr and R. G. Sheath, Academic Press, San Diego. 918 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 3. Phytoplankton composition of effluent samples taken from Mosaic Fertilizer, Inc., South Fort Meade Mine on August 23, 2004.

Mosaic Fertilizer, Inc. - South Ft. Meade Mine	Effluent Samples
Number of Taxa	41
Shannon-Weaver Diversity	4
Chlorophyll a (µg/L)	1.4 U
Phaeophytin (µg/L)	1.4 U
Algal Density (number/cm²)	5740
Percent Dominant Taxon	22
Dominant Taxon (name)	*Anabaena*
Number of Algal Units Identified	305
Percentage Composition	
Blue-green algae	42.3
Cryptomonads	2.9
Diatoms	22.6
Dinoflagellates	0.7
Euglenoids	2.3
Green algae	27.5
Other	1.7

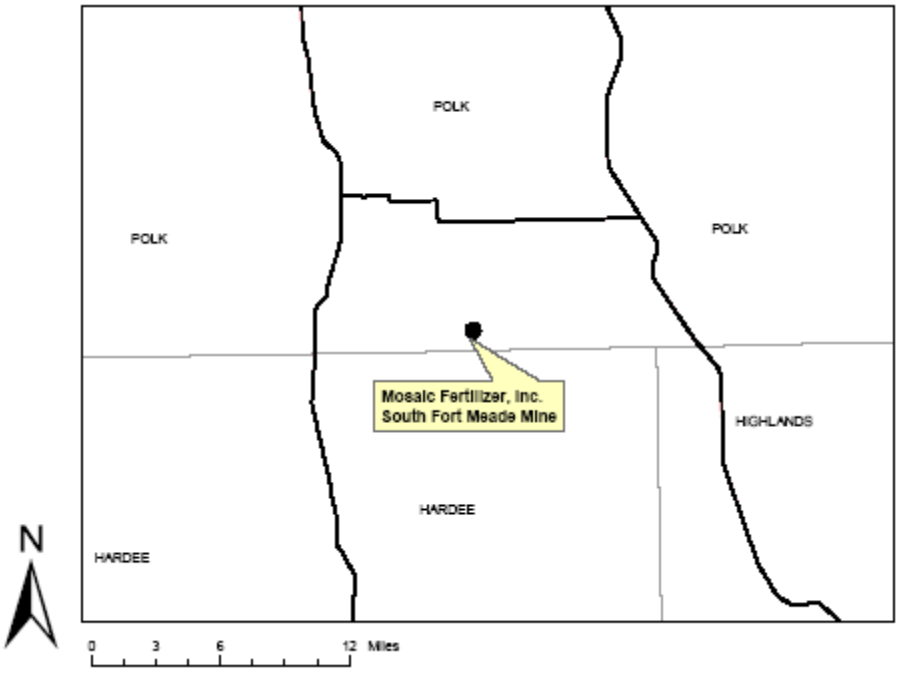
U - Material analyzed for but not detected; value reported is the minimum detection limit

Appendices

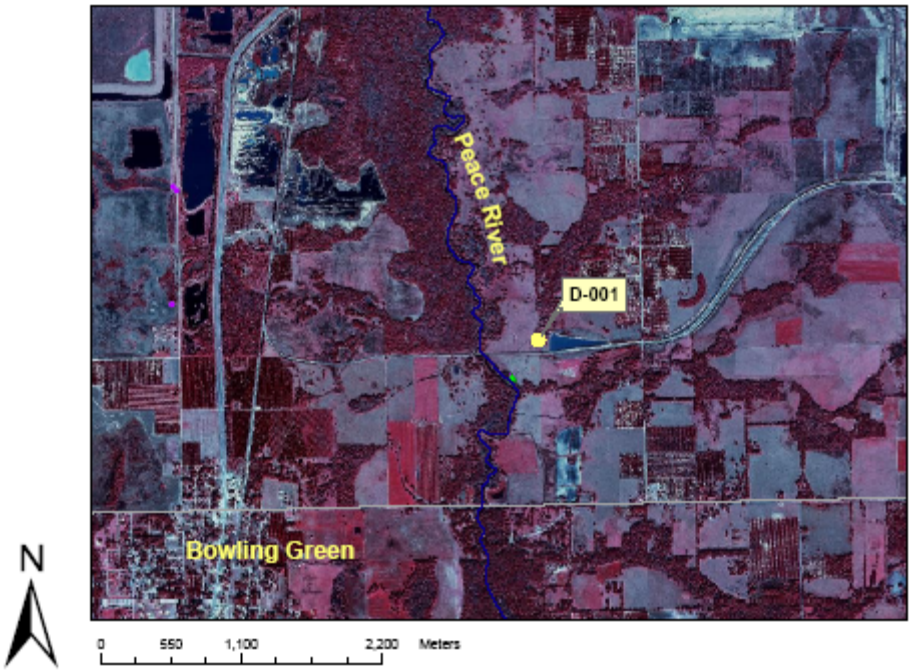
- Appendix 1. Map of Facility
- Appendix 2. Facility summary
- Appendix 3. Explanation of measurements
- Appendix 4. Chemical analyses of effluent.
- Appendix 5. Additional physical, chemical, toxicological and microbiological results
- Appendix 6a. Phytoplankton: Taxa list and density (number of individuals per mL)
- Appendix 6b. Phytoplankton: Taxa list and number of individuals counted

