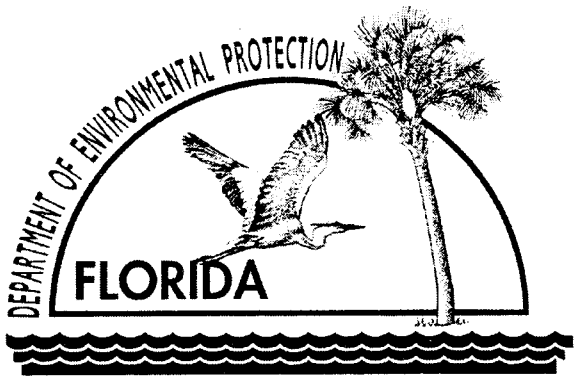


Biological Assessment of

Macclenny Wastewater Treatment Plant

Baker County

NPDES #FL0040495

Sampled March 1999

January 2000

Biology Section
Division of Administrative and Technical Services
Bureau of Laboratories

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger:	Macclenny Wastewater Treatment Plant
County:	Baker
NPDES Number:	FL0040495
Permit Expiration Date:	19 February 2002

Toxics Sampling Inspection (**XSI**)	
Date Sampled:	22 March 99
Results:	Silver (0.12 µg/L) wasdetected in the effluent at a level that exceeded Class III water quality standards (Rule 62-302.530 (60) FAC, respectively). Cadmium, copper, iron, lead, and zinc were detected at levels that complied with Class III water quality standards. The herbicide atrazine was detected at a non-problem level.

Compliance Biomonitoring Inspection (**CBI**)	
Date Sampled:	22 March 99
Results:	The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia,* during the 48-hour bioassay.

Impact Bioassessment Inspection (**IBI**)	
Date Sampled:	22 March 99
Results:	Effluent nutrients appear to be affecting the downstream algal communities. Periphyton chlorophyll *a* was 785% higher and AGP was 1,100% greater at the test site compared to the control site. The test site AGP (20.4 mg dry wt/L) greatly exceeded the 5 mg dry wt/L "problem threshold". The major responses by the macroinvertebrate community were a loss of sensitive EPT taxa, an increase in tolerant taxa, and a shift in community dominance.

Water Quality Inspection (**WQI**)	
Date Sampled:	22 March 99
Results:	Effluent organic nitrogen and ammonia concentrations were within permit limits, however, the concentrations contributed to nutrient enrichment at the test site which were substantially higher than control site levels. Test site levels of ortho-phosphate, total phosphorus, and nitrate+nitrite were between 65% and 75% higher than other typical Florida streams.

This biological assessment was prepared by DEP staff to provide information to be used in reviewing an NPDES permit renewal application for the subject facility. This assessment will be used in conjunction with other information concerning the facility and its receiving water body to determine appropriate final permit conditions.

Introduction

The Macclenny Wastewater Treatment Plant is located in Baker County, Florida (see maps in the Appendix). This 1.3 MGD facility is permitted as an advanced secondary activated sludge wastewater treatment plant consisting of influent screening and grit removal, four 417,000 gallon sequencing batch reactors, two 425 square foot traveling bridge type filters, two aerobic digesters, two chlorine contact chambers, one post aeration basin, chlorination and dechlorination. The effluent is discharged into the Class III Turkey Creek (see Facility Permit in Appendix). The mean flow during this period was 0.59 MGD.

State permit limits for the Macclenny WWTP are listed in Table 1. According to the facility's monthly operating reports, the bioassay samples taken in March, 1996, by department personnel were acutely toxic to *Cyprinella leedsi* (Appendix). Total residual chlorine was 0.04 mg/L and total and un-ionized ammonia concentrations were 13.25 mg/L and 0.27 mg/L, respectively. The silver concentration (0.43 µg/L) exceeded Class III surface water criteria (see Facility Summary in Appendix). The city has recently put a new 1.3 MGD SBR plant on line, and the quality of the effluent has improved since that time. As part of a Consent Decree entered into with the U.S. Environmental Protection Agency, in order to settle a 1986 civil action, the City of Macclenny agreed to a construction schedule and to provisional interim and final effluent limitations. The city is required to meet limits for 24 consecutive months.

Methods

The purpose of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a control site (in Turkey Creek approximately 200 meters upstream of the discharge) and a test site (in Turkey Creek approximately 200 meters downstream of the discharge). 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. Data for this report were collected on March 22, 1999. The effluent was analyzed for nutrients, metals, and organic constituents (base neutral and acid extractables, and pesticide extractables).

Acute screening toxicity bioassays, using the invertebrate, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi*, as test organisms, were performed on an effluent sample. Bacterial populations were analyzed for total and fecal coliforms.

Benthic macroinvertebrates were evaluated at control and test sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip-net sweeps. Additional invertebrate collections were accomplished using Hester-Dendy multiplate samplers that were incubated for 28 days.

Periphyton were sampled at both control and test sites by incubating glass microscope slides in a standard periphytometer for 28 days. Phytoplankton were sampled at both control and test sites via subsurface grabs. Chlorophyll *a* was determined for both phytoplankton and periphyton communities. *Selenastrum capricornutum* was used as the test organism for algal growth potential tests. All laboratory methods were carried out following the Bureau's Standard Operating Procedures (SOP's). The SOP's can be viewed on our web site at <www.dep.state.fl.us/labs/sops.htm>.

Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of the discharge. These measurements include: habitat assessment, taxa richness, Shannon-Weaver Diversity Index, the Florida Index, Ephemeroptera/Plecoptera/Trichoptera (EPT) Index, community composition, functional feeding groups, algal biomass, and the Stream Condition Index (SCI). For a discussion of each of these measures, see *Explanation of Measurements of Community Health* in the Appendix.

For graphical purposes, the percent differences between the control and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, the diatom to blue-green algae ratio, and the % filter-feeders, the number of polychaete taxa, and the % pelecypods are measured as the control site minus test site divided by the control site. The percent differences between sites involving the % tubificids, % contribution, algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus control site divided by the control site.

The following personnel were involved in this investigation: Jeff Martin, Pat O'Conner, Bonnie Niedbalski, and Kathleen Gerard (DEP Northeast District), and Julie

Table 1. Effluent limits and summary of chemistry data.

Macclenny WWTP	Effluent Limits	Effluent Sample	Control Site	Test Site
Organic Constituents (µg/L)				
Atrazine	-	0.062 I	-	-
Metals (µg/L)				
Aluminum	-	50 U	-	-
Arsenic	≤50 **	2.0 U	-	-
Cadmium	7.50 **b	0.073 I	-	-
Chromium	1483.5 **b	10 U	-	-
Copper	92.3 **b	2.8 A	-	-
Iron	≤1000 **	76 A	-	-
Lead	67.9 **b	1.51 A	-	-
Mercury	≤0.012 **	0.10 U	-	-
Nickel	1206 **b	6.0 U	-	-
Selenium	≤5.0 **	1.2 U	-	-
Silver	≤0.07 **	0.12 I	-	-
Zinc	813 **b	99 A	-	-
Nutrients (mg/L)				
Ortho-phosphate	-	1.4	0.016	0.18
Total phosphorus	-	1.2	0.051	0.22
Ammonia	4.0 *a	0.54 A	0.010 U	0.010 U
Unionized ammonia	**	0.003	-	-
Nitrate+Nitrite	-	0.13	0.046	0.26
TKN	-	2.0	0.46 Q	0.56
Organic Nitrogen	4.0 *a	1.46	0.46	0.56
Total Nitrogen	-	2.13	0.506	0.82
General Phys-Chem Parameters				
Habitat Assessment	-	-	137	131
DO (mg/L)	≥ 6.0 *	8.4	6.8	8.1
pH (SU)	6.0-8.5 *	7.0	6.1	6.9
Conductivity (µmhos/cm)	**	605	77	375
Temperature (°C)	**c	19.9	16.4	19.4
CBOD, 5 day (mg/L)	10.0 *a	2 K	2 K	2 K
TSS (mg/L)	10.0 *a	2	5	1
Flow (MGD)	1.3 *	0.59	-	-
Hardness (mg $CaCO_3$)	-	147.8	-	-
AGP (mg dry wt/L)	-	14.0	1.7	20.4
Toxicity (48-hour static, screening bioassay)				
Bioassay - Fish	-	Not Toxic	-	-
Bioassay - Invertebrate	-	Not Toxic	-	-
Microbiology (#counts/100 ml)				
Fecal Coliforms	800 **	<10 K	70	20 B
Total Coliforms	2,400 **	30 B	270	250

A - Value is the mean of two or more determinations
I - Value is < the MQL, and ≥ the MDL
K - Actual value is known to be less than value given
Q - Sample held beyond normal holding time
U - Analyzed for but not detected; value is the MDL

* Permit limit
** Class III standard
a - Single sample
b - Based on hardness
c- Shall not be > 5° F above ambient

Baughman, Ken Espy, Marshall Faircloth, Michael Heyn, Joy Jackson, Vicki McGee, Elizabeth Miller, Urania Quintana, Johnny Richardson, Lisa Homann, Amy Weaver, David Whiting, and Steve Wolfe (DEP Central Biology Laboratory in Tallahassee). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Chuck Ziegmont, and Michael Tanski, as well as District representatives.

