SITE: Milliken + Co
BREAK: 1.1
OTHER: v.2

PRELIMINARY ASSESSMENT

MILLIKEN & COMPANY – HILLSIDE PLANT
LAGRANGE, TROUP COUNTY, GEORGIA
GAD 981 275 993

PREPARED FOR:

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV
ATLANTA FEDERAL BUILDING
61 FORSYTH STREET, S.W.
ATLANTA, GEORGIA 30303-3415

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DECEMBER 2007

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V. 2-040506

Appendix

I

Part 70 Operating Permit

Permit Number: **3069-285-0082-V-01-0** **Effective Date:** **May 10, 2001**

Facility Name: **Milliken & Company - Hillside Coating Plant**

Facility Address: 1300 Brownwood Avenue
LaGrange, Georgia 30240 (Troup County)

Mailing Address: P.O. Box 1926, Mailstop M-482
Spartanburg, South Carolina 29304

Parent/Holding Company: Milliken & Company

Facility AIRS Number: 04-13-285-00082 **Primary SIC:** 3069

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Georgia Rules for Air Quality Control, Chapter 391-3-1, adopted pursuant to and in effect under the Act, the Permittee described above is issued a Part 70 Permit for:

the operation of a fabric coating facility.

This Permit is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted or in effect under that Act, or any other condition of this Permit. Unless modified or revoked, this Permit expires five years after the effective date indicated above.

This Permit may be subject to revocation, suspension, modification or amendment by the Director for cause including evidence of noncompliance with any of the above; or for any misrepresentation made in Title V Application No. TV-9109 which was determined to be complete on December 21, 1996; any other applications upon which this Permit is based; supporting data entered therein or attached thereto; or any subsequent submittal or supporting data; or for any alterations affecting the emissions from this source.

This Permit is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached **28** pages, which pages are a part of this Permit.

Director
Environmental Protection Division

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PART 1.0 FACILITY DESCRIPTION

1.1 Site Determination

The Milliken & Company Hillside Plant (AFS No. 285-00040), Milliken & Company Hillside Coating Plant (AFS No. 285-00082) and Milliken & Company Valway Plant (AFS No. 285-00045) comprise the same Title V site because the plants are located on contiguous property, operate under common control, and are a major source of HAPs. This Title V Permit will cover only the Milliken & Company Hillside Coating Plant (AFS No. 285-00082). The remaining portions of this site are covered under the following Title V permit applications:

Plant	Application No.	Primary SIC Code
Milliken & Company - Hillside Plant	TV-9182	2262
Milliken & Company -Valway Plant	TV-9115	2262

Also, please note that the Milliken & Company Hillside Coating Plant (AFS No. 285-00082) does not comprise the same Title I site with the Milliken & Company Hillside Plant (AFS No. 285-00040) and Milliken & Company Valway Plant (AFS No. 285-00045) because the Hillside Coating Plant does not have the same two digit SIC code and it is not classified as a support facility.

1.2 Previous and/or Other Names

Previous names identified include Milliken & Company - Hillside Plant.

1.3 Overall Facility Process Description

The Milliken & Company Hillside Coating Plant (Milliken) is a fabric coating facility. The coating operation involves the continuous application of a polymeric coating to a fabric substrate. The polymeric coating is compounded and pelletized in a Banbury Mixer Process Group. The polymeric coating is formulated by dissolving the pellets in solvent in mixers LM01 and LM02. The polymeric mixture plus curing agents are applied in coating range CTNG. After the coated fabric exits this range it is routed to a powder application area which applies powders to keep the fabric from sticking together. After the powder application, the fabric goes through a curing range (CURG) for final curing. The exhausts from LM01, LM02, CTNG, and CURG are routed to thermal oxidizer TOXX. The exhaust from TOXX is either routed to the stack or to boiler HSCB. Boiler HSCB provides steam for the coating process and this boiler is fired on natural gas and/or vaporized propane and is rated at approximately 21 MMBtu/hr.

PART 2.0 REQUIREMENTS PERTAINING TO THE ENTIRE FACILITY

2.1 Emission Limits

None applicable.

2.2 Facility Wide Federal Rule Standards

None applicable.

2.3 Facility Wide SIP Rule Standards

None applicable.

2.4 Facility Wide Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit

None applicable.

PART 3.0 REQUIREMENTS FOR EMISSION UNITS

Note: Except where an applicable requirement specifically states otherwise, the averaging times of any of the Emissions Limitations or Standards included in this permit are tied to or based on the run time(s) specified for the applicable reference test method(s) or procedures required for demonstrating compliance.

3.1 Emission Units

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	Description	Applicable Requirements / Standards*	Corresponding Permit Conditions	ID No.	Description
HSCB	Hurst Boiler rated at 21 MMBtu/hr	391-3-1-.02(2)(d) 391-3-1-.02(2)(g) 40 CFR 60 Subpart Dc	3.4.3, 3.4.4, 3.4.5, 6.2.1	None	NA
LM01	Non-Reactive Bulk Mixer	391-3-1-.02(2)(e) 391-3-1-.02(2)(b) 40 CFR 60 Subpart VVV	3.3.5, 3.3.7, 3.3.8, 6.2.7	TOXX	Thermal Incinerator
LM02	Non-Reactive Bulk Mixer	391-3-1-.02(2)(e) 391-3-1-.02(2)(b) 40 CFR 60 Subpart VVV	Same as LM01	TOXX	Thermal Incinerator
CTNG	Process Group Coating Range which includes a coating applicator and curing oven	391-3-1-.02(2)(e) 391-3-1-.02(2)(b) 391-3-1-.02(2)(x) 40 CFR 60 Subpart VVV	3.2.1, 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.6, 3.4.1, 3.4.2, 3.4.6, 3.4.7, 5.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7	TOXX	Thermal Incinerator
CURG	Process Group - Curing Range which includes a curing oven and a label printer	391-3-1-.02(2)(e) 391-3-1-.02(2)(b)	3.2.1, 3.4.1, 3.4.2, 6.2.3, 6.2.5, 6.2.6	TOXX	Thermal Incinerator

* Generally Applicable Requirements contained in this permit may apply also to emission units listed above.

3.2 Equipment Emission Caps and Operating Limits

3.2.1 The Permittee shall not discharge, nor cause the discharge, into the atmosphere, from Process Groups CTNG and CURG, combined, VOC emissions in excess of 100 tons during any 13 consecutive 4 week period. For purposes of this condition a period is defined as 4 calendar weeks. [Fee Reduction - 391-3-1-.03(9)]

3.3 Equipment Federal Rule Standards

3.3.1 The Permittee shall install, operate, and maintain a *total enclosure* around the coating applicator of Process Group CTNG and vent the captured VOC emissions from the total enclosure to thermal incinerator TOXX. [40 CFR 60.742(b)(2)]

3.3.2 For purposes of this Permit, the term "*total enclosure*" shall mean a structure that is constructed around a source of emissions and operated so that all VOC emissions are collected and exhausted through a stack or duct. [40 CFR 60.741]

3.3.3 The *total enclosure*, required by Condition 3.3.1, shall comply with Method 204 for a permanent total enclosure. [40 CFR 60.743(b)(1)]

3.3.4 The Permittee shall maintain thermal incinerator TOXX such that is has a VOC control efficiency of at least ninety-five (95) percent whenever Process Group CTNG is operating. [40 CFR 60.742(b)(2)]

3.3.5 *Coating mix preparation equipment (tanks)* LM01 and LM02 shall be vented to thermal incinerator TOXX while the said equipment is in operation. [40 CFR 60.743(c)(3)]

3.3.6 Process Group CTNG is subject to all applicable requirements of 40 CFR 60, Subpart A - *General Provisions*. [40 CFR 60 Subpart A]

3.3.7 Each coating mix preparation tank, LM01 and LM02, shall be equipped with covers that meet the following specification: [40 CFR 60.743(c)(1)]

a. The tank cover shall be closed at all times except when adding ingredients, withdrawing samples, transferring the contents, or making visual inspection when such activities cannot be carried out with cover in place. Such activities shall be carried out through ports of the minimum practical size;

b. The tank cover shall extend at least 2 centimeters beyond the outer rim of the opening or shall be attached to the rim;

c. The tank cover shall be of such design and construction that contact is maintained between cover and rim along the entire perimeter;

d. Any breach in the tank cover (such as a slit for insertion of a mixer shaft or port for addition of ingredients) shall be covered consistent with Condition Nos. 5.2.3.a., 5.2.3.b, and 5.2.3.c when not actively in use. An opening sufficient to allow safe clearance for a mixer shaft is acceptable during those periods when the shaft is in pace; and

e. A polyethylene or nonpermanent cover may be used provided it meets the requirements of Condition Nos. 5.2.3.a, 5.2.3.b, 5.2.3.c, and 5.2.3.d. Such a cover shall not be reused after once being removed.

3.3.8 The Permittee shall post the procedures detailing the proper use of covers, as specified in Condition 3.3.7.a, in view of LM01 and LM02. [40 CFR 60.743(c)(2)]

3.4 Equipment SIP Rule Standard

3.4.1 The Permittee shall not discharge, or cause the discharge, into the atmosphere from Process Group CTNG and CURG, combined, and from LM01 and LM02, combined, any gases which contain PM in excess of the rate derived from the equation noted below. [391-3-1-.02(2)(e)1.]

a. For process input weight rate up to and including 30 tons/hr:
$E = 4.1P^{0.67}$; or

b. For process input weight rate above 30 tons/hr:
$E = 55P^{0.11} - 40$

where E equals the allowable PM emission rate in pounds per hour; and P equals the process input weight rate in tons per hour.