Appendix 1

Map of Facility



South Fort Meade Mine Sampling Site



Appendix 2

State of Florida
Department of Environmental Protection
Facility Summary

Facility Name: Cargill-South Fort Meade Mine		**Prepared By: J. Champion**
Location: 5880 Manley Rd Ft. Meade, FL 33841	**County: Polk**	**District: SWD**
Federal Permit No.: FL0037958 **Expiration Date: 3/14/05**	**State Permit No.: FL0037958** **Expiration Date: 3/14/05**	**Facility Type: IW**
Function of Facility: Cargill Fertilizer, Inc.'s South Fort Meade Mine operations include phosphate mining and beneficiation facilities, phosphatic clay settling areas, sand tailings disposal areas and a mine water recirculation system. The activities include the mining and washing of phosphate ore. The mined ore is slurried into a pit and pumped to the beneficiation plant where the fine clays and sand are separated from the phosphate rock (product) by washing, screening and double flotation. The generated wet phosphate rock is transported to another location for further processing. The separated clays are pumped to settling areas. Sand tailings are pumped as a slurry to mined areas for use as reclamation fill or is stored above grade for later use in reclamation.		
Description of treatment process: Solids are settled out before discharge.		
Receiving Waters: Unnamed Swale then to the Peace River		**Classification:** Class III - Fresh
Design Flow: N/A	**Mean Flow:** 11.44 MGD from 1/03 to 3/04	**Flow During Survey:** 12,667 GPM
Discharge is: Intermittent		
Facility Mixing Zone Details: None		
List Effluent Limits: See Attached Table below.		
Description of permitted outfall: Rectangular Weir structure		
List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: None		
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:		
Discuss MOR trends to prior data; is trend improving or declining:		
Additional Information:		

Page 1 of 4

Parameters (units)	Discharge Limitations			Monitoring Requirements	
	Daily Minimum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow (MGD)	N/A	Report	Report	Continuous	Recorder
Total Non-filterable Residue (TSS) (mg/l)	N/A	30.0	60.0	1/Week	Grab
Total Non-volatile, Non-filterable Residue (FS) (mg/l)	N/A	12.0	25.0	1/Week	Grab
Total Phosphorus (as P) * (mg/l)	N/A	3.0	5.0	1/Week	Grab
Total Phosphorus (as P) (lbs./day) [See Part I.A.3. below]	N/A	Report	Report	1/Week	Calculation
pH (standard units)	6.0	Report	8.5	1/Week	Grab
Specific Conductance (µmhos/cm)	N/A	Report	See I.A.5.	1/Week	Grab
Dissolved Oxygen (mg/l)	5.0	N/A	N/A	1/Month	Grab
Temperature (°F)	N/A	N/A	Report	1/Month	Grab
Total Nitrogen (as N) (mg/l)	N/A	N/A	5.0**	1/Month	Grab
Total Nitrogen (as N) (lbs./day) [See Part I.A.3. below]	N/A	N/A	Report	1/Month	Calculation
Total Nitrogen [as N] (lbs./year)	N/A	N/A	45,040**	1/Year	Calculation
Fluorides (mg/l)	N/A	N/A	10.0	1/Quarter	Grab
Total Sulfates (mg/l)	N/A	N/A	Report	1/Quarter	Grab
Chlorophyll-a (µg/l)	N/A	N/A	Report	1/Quarter	Grab
Gross Alpha Particle Activity **** (pCi/l)	N/A	N/A	15	Semi-Annually	Grab
Combined Radium 226 & 228 *** (pCi/l)	N/A	N/A	5.0	Semi-Annually	Grab
Whole Effluent Toxicity	See I.A.2.				

