

Biological Assessment of

Florida Mining and Materials Corp.

Leon County

NPDES #FL0034754

Sampled March and April 1993

June 1993

Biology Section
Division of Technical Services

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: Florida Mining and Materials Corp.
County: Leon
NPDES Number: FL0034754
State Permit Expiration Date: 1 July 1993

Toxics Sampling Inspection (XSI)

Date Sampled: 8 March 1993

Results: Petroleum hydrocarbons (2300 µg/L) were detected in the discharge. This is cause for concern, since short chain aliphatic hydrocarbons may be acutely toxic at levels as low as 500 µg/L. Of the five metals found in the effluent, none were present at levels which exceeded Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 8 March 1993

Results: The effluent sample was not toxic to the invertebrate, *Ceriodaphnia dubia,* or to the fish, *Notropis leedsi.*

Impact Bioassessment Inspection (IBI)

Date Sampled: 8 March 1993 and 5 April 1993

Results: Measures of benthic macroinvertebrate community health indicated that both sites were degraded, but that conditions were worse downstream of the Florida Mining discharge. The stress seen in macroinvertebrate populations at the Munson Slough reference site was probably caused by the poor habitat quality and by the general water quality problems associated with urban stormwater runoff. The less hospitable conditions found below the discharge were probably caused by these same factors and also by the previously documented extremely high pH of the effluent. Even though the pH problem had supposedly been corrected before this study, there had been insufficient time for the biota in Lafayette Ditch to recover from the past toxic levels of hydroxyl ions in the system. The attached algal communities in these streams may be responding to factors related to the widespread stormwater runoff which affects both locations. Since the life cycles of algae are shorter than those of macroinvertebrates, the previous episodes of caustic discharges (pH 12.1 water) may not be reflected in the current algal populations. The facility was not discharging during sampling.

Water Quality Inspection (WQI)

Date Sampled: 8 March 1993

Results: Water at both study sites was enriched with nitrate-nitrite. Ammonia at the test site was higher than 80% of other Florida streams. Since the effluent ammonia and nitrate-nitrite levels were lower than those found at the test site, it appeared that this bioreactive nitrogen enrichment was caused by non-point source runoff. Although total phosphorus was elevated in the effluent, TP in the receiving waters was relatively normal (there was no discharge at time of sampling). Algal growth potential tests indicated that both sites suffered from nutrient enrichment, at levels 5 to 6 times higher than the AGP "problem threshold" of 5 mg algal dry wt/L. Occasional algal blooms and depressed macroinvertebrate diversities have previously occurred in Lake Munson.

Introduction

Florida Mining and Materials Corp., located on West Madison Street in Tallahassee, Florida, is a ready-mix concrete batch plant (see maps in Appendix). The facility produces and delivers approximately 600 cubic yards of concrete per day. Runoff, consisting of wash water (cement trucks are acid washed daily to remove the dried product) and stormwater from the mixing silos and sand/gravel piles, is intercepted by a series of three settling ponds. Acid injection is utilized to neutralize the very high pH (sometimes above 12 SU's) of the water in the settling ponds before discharge.

Until February, 1993, unused concrete was also returned to the facility, where it was transferred to a reclaimer unit. The reclaimer unit would separate the sand and gravel portion from the concrete, but a portion of the Portland cement component would be discharged into the settling ponds (greatly increasing pH and TSS). Use of the reclaimer unit was discontinued approximately 6 weeks before this investigation, due to the problems it was causing the wastewater treatment system and effluent quality. This facility discharges on an intermittent basis (rainfall dependent), with a design flow of 0.006 MGD. There was no flow during this investigation. Effluent is discharged over a "V" notch weir to an unnamed tributary of the Class III Munson Slough, which flows to Lake Munson. Water from Lake Munson eventually flows to Ames Sink, where it enters the Floridan Aquifer.

State permit limits for the effluent are as follows: flow (0.006 MGD), TSS (monthly average of 55 mg/L, maximum of 110 mg/L), turbidity (less than or equal to 29 NTU's above background), and pH (6 to 8.5, or not more than 1 unit above or below background) (see facility summary in Appendix).

For the past few years, the facility has consistently violated permit limits for pH and TSS. The extremely caustic (pH of 12.1) nature of the discharge is of particular significance to receiving water organisms, since this pH is toxic to the vast majority of living things. The Department issued a Warning Notice for violations in February, 1992, requiring the submission of a construction permit application to upgrade the treatment facility. This permit, requiring modifications of the facility, as well as changes in its operation, expires on October 31, 1993. One consequence of these enforcement actions was the facility discontinuing its use of the concrete reclaimer unit, thought to be a major contributor to permit violations. EPA is also involved in enforcement actions with this facility. Florida Mining and Materials Corp. currently has plans to sell this property to the Florida State University.

Major characteristics of community structure of control and test sites.