Results

The chemical and biological results for this report are presented in Tables 1–3.

Discussion

The habitat assessment scores were in the "optimal" range at the control (137 points) and test sites (131 points) (see Habitat Assessments in the Appendix). There was slightly less available habitat and less of a riparian buffer zone on one bank at the test site resulting in the slightly lower score. There were some differences in the physical/chemical parameters as well (Table 1). The conductivity was significantly higher at the test site (375 µmhos/cm) compared to the control site (77 µmhos/cm), as was the temperature (19.4°C at the test site and 16.4°C at the control site).

Silver (0.12 µg/L) was detected in the effluent at a level that exceeded Class III water

Table 2. Algal community structure of study sites.

Macclenny WWTP	Control Site	Test Site
Phytoplankton Algae		
Number of Taxa	13	14
Shannon-Weaver diversity	3.38	3.31
Chlorophyll *a* (µg/L)	1.00 U	1.00 U
Algal Density (#/mL)	107	193
% Blue-green	17.1	37.1
% Green	28.6	11.3
% Diatoms	51.4	51.6
Periphyton Algae		
Number of Taxa	28	26
Shannon-Weaver diversity	3.18	3.37
Chlorophyll *a* (mg/m2)	26.2	232.0
Algal Density (#/cm2)	569,230	441,833
Diatom/Diatom + B-G Ratio	0.94	0.97
%Blue-green	3.8	2.1
% Diatoms	54.6	77.9
AGP (mg dry wt/L)	1.7	20.4

U - Analyzed for but not detected; value is the MDL

quality standards (Rules 62-302.530 (60) FAC, respectively). Cadmium, copper, iron, lead, and zinc were detected at levels that complied with Class III water quality standards. The herbicide atrazine, an organic pollutant, was detected at a non-problem level (Table 1).

The effluent sample was not toxic to the fish, *Cyprinella leedsi,* or to the invertebrate, *Ceriodaphnia dubia,* during the 48-hour bioassay (Appendix).

Effluent nutrients were elevated and appeared to contribute to substantial increases at the test site compared to the control site (Table 1). For example, orthophosphate increased 1,025% at the test site compared to the control site and was higher than 70% of other typical Florida streams (see *Typical Values for Selected Parameters in Florida Waters* in Appendix). Test site levels of total phosphorus increased 331% and nitrate+nitrite increased 465% over control site levels. Control site levels of total phosphorus and nitrate+nitrite were 20% and 30% greater than other typical Florida streams while the test site levels exceeded 65% and 75%, respectively.

Changes in the test site periphyton community appear to be due to the addition of the effluent. Periphyton chlorophyll *a* and Algal Growth Potential (AGP) exhibited a substantial increase at the test site compared to background levels (Table 2). Chlorophyll *a* was 785% higher and AGP increased 1,100% at the test site compared to the control site (Figure 1). The control site AGP value (1.7 mg dry wt/L) was significantly lower that the 5 m dry wt/L "problem threshold" (Raschke and Schultz 1987). The addition of the discharge to the test site caused the AGP to greatly exceed this threshold (20.4 mg dry wt/L). The effluent AGP was 14.0 mg dry wt/L.

Quantitative and qualitative measures of the macroinvertebrate community health showed minor changes at the test site compared

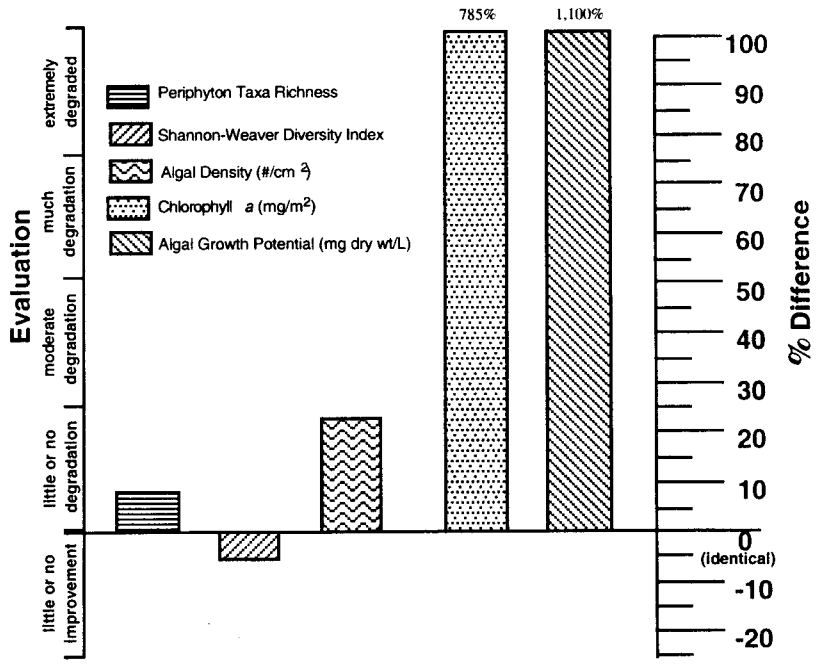


Figure 1. Effect of discharge on the periphyton community.

Table 3. Benthic community structure of study sites.

Macclenny WWTP	Control Site	Test Site
Macroinvertebrate Qualitative		
% Dominant Taxon	12.0	15.0
EPT Index	6	3
Florida Index	24	22
Number of Taxa	34	34
SCI	29	29
Community Composition		
% Coleoptera	1.9	4.5
% Diptera	76.9	75.6
% Ephemeroptera	6.9	1.3
% Gastropoda	0.0	1.9
% Odonata	0.6	1.3
% Oligochaeta	0.0	0.6
% Pelecypoda	3.8	0.0
% Plecoptera	0.0	0.0
% Trichoptera	5.0	9.0
% Other	5.0	5.8
Functional Feeding Groups		
% Burrowing Deposit Feeders	0.0	0.6
% Predators	13.8	16.0
% Surface Deposit Feeders	35.9	34.6
% Suspension Feeders/Filterers	28.8	25.3
% Scrapers	4.4	4.5
% Shredders	12.8	13.5
Macroinvertebrate Hester-Dendy		
Number of Taxa	39	42
Florida Index	24	19
Shannon-Weaver Diversity	4.14	4.01
EPT Index	7	5
Community Composition		
% Coleoptera	2.7	2.0
% Diptera	68.4	83.1
% Ephemeroptera	22.6	5.5
% Gastropoda	0.3	3.0
% Trichoptera	3.4	0.3
% Other	2.7	6.0
Functional Feeding Groups		
% Predators	17.8	29.2
% Scrapers	12.8	6.4
% Shredders	11.7	2.1
% Surface Deposit Feeders	31.4	35.4
% Suspension Feeders	24.6	18.9

to the control site (Figure 2). In the qualitative samples, there was a 50% decline in the number of sensitive EPT taxa; otherwise, the communities were similar. Each site received 29 SCI points, placing them in the "excellent" category (see SCI Worksheet in the Appendix). In the quantitative samples, there was a 15% increase in the contribution of the dominant taxa and a shift from a community dominated by the pollution-sensitive ephemeropteran, *Stenonema smithae,* at the control site to one dominated by the pollution-tolerant dipteran, *Tanytarsus* sp., at the test site (see Macroinvertebrate Taxa Lists in the Appendix).

These results suggest that, although the test site macroinvertebrate community is currently healthy, it is beginning to show signs of stress from the elevated nutrients and if left unchecked may result in further degradation to the receiving waters.

Literature Cited

Barbour, M. T., J. Gerritsen, and J. S. White. 1996. Development of the Stream Condition Index for Florida. Prepared for the Fla. Dept. Environ. Protection. 105 p.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla. Dept. Environ. Protection. Unpaginated.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 73 p.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 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. Fla. Dept. En-

viron. Reg. Tech. Ser. 10(1): 1-47.

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

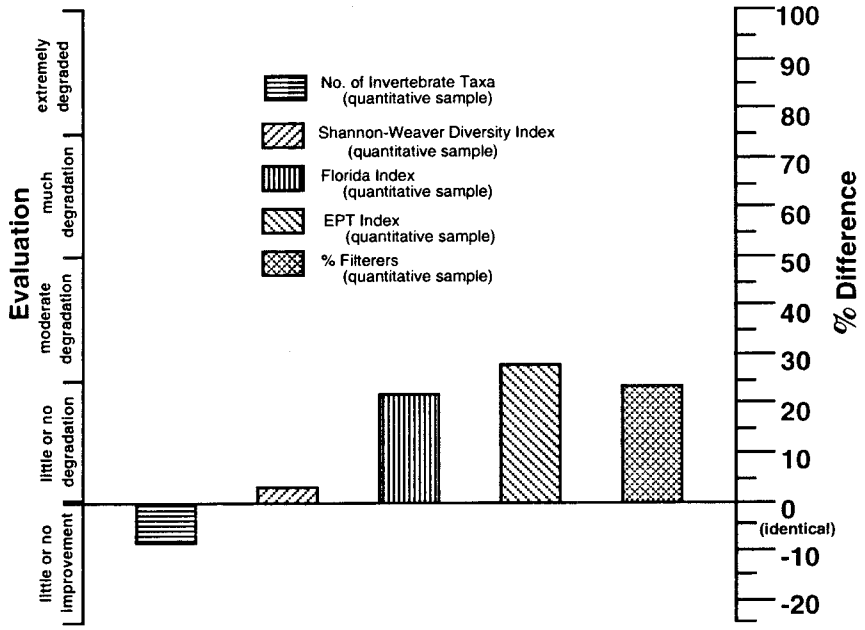


Figure 2. Effect of discharge on the macroinvertebrate community.