* Total phosphorus shall be for monitoring and reporting only, except: if monitoring data shows total phosphorus levels exceed 3.0 mg/l monthly average for more than one 30-day period per calendar year, the permittee, upon written notification by the Department, shall prepare and file within 120 days (unless the time is extended by the Department) a study consisting of the following:

(1) a chronology of at least one year's discharge data;
(2) an assessment of the cause and origin of the phosphorus constituent of the discharge;
(3) a description of the discharger's current maintenance operation and management practices directly related to the control of phosphorus;
(4) an evaluation of the environmental significance of the phosphorus levels; and
(5) an identity of reasonable methods to abate, to the extent practicable, the influx of phosphorus into the discharge.

Upon receipt of the report, the Department shall require the applicant to publish a public notice in a newspaper of general circulation in the affected area which states that the report was received and where it is available for public inspection. The Department shall evaluate the report and may amend the discharger's permit to reflect additional requirements (subject to administrative and judicial review), including the implementation of cost-effective management practices or technological advances which

reduce or eliminate the phosphorus in the discharge to the maximum extent practicable.

** Total nitrogen target values (goals) which shall be for monitoring and reporting purposes only. [See Part I.A.9. on page 5 of 26]

*** During the semi-annual sampling event performed in accordance with the monitoring requirements of Part I.A.1. above, a properly preserved sample must be taken for the determination of Gross Alpha Particle Activity as well as Combined Radium (Ra 226 & 228). The sample must be first analyzed for Gross Alpha Particle Activity. If the total value of the Gross Alpha Particle Activity exceeds the MCL of 15 pCi/l, the Combined Radium (Ra 226 & 228) sample shall be analyzed and reported.

**** This parameter represents the Gross Alpha Particle Activity including Radium 226, but excluding Radon and Uranium. [Section 62-302.530(58)(b) F.A.C.]

1. In order to provide the Department with reasonable assurance that the discharge from Outfall 001 does not violate the acute toxicity requirements of Section 62-302.500(d), F.A.C., the permittee shall perform the toxicity tests as specified below and submit the results to the Department.

   The permittee shall initiate the series of tests described below, beginning in the first testing period following the effective date of this permit, to evaluate whole effluent toxicity of the discharge from Outfall 001. All test species, procedures, and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-90/027F, or the most current edition. The control water and dilution water used will be moderately hard water as described in EPA/600/4-90/027F, Table 6, or the most current edition. A standard reference toxicant (SRT) quality assurance (QA) acute toxicity test shall be conducted concurrently or no greater than 30 days before the date of the "routine" test, with each species used in the toxicity tests. The results of all toxicity tests shall be submitted with the discharge monitoring report (DMR). Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

   a. (1) The permittee shall conduct 96-hour acute static renewal toxicity tests using the daphnid, Ceriodaphnia dubia, and the bannerfin shiner, Cyprinella leedsi. All tests will be conducted on single grab samples of 100% whole effluent and on a control.

   (2) If control mortality exceeds 10% for either species in any test, the test(s) for that species (including the control) shall be repeated. A test will be considered valid only if control mortality does not exceed 10% for either species. If, in any separate grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates unacceptable acute toxicity.

   b. (1) The toxicity tests specified above shall be conducted once during the months of December, January and February, and again during the months of July, August and September, but not to exceed two tests per year. Samples shall be collected only during actual discharge events. These tests are referred to as "routine" tests. The permittee shall monitor the toxicity, as described above, for the life of this permit.

   (2) All "routine" tests shall be conducted using a control (0% effluent) and a test concentration of 100% final effluent

   (3) Results from "routine" tests shall be reported according to EPA/600/4-90/027F, Section 12, Report Preparation (or the most current edition), and shall be submitted to the address listed in Part I.B.3.

   c. (1) If unacceptable acute toxicity (greater than 20% mortality of either test species in any grab sample test) is found in a "routine" test, the permittee shall conduct three additional tests on each species indicating unacceptable toxicity. The first additional test will include four grab samples taken over a 24-hour period (6-hr intervals) and run as four separate definitive analyses. The second and third additional definitive tests will be run on a single grab sample collected on the day and time when the greatest toxicity was identified in the first additional definitive test. Results for each additional test will include the determination of LC50 values with 95% confidence limits.