3.4.2 The Permittee shall not discharge, or cause the discharge, into the atmosphere, from each unit in Process Groups CTNG and CURG and from LM01 and LM02, any gases that exhibit visible emissions, the opacity of which is equal to or greater than forty (40) percent. [391-3-1-.02(2)(b)]

3.4.3 The Permittee shall not discharge, or cause the discharge, into the atmosphere from boiler, HSCB, gases which contain PM in amounts equal to or exceeding the rate derived from the equation noted below: [391-3-1-.02(2)(d)2.]

$$P = 0.5(10/R)^{0.5}$$

where P equals the allowable PM emission rate in pounds per million Btu and R equals the heat input in million Btus per hour.

3.4.4 The Permittee shall not discharge, or cause the discharge, into the atmosphere, from boiler, HSCB, any gases that exhibit visible emissions, the opacity of which is equal to or greater than twenty(20) percent except for one six minute period per hour of not more than twenty-seven (27) percent opacity.
[391-3-1-.02(2)(d)3.]

3.4.5 The Permittee shall not fire any fuel that contains greater than 2.5 weight percent sulfur in boiler HSCB. [391-3-1-.02(2)(g)2.]

3.4.6 The Permittee shall not discharge, or cause the discharge, into the atmosphere, VOC emissions from Process Group CTNG in excess of 2.9 pounds per gallon of coating, excluding water, delivered to the coating applicator. If any coating delivered to the coating applicator contains more than 2.9 pounds of VOC per gallon of coating, excluding water, then the Permittee shall meet the solids equivalent limit of 4.79 pounds VOC per gallon of coating solids as delivered to the coating applicator. [391-3-1-.02(2)(x)1.(i)]

3.4.7 The Permittee shall comply with the emission limitation specified in Condition 3.4.6 by the following: [391-3-1-.02(2)(x)2.(iii)]

a. Operate a Division approved capture system and by operating air pollution control equipment that recovers or destroys at least ninety (90) percent of the nonmethane volatile organic compounds; and

b. Each and every coating used on CTNG does not exceed the solids equivalent limit of 4.79 pounds VOC per gallon of coating solids as delivered to the coating applicator, after controlled by TOXX.

3.5 Equipment Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit

None Applicable.

PART 4.0 REQUIREMENTS FOR TESTING

4.1 General Testing Requirements

4.1.1 The Permittee shall cause to be conducted a performance test at any specified emission point when so directed by the Environmental Protection Division ("Division"). The test results shall be submitted to the Division within 30 days of the completion of the testing. Any tests shall be performed and conducted using methods and procedures which have been previously specified or approved by the Division.
[391-3-1-.02(6)(b)1(i)]

4.1.2 The Permittee shall provide the Division thirty (30) days prior written notice of the date of any performance test(s) to afford the Division the opportunity to witness and/or audit the test, and shall provide with the notification a test plan in accordance with Division guidelines.
[391-3-1-.02(3)(a)]

4.1.3 Performance and compliance tests shall be conducted and data reduced in accordance with applicable procedures and methods specified in the Division's **Procedures for Testing and Monitoring Sources of Air Pollutants**. The methods for the determination of compliance with emission limits listed under Sections 3.2, 3.3, 3.4 and 3.5 which pertain to the emission units listed in Section 3.1 are as follows:

a. Method 1 shall be used for the determination of sample point locations,

b. Method 2 shall be used for the determination of stack gas flow rate,

c. Method 3 or 3A shall be used for the determination of stack gas molecular weight,

d. Method 3B shall be used for the determination of the emission rate correction factor for excess air. Method 3A may be used as an alternative to Method 3B,

e. Method 4 shall be used for the determination of stack gas moisture,

f. Method 5 shall be used for the determination of Particulate Matter concentration,

g. Method 9 and the procedures contained in Section 1.3 of the above referenced document for the determination of opacity,

h. Method 19 shall be used for the determination of Particulate Matter emission rate,

i. Method 24 shall be used for the determination of VOC content in coatings used in range CTNG,

j. Method 25 shall be used for the determination of VOC concentrations of the thermal incinerator TOXX gas streams. Methods 18 or 25A may be used as alternatives to Method 25, and

k. Method 204, *Criteria and Verification of a Permanent or Temporary Total Enclosure*, shall be used for the verification of the enclosure around the coating applicator in Process Group CTNG.

Minor changes in methodology may be specified or approved by the Director or his designee when necessitated by process variables, changes in facility design, or improvement or corrections which, in his opinion, render those methods or procedures, or portions thereof, more reliable.
[391-3-1-.02(3)(a)]

4.2 Specific Testing Requirements

None applicable.

PART 5.0 REQUIREMENTS FOR MONITORING (Related to Data Collection)

5.1 General Monitoring Requirements

5.1.1 Any continuous monitoring system required by the Permit shall be in continuous operation and data recorded as set forth in this Permit during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Data shall be recorded during calibration checks and zero and span adjustments. Maintenance or repair shall be conducted in the most expedient manner to minimize the period during which the system is out of service. [391-3-1-.02(6)(b)1]

5.2 Specific Monitoring Requirements

5.2.1 The Permittee shall install, calibrate, maintain, and operate a system to continuously monitor and record the indicated parameters on the following equipment. Where such performance specification(s) exist, each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1, 40 CFR 70.6(a)(3)(i), and 40 CFR 60.744(e)]

a. Combustion zone temperature of thermal incinerator TOXX. The monitoring device shall have an accuracy within ±1 percent of the temperature being measured in Celsius degrees.

b. Gas stream velocity pressure in the total enclosure duct before the inlet of the oxidizer TOXX fan. The velocity pressure shall be measured in inches of water column using a pitot tube.

5.3 Record Keeping and Reporting Requirements (associated with Specific Monitoring Requirements)

5.3.1 The Permittee shall, in accordance with the requirements of Condition Nos. 6.1.1 and 6.1.6 of the Permit, maintain records of all data and information required by Condition 5.2.1. Reports shall be submitted in accordance with the requirements of Condition 6.1.4 of this Permit.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

PART 6.0 OTHER RECORD KEEPING AND REPORTING REQUIREMENTS

6.1 General Record Keeping and Reporting Requirements

6.1.1 Unless otherwise specified, all records required to be maintained by this Permit shall be recorded in a permanent form suitable for inspection and submission to the Division and to the EPA. The records shall be retained for at least five (5) years following the date of entry.
[391-3-1-.02(6)(b)1(i) and 40 CFR 70.6(a)(3)]

6.1.2 In addition to any other reporting requirements of this Permit, the Permittee shall report to the Division in writing, within seven (7) days, any deviations from applicable requirements associated with any malfunction or breakdown of process, fuel burning, or emissions control equipment for a period of four hours or more which results in excessive emissions.

The Permittee shall submit a written report which shall contain the probable cause of the deviation(s), duration of the deviation(s), and any corrective actions or preventive measures taken.
[391-3-1-.02(6)(b)1(iv), 391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(3)(iii)(B)]

6.1.3 The Permittee shall submit written reports of any failure to meet an applicable emission limitation or standard contained in this permit and/or any failure to comply with or complete a work practice standard or requirement contained in this permit which are not otherwise reported in accordance with conditions 6.1.4 or 6.1.2. Such failures shall be determined through observation, data from any monitoring protocol, or by any other monitoring which is required by this permit. The reports shall cover each semiannual period ending June 30 and December 31 of each year, shall be postmarked by the 30th day following the end of each reporting period, July 30 and January 30, respectively, and shall contain the probable cause of the failure(s), duration of the failure(s), and any corrective actions or preventive measures taken.
[391-3-1-.03(10)(d)1.(i) and 40 CFR 70.6(a)(3)(iii)(B)]

6.1.4 The Permittee shall submit a written report containing any excess emissions, exceedances, and/or excursions as described in this permit and any monitor malfunctions for each semiannual period ending June 30 and December 31 of each year. All reports shall be postmarked by the 30th day following the end of each reporting period, July 30 and January 30, respectively. In the event that there have not been any excess emissions, exceedances, excursions or malfunctions during a reporting period, the report should so state. Otherwise, the contents of each report shall be as specified by the Division's Procedures for Testing and Monitoring Sources of Air Pollutants and shall contain the following:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(iii)(A)]

a. A summary report of excess emissions, exceedances and excursions, and monitor downtime, in accordance with Section 1.5(c) and (d) of the above referenced document, including any failure to follow required work practice procedures.

b. Total process operating time during each reporting period.

c. The magnitude of all excess emissions, exceedances and excursions computed in accordance with the applicable definitions as determined by the Director, and any conversion factors used, and the date and time of the commencement and completion of each time period of occurrence.

d. Specific identification of each period of such excess emissions, exceedances, and excursions that occur during startups, shutdowns, or malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventive measures adopted.

e. The date and time identifying each period during which any required monitoring system or device was inoperative (including periods of malfunction) except for zero and span checks, and the nature of the repairs, adjustments, or replacement. When the monitoring system or device has not been inoperative, repaired, or adjusted, such information shall be stated in the report.

f. Certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

6.1.5 Where applicable, the Permittee shall keep the following records:
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(3)(ii)(A)]

a. The date, place, and time of sampling or measurement;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of such analyses; and

f. The operating conditions as existing at the time of sampling or measurement.

6.1.6 The Permittee shall maintain files of all measurements, including continuous monitoring systems, monitoring devices, and performance testing measurements; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices. These files shall be kept in a permanent form suitable for inspection and shall be maintained for a period of at least five (5) years following the date of such measurements, reports, maintenance and records.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6 (a)(3)(ii)(B)]

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. Excess emissions: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping which is specifically defined, or stated to be, excess emissions by an applicable requirement)

None required to be reported in accordance with Condition 6.1.4.

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. Any 13 consecutive four-week period total VOC emissions from CTNG and CURG, combined, that exceeds 100 tons. For purposes of this condition, a period is defined as 4 calendar weeks.

ii. Any time in which a coating is used on CTNG which exceeds 4.79 pounds of VOC per gallon of coating solids as applied, after controlled by TOXX.