Typical Values for Selected Parameters in Florida Waters

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

Parameter	Percentile Distribution 5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
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 Phosphate	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-Phosphate	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-Phosphate	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

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health may have been employed to determine the effects of a discharge. These are briefly discussed here.

Habitat Assessment: Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); and Poor (0-34 points).

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa.

The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. 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.

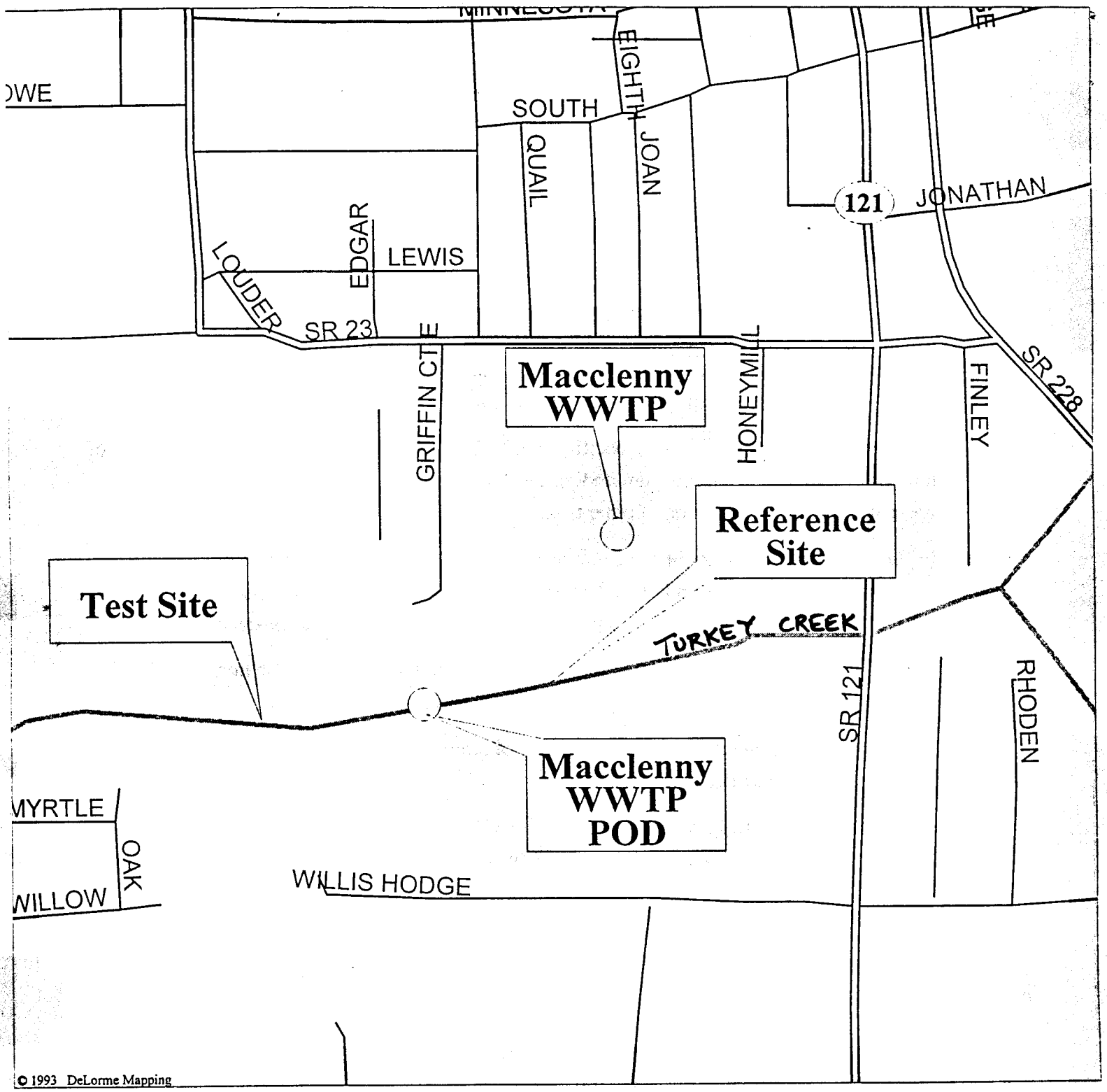
Ephemeroptera/Plecoptera/Trichoptera (EPT) Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in proportions of major groups of organisms, compared to control conditions, may indicate degradation.

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. 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 in flowing streams.

Functional Feeding Groups: Disturbance can shift the feeding strategies of invertebrates. In Florida, for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric (Barbour *et al.* 1996) developed for Florida. The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected control condition (see SCI calculation table in Appendix).



LEGEND

- Population Center
- State Route
- Street, Road
- State Route
- Interstate Highway
- US Highway
- Railroad
- River

Scale 1:7,813 (at center)

500 Feet

200 Meters

Mag 15.00
Thu Mar 25 10:58:26 1999

DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Facility Name: Macclenny WWTF		Date Summary Prepared: March 19, 1999
Location (attach detailed map): SR. 23A and Honeymill Road, Macclenny, Florida	County: Baker	District: Northeast District
Federal Permit # FL0040495 and expiration date: February 19, 2002	State GMS # and 3102M01828 State expiration date: February 19, 2002.	Facility Type: Industrial (Municipal) Federal Agricultural Other (list):

Function of facility:

Wastewater Treatment Facility

Description of treatment process:

This facility is permitted as a 1.3 MGD AADF advanced secondary activated sludge wastewater treatment plant consisting of influent screening and grit removal, four 417,000 gallon sequencing batch reactors, two 425 SQ FT traveling bridge type filters, two aerobic digesters, two chlorine contact chambers, one postaeration basin, chlorination and dechlorination

Receiving waters: Turkey Creek	Classification: I II (III)	
Design Flow: 1.3 MGD.	Mean Flow: 0.59 MGD.	Flow during survey:

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

therefore, the best time to sample is:

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

A SSAC for dissolved oxygen was adopted by the department on December 20, 1985, and approved by EPA on April 23, 1986. Refer to the attached EPA permit - condition number 8.

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

Parameter	Limit (units)			
	Annual	Monthly	single Sample	
cBOD5	5.0	6.25	10.0	mg/L
TSS	5.0	6.25	10.0	mg/L
Total Organic N	2.0	2.5	4.0	mg/L
Total Ammonia	2.0	2.5	4.0	mg/L
Fecal Coliforms	200 No/100mL	----	800	
chlorine	minimum		0.5 mg/L	
chlorine	maximum		0.01 mg/L	
Dissolved oxygen	minimum		6.0	mg/L.
pH	minimum		6.0	std. units
	maximum		8.5	std. units.

Describe special permit conditions and permit modifications:

See attached specific condition I.A. 8 and 9 regarding quarterly monitoring requirements for both effluent and stream samples, as well as toxicity monitoring requirements found in Condition number 12.

Macclenny WWTF
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

FACILITY SUMMARY

Description of permitted outfall(s):

Effluent falls out of concrete box to rip rap and then to Turkey Creek. The point of discharge is located at latitude 30° 16' 11" N, longitude 82° 07' 37" W.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:

See attached summary of data taken from DMRs that were submitted during the last year. Note the effluent quality has improved since the new 1.3 MGD plant was put on line.

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

Bioassay samples taken March 1996 by department personnel were acutely toxic to Cyprinella leedsi. Total residual chlorine sample was 0.004 mg/L. Total and unionized ammonia concentrations were 13.25 mg/L & 0.27 mg/L the silver concentration of 0.43 ug/L exceeded Class III surface water criteria. The Environmental Protection Agency (EPA) and the City of Macclenny entered into a Consent Decree to settle a civil action, Case No 89-454-CIV-J-20 on July 18, 1989. The Consent Decree was modified on May 2, 1996. The Consent Decree contains a construction schedule and provisions for interim and final effluent limitations. The City is required to meet limits for 24 consecutive months.

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

The City recently put a new 1.3 MGD SBR plant on line. The quality of effluent improved since the new plant was put on line.