   (2) The first additional test shall be conducted using a control (0% effluent) and a minimum of five

dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent. The dilution series may be modified in the second and third test to more accurately identify the toxicity, such that at least two dilutions above and two dilutions below the target toxicity and a control (0% effluent) are run.

(3) For each additional test, the sample collection requirements and the test acceptability criteria specified in Section 1 above must be met for the test to be considered valid. The first test shall begin within two weeks of the "routine" tests, and shall be conducted weekly thereafter until *three* additional, valid tests are completed. The additional tests will be used to determine if the toxicity found in the "routine" test is still present.

(4) Mortalities of greater than 50% in 100% effluent or an LC50 of less than 100% effluent in any additional definitive test will constitute a violation of these permit conditions, and Rule 62-302.200(1), Rule 62-302.500(1)(d), and Rule 62-4.244(3)(a), F. A. C.

(5) Results from additional tests, required due to unacceptable acute toxicity in the "routine" tests, shall be submitted in a single report prepared according to EPA/600/4-90/027F, Section 12, or the most current edition and submitted within 45 days of completion of the additional, valid tests. Upon completion of the third additional test, the permittee will schedule to meet with the Department within 30 days of the report submittal to identify the cause(s) and corrective actions (if applicable) necessary to remedy the unacceptable acute toxicity.

(6) If acute toxicity is found, chronic toxicity testing may be required.

Appendix 3

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.floridadep.org/labs/sop/index.htm and/or http://www.floridadep.org/labs/qa/index.htm .

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. A list of the analytes tested for, results, data qualifiers, the minimum detection limit and the practical quantitation limit are given in Appendix 4. The results from these analyses were compared with Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1, Appendix 2). Exceedances of Water Quality Criteria may be violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Acute screening toxicity bioassays were performed on the effluent sample using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* following FDEP SOPs TA07_01 and TA07_02. Failure of toxicity testing may constitute a violation of 62-302.520(21), 62-302.530(62) and/or facility permit limits.

(4) Algal Growth Potential (AGP)

The effluent and water from control and test sites are autoclaved, filtered (0.45μm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum,* USEPA 2002*),* and incubated for 14 days (FDEP SOP TA08_05). The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute one line of evidence for violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of ± 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may be a violation of 62-302.530(62) F.A.C..

(5) Algal Phytoplankton Assemblages

Methods: Phytoplankton were sampled using a 1 L grab sample (QA Rule SOP FS7100). Phytoplankton was subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1 and AB05).

Chlorophyll *a* Content: Chlorophyll *a* content is measured in phytoplankton samples to estimate algal biomass (FDEP SOP BB05). High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be a violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present with more equitable abundance among taxa (Magurran 1988). Low diversity scores related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Appendix 4

Chemical analysis of effluent

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 11:00	OUTFALL 001	Bio-AGP/LimNut	Algal Growth Potential	0.673	mg DryWt/L	AJ	0.1	0.3
8/23/2004 11:00	OUTFALL 001	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	1.4	ug/L	U	1.4	4.3
8/23/2004 11:00	OUTFALL 001	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	1.4	ug/L	U	1.4	4.3
8/23/2004 11:00	OUTFALL 001	Bio-Peri/Phyto	Phytoplankton-Quantitative-# Wet Taxa	35	#Taxa			
8/23/2004 11:00	OUTFALL 001	Bio-Peri/Phyto	Phytoplankton-Quantitative-#Diatom Taxa	6	#Taxa			
8/23/2004 11:00	OUTFALL 001	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
8/23/2004 11:00	OUTFALL 001	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
8/23/2004 10:30	BLANKS	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
8/23/2004 10:30	BLANKS	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
8/23/2004 10:30	BLANKS	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
8/23/2004 10:30	BLANKS	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
8/23/2004 10:30	BLANKS	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
8/23/2004 10:30	BLANKS	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Benzidine	95	ug/L	U	95	380
8/23/2004 10:30	BLANKS	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
8/23/2004 10:30	BLANKS	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 10:30	BLANKS	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
8/23/2004 10:30	BLANKS	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
8/23/2004 10:30	BLANKS	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
8/23/2004 10:30	BLANKS	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
8/23/2004 10:30	BLANKS	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
8/23/2004 10:30	BLANKS	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
8/23/2004 10:30	BLANKS	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
8/23/2004 10:30	BLANKS	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
8/23/2004 10:30	BLANKS	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
8/23/2004 10:30	BLANKS	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 10:30	BLANKS	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 11:00	OUTFALL 001	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
8/23/2004 11:00	OUTFALL 001	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
8/23/2004 11:00	OUTFALL 001	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
8/23/2004 11:00	OUTFALL 001	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzidine	95	ug/L	U	95	380
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
8/23/2004 11:00	OUTFALL 001	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
8/23/2004 11:00	OUTFALL 001	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
8/23/2004 11:00	OUTFALL 001	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
8/23/2004 11:00	OUTFALL 001	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
8/23/2004 11:00	OUTFALL 001	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
8/23/2004 11:00	OUTFALL 001	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
8/23/2004 11:00	OUTFALL 001	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6