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. Any three-hour rolling period during operation of the coating applicator in range CTNG that the average combustion zone temperature of thermal incinerator TOXX drops below 1385 °F.
[40 CFR 60.747(d)(4)]

ii. Any three-hour rolling period during operation of the coating applicator in range CTNG that the average pitot tube pressure drop, as measured by the monitoring system required by Condition 5.2.1, is outside the range of 1.27 to 1.34 inches of water.
[40 CFR 60.747(d)(6)]

6.2 Specific Record Keeping and Reporting Requirements

6.2.1 The Permittee shall maintain monthly records that specify the volume of natural gas and propane consumed by boiler HSCB. [40 CFR 70.6(a)(3)(i) , 40 CFR 60.48c(g) and Alternate Fuel Usage Recordkeeping Frequency for Dc Boilers, Approved by U.S. EPA Region 4 on August 14, 1996]

6.2.2 The Permittee shall maintain usage records of all materials containing volatile organic compounds used in Process Group CTNG on a 4-calendar week period basis. These records shall include the total weight of each material used, the volatile organic compound content of each material (expressed as a weight percentage), and the weight of any material disposed as waste. All calculations used to determine usages should be kept as part of the daily record.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

6.2.3 The Permittee shall use the records required in Condition 6.2.2 to calculate the 4- calendar week period VOC emissions (in tons) from Process Group CTNG and CURG, combined. The Permittee shall use the following formula to compute VOC emissions:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

VOC emissions (tons/period) = [(A+B) - (C)]*(1.00)*(1-0.95)*(1 ton/2000 lbs)

where,
A = Beginning mass of volatile organic solvents in inventory (pounds)
B = Mass of volatile organic solvents received in inventory (pounds)
C = Ending inventory mass of volatile organic solvents (pounds)
1.00 = VOC capture efficiency
(1-0.95) = 1 - allowable VOC destruction efficiency

All calculations used to determine this parameter shall be kept as part of the record for that period.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

6.2.4 The Permittee shall use the records required in Condition 6.2.2 to calculate the VOC emissions from CTNG in pounds of VOC per gallon of coating solids applied, after controlled by TOXX, for each coating formulation used on CTNG for each 4-calendar week period. All calculations used to determine this parameter shall be kept as part of the record.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

6.2.5 The Permittee shall use the records required by Condition 6.2.3 to determine the 13 consecutive four-week period total of VOC emissions (in tons) from CTNG and CURG, combined, on a period basis. A 13 consecutive four-week period total shall be the total for a four-week period in the reporting period plus the totals for the previous 12 consecutive four-week periods. For purposes of this condition, a period is defined as 4 calendar weeks.
[391-3-1-.02(6)(b)1. and 40 CFR 70.6(a)(3)(i)]

6.2.6 The Permittee shall submit a report of the following information with the report required by Condition 6.1.4:
[391-3-1-.02(6)(b)1. and 40 CFR 70.6(a)(3)(i)]

a. The 13 consecutive four-week period total VOC emissions (tons) from CTNG and CURG, combined, for each period and portion thereof in the quarterly reporting time frame noted in Condition 6.1.4. For purposes of this condition, a period is defined as 4 calendar weeks. The Permittee shall include any portion of a period needed to complete the semiannual reporting requirement. The reports shall be prepared from the records retained in Condition 6.2.5.

6.2.7 The Permittee shall submit a written report containing the following information for each quarterly period ending March 31, June 30, September 30, and December 31 of each year. All reports shall be postmarked by the 30th day following the end of each reporting period, April 30, July 30, October 30, and January 30, respectively. In the event that there have not been any occurrence noted below during a reporting period, the report should so state.
[391-3-1-.02(6)(b)1., 40 CFR 70.6(a)(3)(i), and 40 CFR 60.747(f)]

a. All periods during actual mixing or coating in mixing tanks LM01 or LM02 and coating range CTNG when the monitoring devices required by Condition 5.2.1 (a) and (b) were malfunctioning or not operating; and

b. All periods during actual mixing or coating in mixing tanks LM01 or LM02 and coating range CTNG when thermal incinerator TOXX was malfunctioning or not operating.

PART 7.0 OTHER SPECIFIC REQUIREMENTS

7.1 Operational Flexibility

7.1.1 The Permittee may make Section 502(b)(10) changes as defined in 40 CFR 70.2 without requiring a Permit revision, if the changes are not modifications under any provisions of Title I of the Federal Act and the changes do not exceed the emissions allowable under the Permit (whether expressed therein as a rate of emissions or in terms of total emissions). For each such change, the Permittee shall provide the Division and the EPA with written notification as required below in advance of the proposed changes and **shall obtain any Permits required under Rules 391-3-1-.03(1) and (2)**. The Permittee and the Division shall attach each such notice to their copy of this Permit.
[391-3-1-.03(10)(b)5 and 40 CFR 70.4(b)(12)(i)]

a. For each such change, the Permittee's written notification and **application for a construction Permit shall be submitted well in advance of any critical date** (typically at least 90 days in advance of any commencement of construction, Permit issuance date, etc.) involved in the change, but no less than seven (7) days in advance of such change and shall include a brief description of the change within the Permitted facility, the date on which the change is proposed to occur, any change in emissions, and any Permit term or condition that is no longer applicable as a result of the change.

b. The Permit shield described in Condition 8.16.1 shall not apply to any change made pursuant to this condition.

7.2 Off-Permit Changes

7.2.1 The Permittee may make changes that are not addressed or prohibited by this Permit, other than those described in Condition 7.2.2 below, without a Permit revision, provided the following requirements are met:
[391-3-1-.03(10)(b)6 and 40 CFR 70.4(b)(14)]

a. Each such change shall meet all applicable requirements and shall not violate any existing Permit term or condition.

b. The Permittee must provide contemporaneous written notice to the Division and to the EPA of each such change, except for changes that qualify as insignificant under Rule 391-3-1-.03(10)(g). Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result of the change.

c. The change shall not qualify for the Permit shield in Condition 8.16.1.

d. The Permittee shall keep a record describing changes made at the source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under the Permit, and the emissions resulting from those changes.

e. **The source shall obtain any Permits required under Rules 391-3-1-.03(1) and (2).**

7.2.2 The Permittee shall not make, without a Permit revision, any changes that are not addressed or prohibited by this Permit, if such changes are subject to any requirements under Title IV of the Federal Act or are modifications under any provision of Title I of the Federal Act. [Rule 391-3-1-.03(10)(b)7 and 40 CFR 70.4(b)(15)]

7.3 Alternative Requirements
[White Paper #2]

Not Applicable

7.4 Insignificant Activities
(see Attachment B for the list of Insignificant Activities in existence at the facility at the time of permit issuance)

7.5 Temporary Sources
[391-3-1-.03(10)(d)5 and 40 CFR 70.6(e)]

Not Applicable

7.6 Short-term Activities
(see Section 4.40 of Permit application and White Paper #1)

7.6.1 The Permittee shall maintain records of the duration and frequency of asbestos removal in accordance with Georgia Rule 391-3-1-.02(9)(b)7.

7.7 Compliance Schedule/Progress Reports
[391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(4)]

None applicable.

7.8 Emissions Trading
[391-3-1-.03(10)(d)1(ii) and 40 CFR 70.6(a)(10)]

Not Applicable

7.9 Acid Rain Requirements

Not Applicable

7.10 Prevention of Accidental Releases (Section 112(r) of the 1990 CAAA)
[391-3-1-.02(10)]

7.10.1 The Permittee shall submit a Risk Management Plan (RMP) in accordance with the 40 CFR Part 68, when and if, such requirement becomes applicable. All reports and notifications required by 40 CFR Part 68 must be submitted electronically (e.g. diskette or compact disc) to:

Attention: RMP*Submit
RMP Reporting Center
P.O. Box 3346
Merrifield, VA 22116-3346

7.11 Stratospheric Ozone Protection Requirements (Title VI of the CAAA of 1990)

7.11.1 If the Permittee performs any of the activities described below or as otherwise defined in 40 CFR Part 82, the Permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, except as provided for motor vehicle air conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to 40 CFR 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliance must comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 CFR 82.161.

d. Persons disposing of small appliances, MVACs, and MVAC-like appliances must comply with record keeping requirements pursuant to 40 CFR 82.166.
[Note: "MVAC-like appliance" is defined in 40 CFR 82.152.]

e. Persons owning commercial or industrial process refrigeration equipment must comply with the leak repair requirements pursuant to 40 CFR 82.156.

f. Owners/operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR 82.166.

7.11.2 If the Permittee performs a service on motor (fleet) vehicles and if this service involves an ozone-depleting substance (refrigerant) in the MVAC, the Permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners.

The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term "MVAC" as used in Subpart B does not include air-tight sealed refrigeration systems used for refrigerated cargo, or air conditioning systems on passenger buses using HCFC-22 refrigerant.

7.12 Revocation of Existing Permits and Amendments

The following Air Quality Permits and Amendments are hereby revoked:

Air Quality Permit Number	Dates of Original Permit Issuance or Amendment
3069-141-10507	April 6, 1990 Amended December 13, 1991 Amended January 22, 1993 Amended July 22, 1993

7.13 Pollution Prevention

Not Applicable

7.14 Specific Conditions

None applicable.

PART 8.0 GENERAL PROVISIONS

8.1 Terms and References

8.1.1 Terms not otherwise defined in the Permit shall have the meaning assigned to such terms in the referenced regulation.