	Control Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	16	10
Florida Index	5	1
% Contribution of Dominant Taxon	29.3	92.2
% Oligochaeta	43.1	92.2
% Diptera	50.0	2.9
% Gastropoda	5.0	0
% Collembolla	0	0
% Hirudinea	0	2.9
% Other	1.9	2.0
% Predators/ Carnivores	1.4	2.9
% Deposit feeders (above surface)/ Collector-Gatherers	21.6	1.5
% Deposit feeders (below surface)	48.3	92.2
% Suspension feeders/ Collector-Filterers	0.6	0
% Scavengers	0	2.9
% Scrapers	6.4	
% Shredders	21.6	0.5
Periphyton Algae		
Number of Taxa	17	10
% Contribution of Dominant Taxon	69.4	32.4
Chlorophyll a (mg/sq. m)	1.7	7.7
Diatom/Diatom + B-G Abundance Ratio	0.15	0.71
% Blue-green	88.9	21.9
% Green	0.6	23.7
% Diatoms	15.0	54.3
% Euglenophyta	0.6	0
Algal Growth Potential (mg dry wt/L)	25.0	31.6

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in Munson Slough, upstream of the discharge) and a test site (located in a tributary of Munson Slough, referred to in this report as Lafayette Ditch, downstream of the discharge) (see maps in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Notropis leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Hester-Dendy artificial substrates were vandalized (data not recovered) during the incubation period. Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Chlorophyll *a* was also determined for periphyton communities (Ross 1990). Algal Growth Potential tests, using Sel*enastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of these, such as the number of taxa, and chlorophyll *a* are well known. Others are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*i.e.*, many clean-water organisms are present). Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI for functional feeding groups.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, Florida Index and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving the percent contribution of dominant taxon, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts (DER Northwest District) and Lyn Burton, Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Kim Pearce, Urania Quintana, Landon Ross, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.

Results and Discussion

Habitat was an obvious limiting factor for biological success at the study sites, with only 42 points at the reference site and 43 points at the test site (Appendix). Very little productive substrate, consisting predominantly of consolidated clay, concrete rubble, and very sparse macrophyte coverage, was available at either station. The banks of this steeply sloped, channelized ditch were heavily eroded, vegetated primarily by weedy grasses. This vegetation appeared to have been recently mowed. Water velocity was the only factor observed which was favorable for benthic macroinvertebrates (up to 0.4 m/sec in

Munson Slough and up to 0.2 m/sec in Lafayette Ditch). At the sampling stations, both streams were mostly shallow (0.1 m deep), with no shading from trees. Non-point sources of pollution from roadways, as well as from residential, commercial, and industrial areas, were obvious at both sites.

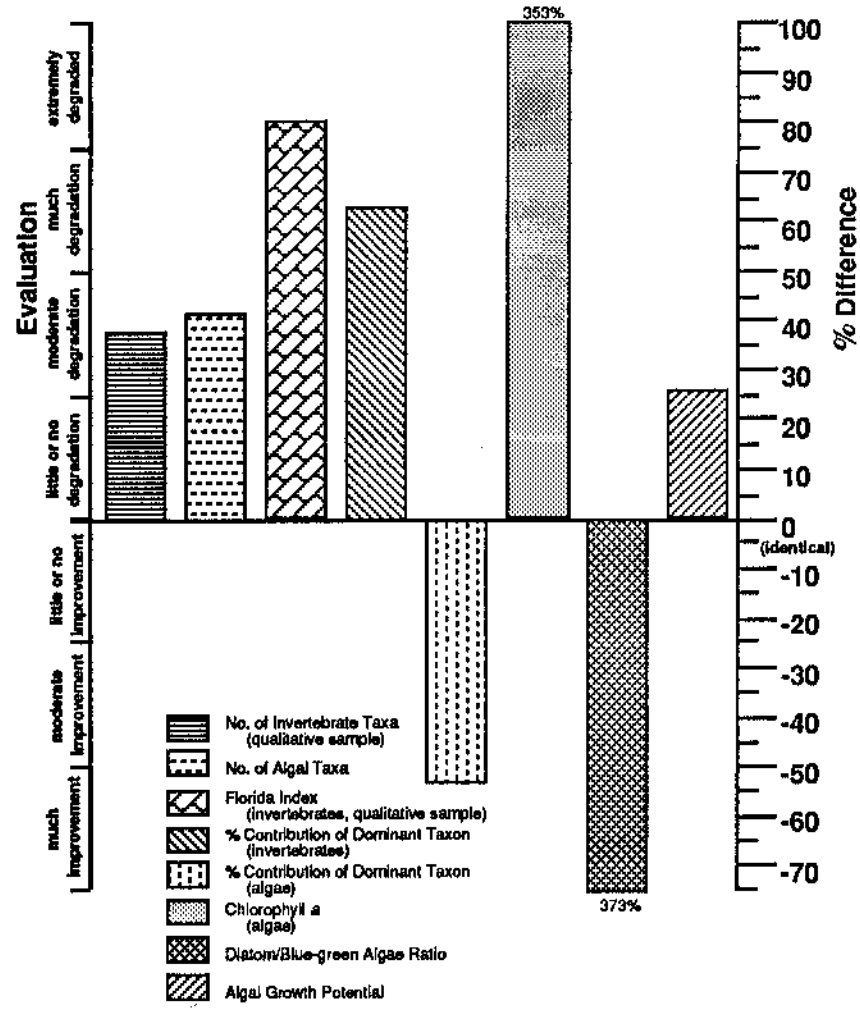
Construction run-off from Doak Campbell Stadium, which affected only the reference site, was very prevalent during a reconnaissance trip. Oily globs and high turbidity water was observed entering Munson Slough from the stadium just upstream of the reference site, on 3 March 1993. The District Branch Office sent a Warning Letter to the Florida State University and Culpepper Construction on March 8, 1993 due to the documented turbidity and oil/grease violations.

Due to a meter malfunction, dissolved oxygen was not measured, however, pH was 8.5 and 8.3 at the reference and test sites, respectively. Specific conductance was somewhat higher below the discharge (420 µmhos/cm) than at the reference station (300 µmhos/cm).