Additional information:

Staff contributing to this review (signature):

	(Biologist)
Kathleen H. Gerard.	(Inspector)
Kathleen H. Gerard.	(Engineer)
	( )
	( )
	( )

GMST35 3102X10226 050053 080082 000530 031616 03/17/99

PARAMETER RESULT TRENDS 11:10:57

FOR 3102M01828 - MACCLENNY, CITY OF

SITE NAME - S.T.P. FINAL EFFLUENT - MACCLENNY

RPT DATE	FLOW,MONTH AVG 050053 MGD	BIOCHEM OXY DEM 080082 MG/L	RES SUSP 000530 MG/L	FECAL COLI MF 031616 #/100
12/00/98	.492	1.0	1.	.5
11/00/98	.530	1.0	1.	.5
10/00/98	.594	2.4	3.	.8
09/00/98	.568	3.2	3.	.8
08/00/98	.536	2.9	1.	1.9
07/00/98	.492	3.3	1.	.5
06/00/98	.490	2.6	1.	1.2
05/00/98	.525	2.5	1.	1.1
04/00/98	.604	1.7	1.	1.4
02/00/98	.978	2.1	1.	.7
01/00/98	.712	1.5	1.	.9
12/00/97	.728	2.6	1.	3.1
11/00/97	.527	6.5	2.	11.9
10/00/97	NO RESULT	3.9	5.	.6
AVERAGE:	12.28760	6.11905	7.89683	193.22222
STD DEV:	90.28823	3.65627	7.04659	365.16371

XMIT HERE FOR NEXT PAGE

DATE RANGE TOO LARGE ALL DATA NOT CAPTURED

GMS139 3102X10228 000610 000630 000605 000625 03/17/99

PARAMETER RESULT TRENDS **11:11:32**

FOR 3102M01828 - MACCLENNY, CITY OF

SITE NAME - S.T.P. FINAL EFFLUENT - MACCLENNY

RPT DATE	NH3 N TOT 000610 MG/L	NO2 + NO3 N 000630 MG/L	NITROGEN ORGAN 000605 MG/L	NITROGEN(N)KJEL 000625 MG/L
12/00/98	.010	NO RESULT	.552	NO RESULT
11/00/98	.010	NO RESULT	.085	NO RESULT
10/00/98	.060	7.310	.300	NO RESULT
09/00/98	.010	NO RESULT	.300	NO RESULT
08/00/98	.216	NO RESULT	.337	NO RESULT
07/00/98	.274	1.640	.131	.126
06/00/98	.190	NO RESULT	.297	NO RESULT
05/00/98	.270	NO RESULT	.481	NO RESULT
04/00/98	.060	8.870	.643	.396
02/00/98	.210	NO RESULT	.550	NO RESULT
01/00/98	6.020	2.660	2.070	NO RESULT
12/00/97	.340	2.090	.660	NO RESULT
11/00/97	2.990	NO RESULT	2.100	NO RESULT
10/00/97	3.330	NO RESULT	2.390	NO RESULT
AVERAGE:	5.63302	2.96800	1.68450	0.26100
STD DEV:	4.13062	3.24102	1.34097	0.19095

XMIT HERE FOR NEXT PAGE

DATE RANGE TOO LARGE ALL DATA NOT CAPTURED

PARAMETER RESULT TRENDS

FOR 3102M01828 - MACCLENNY, CITY OF
SITE NAME - S.T.P. FINAL EFFLUENT - MACCLENNY

RPT DATE	NITROGEN(N)KJEL 000625 MG/L	PHOSPHORUS TOT 000665 MG/L	P ORTHO 070507 MG/L
12/00/98	NO RESULT	NO RESULT	NO RESULT
11/00/98	NO RESULT	NO RESULT	NO RESULT
10/00/98	NO RESULT	3.060	1.650
09/00/98	NO RESULT	NO RESULT	NO RESULT
08/00/98	NO RESULT	NO RESULT	NO RESULT
07/00/98	.126	5.360	1.590
06/00/98	NO RESULT	NO RESULT	NO RESULT
05/00/98	NO RESULT	NO RESULT	NO RESULT
04/00/98	.396	5.750	1.490
02/00/98	NO RESULT	NO RESULT	NO RESULT
01/00/98	NO RESULT	.262	.244
12/00/97	NO RESULT	1.100	.962
11/00/97	NO RESULT	NO RESULT	NO RESULT
10/00/97	NO RESULT	NO RESULT	NO RESULT
AVERAGE:	0.26100	2.48564	1.40431
STD DEV:	0.19095	1.75097	0.55989

XMIT HERE FOR NEXT PAGE

DATE RANGE TOO LARGE ALL DATA NOT CAPTURED

Department of Environmental Protection

Lawton Chiles
Governor

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Virginia B. Wetherell
Secretary

STATE OF FLORIDA
DOMESTIC WASTEWATER FACILITY PERMIT

PERMITTEE:

City of Macclenny
118 East Macclenny Avenue
Macclenny, FL 32263

PERMIT NUMBER: FL0040495 (major)
ISSUANCE DATE: February 19, 1997
EXPIRATION DATE: February 19, 2002
GMS I.D. NO: 3102M01828
APPLICATION NO: 293162

FACILITY:

Macclenny WWTP
Honeymill Road
Baker County
Macclenny, FL
Latitude: 30° 16' 11" N Longitude: 82° 07' 37" W

This permit is issued under the provisions of Chapter 403, Florida Statutes, and applicable rules of the Florida Administrative Code and constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System. This permit is issued in conjunction with Administrative Order Number AO-028-NE. The above named permittee is hereby authorized to operate the facilities shown on the application and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

TREATMENT FACILITIES:

To operate an existing 0.636 MGD AADF permitted capacity activated sludge wastewater treatment plant consisting of a primary clarifier, aeration basin, two secondary clarifiers, two aerobic digesters, three oxidation ponds, chlorine contact chamber, chlorination and dechlorination. Residuals are treated to Class B stabilization requirements and land applied.

To construct and operate a new 1.30 MGD AADF permitted capacity advanced secondary activated sludge wastewater treatment plant consisting of influent screening and grit removal, four 417,000 gallon sequencing batch reactors, two 425 SF traveling bridge type filters with automatic backwash, two 224,000 gallon aerobic digesters, two 15,700 gallon chlorine contact chambers, one 18,145 gallon post aeration basin, chlorination and dechlorination

EFFLUENT DISPOSAL:

Surface Water Discharge: An existing 0.636 MGD AADF permitted capacity discharge to Turkey Creek (Class III fresh waters). The permitted capacity can be increased to 1.30 MGD upon completion of the new treatment facility. The point of discharge is located approximately at latitude 30° 16' 11" N, longitude 82° 07' 37" W.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions as set forth in Pages 1 through 19 of this permit.

PERMITTEE: City of Macclenny
118 East Macclenny Avenue
Macclenny, FL 32263

PERMIT NUMBER: FL0040495
ISSUANCE DATE: February 19, 1997
EXPIRATION DATE: February 19, 2002
APPLICATION NO.: 293162

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D001 to Turkey Creek. Such discharge shall be limited and monitored in accordance with the interim limits established by Administrative Order Number AO-028-NE and the final limits as specified below:

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	mgd	Maximum	See Item I.A.7	-	-	-	Continuous	Recording flow meters and totalizers	EFD-01 or INF-01	See Cond.I.A.4
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	Maximum	5.0	6.25	7.5	10.0	Weekly	16-hour flow proportioned composite	EFD-01	
Total Suspended Solids	mg/L	Maximum	5.0	6.25	7.5	10.0	Weekly	16-hour flow proportioned composite	EFD-01	
pH	std. units	Range	-	-	-	6.0 to 8.5	Continuous	Instrument	EFD-01	See Cond.I.A.3
Fecal Coliform Bacteria	See Permit Condition I.A.5.						Weekly	Grab	EFD-01	
Total Residual Chlorine (For Disinfection)	mg/L	Minimum	-	-	-	0.5	Continuous	Instrument	EFA-01	See Cond.I.A.3, 6
Total Residual Chlorine (For Dechlorination)	mg/L	Maximum	-	-	-	0.01	Daily	Grab	EFD-01	
Nitrogen, Organic, Total as N	mg/L as N	Maximum	2.0	2.5	3.0	4.0	Weekly	16-hour flow proportioned composite	EFD-01	
Ammonia, Total as N	mg/L as N	Maximum	2.0	2.5	3.0	4.0	Weekly	16-hour flow proportioned composite	EFD-01	
Nutrient Monitoring	See Permit Condition I.A.8.									
Stream Monitoring	See Permit Condition I.A.9.									
Whole Effluent Toxicity	See Permit Condition I.A.11 & 12.									
Oxygen, Dissolved (DO)	mg/L	Minimum	-	-	-	6.0	Daily	Grab	EFD-01	

2. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I. A. 1. and as described below:

Monitoring Location Site Number	Description of Monitoring Location
EFA-01	Immediately following disinfection
EFD-01	Effluent, after final treatment
INF-01	Influent, prior to biological treatment

3. Hourly measurement of pH and total residual chlorine for disinfection during the period of required operator attendance may be substituted for continuous measurement. *[Chapter 62-601, Figure 2, Footnotes 1 and 2, 5-31-93]*

4. Recording flow meters and totalizers shall be utilized to measure flow and calibrated at least annually. *[62-601.200(17) and .500(6), 5-31-93]*

5. The arithmetic mean of the monthly fecal coliform values collected during an annual period shall not exceed 200 per 100 mL of effluent sample. The geometric mean of the fecal coliform values for a minimum of 10 samples of effluent each collected on a separate day during a period of 30 consecutive days (monthly), shall not exceed 200 per 100 mL of sample. No more than 10 percent of the samples collected (the 90th percentile value) during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 mL of sample. Any one sample shall not exceed 800 fecal coliform values per 100 mL of sample. Note: To report the 90th percentile value, list the fecal coliform values obtained during the month in ascending order. Report the value of the sample that corresponds to the 90th percentile (multiply the number of samples by 0.9). For example, for 30 samples, report the corresponding fecal coliform number for the 27th value of ascending order. *[62-600.440(4)(c), 6-8-93]*

6. A minimum of 0.5 mg/L total residual chlorine must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-600.440(4)(b), 6-8-93]*

7. The permitted capacity shall be limited to 0.636 MGD Annual Average Daily Flow (AADF). Upon completion of the new facility and after receiving Department approval, the permitted capacity shall be limited to 1.30 MGD AADF.