8.1.2 Where more than one condition in this Permit applies to an emission unit and/or the entire facility, each condition shall apply and the most stringent condition shall take precedence.
[391-3-1-.02(2)(a)2]

8.2 EPA Authorities

8.2.1 Except as identified as "State-only enforceable" requirements in this Permit, all terms and conditions contained herein shall be enforceable by the EPA and citizens of the United States under the Clean Air Act, as amended, 42 U.S.C. 7401, et seq.
[40 CFR 70.6(b)(1)]

8.2.2 Nothing in this Permit shall alter or affect the authority of the EPA to obtain information pursuant to 42 U.S.C. 7414, "Inspections, Monitoring, and Entry."
[40 CFR 70.6(f)(3)(iv)]

8.2.3 Nothing in this Permit shall alter or affect the authority of the EPA to impose emergency orders pursuant to 42 U.S.C. 7603, "Emergency Powers."
[40 CFR 70.6(f)(3)(i)]

8.3 Duty to Comply

8.3.1 The Permittee shall comply with all conditions of this operating Permit. Any Permit noncompliance constitutes a violation of the Federal Clean Air Act and the Georgia Air Quality Act and/or State rules and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. Any noncompliance with a Permit condition specifically designated as enforceable only by the State constitutes a violation of the Georgia Air Quality Act and/or State rules only and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(i)]

8.3.2 The Permittee shall not use as a defense in an enforcement action the contention that it would have been necessary to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(ii)]

8.3.3 Nothing in this Permit shall alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of Permit issuance.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(f)(3)(ii)]

8.3.4 Issuance of this Permit does not relieve the Permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Director or any other federal, state, or local agency.
[391-3-1-.03(10)(e)1(iv) and 40 CFR 70.7(a)(6)]

8.4 Fee Assessment and Payment

8.4.1 The Permittee shall calculate and pay an annual Permit fee to the Division. The amount of fee shall be determined each year in accordance with the "Procedures for Calculating Air Permit Fees."
[391-3-1-.03(9)]

8.5 Permit Renewal and Expiration

8.5.1 This Permit shall remain in effect for five (5) years from the date of issuance. The Permit shall become null and void after the expiration date unless a timely and complete renewal application has been submitted to the Division at least six (6) months, but no more than eighteen (18) months prior to the expiration date of the Permit.
[391-3-1-.03(10)(d)1(i), (e)2, and (e)3(ii) and 40 CFR 70.5(a)(1)(iii)]

8.5.2 Permits being renewed are subject to the same procedural requirements, including those for public participation and affected State and EPA review, that apply to initial Permit issuance.
[391-3-1-.03(10)(e)3(i)]

8.5.3 Notwithstanding the provisions in 8.5.1 above, if the Division has received an application for renewal, deemed it administratively complete, and failed to reissue the Permit for reasons other than cause, authorization to operate shall continue beyond the expiration date to the point of Permit modification, reissuance, or revocation.
[391-3-1-.03(10)(e)3(iii)]

8.6 Transfer of Ownership or Operation

8.6.1 This Permit is not transferable by the Permittee. Future owners and operators shall obtain a new Permit from the Director. The new Permit may be processed as an administrative amendment if no other change in this Permit is necessary, and provided that a written agreement containing a specific date for transfer of Permit responsibility coverage and liability between the current and new Permittee has been submitted to the Division at least thirty (30) days in advance of the transfer.
[391-3-1-.03(4)]

8.7 Property Rights

8.7.1 This Permit shall not convey property rights of any sort, or any exclusive privileges.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(iv)]

8.8 Submissions

8.8.1 Reports, test data, monitoring data, notifications, annual certifications, and requests for revision and renewal shall be submitted to:

Georgia Department of Natural Resources
Environmental Protection Division

Air Protection Branch
Atlanta Tradeport, Suite 120
4244 International Parkway
Atlanta, Georgia 30354-3908

8.8.2 Any records, compliance certifications, and monitoring data required by the provisions in this Permit to be submitted to the EPA shall be sent to:

Air and EPCRA Enforcement Branch
U. S. EPA Region 4
61 Forsyth Street
Atlanta, Georgia 30303

8.8.3 Any application form, report, or compliance certification submitted pursuant to this Permit shall contain a certification by a responsible official of its truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(d)]

8.8.4 Unless otherwise specified, all submissions under this permit shall be submitted to the Division only.

8.9 Duty to Provide Information

8.9.1 The Permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the Permit application, shall promptly submit such supplementary facts or corrected information to the Division.
[391-3-1-.03(10)(c)5]

8.9.2 The Permittee shall furnish to the Division, in writing, information that the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the Permit, or to determine compliance with the Permit. Upon request, the Permittee shall also furnish to the Division copies of records that the Permittee is required to keep by this Permit or, for information claimed to be confidential, the Permittee may furnish such records directly to the EPA, if necessary, along with a claim of confidentiality.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(v)]

8.10 Modifications

8.10.1 Prior to any source commencing a modification as defined in 391-3-1-.01(pp) which may result in air pollution and not exempted by 391-3-1-.03(6), the Permittee shall submit a Permit application to the Division. The application shall be submitted sufficiently in advance of any critical date involved to allow adequate time for review, discussion, or revision of plans, if necessary. Such application shall include, but not be limited to, information describing the precise nature of the change, modifications to any emission control system, production capacity of the plant before and after the change, and the anticipated completion date of the change. The application shall be in the form of a Georgia air quality Permit application to construct or modify (otherwise known as a SIP application) and shall be submitted on forms supplied by the Division, unless otherwise notified by the Division.
[391-3-1-.03(1) through (8)]

8.11 Permit Revision, Revocation, Reopening and Termination

8.11.1 This Permit may be revised, revoked, reopened and reissued, or terminated for cause by the Director. The Permit will be reopened for cause and revised accordingly under the following circumstances:

a. If additional applicable requirements become applicable to the source and the remaining Permit term is one (1) year or longer. In this case, the reopening shall be completed no later than eighteen (18) months after promulgation of the applicable requirement. A reopening shall not be required if compliance with the applicable requirement is not required until after the date on which the Permit is due to expire;
[391-3-1-.03(10)(e)6(i)(I)]

b. If any additional applicable requirements of the Acid Rain Program become applicable to the source;
[391-3-1-.03(10)(e)6(i)(II)] (Acid Rain sources only)

c. The Director determines that the Permit contains a material mistake or inaccurate statements were made in establishing the emissions standards or other terms or conditions of the Permit; or
[391-3-1-.03(10)(e)6(i)(III) and 40 CFR 70.7(f)(1)(iii)]

d. The Director determines that the Permit must be revised or revoked to assure compliance with the applicable requirements.
[391-3-1-.03(10)(e)6(i)(IV) and 40 CFR 70.7(f)(1)(iv)]

8.11.2 Proceedings to reopen and reissue a Permit shall follow the same procedures as applicable to initial Permit issuance and shall affect only those parts of the Permit for which cause to reopen exists. Reopenings shall be made as expeditiously as practicable.
[391-3-1-.03(10)(e)6(ii)]

8.11.3 Reopenings shall not be initiated before a notice of intent to reopen is provided to the source by the Division at least thirty (30) days in advance of the date the Permit is to be reopened, except that the Director may provide a shorter time period in the case of an emergency.
[391-3-1-.03(10)(e)6(iii)]

8.11.4 All Permit conditions remain in effect until such time as the Director takes final action. The filing of a request by the Permittee for any Permit revision, revocation, reissuance, or termination, or of a notification of planned changes or anticipated noncompliance, shall not stay any Permit condition.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(iii)]

8.11.5 **State Only Enforceable Condition.**
At any time that the Director determines that additional control of emissions from the facility may reasonably be needed to provide for the continued protection of public health, safety and welfare, the Director reserves the right to amend the provisions of this Permit pursuant to the Director's authority as established in the Georgia Air Quality Act and the rules adopted pursuant to that Act.
[391-3-1-.02(2)(a)3]

8.11.6 A Permit revision shall not be required for changes which are explicitly authorized by the conditions of this Permit.

8.11.7 A Permit revision shall not be required for changes that are part of an approved economic incentive, marketable Permit, emission trading, or other similar program or process for change which is specifically provided for in this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(8)]

8.12 Severability

8.12.1 Any condition or portion of this Permit which is challenged, becomes suspended or is ruled invalid as a result of any legal or other action shall not invalidate any other portion or condition of this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(5)]

8.13 Excess Emissions Due to an Emergency

8.13.1 An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the Permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(1)]

8.13.2 An emergency shall constitute an affirmative defense to an action brought for noncompliance with the technology-based emission limitations if the Permittee demonstrates, through properly signed contemporaneous operating logs or other relevant evidence, that:
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(2) and (3)]

a. An emergency occurred and the Permittee can identify the cause(s) of the emergency;

b. The Permitted facility was at the time of the emergency being properly operated;

c. During the period of the emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards, or other requirements in the Permit; and

d. The Permittee promptly notified the Division and submitted written notice of the emergency to the Division within two (2) working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

8.13.3 In an enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency shall have the burden of proof.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(4)]

8.13.4 The emergency conditions listed above are in addition to any emergency or upset provisions contained in any applicable requirement.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(5)]

8.14 Compliance Requirements

8.14.1 Compliance Certification

The Permittee shall provide written certification to the Division and to the EPA, at least annually, of compliance with the conditions of this Permit. The annual written certification shall be postmarked no later than January 30 of each year and shall be submitted to the Division and to the EPA. The certification shall include, but not be limited to, the following elements: [391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(5)]

a. The identification of each term or condition of the Permit that is the basis of the certification;

b. The status of compliance with the terms and conditions of the permit for the period covered by the certification, based on the method or means designated in paragraph c below. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion or exceedance as defined under 40 CFR Part 64 of this chapter occurred;

c. The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period and whether such methods or other means provide continuous or intermittent data;

d. Any other information that must be included to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information; and

e. Any additional requirements specified by the Division.