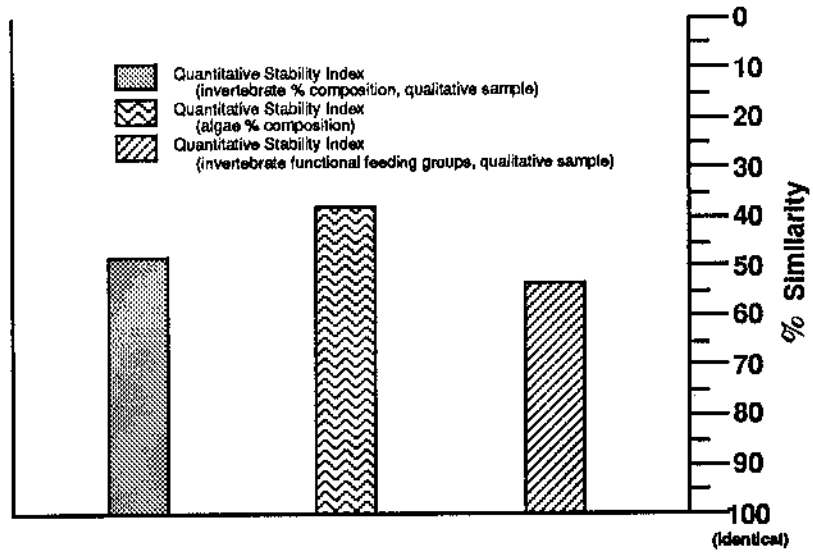
Petroleum hydrocarbons (2300 µg/L) were detected in the discharge. This is cause for concern, since short chain aliphatic hydrocarbons may be acutely toxic at levels as low as 500 µg/L (Dye and Frydenborg 1980). Aluminum (217 µg/L), cadmium (0.35 µg/L), chromium (26 µg/L), iron (281 µg/L), and zinc (21 µg/L) were found in the effluent in concentrations above the practical quantitation limit. None of these metals values represents a violation of Class III standards.

The effluent sample was not toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*. No mortality occurred in either 48 hour static acute bioassay (Appendix).

Water at both study sites was enriched with nitrate-nitrite, where concentrations exceeded 80% (at the reference site) to 85% (at the test site) of other Florida streams (see Table of typical water quality parameters in the Appendix). Nitrate-nitrite was increased from 0.31 mg/L at the Munson Slough reference site, to 0.51 mg/L downstream of the facility in Lafayette Ditch. Since the effluent nitrate-nitrite level was 0.46 mg/L, the facility did not appear responsible for the increase. Furthermore, the facility was not discharging during the time of sampling. Ammonia at the test site (0.22 mg/L) was higher than 80% of other Florida streams. Interestingly, ammonia was very low in the effluent (0.02 mg/L) and relatively normal (0.07 mg/L, or the 45th percentile compared to other systems) at the Munson Slough reference site. The bioreactive nitrogen enrichment was apparently caused by non-point source runoff. Although total phosphorus was elevated in the effluent (1.2 mg/L), TP in the receiving waters (0.1 mg/L to 0.12 mg/L) was relatively normal. When this intermit-



Effect of discharge on receiving stream
(measured as difference between control and test sites).



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

tent discharge begins flowing (*e.g.*, after a rain event), phosphorus enrichment may occur at the test site and farther downstream in Munson Slough.

Algal growth potential tests indicated that both sites suffered from nutrient enrichment. AGP was 25.0 mg algal dry wt/L at the reference site, and 31.6 mg algal dry wt/L at the test site. According to Raschke and Schultz (1987), at AGP levels above 5 mg dry wt/L, enrichment problems such as excessive algal growth and fish kills are likely to occur. Occasional algal blooms and depressed macroinvertebrate diversities have occurred in Lake Munson, thought to caused by non-point sources, as well as from previous domestic waste discharges (FDER 1988). The effluent AGP was 25.7 mg algal dry wt/L.

Measures of benthic macroinvertebrate community health indicated that both sites were degraded, but that conditions were worse downstream of the Florida Mining discharge. The figure on p. 3 indicates the degree of difference between the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference site. The relative abundance of each individual taxon appears in the Appendix. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Taxa richness was unusually depressed at both stations, ranging from 16 to 10 taxa at reference and test sites, respectively. These values are lower than 80% (reference site) to 95% (test site) of typical Florida streams. Florida Index was also much lower than expected at both sites, which should be 20 points at a minimum for flowing streams in north Florida. Florida index was reduced from 5 points at the reference site to 1 point at the test site. This indicates that although pollution sensitive taxa were very scarce in Munson Slough, conditions were worse below the discharge.

The benthic populations at both sites were dominated by organisms typical of polluted situations, such as *Cricotopus bicinctus* and *Limnodrilus hoffmeisteri* (Hudson *et al.* 1990). The stress seen in macroinvertebrate populations at the reference site was probably caused by the poor habitat quality and by the general water quality problems associated with urban stormwater runoff (*e.g.*, turbidity, BOD, oils and greases, metals). The less hospitable conditions found below the discharge were probably caused by these same factors and also by the previously documented extremely high pH of the effluent. Even though the pH problem had supposedly been corrected approximately six weeks before this study, there had been insufficient time for the biota in Lafayette Ditch to recover from the past toxic levels of hydroxyl ions in the system.