8/23/2004 11:00	OUTFALL 001	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 11:00	OUTFALL 001	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
8/23/2004 11:00	OUTFALL 001	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
8/23/2004 11:00	OUTFALL 001	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
8/23/2004 11:00	OUTFALL 001	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 11:00	OUTFALL 001	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
8/23/2004 10:30	BLANKS	GC-Water	Alachlor	0.58	ug/L	UJ	0.58	2.3
8/23/2004 10:30	BLANKS	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
8/23/2004 10:30	BLANKS	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
8/23/2004 10:30	BLANKS	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Chlorpyrifos Methyl	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Diazinon	0.048	ug/L	UJ	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Ethion	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Ethoprop	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
8/23/2004 10:30	BLANKS	GC-Water	Fonofos	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Hexazinone	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
8/23/2004 10:30	BLANKS	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
8/23/2004 10:30	BLANKS	GC-Water	Metolachlor	0.48	ug/L	UJ	0.48	1.9
8/23/2004 10:30	BLANKS	GC-Water	Metribuzin	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
8/23/2004 10:30	BLANKS	GC-Water	Naled	0.77	ug/L	UJ	0.77	3.1
8/23/2004 10:30	BLANKS	GC-Water	Norflurazon	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
8/23/2004 10:30	BLANKS	GC-Water	Parathion Methyl	0.096	ug/L	U	0.096	0.38
8/23/2004 10:30	BLANKS	GC-Water	Phorate	0.048	ug/L	U	0.048	0.19
8/23/2004 10:30	BLANKS	GC-Water	Prometryn	0.14	ug/L	UJ	0.14	0.56
8/23/2004 10:30	BLANKS	GC-Water	Simazine	0.048	ug/L	U	0.048	0.19
8/23/2004 11:00	OUTFALL 001	GC-Water	Alachlor	0.6	ug/L	UJ	0.6	2.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Atrazine	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Bromacil	0.28	ug/L	I	0.2	0.8
8/23/2004 11:00	OUTFALL 001	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
8/23/2004 11:00	OUTFALL 001	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Diazinon	0.05	ug/L	UJ	0.05	0.2