8.14.2 Inspection and Entry

a. Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow authorized representatives of the Division to perform the following: [391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(2)]

i. Enter upon the Permittee's premises where a Part 70 source is located or an emissions-related activity is conducted, or where records must be kept under the conditions of this Permit;

ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this Permit; and

iv. Sample or monitor any substances or parameters at any location during operating hours for the purpose of assuring Permit compliance, compliance with applicable requirements, or as otherwise authorized by the Clean Air Act.

b. No person shall obstruct, hamper, or interfere with any such authorized representative while in the process of carrying out his official duties. Refusal of entry or access may constitute grounds for Permit revocation and assessment of civil penalties.
[391-3-1-.07 and 40 CFR 70.11(a)(3)(i)]

8.14.3 Schedule of Compliance

a. For applicable requirements with which the Permittee is in compliance, the Permittee shall continue to comply with those requirements.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(A)]

b. For applicable requirements that become effective during the Permit term, the Permittee shall meet such requirements on a timely basis unless a more detailed schedule is expressly required by the applicable requirement.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(B)]

c. Any schedule of compliance for applicable requirements with which the source is not in compliance at the time of Permit issuance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(C)]

8.15 Circumvention

8.15.1 **State Only Enforceable Condition.**
The Permittee shall not build, erect, install, or use any article, machine, equipment or process the use of which conceals an emission which would otherwise constitute a violation of an applicable emission standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of the pollutants in the gases discharged into the atmosphere.
[391-3-1-.03(2)(c)]

8.16 Permit Shield

8.16.1 Compliance with the terms of this Permit shall be deemed compliance with all applicable requirements as of the date of Permit issuance provided that all applicable requirements are included and specifically identified in the Permit.
[391-3-1-.03(10)(d)6]

8.16.2 Any Permit condition identified as "State only enforceable" does not have a Permit shield.

8.17 Operational Practices

8.17.1 At all times, including periods of startup, shutdown, and malfunction, the Permittee shall maintain and operate the source, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on any information available to the Division which may include, but is not limited to, monitoring results, observations of the opacity or other characteristics of emissions, review of operating and maintenance procedures or records, and inspection or surveillance of the source.
[391-3-1-.02(2)(a)10]

8.17.2 No person owning, leasing, or controlling, the operation of any air contaminant sources shall willfully, negligently or through failure to provide necessary equipment or facilities or to take necessary precautions, cause, permit, or allow the emission from said air contamination source or sources, of such quantities of air contaminants as will cause, or tend to cause, by themselves, or in conjunction with other air contaminants, a condition of air pollution in quantities or characteristics or of a duration which is injurious or which unreasonably interferes with the enjoyment of life or use of property in such area of the State as is affected thereby. Complying with Georgia's Rules for Air Quality Control Chapter 391-3-1 and Conditions in this Permit, shall in no way exempt a person from this provision.
[391-3-1-.02(2)(a)1]

8.18 Visible Emissions
[391-3-1-.02(2)(b)]

8.18.1 Except as may be provided in other provisions of this Permit, the Permittee shall not cause, let, suffer, permit or allow emissions from any air contaminant source the opacity of which is equal to or greater than forty (40) percent.

8.18.2 The visible emission limitation in Condition 8.18.1 applies only to facilities or sources subject to some other emission limitation under the Georgia Air Quality Control Rule 391-3-1-.02(2).

8.19 Fuel-burning Equipment

8.19.1 The Permittee shall not cause, let, suffer, permit, or allow the emission of fly ash and/or other particulate matter from any fuel-burning equipment with rated heat input capacity of less than 10 million Btu per hour, in operation or under construction on or before January 1, 1972 in amounts equal to or exceeding 0.7 pounds per million BTU heat input.
[391-3-1-.02(2)(d)]

8.19.2 The Permittee shall not cause, let, suffer, permit, or allow the emission of fly ash and/or other particulate matter from any fuel-burning equipment with rated heat input capacity of less than 10 million Btu per hour, constructed after January 1, 1972 in amounts equal to or exceeding 0.5 pounds per million BTU heat input.
[391-3-1-.02(2)(d)]

8.19.3 The Permittee shall not cause, let, suffer, permit, or allow the emission from any fuel-burning equipment constructed or extensively modified after January 1, 1972, visible emissions the opacity of which is equal to or greater than twenty (20) percent except for one six minute period per hour of not more than twenty-seven (27) percent opacity.
[391-3-1-.02(2)(d)]

8.20 Sulfur Dioxide

8.20.1 Except as may be specified in other provisions of this Permit, the Permittee shall not:
[391-3-1-.02(2)(g)]

a. burn fuel containing more than 2.5 percent sulfur, by weight, in any fuel burning sources rated below 100 million BTU's of heat input per hour;

b. burn fuel containing more than 3 percent sulfur, by weight, in any fuel burning sources rated at or above 100 million BTU's of heat input per hour.

8.21 Particulate Emissions

8.21.1 Except as may be specified in other provisions of this Permit, the Permittee shall not cause, let, permit, suffer, or allow the rate of emission from any source, particulate matter in total quantities equal to or exceeding the allowable rates shown below. Equipment in operation, or under construction contract, on or before July 2, 1968, shall be considered existing equipment. All other equipment put in operation or extensively altered after said date is to be considered new equipment.
[391-3-1-.02(2)(e)]

a. The following equations shall be used to calculate the allowable rates of emission from new equipment:

$E = 4.1P^{0.67}$; for process input weight rate up to and including 30 tons per hour.

$E = 55P^{0.11} - 40$; for process input weight rate above 30 tons per hour.

b. The following equation shall be used to calculate the allowable rates of emission from existing equipment:

$E = 4.1P^{0.67}$

In the above equations, E = emission rate in pounds per hour, and
P = process input weight rate in tons per hour.

8.22 Fugitive Dust
[391-3-1-.02(2)(n)]

8.22.1 Except as may be specified in other provisions of this Permit, the Permittee shall take all reasonable precautions to prevent dust from any operation, process, handling, transportation or storage facility from becoming airborne. Reasonable precautions which could be taken to prevent dust from becoming airborne include, but are not limited to, the following:

a. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

b. Application of asphalt, water, or suitable chemicals on dirt roads, materials, stockpiles, and other surfaces which can give rise to airborne dusts;

c. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods can be employed during sandblasting or other similar operations;

d. Covering, at all times when in motion, open bodied trucks, transporting materials likely to give rise to airborne dusts; and

e. The prompt removal of earth or other material from paved streets onto which earth or other material has been deposited.

8.22.2 The opacity from any fugitive dust source shall not equal or exceed 20 percent.

Attachments

A. List of Standard Abbreviations and List of Permit Specific Abbreviations
B. Insignificant Activities Checklist, Insignificant Activities Based on Emission Levels and Generic Emission Groups
C. List of References

ATTACHMENT A

List Of Standard Abbreviations

AIRS	Aerometric Information Retrieval System
APCD	Air Pollution Control Device
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BTU	British Thermal Unit
CAAA	Clean Air Act Amendments
CEM	Continuous Emission Monitor
CFR	Code of Federal Regulations
CMS	Continuous Monitoring System(s)
CO	Carbon Monoxide
COM	Continuous Opacity Monitor
dscf / dscm	Dry Standard Cubic Foot / Dry Standard Cubic Meter
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
gr	Grain(s)
GPM (gpm)	Gallons per minute
H_2O (H2O)	Water
HAP	Hazardous Air Pollutant
HCFC	Hydro-chloro-fluorocarbon
MACT	Maximum Achievable Control Technology
MMBtu	Million British Thermal Units
MVAC	Motor Vehicle Air Conditioner
MW	Megawatt
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOx	Nitrogen Oxides
NSPS	New Source Performance Standards
OCGA	Official Code of Georgia Annotated
PM	Particulate Matter
PM10 (PM_{10})	Particulate Matter less than 10 micrometers in diameter
PPM (ppm)	Parts per Million
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RMP	Risk Management Plan
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO2 (SO_2)	Sulfur Dioxide
USC	United States Code
VE	Visible Emissions
VOC	Volatile Organic Compound

List of Permit Specific Abbreviations

None

ATTACHMENT B

NOTE: Attachment B contains information regarding insignificant emission units/activities and groups of generic emission units/activities in existence at the facility at the time of Permit issuance. Future modifications or additions of insignificant emission units/activities and equipment which are part of generic emissions groups may not necessarily cause this attachment to be updated.

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Mobile Sources	1. Cleaning and sweeping of streets and paved surfaces	Varies
Combustion Equipment	1. Fire fighting and similar safety equipment used to train fire fighters or other emergency personnel.	Varies
	2. Small incinerators that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act and are not considered a "designated facility" as specified in 40 CFR 60.32e of the Federal emissions guidelines for Hospital/Medical/Infectious Waste Incinerators, that are operating as follows:: i) less than 8 million BTU/hr heat input, firing types 0, 1, 2, and/or 3 waste.	0
	ii) less than 8 million BTU/hr heat input with no more than 10% pathological (type 4) waste by weight combined with types 0, 1, 2, and/or 3 waste.	0
	iii) less than 4 million BTU/hr heat input firing type 4 waste. (Refer to 391-3-1-.03(10)(g)2.(ii) for descriptions of waste types)	0
	3. Open burning in compliance with Georgia Rule 391-3-1-.02 (5).	0
	4. Stationary engines burning: i) Natural gas, LPG, gasoline, dual fuel, or diesel fuel which are used exclusively as emergency generators;	0
	ii) Natural gas, LPG, and/or diesel fueled generators used for emergency, peaking, and/or standby power generation, where the combined peaking and standby power generation do not exceed 200 hours per year.	0
	iii) Natural gas, LPG, and/or diesel fuel used for other purposes, provided that the output of each engine does not exceed 400 horsepower and that no individual engine operates for more than 2,000 hours per year.	0
	iv) Gasoline used for other purposes, provided that the output of each engine does not exceed 100 horsepower and that no individual engine operates for more than 500 hours per year.	0
Trade Operations	1. Brazing, soldering, and welding equipment, and cutting torches related to manufacturing and construction activities whose emissions of hazardous air pollutants (HAPs) fall below 1,000 pounds per year.	Varies
Maintenance, Cleaning, and Housekeeping	1. Blast-cleaning equipment using a suspension of abrasive in water and any exhaust system (or collector) serving them exclusively.	Varies
	2. Portable blast-cleaning equipment.	Varies
	3. Non-Perchloroethylene Dry-cleaning equipment with a capacity of 100 pounds per hour or less of clothes.	0
	4. Cold cleaners having an air/vapor interface of not more than 10 square feet and that do not use a halogenated solvent.	Varies
	5. Non-routine clean out of tanks and equipment for the purposes of worker entry or in preparation for maintenance or decommissioning.	Varies
	6. Devices used exclusively for cleaning metal parts or surfaces by burning off residual amounts of paint, varnish, or other foreign material, provided that such devices are equipped with afterburners.	0
	7. Cleaning operations: Alkaline phosphate cleaners and associated cleaners and burners.	Varies