There were some differences in periphyton communities between the reference and test sites, but two measurements of algal health indicated degradation and two measurements indicated improvement. While 17 taxa were collected at the reference site, only 10 were represented in the test site sample (see taxa list in Appendix). There was a 353% increase in periphyton biomass (chlorophyll *a*) at the test site, compared to the control. On the other hand, the percent contribu-

tion of the dominant taxon was lower at the test site (usually regarded as improvement). Similarly, diatoms (54.3%) were most numerous in Lafayette Ditch, while 21.9 % of the population there consisted of cyanophytes. The reference site population had a considerably higher abundance of blue-greens (83.9%) and fewer diatoms (15.0%). This contributed to a better diatom to blue green ratio at the test site. The interpretation of these data is complicated by the widespread stormwater runoff which affects both locations. The attached algal communities in these streams may be responding to different factors related to these non-point sources, which have not been quantified. Since the life cycles of algae are shorter than those of macroinvertebrates, the previous episodes of caustic discharges (pH 12.1 water) may not be reflected in the current algal populations.

Conclusions

Poor quality habitat and stormwater runoff were factors affecting the biological success at both study sites.

Petroleum hydrocarbons (2300 µg/L) were detected in the discharge. This is cause for concern, since short chain aliphatic hydrocarbons may be acutely toxic at levels as low as 500 µg/L (Dye and Frydenborg 1980). Of the five metals found in the effluent, none were present at levels which exceeded Class III standards.

The effluent sample was not toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Notropis leedsi*. No mortality occurred in either 48 hour static acute bioassay.

Water at both study sites was enriched with nitrate-nitrite, where concentrations exceeded 80% (at the reference site) to 85% (at the test site) of other Florida streams. Ammonia at the test site was higher than 80% of other Florida streams. Since the effluent ammonia and nitrate-nitrite levels were lower than those found at the test site, it appeared that this bioreactive nitrogen enrichment was caused by non-point source runoff. Although total phosphorus was elevated in the effluent (1.2 mg/L), TP in the receiving waters (0.1 mg/L to 0.12 mg/L) was relatively normal. When this intermittent discharge begins flowing (*e.g.*, after a rain event), phosphorus enrichment may occur at the test site and farther downstream in Munson Slough.

Algal growth potential tests indicated that both sites suffered from nutrient enrichment, at levels 5 to 6 times higher than the AGP "problem threshold". Occasional algal blooms and depressed macroinvertebrate diversities have occurred in Lake Munson, thought to be caused by non-point sources, as well as from previous domestic waste discharges (FDER 1988).

Measures of benthic macroinvertebrate community health indicated that both sites were degraded, but that conditions were worse downstream of the Florida Mining discharge. Taxa richness and the Florida Index were unusually depressed at both stations, but were lower downstream of the discharge. The benthic populations at both sites were dominated by organisms typical of polluted situations. The stress seen in macroinvertebrate populations at the reference site was probably caused by the poor habitat quality and by the general water quality problems associated with urban stormwater runoff. The less hospitable conditions found below the discharge were probably caused by these same factors and also by the previously documented extremely high pH of the effluent. Even though the pH problem had supposedly been corrected approximately six weeks before this study, there had been insufficient time for the biota in Lafayette Ditch to recover from the past toxic levels of hydroxyl ions in the system.

There were some differences in periphyton communities between the reference and test sites, but two measurements of algal health indicated degradation and two measurements indicated improvement. The interpretation of the algal data was complicated by the widespread stormwater runoff which affects both locations. The attached algal communities in these streams may be responding to factors related to these non-point sources, which have not been quantified. Since the life cycles of algae are shorter than those of macroinvertebrates, the previous episodes of caustic discharges (pH 12.1 water) may not be reflected in the current algal populations. It should be noted that there was no discharge during the time of sampling.

Literature Cited

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Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 p.

Chemistry summary table for Florida Mining and Materials Corp.

	Effluent	Control Site	Test Site
Organic Constituents (ug/L)			
Total extractable petroleum hydrocarbons	2300		
Metals (ug/L)			
Aluminum	217 A		
Arsenic	20 U		
Cadmium	0.35 T		
Copper	5 U		
Chromium	26 A		
Iron	281		
Lead	30 U		
Mercury	0.1 U		
Nickel	5 U		
Silver	0.1 U		
Zinc	21 A		
Nutrients (mg/L)			
Ortho-phosphate	1.0	0.08	0.12
Total phosphorus	1.2	0.10	0.12
Ammonia	0.02	0.07	0.22
Nitrate+Nitrite	0.46	0.31	0.51
TKN	0.34	0.45	0.66
Other Parameters			
Habitat Assessment		42	43
D.O. (mg/L)		Meter malfunction	Meter malfunction
pH (SU's)	7.1	8.5	8.3
Conductivity (µmhos/cm)	910	300	420
Temperature (°C)		Meter malfunction	Meter malfunction
AGP (mg dry wt/L)	25.7	25.0	31.6
Bioassay Fish	Not toxic		
Bioassay Invertebrate	Not toxic		

A - Value reported is the mean of two or more determinations
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material
O- Sampled, but analysis lost or not performed
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the minimum detection limit
T- Value reported is less than the practical quantitation limit

Typical Values for Selected Parameters in Florida Waters

Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
					Percentile Distribution						
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphorus	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphorus	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphorus	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