8. No later than sixty (60) days following permit date of issuance, effluent discharged by the subject facility shall be sampled and tested for the following:

   a. Organic nitrogen.
   b. Nitrite nitrogen (NO2-N) and nitrate nitrogen (NO3-N).
   c. Total ammonia (NH3-N and NH4+-N).
   d. Total nitrogen.
   e. Total phosphorus.
   f. Orthophosphorus.
   g. Unionized ammonia (as calculated based on a separate single grab sample of total ammonia, pH and temperature taken during the 16-hr composite event).
   h. Total Kjeldahl nitrogen.

   16-hr flow proportioned composite samples shall be taken at least once every ninety (90) days until further notice is received from the Department. Test results (showing parameters and corresponding concentrations in mg/L) shall be submitted to the Department as an attachment to the discharge monitoring report corresponding to the months in which the samples were taken.

9. The Permittee shall conduct regular monitoring of the segment of Turkey Creek near the outfall for maintaining data on the impact of the discharge to the water quality of the surface water body. Monitoring shall be on a quarterly basis and shall coincide with the quarterly nutrient monitoring of the facility effluent discharge. The monitoring sites are described as follows:

SWB-1 - Upstream of outfall, Turkey Creek at S.R. 121
SWB-2 - 0.5 miles downstream of outfall in Turkey Creek
SWB-3 - 0.35 miles upstream of confluence of the South Prong of St. Marys River and Turkey Creek at I-10.
SWB-4 - 0.85 miles downstream of the confluence of the South Prong of St. Marys River and Turkey Creek at U.S. 90.

The parameters to be measured shall include the following:

At all sites - DO, pH, temperature, conductivity, total stream depth
At sites SWB-1 and SWB-2 - NH_3-N, ON, chlorides, hardness

All parameters shall be sampled at mid depth. Grab samples are adequate.

The results of instream monitoring shall be submitted to the Northeast District Office.
[62-4.240(3)(c), 4-30-95]

10. The approved analytical methods and corresponding required MDL (method detection limit) and PQL (practical quantification limit) for parameters at Outfall D001 are:

Parameter	Analytical Method	MDL (units)	PQL (units)
CBOD	405.1	0.1 (mg/l)	0.5 (mg/l)
TSS	160.2	4.0 (mg/l)	4.0 (mg/l)
pH	150.1	0.10 (SU)	0.10 (SU)
Fecal Coliform	600/8-78-017	1/100 ml	2/100 ml
TRC (disinfection)	330.5	0.2 (mg/l)	0.2 (mg/l)
TRC (dechlor.)	330.1	0.01 (mg/l)	0.01 (mg/l)
Nitrogen, Total	351.2 and 353.2	0.1 (mg/l)	0.2 (mg/l)
Phosphorus, Total	365.1	0.02 (mg/l)	0.05 (mg/l)
Ammonia, Total	350.1	0.02 (mg/l)	0.04 (mg/l)
Nitrate+Nitrite	353.2	0.05 (mg/l)	0.1 (mg/l)
Orthophosphorus	365.1	0.02 (mg/l)	0.05 (mg/l)
TKN	351.2	0.1 (mg/l)	0.2 (mg/l)
Organic Nitrogen	calculated	-	-
Dissolved Oxygen	360.1	0.10 (mg/l)	0.10 (mg/l)

The MDLs and PQLs listed above shall constitute the minimum reporting levels for the life of the permit. The Department shall not accept results for which the laboratory's MDLs or PQLs are greater than those listed above. Unless otherwise specified, sample results shall be reported as follows:

a) results greater than or equal to the PQL shall be reported as the measured quantity.

b) results less than the PQL and greater than the or equal to the MDL shall be reported as the PQL followed by the lab code "m", and shall be deemed equal to the MDL when necessary to calculate an average for that parameter.

c) results less than the MDL shall be reported as the MDL followed by the lab code "u". A value of one half the MDL or half the effluent limit, whichever is lower, shall be used for that sample when necessary to calculate an average for that parameter. Values less than the MDL are considered to demonstrate compliance with an effluent limit or monitoring requirement.

[62-4.246, 6-13-96]

11. A NOEC of less than 100% effluent in any "routine" sample will be a violation of these permit conditions and Rule 62-302.530(62) and Rule 62-4.244(3)(a), F. A. C.

12. Whole Effluent Toxicity Testing

The permittee shall initiate the series of tests described below beginning within 60 days of permit issuance to evaluate whole effluent toxicity of the discharge from outfall D001. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002, or the most current edition.procedures. The control and dilution water will be moderately hard water as described in EPA/600/4-91/002, Table 3. A standard reference toxicant quality assurance chronic toxicity test shall be conducted concurrently with each species used in the toxicity tests and the results submitted with the bioassay report or if monthly QA/QC reference toxicant tests are conducted, these results must be submitted. Any deviation from the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

A. ROUTINE TEST REQUIREMENTS

1. The permittee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction test and a fathead minnow, Pimephales promelas, Larval Survival and Growth Test. These tests shall be conducted using a control (0% effluent) and one test concentration of 100% effluent. A no observed effect concentration (NOEC) less than 100% effluent will constitute a violation of this permit and Chapter 62-302.530(62), F.A.C. All test results shall be statistically analyzed according the Appendix in EPA/600/4-91-002, or the most current edition.

2. For each set of tests conducted, a *24-hour* composite sample of final effluent shall be collected and used per the sampling schedule discussed in EPA/600/4-89/001, Section 8. Two additional composite samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

3. If control mortality exceeds 20% 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 20% 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 20% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates chronic toxicity. Additionally, test must meet the acceptability criteria for each species as defined in EPA/600/4-91/002 Section 13.11 and Section 11.11, respectively.

4. The toxicity tests specified above shall be conducted once every six months until the construction of the new treatment facility is completed. Upon the completion of and at which time the new treatment facility is placed into operation, the toxicity tests specified above shall be conducted

once every two months (beginning 30 days from the date the new facility is placed into operation) until six valid bi-monthly tests are completed. These tests are referred to as "routine" tests. Upon the completion of six valid tests which demonstrate that no chronic toxicity (as defined in 12.B.2.) has been identified, the permittee may petition the Department for a reduction in monitoring frequency.

5. Results from "routine" tests shall be reported according to EPA/600/4-91/002, Section 10, Report Preparation (or the most current edition), and shall be submitted to:

FL Department of Environmental Protection
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256
Attn.: Toxicity Coordinator

Additionally, all results shall be recorded and submitted on the Discharge Monitoring Report (DMR) in the following manner:
1. For the chronic test results, if the NOEC of a test species is less than 100% effluent, "<100%" should be entered on the DMR for that species. If the NOEC of a test species is greater than or equal to 100% effluent, "≥100%" should be entered.

B. ADDITIONAL TESTING REQUIREMENTS

1. An NOEC of less than 100% effluent in any "routine" sample will be a violation of these permit conditions and Rule 62-302.530(62) and Rule 62-4.244(3)(a), F. A. C.

2. If chronic toxicity (an NOEC of less than 100% effluent) is found in a "routine" test, the permittee shall conduct three additional tests on the specie(s) indicating unacceptable toxicity.

3. 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 and a control (0% 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 (not to exceed 100% effluent) and two dilutions below the target toxicity and a control (0% effluent) are run.

4. For each additional test, the sample collection requirements and the test acceptability criteria specified in 12.A.2 above must be met for the test to be considered valid. The first test shall begin within one week of the end 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.

5. Results from additional tests, required due to a chronic toxicity violation in the "routine" tests, shall be submitted in a single report prepared according to EPA/600/4-91/002, Section 10, or the most current edition and submitted within 45 days of completion of the additional, valid test. Upon the completion of the additional tests, the permittee will meet with the Department within 30 days of the report submittal to identify corrective actions necessary to remedy the observed chronic toxicity.