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 11:00	OUTFALL 001	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
8/23/2004 11:00	OUTFALL 001	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
8/23/2004 11:00	OUTFALL 001	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
8/23/2004 11:00	OUTFALL 001	GC-Water	Metolachlor	0.5	ug/L	UJ	0.5	2
8/23/2004 11:00	OUTFALL 001	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
8/23/2004 11:00	OUTFALL 001	GC-Water	Naled	0.8	ug/L	UJ	0.8	3.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
8/23/2004 11:00	OUTFALL 001	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
8/23/2004 11:00	OUTFALL 001	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
8/23/2004 11:00	OUTFALL 001	GC-Water	Prometryn	0.15	ug/L	UJ	0.15	0.6
8/23/2004 11:00	OUTFALL 001	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
8/23/2004 10:30	BLANKS	Metals-Water	Aluminum	5	ug/L	U	5	20
8/23/2004 10:30	BLANKS	Metals-Water	Arsenic	6	ug/L	U	6	24
8/23/2004 10:30	BLANKS	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
8/23/2004 10:30	BLANKS	Metals-Water	Calcium	0.2	mg/L	U	0.2	0.8
8/23/2004 10:30	BLANKS	Metals-Water	Chromium	2	ug/L	U	2	8
8/23/2004 10:30	BLANKS	Metals-Water	Copper	1	ug/L	U	1	4
8/23/2004 10:30	BLANKS	Metals-Water	Iron	10	ug/L	U	10	40
8/23/2004 10:30	BLANKS	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
8/23/2004 10:30	BLANKS	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
8/23/2004 10:30	BLANKS	Metals-Water	Nickel	2	ug/L	U	2	8
8/23/2004 10:30	BLANKS	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
8/23/2004 10:30	BLANKS	Metals-Water	Silver	0.01	ug/L	U	0.01	0.04
8/23/2004 10:30	BLANKS	Metals-Water	Zinc	3	ug/L	U	3	12
8/23/2004 11:00	OUTFALL 001	Metals-Water	Aluminum	494	ug/L		5	20
8/23/2004 11:00	OUTFALL 001	Metals-Water	Arsenic	6	ug/L	U	6	24
8/23/2004 11:00	OUTFALL 001	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
8/23/2004 11:00	OUTFALL 001	Metals-Water	Calcium	42.2	mg/L		0.05	0.2
8/23/2004 11:00	OUTFALL 001	Metals-Water	Chromium	2	ug/L	U	2	8
8/23/2004 11:00	OUTFALL 001	Metals-Water	Copper	1	ug/L	U	1	4
8/23/2004 11:00	OUTFALL 001	Metals-Water	Iron	131	ug/L		10	40
8/23/2004 11:00	OUTFALL 001	Metals-Water	Lead	0.47	ug/L		0.05	0.2
8/23/2004 11:00	OUTFALL 001	Metals-Water	Magnesium	14.9	mg/L		0.02	0.08
8/23/2004 11:00	OUTFALL 001	Metals-Water	Nickel	2.5	ug/L	I	2	8
8/23/2004 11:00	OUTFALL 001	Metals-Water	Selenium	0.73	ug/L	I	0.5	2
8/23/2004 11:00	OUTFALL 001	Metals-Water	Silver	0.01	ug/L	U	0.01	0.04
8/23/2004 11:00	OUTFALL 001	Metals-Water	Zinc	3	ug/L	U	3	12
8/23/2004 10:30	BLANKS	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
8/23/2004 10:30	BLANKS	Nutrients-Liquid	Kjeldahl Nitrogen	0.06	mg N/L	U	0.06	0.2
8/23/2004 10:30	BLANKS	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
8/23/2004 10:30	BLANKS	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01

8/23/2004 10:30	BLANKS	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Ammonia-N	0.014	mg N/L	I	0.01	0.02
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Chloride	9.8	mg Cl/L		1	2.5

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Color	20	PCU		5	5
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Fluoride	1.3	mg F/L		0.05	0.1
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Kjeldahl Nitrogen	0.59	mg N/L		0.06	0.2
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	O-Phosphate-P	0.93	mg P/L		0.08	0.2
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Sulfate	190	mg SO4/L		1	2.5
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	TDS	368	mg/L	AQ	15	60
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	TSS	9	mg/L	IQ	4	16
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Total-P	1.1	mg P/L		0.04	0.12
8/23/2004 11:00	OUTFALL 001	Nutrients-Liquid	Turbidity	5.2	NTU		0.05	0.05
8/23/2004 11:00	OUTFALL 001	Overflow	Alpha, Total	2.3	pCi/L			
8/23/2004 11:00	OUTFALL 001	Overflow	Alpha-Counting Error	0.9	pCi/L			
8/23/2004 11:00	OUTFALL 001	Overflow	Oil and Grease	0.69	mg/l	U		
8/23/2004 11:00	OUTFALL 001	Overflow	Radium 226	0.5	pCi/L			
8/23/2004 11:00	OUTFALL 001	Overflow	Radium 226-Counting Error	0.1	pCi/L			
8/23/2004 11:00	OUTFALL 001	Overflow	Radium 228	0.9	pCi/L	U		
8/23/2004 11:00	OUTFALL 001	Overflow	Radium 228-Counting Error	0.5	pCi/L			

FDEP Biology Section - Acute
Bioassay Bench Sheets

Facility: Cargill Fertilizer, Inc. South FT. Meade
Address: 8813 U.S. Highway 41 South
City: Bowling Green **County:** Polk
Contact/District: Jacki Champion / SW
NPDES Permit #: FL 0037958
LIMS Job #: TLH-2004-08-24-05 **LIMS Sample #:** 776304

Sample Collection: Date: 8/23/04 Time: 1100
Hold time Start: Date: 8/23/04 Time: 1100

Comments: 96 hr Screening test Per permit
Bioassay collected from outfall 002 - NPDES site

Lims Data Entry: MF 8/25/04 Data Entry Verification: DN 8/28/04

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:

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

PH adjustment : yes (no) Initial pH NaOH N HCl N Drops mL Final pH
Aeration : yes (no) Initial DO: mg/L Final DO: mg/L Duration: minutes Rate: ~ 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

Temperature Range °C
Incubator # 3 Range 24.2-24.5
Room B246: 23.6-24.5
Waterbath: N/A