Units:
Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates



SCALE 1 : 24000

0 1/2 1 MILE

1000 0 1000 2000 FEET

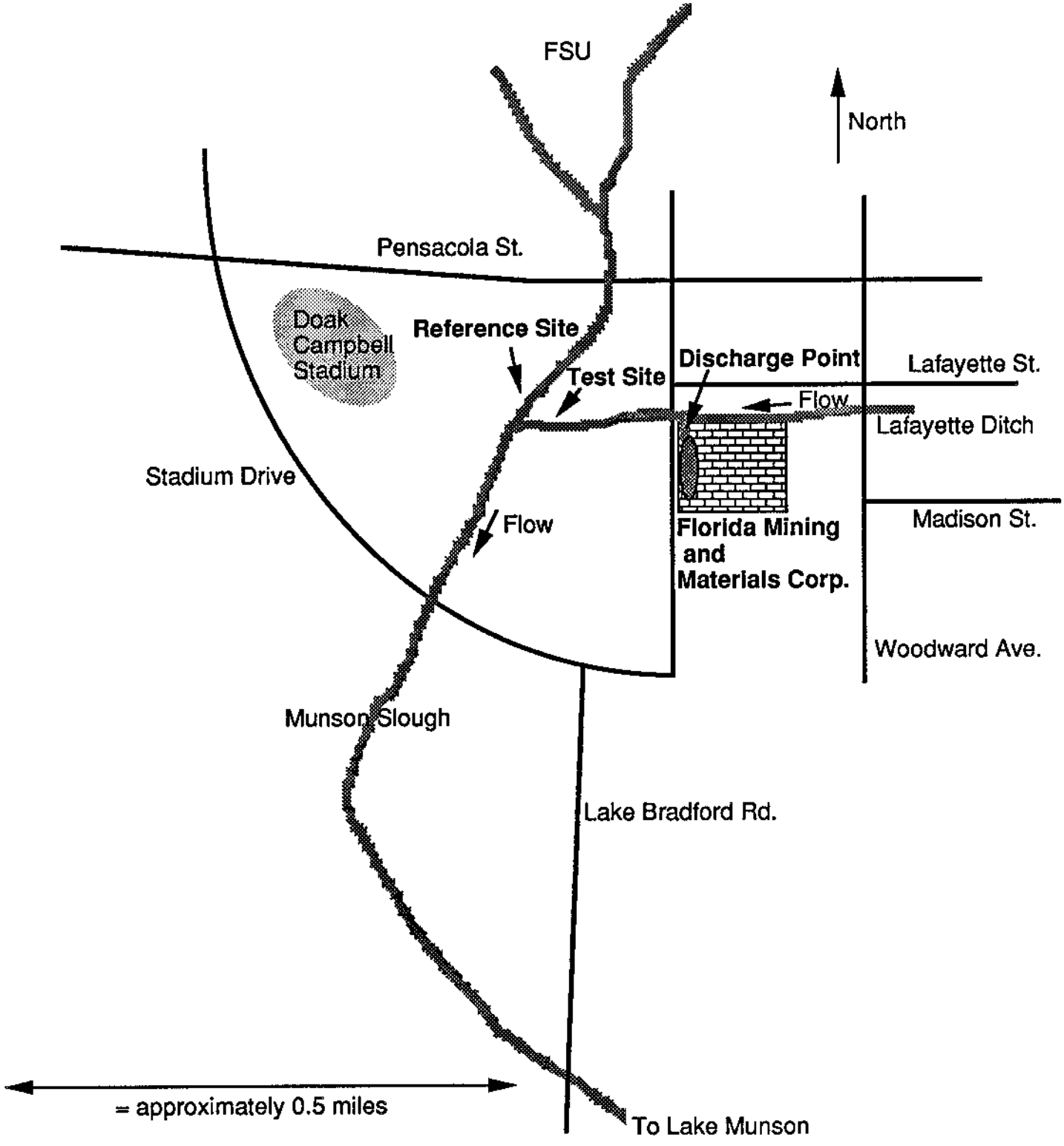
SITE LOCATION MAP

FLORIDA MINING & MATERIALS CORPORATION

TALLAHASSEE, LEON COUNTY, FLORIDA

USGS QUAD: TALLAHASSEE, FLORIDA 1976

Station Location Map for Florida Mining and Materials Corp Bioassessment



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name:		Date Summary Prepared:
Location (attach detailed map):	County	District
Federal Permit # and expiration date: N/A	State GMS # and State expiration date:	Facility Type: Industrial Municipal Federal Agricultural Other (list):

Function of facility:

Description of treatment process: Consists of a reclaimed water storage pond with [illegible] discharges into Lake Munson. Has since stopped USING reclaimed water. Storm water runoff [illegible]

Receiving waters: Lake Munson	Classification: I II III

Design Flow: .005 MGD	Mean Flow: —	Flow during survey: 0.0

Discharge is: Continuous Intermittent Seasonal Rainfall dependent
Other (describe) Batch

therefore, the best time to sample is:

If facility has a mixing zone, give details (size, parameters affected, etc.):

N/A

List effluent limits (if necessary, attach relevant paperwork):

Parameter	Limit (units)
Flow	.005
Total Suspended Solids	55 mg/l (monthly Average); 110 mg/l (max)
Turbidity	≤ 29 NTU's above Background
PH	[illegible]
Total Dissolved Solids	N/A

Describe special permit conditions and permit modifications:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

(Facility)

Description of permitted outfall(s):

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: A review of the monthly operating reports for the past year indicates the following:

1. The Facility has exceeded the monthly average concentrations for [illegible]
2. The levels were high in the winter [illegible] 12.1 in the months of March and April
3. From February 1990 to November 1991, the Facility was in compliance only once

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:

Enforcement actions: A warning letter was issued on February [illegible] regarding submission of a construction permit application to upgrade the Facility. However, to date the construction permit has not been issued. Further enforcement may be taken if the upgrade is not forthcoming.