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Laboratories and Testing	1. Laboratory fume hoods and vents associated with bench-scale laboratory equipment used for physical or chemical analysis.	2
	2. Research and development facilities, quality control testing facilities and/or small pilot projects, where combined daily emissions from all operations are not individually major or are support facilities not making significant contributions to the product of a collocated major manufacturing facility.	1
Pollution Control	1. Sanitary waste water collection and treatment systems, except incineration equipment or equipment subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act..	0
	2. On site soil or groundwater decontamination units that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	0
	3. Bioremediation operations units that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	0
	4. Landfills that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	0
Industrial Operations	1. Concrete block and brick plants, concrete products plants, and ready mix concrete plants producing less than 125,000 tons per year.	0
	2. Any of the following processes or process equipment which are electrically heated or which fire natural gas, LPG or distillate fuel oil at a maximum total heat input rate of not more than 5 million BTU's per hour:	
	i) Furnaces for heat treating glass or metals, the use of which do not involve molten materials or oil-coated parts.	0
	ii) Porcelain enameling furnaces or porcelain enameling drying ovens.	0
	iii) Kilns for firing ceramic ware.	0
	iv) Crucible furnaces, pot furnaces, or induction melting and holding furnaces with a capacity of 1,000 pounds or less each, in which sweating or distilling is not conducted and in which fluxing is not conducted utilizing free chlorine, chloride or fluoride derivatives, or ammonium compounds.	0
	v) Bakery ovens and confection cookers.	0
	3. Carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, shot blasting, shot peening, or polishing; ceramics, glass, leather, metals, plastics, rubber, concrete, paper stock or wood, also including roll grinding and ground wood pulping stone sharpening, provided that: i) Activity is performed indoors; & ii) No significant fugitive particulate emissions enter the environment; & iii) No visible emissions enter the outdoor atmosphere.	Varies
	4. Photographic process equipment by which an image is reproduced upon material sensitized to radiant energy (e.g., blueprint activity, photographic developing and microfiche).	0
	5. Grain, food, or mineral extrusion processes	0
	6. Equipment used exclusively for sintering of glass or metals, but not including equipment used for sintering metal-bearing ores, metal scale, clay, fly ash, or metal compounds.	0
	7. Equipment for the mining and screening of uncrushed native sand and gravel.	0
	8. Ozonization process or process equipment.	0
	9. Electrostatic powder coating booths with an appropriately designed and operated particulate control system.	0
	10. Activities involving the application of hot melt adhesives where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	0

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Industrial Operations (continued)	11. Equipment used exclusively for the mixing and blending water-based adhesives and coatings at ambient temperatures.	0
	12. Equipment used for compression, molding and injection of plastics where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	0
	13. Ultraviolet curing processes where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	0
Storage Tanks and Equipment	1. All petroleum liquid storage tanks storing a liquid with a true vapor pressure of equal to or less than 0.50 psia as stored.	0
	2. All petroleum liquid storage tanks with a capacity of less than 40,000 gallons storing a liquid with a true vapor pressure of equal to or less than 2.0 psia as stored that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	0
	3. All petroleum liquid storage tanks with a capacity of less than 10,000 gallons storing a petroleum liquid.	0
	4. All pressurized vessels designed to operate in excess of 30 psig storing petroleum fuels that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	Varies
	5. Gasoline storage and handling equipment at loading facilities handling less than 20,000 gallons per day or at vehicle dispensing facilities that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	0
	6. Portable drums, barrels, and totes provided that the volume of each container does not exceed 550 gallons.	Varies
	7. All chemical storage tanks used to store a chemical with a true vapor pressure of less than or equal to 10 millimeters of mercury (0.19 psia).	Varies

INSIGNIFICANT ACTIVITIES BASED ON EMISSION LEVELS

Description of Emission Units / Activities	Quantity
Liquid Mix Storage Tank	1
Solvent Storage Tank	1
Solvent Containment Tank	1

ATTACHMENT B (continued)

GENERIC EMISSION GROUPS

Emission units/activities appearing in the following table are subject only to one or more of Georgia Rules 391-3-1-.02 (2) (b), (e) &/or (n). Potential emissions of particulate matter, from these sources based on TSP, are less than 25 tons per year per process line or unit in each group. Any emissions unit subject to a NESHAP, NSPS, or any specific Air Quality Permit Condition(s) are not included in this table.

Description of Emissions Units / Activities	Number of Units (if appropriate)	Applicable Rules		
		Opacity Rule (b)	PM from Mfg Process Rule (e)	Fugitive Dust Rule (n)
Powder Applicator and Product Handling Equipment	1	X	X	
Polymer Compounding	1	X	X	

The following table includes groups of fuel burning equipment subject only to Georgia Rules 391-3-1-.02 (2) (b) & (d).Any emissions unit subject to a NESHAP, NSPS, or any specific Air Quality Permit Condition(s) are not included in this table.

Description of Fuel Burning Equipment	Number of Units
Fuel burning equipment with a rated heat input capacity of less than 10 million BTU/hr burning only natural gas and/or LPG.	0
Fuel burning equipment with a rated heat input capacity of less than 5 million BTU/hr, burning only distillate fuel oil, natural gas and/or LPG.	0
Any fuel burning equipment with a rated heat input capacity of 1 million BTU/hr or less.	0

ATTACHMENT C

LIST OF REFERENCES

1. The Georgia Rules for Air Quality Control Chapter 391-3-1. All Rules cited herein which begin with 391-3-1 are State Air Quality Rules.

2. Title 40 of the Code of Federal Regulations; specifically 40 CFR Parts 50, 51, 52, 60, 61, 63, 64, 68, 70, 72, 73, 75, 76 and 82. All rules cited with these parts are Federal Air Quality Rules.

3. ***Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch,*** Procedures for Testing and Monitoring Sources of Air Pollutants.

4. ***Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch,*** Procedures for Calculating Air Permit Fees.

5. **Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources**. This information may be obtained from EPA's TTN web site at *www.epa.gov/ttn/chief/ap42.html.*

6. The latest properly functioning version of EPA's **TANKS** emission estimation software. The software may be obtained from EPA's TTN web site at *www.epa.gov/ttn/chief/tanks.html.*

7. The Clean Air Act (42 U.S.C. 7401 et eq).

8. White Paper for Streamlined Development of Part 70 Permit Applications, July 10, 1995 (White Paper #1).

9. White Paper Number 2 for Improved Implementation of the Part 70 Operating Permits Program, March 5, 1996 (White Paper #2).

Appendix

J

General Permit
No. GAR000000

State of Georgia
Department of Natural Resources
Environmental Protection Division

Authorization To Discharge Under The National Pollutant Discharge Elimination System Storm Water Discharges Associated With Industrial Activity

In compliance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p. 416, as amended), hereinafter called the "State Act," the Federal Clean Water Act, as amended (33 U.S.C.1251 et seq.), hereinafter called the "Clean Water Act," and the Rules and Regulations promulgated to each of these Acts, new and existing storm water point sources within the State of Georgia that are required to have a permit, upon submittal of a Notice of Intent, are authorized to discharge storm water associated with industrial activity to the waters of the State of Georgia in accordance with the limitations, monitoring requirements and other conditions set forth in Parts I through VIII hereof.

This permit shall become effective on August 1, 2006.

This permit and the authorization to discharge shall expire at midnight, July 31, 2011.

Signed this 16th day of June, 2006.

Director,
Environmental Protection Division

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Part I. COVERAGE UNDER THIS PERMIT

A. Permit Area.

This permit regulates all point source discharges of storm water associated with industrial activity, as defined in this permit, to the waters of the State of Georgia.

B. Eligibility.

1. This permit authorizes all point source discharges of storm water associated with industrial activity to waters of the State of Georgia, except for storm water discharges identified under Part I.B.2. Municipally owned or operated industrial facilities and military installations must comply with the permit and monitoring requirements for all types of industrial activities that such installations perform.