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)

Investigators' Signatures
Dennis Nicholson
Marshall Faircloth
Sarah Pinchard
James Daniel

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	not measured			DN
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03				<0.03	HACH	SP	DN
Alkalinity (mg/L as $CaCO_3$):	105	158				79	HACH	JD	SP
Hardness (mg/L as $CaCO_3$):	91	153				199	HACH	JD	DN
Total Ammonia (mg/L as N):	<0.017	<0.017				<0.017	DENVER	DN	JD
Salinity (ppt):	<1	<1				<1	YSI	JD	DN

V.2 2/26/04

Page 000158

FDEP Biology Section - - Bioassay Bench Sheet

Survival

LIMS Sample #: 776304 Test #: 1

Test Started: Date 8/24/04 Time: 1410

Organism: C. dubia

Test Ended: Date 8/28/04 Time: 1055

Organism Batch: 33 Diluent/ Batch: DMW 1 29

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

Chamber Size 30 mL Batch: 5 35 ________

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	CA	5	5	5	5	5	5
	B	CB	5	5	5	5	5	5
	C	CC	5	5	5	5	5	5
	D	CD	5	5	5	5	5	5
100	A	1A	5	5	5	5	5	5
	B	1B	5	5	5	5	5	5
	C	1C	5	5	5	5	5	5
	D	1D	5	5	5	5	5	5
Organisms loaded by: MF		Checked by: (initials)	TO	MF	MF	MF	MF	MF

Loading Verified by: TO

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).

FDEP Biology Section - - Bioassay Bench Sheet

Survival

LIMS Sample #: 776304 **Test #:** 2

Test Started: Date 8/24/04 **Time:** 1400

Organism: C. leedsi

Test Ended: Date 8/28/04 **Time:** 1045

Organism Batch: #20 **Diluent/ Batch:** Well / N/A

Organism Age: 6 days **Food:** YCT *P. subcapitata* Artemia

Chamber Size 1000 **mL** **Batch:** ___ ___ 041254256

Test Volume 500 **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	C17	5	5	5	5	5	5
	B	C18	5	5	5	5	5	5
	C	C19	5	5	5	5	5	5
	D	C20	5	5	5	5	5	5
100	A	C21	5	5	5	5	5	5
	B	C22	5	5	5	5	5	5
	C	C23	5	~~4 10~~ (a) 4, 0	4	4	4 ~~5~~ (b) MF	4 ~~5~~ (b) MF
	D	C24	5	5	5	5	5	5

(a) wrong # - SD.
(b) incorrect entry MF 8/27-28/04

Organisms loaded by: SD

Loading Verified by: MF

Checked by: (initials)	SD	SD	SD	SD	MF	MF

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

Comments:

Test Results:

% mortality in 100% sample ~~0~~ 5 MF error 8/28/04

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).

Bioassay Parameters

LIMS Sample # : 776304 **Test # :** 1 **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	B		D (MF) A
pH (S.U.)	8.2		8.2	8.3	MF 8/28	8.2
Temperature °C	24.5		24.0	24.0	24.4 (WNOVA)	24.4
Dissolved Oxygen mg/L	8.3		7.6	7.5		7.6
Conductivity (µmhos) mmhos	190		180	190		195
(initials) Measured by:	MF		SD	SD		MF
(initials) Recorded by:	MF		SD	SD		MF

Comments: 96 hr A replicate for Parameter MF 8/28/08

Concentration: 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		B	B		(MF) A D
pH (S.U.)	7.8		8.1	7.9		8.1
Temperature °C	24.3		24.0	24.0		24.4
Dissolved Oxygen mg/L	7.9		7.7	7.7		7.6
Conductivity (µmhos) mmhos	530		550	510		610
(initials) Measured by:	MF		SD	SD		MF
(initials) Recorded by:	MF		SD	SD		MF

Comments: See comment at left, MF 8/28/08

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:

V.1 2/24/04

Bioassay Parameters

LIMS Sample # : 776304 **Test # :** 2 **of** 2

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

V.1 2/24/04

Concentration: Control	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.2	8.2	8.4	7.9	8.1	8.3
Temperature °C	24.1	24.8	24.3	24.4	24.4	24.2
Dissolved Oxygen mg/L	8.4	7.5	7.5	7.5	7.2	8.1
Conductivity (µmhos) mmhos	280	265	245	265	255	280
(initials) Measured by:	MF	JD	JD	JD	JD	MF
(initials) Recorded by:	MF	JD	JD	JD	JD	MF