6. Should the results from any valid additional test indicate the characteristic of toxicity, the permittee shall prepare a plan of study to identify the cause(s) or sources(s) of toxicity of the effluent and evaluate feasible methodologies to reduce or eliminate the toxicity. The plan may include a chemical analysis of the effluent, including priority pollutants (metals, volatile and nonvolatile organics) and nonpriority pollutants peaks, along with total and unionized ammonia, nitrate and nitrite nitrogen, TKN, and orthophosphorus.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 14 1995

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REF: 4WM-WPEB

Mr. J.G. Dopson
City Manager
City of Macclenny
118 East Macclenny Avenue
Macclenny, Florida 32603

RE: Final Issuance of NPDES Permit No. FL0040495 DEP JACKSONVILLE
City of Macclenny Wastewater Treatment Plant

Dear Mr. Dopson:

Enclosed is the National Pollutant Discharge Elimination System (NPDES) permit for the above-referenced facility. This action constitutes the Environmental Protection Agency's final permit decision in accordance with Title 40, Code of Federal Regulations (CFR) Section 124.15(a). The permit will become effective as specified, provided that no timely request for an evidentiary hearing is received by the Agency.

Any interested person may contest this decision by submitting a timely request for an evidentiary hearing (hearing) pursuant to the procedures at 40 CFR § 124.74. If a request for a hearing is received by the Agency, following review, a determination will be made and the requester advised of the Agency's decision on the request. Until that time, please be advised that any request will render the permit ineffective pursuant to 40 CFR § 124.15(b). For a new source, a new discharger, a recommencing discharger, or a facility for which an untimely permit renewal application was submitted, a hearing request renders the facility without an NPDES permit and the facility may not discharge (unless relief is granted by the Presiding Officer under 40 CFR § 124.60(a)).

If the evidentiary hearing request is granted, in whole or part, to an existing source, the effect of the contested provision(s), and any other conditions not severable from those conditions, will be stayed and not subject to judicial review pending final Agency action. In this case, all provisions of the prior permit, as well as, all uncontested provisions of the reissued permit shall continue fully enforceable and effective pending final Agency action on the permit appeal. See 40 CFR § 124.60.

Permit # File
FL0O_____Folder_____Type____

Permittee ____ _____

INITIAL & ROUTE							
	CJO						
	CJP						

√District cc: Northeast

Printed on Recycled Paper

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. Testing for total residual chlorine (TRC) shall be conducted according to either the low-level amperometric titration method or the DPD colorimetric method as specified in Section 4500-Cl E. or 4500-Cl G., respectively, Standard Methods for the Examination of Water and Wastewater, 18h Edition (or most current edition).

3. The pH shall not be less than 6.0 standard units nor greater than 8.5 standard units.

4. There shall be no discharge of floating solids or visible foam in other than trace amounts.

5. The effluent shall not cause a visible sheen on the receiving water.

6. Any bypass of the treatment facility, which is not included in the effluent monitored above, is to be monitored for flow and all other parameters (except whole effluent toxicity). For parameters other than flow, at least one grab sample per day shall be monitored. Daily flow shall be monitored or estimated, as appropriate, to obtain reportable data. All monitoring results shall be reported on a Discharge Monitoring Report (DMR) Form (#3320-1).

7. Samples taken in compliance with the monitoring requirements specified above shall be taken at the nearest accessible point after treatment but prior to discharge to the receiving water.

8. a. The effluent dissolved oxygen concentration shall be a daily minimum of 6.0 mg/l.

b. The following requirements are conditions of the site specific alternative criteria for dissolved oxygen adopted by the Florida Department of Environmental Regulation (FDER), on December 20, 1985, and approved by EPA on April 23, 1986.

The alternative minimum dissolved oxygen criteria of 3.3 mg/l shall apply in Turkey Creek from S.R. 121 to Station 3 (Figure 1), which is approximately 1.0 mile downstream from the City's sewage treatment plant outfall, during the months of May through September, with 5.0 mg/l to apply during other months.

Monitoring of Turkey Creek for dissolved oxygen, temperature, conductivity, pH, NH_3-N, organic nitrogen (as N), and chlorides shall be conducted by the City of Macclenny on a monthly basis with grab samples at S.R. 121 (current Station 1 - upstream) and at a point about 0.5 miles downstream of the outfall (current Station 2 - downstream). Dissolved oxygen and temperature shall be monitored at a point 1.0 mile downstream of outfall (current Station 3 - downstream); at a point just upstream of the confluence with the South Prong of the St. Marys River (current Station 4); and at a point just downstream of the confluence with the South Prong of the St. Marys River (current Station 5) (reference Figure 1). Samples shall be taken at mid depth and time of day and depth should be included in the sampling data. Results of this monitoring shall be submitted with each discharge monitoring report (DMR).

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	19010072	3/22/99	1210	Turkey Creek to St Marys R.

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
	BAKER	Turkey Creek 200 yds upstream of FDOT	Control / Ref

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specify)
10	20			60	10		

Local Watershed Erosion: None: ☐ Slight: ☒ Moderate: ☐ Heavy: ☐

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☒ Obvious sources: ☐

Width of riparian vegetation (m) on least buffered side: >18

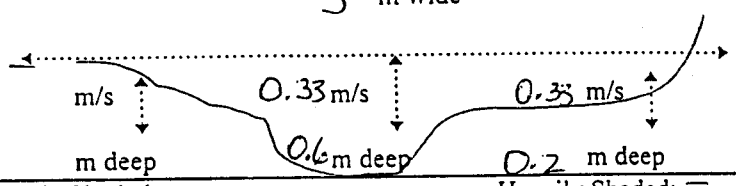
List & map dominant vegetation on back

Artificially Channelized ☒ NO ☐ YES — none

Artificially Impounded

High Water Mark: 1.0 + 0.6 = 1.6 (m above present water level) (present depth in m) (m above bed)

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect



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

SEDIMENT SUBSTRATE

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

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

Sediment Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	5	DipNet	Sand	35 > 40	5	DipNet
Leaf Packs or Mats	5	5	DipNet	Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	10	5	DipNet	Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m):
Top								
Mid-depth	0.33	16.37	6.14	6.75	77	1210		0.6 L
Bottom								

System Type: Stream: ☒ 1st - 2nd order Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☒ Slightly Turbid: ☐ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes:

CLEAR
Cool

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

Sampling Team: J MARTIN, P O'CONNOR, B NIEDBALSKI

Signature: Patrick O'Connor

Date:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5/21/98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE:	TIME:	RECEIVING BODY OF WATER:
	1901 0073	3/22/99	1440	

REMARKS:	COUNTY:	LOCATION:	FIELD NAME:
WWTP Discharging @ time of Sample	BAKER	Turkey Creek 200yds Downstream of POD	TEST

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commericial	Industrial	Other (specify)
10	20			60	10		

Local Watershed Erosion: None: ☐ Slight: ☐ Moderate: ☒ Heavy: ☐

Local Watershed NPS Pollution: No evidence: ☐ Slight: ☐ Moderate potential: ☐ Obvious sources: ☐

Width of riparian vegetation (m) on least buffered side: 6

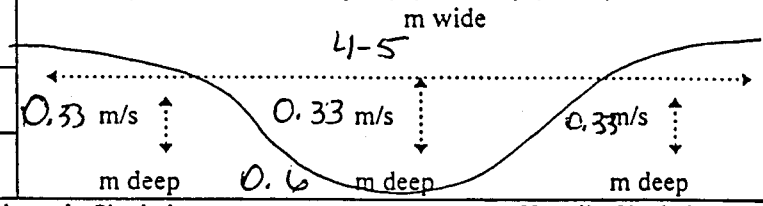
List & map dominant vegetation on back

Artificially Channelized ☒ NO ☐ YES — none

Artificially Impounded

High Water Mark: 1.0 + 0.6 = 1.6 (m above present water level) (present depth in m) (m above bed)

Typical Width (m)/Depth (m)/Velocity (m/sec) Transect



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 Deposition: Sludge: ☐ Sand smothering: none Silt smothering: none Other: ☐

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	5	DIPNET	Sand	40 → 5		DIPNET
Leaf Packs or Mats	5	5	DIPNET	Mud/Muck/Silt	30		
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	15	5	DIPNET	Draw aerial view sketch of habitats found in 100 m section.			