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:

Additional information:

Staff contributing to this review (signature):

(Biologist)

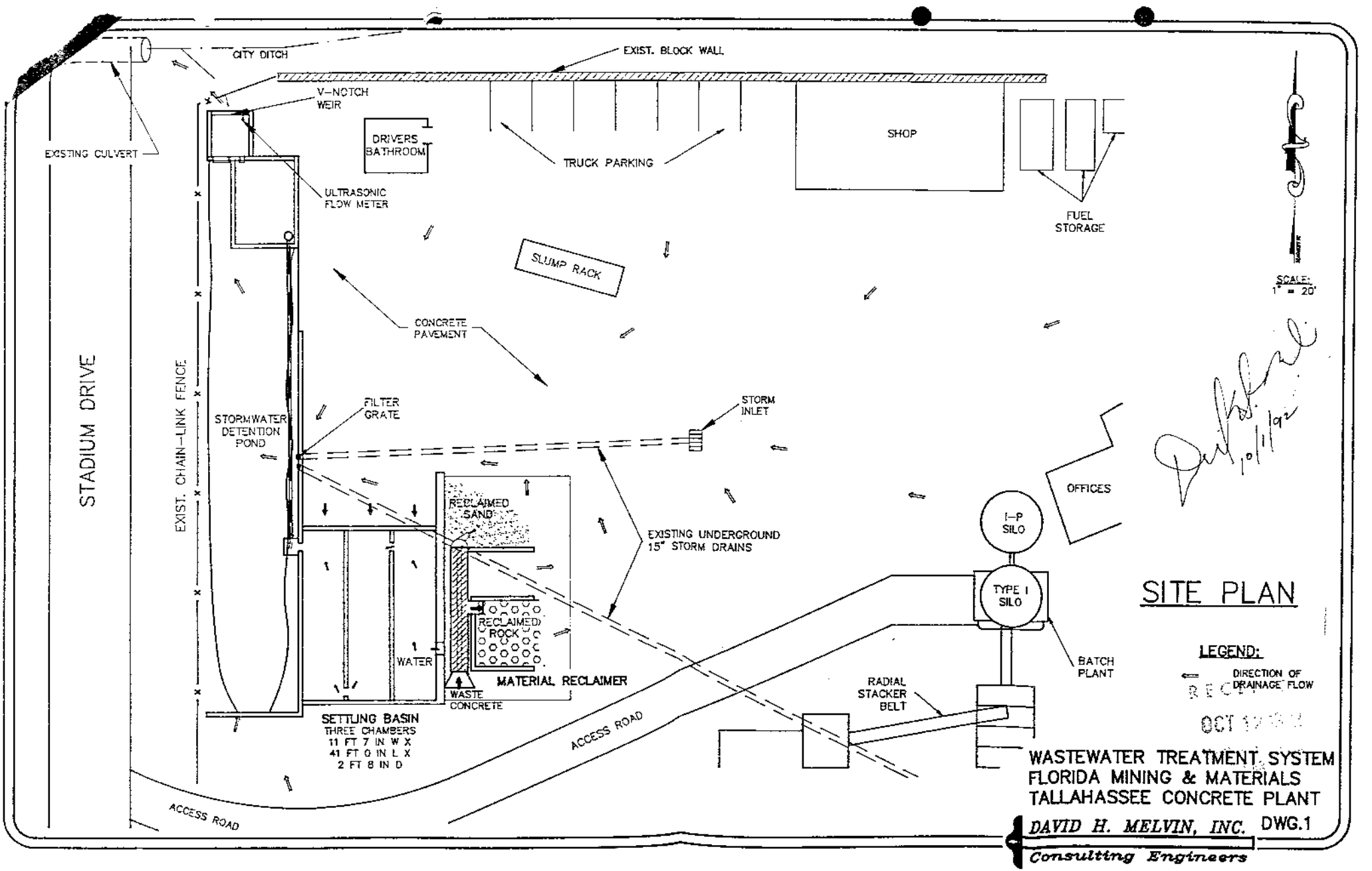
(Inspector)

(Engineer)

( )

( )

( )


CITY DITCH
EXIST. BLOCK WALL
V-NOTCH WEIR
EXISTING CULVERT
DRIVERS BATHROOM
TRUCK PARKING
SHOP
FUEL STORAGE
ULTRASONIC FLOW METER
SLUMP RACK
SCALE: 1" = 20'
CONCRETE PAVEMENT
STADIUM DRIVE
EXIST. CHAIN-LINK FENCE
STORMWATER DETENTION POND
FILTER GRATE
STORM INLET
RECLAIMED SAND
EXISTING UNDERGROUND 15" STORM DRAINS
OFFICES
I-P SILO
TYPE I SILO
RECLAIMED ROCK
WATER
WASTE CONCRETE
MATERIAL RECLAIMER
BATCH PLANT
RADIAL STACKER BELT
SETTLING BASIN
THREE CHAMBERS
11 FT 7 IN W X
41 FT 0 IN L X
2 FT 8 IN D
ACCESS ROAD
ACCESS ROAD
SITE PLAN
LEGEND:
DIRECTION OF DRAINAGE FLOW
OCT 12
WASTEWATER TREATMENT SYSTEM
FLORIDA MINING & MATERIALS
TALLAHASSEE CONCRETE PLANT
DAVID H. MELVIN, INC.
Consulting Engineers
DWG.1

DEPARTMENT OF ENVIRONMENTAL REGULATION

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 3-8-93	RECEIVING BODY OF WATER: MUNSON SL.