Comments:

Concentration: 100 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.8	7.9	8.1	7.8	7.8	8.0
Temperature °C	24.1	25.2	24.6	24.6	24.6	24.3
Dissolved Oxygen mg/L	7.8	7.4	7.3	7.1	6.9	7.9
Conductivity (µmhos) mmhos	540	545	550	510	525	585
(initials) Measured by:	MF	JD	JD	JD	JD	MF
(initials) Recorded by:	MF	JD	JD	JD	JD	MF

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:

V.1 2/24/04

Appendix 6a

Taxa list and density (number/mL) for phytoplankton collected from the effluent swale of Mosaic Fertilizer, Inc., South Fort Meade Mine, August 23, 2004.

	Effluent
Bacillariophyta	
Bacillariophyceae	1
Cyclotella sp.	60
Navicula sp.	1
Navicula minima	1
Naviculaceae	1
Nitzschia sp.	5
Chlorophycota	
Ankistrodesmus falcatus	2
Chlamydomonas sp.	7
Chlorella sp.	18
Chlorophyceae	7
Cosmarium sp.	2
Dictyosphaerium sp.	1
Lagerheimia subsalsa	1
Scenedesmus sp.	5
Scenedesmus dimorphus	1
Scenedesmus quadricauda	3
Schroederia setigera	11
Selenastrum sp.	24
Selenastrum westii	1
Treubaria setigerum	1
Chrysophyta	
Chrysophyceae	1
Dinobryon sp.	2
Cryptophycophyta	
Cryptomonas sp.	6
Cryptophyceae	3
Cyanophycota	
Anabaena sp.	67
Anabaena circinalis	3
Aphanocapsa sp.	2
Cyanobium parvum	5
Cyanobium plancticum	8
Jaaginema sp.	15
Merismopedia warmingiana	2
Microcystis sp.	1
Pseudanabaena sp.	2
Rhabdogloea sp.	23
Romeria sp.	1
Euglenophycota	
Euglena sp.	2
Lepocinclis sp.	2
Phacus sp.	1
Trachelomonas sp.	2
Prasinophyta	
Spermatozoopsis sp.	2
Pyrrophycophyta	
Glenodinium sp.	2

Appendix 6b

Taxa list and number of individuals counted for phytoplankton collected from the effluent swale of Mosaic Fertilizer, Inc., South Fort Meade Mine, August 23, 2004.

	Effluent
Bacillariophyta	
Bacillariophyceae	19
Cyclotella sp.	1,128
Navicula sp.	19
Navicula minima	19
Naviculaceae	19
Nitzschia sp.	94
Chlorophycota	
Ankistrodesmus falcatus	38
Chlamydomonas sp.	132
Chlorella sp.	338
Chlorophyceae	132
Cosmarium sp.	38
Dictyosphaerium sp.	19
Lagerheimia subsalsa	19
Scenedesmus sp.	94
Scenedesmus dimorphus	19
Scenedesmus quadricauda	56
Schroederia setigera	207
Selenastrum sp.	451
Selenastrum westii	19
Treubaria setigerum	19
Chrysophyta	
Chrysophyceae	19
Dinobryon sp.	38
Cryptophycophyta	
Cryptomonas sp.	113
Cryptophyceae	56
Cyanophycota	
Anabaena sp.	1,260
Anabaena circinalis	56
Aphanocapsa sp.	38
Cyanobium parvum	94
Cyanobium plancticum	150
Jaaginema sp.	282
Merismopedia warmingiana	38
Microcystis sp.	19
Pseudanabaena sp.	38
Rhabdogloea sp.	432
Romeria sp.	19
Euglenophycota	
Euglena sp.	38
Lepocinclis sp.	38
Phacus sp.	19
Trachelomonas sp.	38
Prasinophyta	
Spermatozoopsis sp.	38
Pyrrophycophyta	
Glenodinium sp.	38

The Bioassay of Mosaic Fertilizer, Inc. - South Fort Meade Mine effluent sampled on August 23, 2004, NPDES #FL0037958.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 3 7 9 5 8 11	12 0 4 0 8 2 3	18 **B**	19 **S**	20 2

Remarks

66

The Priority Pollutants Analysis for Bioassay of Mosaic Fertilizer, Inc. - South Fort Meade Mine effluent sampled on August 23, 2004, NPDES #FL0037958.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 3 7 9 5 8 11	12 0 4 0 8 2 3	18 **X**	19 **S**	20 2

Remarks

66