2. *Limitations on coverage.* The following storm water discharges associated with industrial activity are not authorized by this permit:

   a. storm water discharges associated with industrial activity to waters of the State for which a Total Maximum Daily Load (TMDL) has been approved, unless the facility develops and implements a Storm Water Pollution Prevention Plan (SWP3) that is consistent with the TMDL.

   b. storm water discharges associated with industrial activity that are mixed with sources of non-storm water other than non-storm water discharges that are:

   (1). in compliance with a different NPDES permit; or

   (2). identified by and in compliance with Part III.A.2 of this permit.

   c. storm water discharges associated with industrial activity which are subject to an existing effluent limitation guideline addressing storm water (or a combination of storm water and process water), unless the effluent limitation is contained in this permit.

   d. storm water discharges associated with industrial activity that are covered by an existing NPDES individual or general permit, except for individual NPDES permits which authorize storm water discharges under Part II.B.16 of the individual permit. Storm water discharges may be authorized under this permit after an existing individual NPDES permit expires provided the existing permit did not establish numeric limitations for such discharges unless the numeric effluent limitation in the individual permit is no more stringent than the corresponding limitation contained in this General Permit and the

discharge is composed only of storm water and any non-storm water authorized by Part III.A.2 of the General Permit).

e. storm water discharges associated with industrial activity from construction sites, except storm water discharges that can be classified as an industrial activity under 40 CFR 122.26(b)(14)(i) through (ix) or (xi) (including storm water discharges from mobile asphalt plants, and mobile concrete plants).

f. storm water discharges associated with industrial activity that, on or before seven (7) days after submittal of the Notice of Intent (NOI) for the discharge under this permit, the Director has determined to be causing, or that may reasonably be expected to be causing or contributing to, a violation of a water quality standard.

g. storm water discharges associated with industrial activity from inactive mining, inactive landfills, or inactive oil and gas operations occurring on Federal lands where an operator cannot be identified.

h. storm water discharges associated with industrial activity denied coverage under Part I.C.3 of this permit.

3. Storm water discharges associated with industrial activity which are authorized by this permit may be combined with other sources of storm water which are not classified as associated with industrial activity pursuant to 40 CFR 122.26(b)(14), so long as the discharger is in compliance with this permit, the unclassified storm water is identified in the Storm Water Pollution Prevention Plan, and appropriate best management practices are employed.

C. Authorization.

1. Dischargers of storm water associated with industrial activity must submit a Notice of Intent – Version 2006 (NOI) in accordance with the requirements of Part II of this permit, using the appropriate NOI form supplied by the Georgia Environmental Protection Division (EPD), to be authorized to discharge under this general permit.

2. Unless notified by the EPD to the contrary, owners or operators who submit such notification are authorized to discharge storm water associated with industrial activity under the terms and conditions of this permit one (1) week after the date that the NOI is postmarked. Those facilities that were covered by the 1998-2003 permit are authorized to discharge storm water associated with industrial activity under the terms and conditions of this permit immediately upon submittal of the NOI to EPD (e.g. on the day the NOI is postmarked).

3. The Director may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information. Should the Director deny coverage under this permit, coverage under this permit is authorized until the date of receipt of the notice of denial or a later date established by the Director. Coverage under the General Permit will cease before the individual NPDES permit is issued if a facility owner or operator that has been directed to apply for such an individual permit does not submit a timely application for that permit (i.e., within sixty (60) days of EPD notice that an individual permit is required) or file a timely administrative appeal of the Director's decision.

D. Definitions.

The definitions are set forth in Appendix A of this permit.

Part II. NOTICE OF INTENT REQUIREMENTS

A. Deadlines for Notification.

1. Except as provided in Parts II.A.4 and II.A.5, operators who intend to obtain coverage for an existing storm water discharge associated with industrial activity under this general permit shall submit a Notice of Intent – Version 2006 (NOI) in accordance with the requirements of this Part within thirty (30) days after the effective date of this permit. Any permittee of the previous (1998-2003) general permit will remain covered by that permit until a NOI for coverage under this permit is submitted to EPD, provided that the NOI is submitted no later than thirty (30) days after the effective date of the permit.

2. Except as provided in Parts II.A.3, II.A.4, and II.A.5, operators of facilities which begin industrial activity after issuance of this permit shall submit a NOI in accordance with the requirements of this Part at least one (1) week prior to the commencement of the industrial activity at the facility.

3. Operators of oil and gas exploration, production, processing, or treatment operations or transmission facilities, that were not required to submit a permit application as of October 1, 1992 in accordance with 40 CFR 122.26(c)(1)(iii), but that after October 1, 1992 have or have had a discharge of a reportable quantity of oil or a hazardous substance for which notification is required pursuant to either Georgia's Oil or Hazardous Material Spills or Releases Act (O.C.G.A. 12-14-2), 40 CFR 110.6, 40 CFR 117.21 or 40 CFR 302.6 must submit a NOI in accordance with the requirements of Part II.C of this permit within 14 calendar days of the first knowledge of such release.

4. Where the operator of a facility with a storm water discharge associated with industrial activity which is covered by this permit changes, the new operator of the facility must submit a new NOI in accordance with this Part no later than thirty (30) days after the change of the operator.

5. An operator of a facility with a storm water discharge associated with industrial activity is not precluded from submitting a NOI in accordance with the requirements of this Part after more than thirty (30) days after the effective date of this permit, or as otherwise required in Parts II.A. 2, 3, or 4 of this permit. In such instances, the EPD may bring an enforcement action for failure to submit a NOI in a timely manner or for any unauthorized discharges of storm water associated with industrial activity that have occurred on or after the dates or periods of time specified in Parts II.A.1, 2, 3, or 4 of this permit.

6. *Industrial No Exposure Exclusion.*

   Those facilities that have certified to a condition of No Exposure by submitting the Industrial No Exposure Exclusion (NEE) Certification form (available on EPD's website) are exempt from storm water permitting as long as the condition of No Exposure is maintained and, therefore, are not required to submit a NOI. Permitted facilities that are able to meet the requirements for the No Exposure Exclusion at a later date will, after submitting the Industrial No Exposure Exclusion Certification form, no longer be authorized by or required to comply with this permit. Submittal of a Notice of Termination is not required prior to submittal of the Industrial No Exposure Exclusion Certification form. Owners and operators of facilities for which a No Exposure Exclusion Certification form is submitted (NEE facilities) shall conduct quarterly inspections each year after the effective date of this permit to ensure that a condition of No Exposure is maintained at the facility. Results of each such inspection shall be maintained at the NEE facility and available to EPD upon request. If an inspection shows that a condition of No Exposure does not exist, then the NEE facility must be restored to a condition of No Exposure by implementing appropriate remedial measures within thirty (30) days of the inspection, or the facility owner or operator must submit a NOI by the end of that thirty (30) day period to obtain coverage under this permit and must thereafter comply with the conditions of this permit. The Director may revoke NEE status for any facility that does not adequately demonstrate that it complied or continues to comply with the NEE requirements.

B. Contents of Notice of Intent. The Notice of Intent shall be signed in accordance with Part VII.G of this permit and shall include the following information:

1. Name, mailing address, street address (provide a descriptive or narrative location if no address is available), and county of the facility for which the notification is submitted;

2. Up to four 4-digit Standard Industrial Classification (SIC) codes that best represent the principal manufacturing process or activity and a statement of whether the facility is a hazardous waste treatment, storage, or disposal facility, a land disposal facility that receives or has received any hazardous waste, a steam electric power generating facility, or a treatment works treating domestic sewage;

3. The legal name, address, and telephone number of the operator of the facility and a statement of whether the facility is publicly or privately operated. For publicly operated facilities, state whether the facility is operated by local, state, or federal government;

4. The permit number of any additional NPDES permits for any discharges (including non-storm water discharges) from the site;

5. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer system (MS4), the name of the MS4 operator and the receiving water for the discharge from the MS4;

6. A statement of whether the owner or operator has existing quantitative data describing the concentration of pollutants in storm water discharges (do not attach or include existing data when submitting the NOI);

7. The latitude and longitude, in degrees minutes and seconds, of the approximate center of the facility to the nearest fifteen (15) seconds;

8. The name and title of the individual at the facility who will serve as the point of contact for storm water and permit-related issues. Include a telephone number for the site contact;

9. A statement of whether a current Storm Water Pollution Prevention Plan (SWP3) for the facility has been developed and implemented. Facilities with an existing storm water discharge associated with industrial activity prior to the effective date of this permit shall implement and maintain a SWP3 in compliance with Part IV of this permit within ninety (90) days after the effective date of this permit. Facilities that begin industrial operations after the effective date of this permit are required to implement and maintain a SWP3 in compliance with Part IV of this permit on or before the day industrial operations commence at the facility.

10. A statement of whether the facility is discharging storm water associated with industrial activity to, or within one (1) linear mile upstream of and within the same watershed as, any portion of an impaired stream segment listed as "partially-supporting" or "not supporting" designated uses on Georgia's most current 303(d) list. Georgia's 303(d) list can be viewed on EPD's website at www.gaepd.org.

11. For those facilities that answered "Yes" to #10 above, a statement of whether the pollutant(s) of concern for the impaired stream segment may be exposed to

storm water, as a result of current or previous industrial activity at the facility, during the term of the this permit.

C. **Where to Submit.** Facilities that discharge storm water associated with industrial activity must use a NOI form provided by the EPD. Forms are available on EPD's web site at www.gaepd.org or by calling EPD at (404) 675-6240. NOI forms must be signed in accordance with Part VII.G of this permit. NOI forms must be submitted ***by return receipt certified mail*** (or a similar service) to the EPD at the following address:

Georgia Environmental Protection Division
4220 International Parkway, Suite 101
Atlanta, Georgia 30354

A copy of the NOI form with the return receipt attached should be filed at the facility with the Storm Water Pollution Prevention Plan (SWP3).

D. **Additional Notification.** Facilities that discharge storm water associated with industrial activity through a permitted municipal separate storm sewer system (MS4), or when required by local ordinance, shall, in addition to filing the NOI in accordance with Part II.C, also submit signed copies of the NOI to the city or county in accordance with the deadlines in Part II.A.

E. **Renotification.** Upon issuance of a new or different general permit for some or all of the discharges of storm water covered by this permit, the permittee is required to notify the EPD of its intent to be covered by the new or different permit. The permittee is required to submit a new NOI in accordance with the notification requirements of the new or different permit at that time.

F. **Change of Information.** If any of the information supplied on the NOI form changes during the term of this permit, with the exception of the statement regarding existing quantitative data (see Part II.B.6 above) and the name of the site contact (see Part II.B.8 above), the permittee must submit an updated NOI, with the "Change of Information" box marked at the top of the form, within thirty (30) days after the change.