Water Quality	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):	Time		Secchi (m):
Top								
Mid-depth	0.33	19.4	6.91	8.12	375	1440		0.6 L
Bottom								

System Type: Stream: ☒ (1st - 2nd order) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils: None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity: Clear: ☒ Slightly Turbid: ☐ Turbid: ☐ Opaque: ☐

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

Weather Conditions/Notes: Cool CLEAR

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

Sampling Team: B NIEDBALSKI, J MARTIN, P O'CONNOR

Signature: Patrick W O'Connor

Date: 3/22/99

DEPARTMENT OF ENVIRONMENTAL PROTECTION

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 1901007Z	DATE: (M/D/Y) 3/22/99	RECIEVING BODY OF WATER: Turkey Creek to St MARYS R
REMARKS:	COUNTY: BAKER	LOCATION: TURKEY CREEK 200YDS UPSTREAM OF POD	FIELD ID/NAME: Control / Ref

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 15	Four or more productive habitats present (snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitats present. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 18	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 2 1
Water Velocity 19	Max. observed at typical transect: > 0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: > 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.1 to 0.5 m/sec 10 9 8 7 6	Max. observed at typical transect: < 0.05 m/sec., or spate occuring; > 1 m/sec 5 4 3 2 1
Habitat Smothering 13	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20% - 50% of habitats affected by sand or silts accumulation 15 14 13 12 11	Smothering of 50% - 80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of > 80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1

PRIMARY SCORE 65

Secondary Habitat Components				
Artificial Channelization 20	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 8	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60% - 100% raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of native vegetation (least buffered side) greater than 18m 10 9	Width of native vegetation (least buffered side) 12m to 18m 8 7 6	Width of native vegetation 6 to 12m, human activities still close to system 5 4	Less than 6m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 9 Left Bank 9	Over 80% of riparian surfaces consist of native plants,, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. vegetation removed to stubble height of 2 inches or less. 3 2 1

SECONDARY SCORE 72 **TOTAL SCORE** 137

ANALYSIS DATE:	ANALYST:	SIGNATURE:
3/22/99	O'CONNOR	Patrick W O'Connor

DEPARTMENT OF ENVIRONMENTAL PROTECTION

FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (5-27-98)

SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 19010073	DATE: (M/D/Y) 3/22/99	RECIEVING BODY OF WATER: Turkey creek to St Marys R.
REMARKS: WWTP Discharging @ time of Sample	COUNTY: BAKER	LOCATION: Turkey Creek 200 yds Downstream of Rd	FIELD ID/NAME: TEST

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 15	Four or more productive habitats present (snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitats present. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 15	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 2 1
Water Velocity 19	Max. observed at typical transect: > 0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: > 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.1 to 0.5 m/sec 10 9 8 7 6	Max. observed at typical transect: < 0.05 m/sec., or spate occuring; > 1 m/sec 5 4 3 2 1
Habitat Smothering 13	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20% - 50% of habitats affected by sand or silts accumulation 15 14 (13) 12 11	Smothering of 50% - 80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of > 80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
PRIMARY SCORE 62				
Secondary Habitat Components **Artificial Channelization** 20	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60% - 100% raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 5	Width of native vegetation (least buffered side) greater than 18m 10 9	Width of native vegetation (least buffered side) 12m to 18m 8 7 6	Width of native vegetation 6 to 12m, human activities still close to system 5 4	Less than 6m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 8 Left Bank 8	Over 80% of riparian surfaces consist of native plants,, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. vegetation removed to stubble height of 2 inches or less. 3 2 1
SECONDARY SCORE 69		**TOTAL SCORE** 131		

ANALYSIS DATE:	ANALYST:	SIGNATURE:
3/22/99	O'CONNOR	

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: MacClenny WWTP
County: Baker
Contact / District: P. O'Connor / Northeast
NPDES Permit #: FL0040495
LIMS Sample #: 375823 LIMS Job #: TH-1999-03-23-73
sample log 4/23/99 DW

Sample Collection: Date 3/22/99 Time ~~10:~~ 11:00 DW
Test Beginning: Date 3/23/99 Time 1345
Test Ending: Date 3/25/99 Time 1355
Organism Batch #: 18 Diluent Batch #: 211 FW
Organism Age: <24hrs SRT toxicant batch #: N/A
Test organism: Ceriodaphnia dubia

Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Test Number: 1 of 2
Incubator #2 Temperature Range 24.5-26.0°C
Room Temperature Range 24.0-25.0°C

Remarks:

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (µmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
Ctr	A	5	5	5	8.1		8.2	25.3		24.1	7.6		7.5	175		235
	B	5	5	5			8.2			24.0			7.9			235
	C	5	5	4[1D]			8.2			24.5			8.0			206
	D	5	5	5			8.2			24.5			8.0			205
100%	A	5	5	5	7.6		8.4	25.4		24.2	7.7		8.1	620		730
	B	5	5	5			8.4			24.4			8.1			640
	C	5	5	5			8.4			24.2			7.9			690
	D	5	5	5			8.4			24.3			8.0			655
measured by:		DW	FW	MF	DW		DW	DW		DW	DW		DW	DW		DW
recorded by:		MF	AS	MF	DW		AS	DW		AS	DW		AS	DW		AS

Investigators' Signatures

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			0.14	N/A	B.N.	FW
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-700	C.H.	FW
Alkalinity (mg/L as $CaCO_3$):	—	76	137	Hach	C.H.	FW
Hardness (mg/L as $CaCO_3$):	—	88	160	Hach	C.H.	FW
Total ammonia (mg/L as N):	—	<0.017	0.655	Denver	MF	FW
Salinity:	—	—	0	YSI	DW	FW

reviewer

form updated 5/22/98

Phytoplankton taxa list and densities (#/mL) for Macclenny WWTP, collected via subsurface grabs in Turkey Creek, on 22 March, 1999.

	Control Site	Test Site
Bacillariophyceae		
Achnanthes sp.	–	3
Diatomaceae	3	–
Eunotia sp.	6	6
Frustulia sp.	3	12
Gomphonema sp.	3	–
Nitzschia sp.	12	16
Pennales sp.	12	28
Pinnularia sp.	15	34
Chlorophyceae		
Chlamydomonas sp.	15	3
Chlorella sp.	6	12
Cosmarium sp.	6	3
Oocystis sp.	3	3
Chrysophyceae		
Dinobryon sp.	3	–
Cyanophyceae		
Anabaena sp.	9	–
Chroococcus sp.	–	9
Cyanophyceae	–	3
Dactylococcopsis sp.	–	3
Lyngbya sp.	–	9
Oscillatoria sp.	9	25
Synechococcus sp.	–	22

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: MacClenny WWTP
County: Baker / Northeast
Contact / District: P. O'Connor / Northeast
NPDES Permit #: FL0040495
LIMS Sample #: 375823 LIMS Job #: TLH-1999-03-23-13
sample log 4/23/99 DW
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2
Incubator #3 Temperature Range 25.0-26.0°C
Room Temperature Range 24.0-25.0°C

Remarks:

Sample Collection: Date 3/22/99 Time 11:00
Test Beginning: Date 3/23/99 Time 13:35
Test Ending: Date 3/25/99 Time 13:45
Organism Batch #: 20 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: ____
Test organism: Cyprinella leedsi

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
ctrA	61	5	5	5	7.9	8.3	8.3	24.7	25.2	26.8	7.6	7.3	7.7	250	260	270
ctrB	62	5	5	5	7.8	8.3	8.3	24.8	24.8	26.4	7.7	7.4	7.5	250	250	270
ctrC	63	5	5	5	7.8	8.3	8.3	24.8	24.9	27.9	7.5	7.4	7.4	250	260	275
ctrD	64	5	5	5	7.8	8.3	8.3	24.9	25.6	26.7	7.5	7.0	7.1	250	265	270
100%A	65	5	5	5	7.6	8.3	8.2	24.9	24.9	27.0	7.7	6.9	7.4	625	585	685
100%B	66	5	5	5	7.6	8.3	8.2	25.1	25.1	26.5	7.8	6.8	7.3	630	625	670
100%C	67	5	5	5	7.6	8.3	8.2	25.2	25.6	26.0	7.8	7.0	7.4	635	645	665
100%D	68	5	5	5	7.6	8.3	8.2	25.2	25.1	26.0	7.8	6.9	7.5	635	640	670
measured by:		DW	AS	CH	DW	CH	DW	DW	CH	DW	DW	CH	DW	DW	CH	DW
recorded by:		DW	AS	AS	DW	AS	AS	DW	AS	AS	DW	AS	AS	DW	AS	AS

Investigators' Signatures

Amber E Shumate

Marshall Faircloth

Courtney Head

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			0.14	N/A	B.N.	FW
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-700	C.H.	FW
Alkalinity (mg/L as $CaCO_3$):	130	—	137	Hach	CH	FW
Hardness (mg/L as $CaCO_3$):	130	—	160	Hach	CH	FW
Total ammonia (mg/L as N):	<0.017	—	0.655	DENVER	MF	FW
Salinity:	—	—	0	YSI	DW	FW

reviewer form updated 5/22/98

Macclenny WWTP **Control Site**

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	34	≥18	17-9	<9	5
EPT Index	6	-	≥3	<3	3
# Chironomid Taxa	20	≥4	3-2	<2	5
% Contribution of Dominant Taxon	12	≤37	38-69	>69	5
% Diptera	77	-	≤67	>67	1
Florida Index	24	≥6	5-3	<3	5
% Suspension feeders/Filterers	29	≥25	25-13	<13	5
Total Score		**Northeast**			**29**
Interpretation of Scores		**Excellent**			26-31
		Good			20-25
		Poor			14-19
		Severely Degraded			7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Northeast (April 1996)

Macclenny WWTP **Test Site**

Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	5	3	1	Score
Total Number of Taxa	34	≥18	17-9	<9	5
EPT Index	3	-	≥3	<3	3
# Chironomid Taxa	21	≥4	3-2	<2	5
% Contribution of Dominant Taxon	15	≤37	38-69	>69	5
% Diptera	76	-	≤67	>67	1
Florida Index	22	≥6	5-3	<3	5
% Suspension feeders/Filterers	25	≥25	25-13	<13	5
Total Score		**Northeast**			**29**
Interpretation of Scores		**Excellent**			26-31
		Good			20-25
		Poor			14-19
		Severely Degraded			7-13

Winter Index Period: Stream Condition Index (SCI) for Florida Northeast (April 1996)

Periphyton taxa list and densities (#/cm^2) for Macclenny WWTP, collected via glass microscope slides in Turkey Creek, on 22 March, 1999.