REMARKS:	LOCATION: FLA MINING	FIELD ID/NAME: REFERENCE

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 10	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 30	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 1	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 1	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 1	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments 0	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	**TOTAL SCORE** 42

COMMENTS: Hydrocotyl, Juncus, mostly grasses

ANALYSIS DATE: 3-8-93	ANALYST: RSF	SIGNATURE: Russell Frydenborg

DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		3-8-93	1330	MUNSON SL

REMARKS:	LOCATION:	FIELD ID/NAME:
DO METER MALFUNCTION	MUNSON SLOUGH ABOVE FLA MINING DISCHARG	REFERENCE SITE

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			30	20	50	

Local Watershed Erosion (check box): None ☐ Moderate ☐ Heavy ☒

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☐ Obvious sources ☒

Point-Source Pollution (list location and describe): FSU, TENNESSEE ST, STADIUM DR.

Estimated System Width (range, m): .5 - 4	Estimated System Depth (range, m): .1 - 1.5	yes
High Water Mark (m above bed): 2.5	Velocity (range, m/s): .1 - .4	Impounded ☐ Channelized ☒

Canopy Cover % : Open : ☒ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☐ Slight: ☒ (Oil sheen patches) Moderate: ☐ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	0			Rock or Shell Rubble (FEW)	5	7	NET
Leaf Packs	0			Sand	95	5	NET
Aquatic Vegetation	2	7	NET	Mud/Muck SILT	5	3	NET
Submerged Roots	0			Other:			
Undercut Banks	0			Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top	SURF		8.5		300			
Mid-depth								
Bottom								

System Type : Stream: ☒ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): Slick: ☐ Sheen: ☐ Globs: ☐ None: ☒

Clarity (check box): Clear: ☒ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☒ Clear: ☐ Other: ☐

Weather Conditions: CLEAR, SUNNY

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☐	☒	☐	☐
Iron/sulfur Bacteria	☐	☐	☒	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
SIME	Russell Frydenborg	

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		3-8-93	1300	MUNSON SL CENTRAL DITCH

REMARKS:	LOCATION:	FIELD ID/NAME:
	FLA MINING DOWNSTREAM	TEST SITE

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
			30	20	50	

Local Watershed Erosion (check box): None ☐ Moderate ☐ Heavy ☒

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☐ Obvious sources ☒

Point-Source Pollution (list location and describe): FLA MINING 100 M UPSTREAM OF THIS SITE

Estimated System Width (range, m):	1-2	Estimated System Depth (range, m):	.1-.5	yes
High Water Mark (m above bed):	2.5	Velocity (range, m/s):	.05-.2	Impounded ☐ Channelized ☐

Canopy Cover % : Open : ☒ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☐ Other: ☒ SLIT

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	0			Rock or Shell Rubble (Gravel)	15	7	NET
Leaf Packs	0			Sand	60	3	NET
Aquatic Vegetation	5	7	NET	Mud/Muck	20	3	NET
Submerged Roots				Other: RIFFLE			
Undercut Banks				Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top	SURF		8.3		420			BOTTOM
Mid-depth								
Bottom								

System Type : Stream: ☒ (Surficial Aquifer Fed / Deep Aquifer Fed / Alluvial / Blackwater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): Slick: ☐ Sheen: ☐ Globs: ☐ None: ☒

Clarity (check box): Clear: ☒ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☒ Clear: ☐ Other: ☐

Weather Conditions: CLEAR, SUNNY

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☐	☒	☐	☐
Aquatic Macrophytes	☐	☒	☐	☐
Iron/sulfur Bacteria	☐	☐	☒	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
TANSKI, QUINTANA, BURTON, WYNN, FRYDENBORG	Russel Frydenborg	3-8-93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		3-8-93	MUNSON SL.

REMARKS:	LOCATION:	FIELD ID/NAME:
	FLA MINING	TEST SITE

Habitat Parameter score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover 15	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity 20	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration 3	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability 2	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality 3	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments		TOTAL SCORE
	Add **5 points** if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	43

COMMENTS: HYDROCOTYL, LUDWIGIA, JUNCUS, WOODY GRASSES

ANALYSIS DATE:	ANALYST:	SIGNATURE:
3-8-93	REF	Russell Frydenborg

Sample Source: Florida Mining
Location:
County: Leon
Contact/District: R Frydenborg / LAB
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 3/8/93 Time 1330
Test Beginning: Date 3/9/93 Time 12:30
Test Ending: Date 3/11/93 Time 12:25
Organism Batch #: 11 Diluent Batch #: 9
Organism Age: <24 hrs.

Test Organism: Ceriodaphnia dubia

irms93mar09 08 5/104

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.4	8.4 @ 23.9	973 @ 1,000 9710 @ 10,000 (24.1)
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 23.0	8.5 @ 23.6	980 @ 1,000 (@24.5°) 9800 @ 10,000
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.5 @ 23.4	970 @ 1,000 (@24.3°) 9720 @ 10,000

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.4		8.3	23.1		23.1	8.7		8.0	145		155
Control	B	5	5	5			8.3						8.0			155
Control	C	5	5	5			8.3						8.0			160
Control	D	5	5	5			8.3						8.0			155
100 %	A	5	5	5	7.3		7.9	23.0		23.3	8.6		8.0	820		860
100 %	B	5	5	5			7.9						8.0			880
100 %	C	5	5	5			7.9						8.1			900
100 %	D	5	5	5			7.9						8.1			920
Measured/Loaded by:		TR	TR	TM	TM		TM	TM		TM	TM		TM	TM		TM
Recorded by:		TR	TR	TM	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

Marshall Frydenborg
Tina Mikeladis
Tobin Rader

Reviewer

form updated 10/20/92

	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			Not measured		
Lab Total Residual Cl2:	0.02	0.02	0.04	DR-100	TM
Alkalinity:	115	60	40	Hach	TM
Hardness:	120	70	330	Hach	TM
Total Ammonia:	<0.01	<0.01	<0.01	Orion	MF