	Control Site	Test Site
Bacillariophyceae		
Achnanthes exigua	–	2674
Achnanthes lanceolata	–	1337
Achnanthes linearis	2440	27406
Achnanthes sp.	7321	27406
Anomoeneis sp.	1220	–
Cocconeis sp.	1220	–
Cymbella minuta	1220	–
Cymbella sp.	14643	4011
Eunotia flexuosa	1220	–
Eunotia formica	–	1337
Eunotia naegelii	1220	–
Eunotia sp.	28675	99596
Frustulia rhomboides rhomboides	10982	–
Frustulia rhomboides saxonica	1220	–
Gomphonema affine	45758	2674
Gomphonema angustatum	14643	2674
Gomphonema grunowii	2440	–
Gomphonema parvulum	35996	56817
Gomphonema sp.	4881	–
Navicula cincta	3661	6684
Navicula cryptocephala	–	14037
Navicula sp.	–	5347
Nitzschia amphibioides	–	12700
Nitzschia gracilis	31115	–
Nitzschia microcephala	2440	1337
Nitzschia palea	17693	19385
Nitzschia paleaformis	1220	1337
Nitzschia sp.	45758	27406
Pennales sp.	4881	–
Pinnularia sp.	28675	26069
Surirella sp.	–	4011
Chlorophyceae		
Chlorella sp.	1220	–
Chlorococcum sp.	1220	–
Closterium sp.	610	668
Cosmarium sp.	610	1337
Microspora sp.	232451	84891
Scenedesmus sp.	–	1337
Tetraedron muticum	610	–
Chrysophyceae		
Ophiocytium sp.	610	–
Cyanophyceae		
Anabaena sp.	–	668

Aphanocapsa sp.	–	1337
Dactylococcopsis sp.	–	668
Lyngbya sp.	–	2005
Microcystis sp.	1830	1337
Oscillatoria limosa	16473	–
Oscillatoria princeps	610	–
Oscillatoria sp.	2440	3342

Benthic macroinvertebrate taxa list for Macclenny WWTP, collected via 20 discrete dip net sweeps in Turkey Creek, on 22 March, 1999.

	Control Site	Test Site
Acariformes		
Hygrobates sp.	1	1
Coleoptera		
Gyrinidae	–	1
Microcylloepus pusillus	2	1
Stenelmis sp.	1	5
Diptera		
Ablabesmyia mallochi	3	9
Ablabesmyia rhamphe grp.	2	6
Chironomidae	–	10
Cladotanytarsus sp.	4	1
Conchapelopia sp.	–	1
Cricotopus bicinctus	–	1
Cryptochironomus sp.	3	–
Cryptotendipes sp.	–	1
Goeldichironomus sp.	1	–
Hemerodromia sp.	1	–
Paralauterborniella nigrohalteralis	2	–
Paratanytarsus sp. A Epler	1	–
Pentaneura inconspicua	1	1
Polypedilum convictum grp.	15	22
Polypedilum illinoense grp	–	3
Polypedilum laetum	1	–
Polypedilum scalaenum grp.	–	3
Polypedilum sp.	–	1
Procladius sp.	–	2
Rheocricotopus robacki	18	12
Rheotanytarsus distinctissimus grp.	–	2
Rheotanytarsus exiguus grp.	10	4
Simulium sp.	11	4
Stenochironomus sp.	1	–
Tanytarsus sp. C Epler	1	1
Tanytarsus sp. D Epler	6	–
Tanytarsus sp. L Epler	–	2
Tanytarsus sp. M Epler	7	20
Tanytarsus sp. U Epler	–	3
Tanytarsus sp.	1	4
Thienemanniella xena	1	1
Thienemannimyia grp.	12	3
Tribelos jucundum	9	–
Tribelos sp.	4	–
Xenochironomus xenolabis	–	1
Xylotopus par	1	–
Undetermined Diptera	7	–

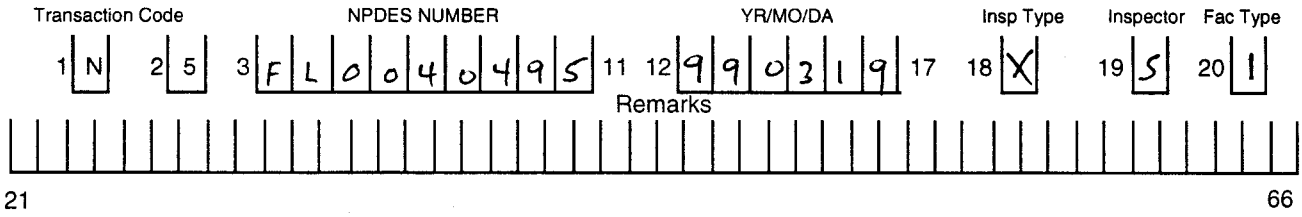
Ephemeroptera		
Acerpenna pygmaeus	–	1
Labiobaetis sp.	2	–
Leptophlebiidae	1	–
Stenonema exiguum	1	–
Stenonema smithae	6	1
Undetermined Ephemeroptera	1	–
Gastropoda		
Ancylidae	–	1
Pisidiidae	6	–
Undetermined Gastropoda	–	2
Isopoda		
Caecidotea sp.	7	8
Odonata		
Enallagma sp.	1	1
Progomphus sp.	–	1
Oligochaeta		
Slavina appendiculata	–	1
Trichoptera		
Cheumatopsyche sp.	5	14
Hydropsychidae	2	–
Nectopsyche sp.	1	–

Benthic macroinvertebrate taxa list for Macclenny WWTP, collected via Hester-Dendy artificial substrates in Turkey Creek, on 22 March, 1999. Densities, in number/m^2, represent the mean of three replicates.

	Control Site	Test Site
Acariformes		
Atractides sp.	3	3
Hygrobates sp.	5	–
Amphipoda		
Hyalella azteca	–	3
Coleoptera		
Ancyronyx variegatus	13	13
Dineutus sp.	–	3
Stenelmis sp.	8	5
Diptera		
Ablabesmyia mallochi	5	127
Ablabesmyia rhamphe grp.	–	3
Chironomidae	103	74
Cladotanytarsus sp.	11	3
Conchapelopia sp.	5	5
Corynoneura sp. C Epler	–	19
Cricotopus bicinctus	3	3
Cricotopus or *Orthocladius* sp.	3	–
Dicrotendipes modestus	3	3
Dolichopodidae sp.	–	3
Hemerodromia sp.	3	3
Labrundinia pilosella	5	108
Labrundinia sp. 4 Epler	–	5
Nanocladius sp.	–	3
Nilothauma sp.	–	3
Orthocladiinae	3	–
Paramerina sp.	–	8
Pentaneura inconspicua	5	5
Polypedilum convictum grp.	56	29
Polypedilum fallax	–	8
Polypedilum scalaenum grp.	3	3
Polypedilum sp.	3	–
Rheocricotopus robacki	111	–
Rheotanytarsus distinctissimus grp.	48	–
Rheotanytarsus exiguus grp.	61	–
Rheotanytarsus sp.	13	–
Simulium sp.	5	–
Stempellinella sp.	5	–
Tanytarsus sp. A Epler	3	37
Tanytarsus sp. C Epler	3	21
Tanytarsus sp. D Epler	5	26
Tanytarsus sp. L Epler	8	53
Tanytarsus sp. M Epler	24	233

Tanytarsus sp. S Epler	3	–
Tanytarsus sp. T Epler	3	–
Tanytarsus sp.	5	19
Thienemanniella sp.	3	–
Thienemanniella sp. A Epler	8	3
Thienemannimyia grp.	21	42
Tribelos jucundum	–	26
Ephemeroptera		
Ephemerellidae	–	3
Eurylophella doris	3	3
Heptageniidae	19	5
Leptophlebia sp.	11	–
Leptophlebiidae	8	13
Stenacron interpunctatum	3	–
Stenacron sp.	–	3
Stenonema smithae	135	29
Stenonema sp.	–	3
Gastropoda		
Ancylidae	–	8
Micromenetus dilatatus	–	5
Physella sp.	–	11
Planorbella sp.	3	–
Planorbidae	–	3
Undetermined Gastropoda	–	5
Isopoda		
Caecidotea sp.	11	16
Oligochaeta		
Dero digitata complex	–	8
Slavina appendiculata	–	34
Pelecypoda		
Pisidiidae	3	–
Trichoptera		
Cheumatopsyche sp.	13	–
Chimarra sp.	3	–
Hydropsyche sp.	8	–
Hydropsychidae	3	–
Polycentropus sp.	–	3

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)