Cl_2 Blank: 0. Ammonia Meter Slope: -54.4. Ammonia Blank: <0.01 Sample Salinity: ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida Mining
Location:
County: Leon
Contact/District: R. Frydenborg / 1116
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 3/8/93 Time 1330
Test Beginning: Date 3/9/93 Time 12:30
Test Ending: Date 3/11/93 Time 12:25
Organism Batch #: 10 Diluent Batch #: well
Organism Age: 10 days
Test Organism: Mysidopsis bahia

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Lims 93MAR0908 5/10/4
Test Number: 2 of 2
Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.4 @ 22.4	8.4 @ 23.9	973 @ 1,000 9710 @ 10,000 241
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.9 @ 23.0	8.5 @ 23.6	980 @ 1,000 @ 24.5° 9800 @ 10,000
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.5 @ 23.4	970 @ 1,000 9720 @ 10,000 @ 24.3°

Conc.	Chamber #	Number Live 0	Number Live 24	Number Live 48	pH 0	pH 24	pH 48	Temperature (°C) 0	Temperature (°C) 24	Temperature (°C) 48	D.O. (mg/L) 0	D.O. (mg/L) 24	D.O. (mg/L) 48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	48	5	5	5	7.9	8.2	8.4	23.4	23.2	23.1	8.4	8.7	7.9	245	240	245
Control	57	5	5	5	7.9	8.2	8.4				8.4	8.7	7.9	245	240	245
100%	19	5	5	5	7.1	7.5	7.6	22.8	23.1	23.0	8.6	8.2	7.6	910	900	900
100%	3	5	5	5	7.1	7.5	7.6				8.7	8.2	7.6	910	905	910
Measured/Loaded by:		TR	TM	TR	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM
Recorded by:		TR	TR	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR

Investigators' Signatures

Tony Mikulski
Robin Rader
Marshall Faircloth

Reviewer

form updated 10/20/92

	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			Not measured		
Lab Total Residual Cl2:	0.02	0.02	0.04	DR-100	TM
Alkalinity:	115	65	40	Hach	TM
Hardness:	120	70	330	Hach	TM
Total Ammonia:	<0.017	<0.017	<0.017	Orion	MF

Cl_2 Blank: _____ Ammonia Meter Slope: -54.4 Ammonia Blank: <0.017 Sample Salinity: _____ ppt

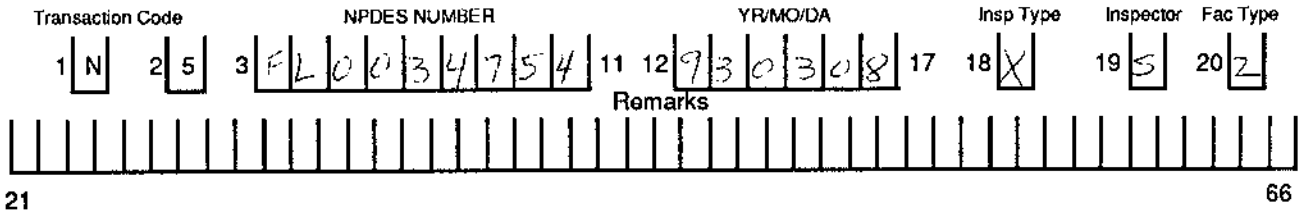
Periphyton taxa list for Florida Mining & Material Corp., collected via glass microscope slides on 5 April, 1993. Densities are in number/mm^2.

	Reference Site	Test Site
Diatoms		
Achnanthes lanceolata	6	–
A. lanceolata v. *dubia*	6	–
Amphora normanii	6	102
Cocconeis placentula	6	–
Gomphonema parvulum	6	10
Navicula cryptocephala	11	–
N. dicephala	6	–
N. minima	11	10
N. minuscula	–	363
N. viridula	23	5
Nitzschia amphibia	40	10
N. palea	34	107
Chlorophyta		
Scenedesmus sp.	6	–
Stigeocolonium sp.	–	266
Cyanophyta		
Anabaena sp.	6	–
Gloeocapsa sp.	17	–
Microcystis sp.	706	97
Plectonema sp. ?	124	148
Euglenophyta		
Phacus sp.	6	–

Taxa list for Florida Mining and Materials Corp., collected via 20 discrete dip net sweeps at a reference site in Munson Slough (upstream of the discharge) and in a tributary of Munson Slough (downstream of the discharge) on 8 March 1993.

	Reference Site	Test Site
Coleoptera		
Desmopachria sp.	–	1
Collembola		
Undetermined collembolid	–	3
Diptera		
Chironomus sp.	1	–
Cricotopus bicinctus	47	–
Cricotopus/Orthocladius grp. sp.	11	1
Undetermined culicid	1	–
Palpomyia grp. sp.	–	1
Undetermined psychodid	–	1
Undetermined dipteran pupae	20	–
Gastropoda		
Physella sp.	9	–
Hemiptera		
Undetermined hemipteran	–	1
Hirudinea		
Mooreobdella sp.	1	–
Odonata		
Argia fumipennis	1	–
Oligochaeta		
Bratislava unidentata	13	–
Dero nivea	2	–
Dero trifida	1	–
Dero vaga	1	–
Undetermined enchytraeid	2	6
Limnodrilus hoffmeisteri	22	82
Lumbriculus variegatus	19	–
Nais pardalis	8	–
Pristina aequiseta	–	2
Pristina plumaseta	–	5
Pristinella jenkinae	1	–

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



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