Part III. SPECIAL CONDITIONS

A. Prohibition on Non-Storm Water Discharges.

1. Except as provided in Part III.A.2, all discharges covered by this permit shall be composed entirely of storm water. This permit does not authorize the discharge of any type of process wastewater.

2. a. Except as provided in Parts III.A.2.b, c, and d, discharges of pollutants or wastewater other than storm water must be in compliance with a NPDES permit (other than this permit) issued for the discharge.

b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharge does not contain pollutants that would adversely affect the quality of storm water discharges from the site or have a reasonable potential to cause or contribute to a water quality violation in a water of the State: discharges from fire fighting activities; fire hydrant flushing; potable water sources including water line flushing; irrigation drainage; lawn watering; uncontaminated air conditioning or compressor condensate and other uncontaminated condensate resulting from the condensing of atmospheric moisture onto cool or cold surfaces (such as uncontaminated discharges of melted condensate from the surface of liquid argon, nitrogen, or oxygen tanks) ; springs; uncontaminated ground water, foundation or footing drains where flows are not contaminated with process materials; incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility (this does not include intentional discharges from cooling towers (e.g. "piped" cooling tower blowdown or drains)); and exterior building washdown water where no detergents or other chemicals are used in conjunction with the cleaning activities.

c. Pavement wash water from containment zones will not be authorized by this permit. Pavement washwater from areas outside containment zones where pollutants have been previously removed (using appropriate best management practices as specified in Part IV.D.3 of this permit) and where spills and/or leaks of toxic or hazardous material have not occurred (unless all spilled materials and residuals have been removed) and where no detergents or chemicals are used in conjunction with the cleaning activities may be authorized provided the non-storm water component of the discharge is in compliance with the measures, controls, and best management practices (BMPs) for the non-storm water discharge section (Part IV.D.3.g) of the SWP3. Containment zones must be delineated in the SWP3 and shall include, but are not limited to, all loading areas, unloading areas, and designated live animal holding areas. A record of the date, time, location, and potential pollutants being discharged for each cleaning activity must be maintained as part of the SWP3.

d. Discharges containing leachate from waste piles or landfills are not authorized by this permit. Storm water discharges from such waste piles or landfills may be authorized by this permit provided that the storm water is not commingled with leachate.

B. Releases in Excess of Reportable Quantities.

1. The discharge of hazardous substances or oil in the storm water discharge(s) from a facility covered by this permit shall be prevented, if at all possible, or minimized in accordance with the applicable SWP3 for the facility. This permit does not relieve the permittee of the reporting requirements of Georgia's Oil or Hazardous Materials Spills or Releases Act (O.C.G.A 12-14-2), 40 CFR 110.6, 40 CFR 117, and 40 CFR 302.

2. The Storm Water Pollution Prevention Plan (SWP3) required under Part IV of this permit must be modified within fourteen (14) calendar days of knowledge of a release equal to or in excess of a reportable quantity under the Georgia Oil or Hazardous Materials Spills or Releases Act, 40 CFR 110.6, 40 CFR 117 or 40 CFR 302 to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the SWP3 must be reviewed and amended to identify measures needed to prevent the reoccurrence of such release and to respond to such releases. The SWP3 must be amended and updated, where appropriate, within thirty (30) days of the release.

3. *Spills.* This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill except in *de minimis* amounts after removal and proper disposal of the spilled material has been completed in accordance with State and Federal requirements.

C. **Discharges Into, Or Within One Mile Upstream Of And Within The Same Watershed As, Any Portion Of An Impaired Stream Segment.**

An operator is not eligible for coverage under this permit for discharges of storm water associated with industrial activity to waters of the State for which a Total Maximum Daily Load (TMDL) is approved prior to or during the term of this permit, unless the facility develops, implements, and maintains a SWP3 that is consistent with the TMDL. The SWP3 must specifically address any conditions or requirements included in the TMDL that are applicable to the operator's discharge within the timeframe specified in the TMDL. If the TMDL establishes a specific numeric wasteload allocation that applies to an operator's discharge, or to storm water discharges associated with industrial activity in general, then the operator must incorporate that allocation into the facility's SWP3 and implement all necessary measures to meet that allocation.

Any operator who intends to obtain coverage under this permit for storm water discharges associated with industrial activity into an Impaired Stream Segment, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment, identified as "partially-supporting" or "not supporting" designated uses on Georgia's most current 303(d) list, must satisfy the requirements of Part III.C of this permit if the pollutant(s) of concern for which the Impaired Stream Segment has been listed may be exposed to storm water as

a result of current or previous industrial activity at the facility. Those discharges that are within one (1) linear mile of an Impaired Stream Segment, but are not located within the watershed of any portion of that stream segment are excluded from this requirement. Georgia's 303(d) list can be viewed on EPD's website at www.gaepd.org.

1. Discharges into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment Impaired by substances other than fecal coliform.

a. Sampling schedule.

Regulated industrial facilities that are subject to the requirements in Part III.C.1. of this permit must conduct storm water discharge sampling for the pollutant(s) of concern two times per quarter for a period of twelve (12) months. The pollutant(s) of concern for each impaired stream segment are identified on Georgia's 303(d) list. The sampling will only be required for those outfalls at the facility that have the potential to discharge the pollutant(s) of concern. The sampling must be conducted in accordance with Parts VI.A.3, 4, and 5 of this permit, except that composite samples may be collected in lieu of grab samples at the permittee's discretion. The Director may require composite or grab sampling where deemed appropriate in order to ensure that representative samples are collected.

Except as provided below, the sampling must begin no later than ninety (90) days after the later of the effective date of the permit or the date the facility becomes subject to the sampling requirements in Part III.C. However, if a facility with an existing storm water discharge associated with industrial activity determines that additional time is needed to design and implement new or improved BMPs specifically for the pollutant(s) of concern, then that facility may delay commencement of the sampling program under this section of the permit for no more than twelve (12) months after the effective date of the permit in order to design and implement those BMPs. Facilities choosing this option must, no later than the date on which the Part III.C sampling would otherwise begin, provide a written notification, signed in accordance with Part VII.G of this permit, to EPD that they have elected to delay sampling and provide a schedule for BMP implementation. The Part III.C sampling program must begin immediately after the BMPs are required to have been implemented according to the schedule provided to EPD.

A summary of the sampling results must be submitted to EPD's Watershed Protection Branch with the Annual Report (see Appendix B of this permit). The report must also identify the applicable benchmark value(s) and state whether the facility has passed or failed the benchmark requirement for the twelve (12) month sampling period.

If a facility is unable to conduct one or both of the Part III.C sampling event(s) during a certain quarter due to adverse climatic conditions (i.e. no qualifying rainfall event occurs), then the facility shall include a written explanation for the absence of the sampling event in the next Annual Report submitted to EPD.

b. *Applicable Benchmark Values.*

The applicable benchmark values for discharges into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment shall be the same numeric value as the Instream Water Quality Criterion for the pollutant(s) of concern as specified in Georgia's Rules and Regulations for Water Quality Control (Georgia Rule 391-3-6-.03) unless otherwise established in Part III.C of this permit. The benchmark values are designed to assist permittees in determining if the BMPs established in a facility's SWP3 are effective in minimizing the concentration of the pollutant(s) of concern in storm water discharge(s) from their facility. These benchmark values are intended to be guideline concentrations rather than numeric effluent limitations or permit conditions. The exceedance of a benchmark value established in Part III.C of this permit is not a permit violation and does not of itself indicate a violation of instream water quality standards. However, an exceedance of a benchmark value may be used in conjunction with other information to demonstrate a violation of this permit or a violation of water quality standards.

(1). *Specific requirements for discharges into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment impaired for DO (Dissolved Oxygen).*

Facilities discharging into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment for which the listing criterion is identified as DO (Dissolved Oxygen) will only be required to conduct sampling under Part III.C if industrial materials that may contribute Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) or ammonia (NH_3) may be exposed to storm water as a result of current or previous industrial activity at the facility. These facilities must sample for Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) and NH_3. The applicable benchmark value for these discharges shall be an Ultimate Oxygen Demand (UOD) of 125 mg/l. The UOD shall be calculated as $[(CBOD_5 \times 1.5) + (NH_3 \times 4.57)]$.

(2). *Specific requirements for discharges into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment impaired by non-pollutant-specific criteria.*

(i). Facilities discharging into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment for which the listing criterion is identified as "Biota or Sediment" are required to conduct

sampling for Total Suspended Solids (TSS) unless a TMDL has identified a different pollutant from nonpoint sources as causing the impairment, in which case sampling should be conducted for the pollutant(s) identified in the TMDL. The applicable TSS benchmark value for these discharges shall be 100 mg/l.

(ii). Facilities discharging into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment for which the listing criterion is toxicity, FCG (fish consumption guidelines), SB (shellfishing ban), CFB (commercial fishing ban) or TWR (trophic weighted residue value of mercury in fish tissue)" will only be required to conduct sampling under Part III.C if a TMDL identifying a specific water quality parameter has been approved for the stream segment.

c. *Evaluation of Part III.C sampling data*

The Part III.C storm water discharge sampling is intended to measure the effectiveness of the Best Management Practices (BMPs) implemented at those facilities. If benchmark values are exceeded using the pass/fail determination provided below, then improved or additional BMPs are required at the facility.

The sampling data for the twelve (12) month period must be evaluated using one of the following criteria. **This shall constitute the pass/fail determination for evaluating BMP effectiveness:**

(1). At least seventy-five (75) percent of the samples collected during the twelve (12) month period do not exceed the applicable benchmark value(s); or

(2). The average of the samples collected during the twelve (12) month period does not exceed the applicable benchmark value(s).

If a facility meets at least one of the above criteria then that facility has passed the benchmark requirement and may discontinue the Part III.C sampling but must thereafter properly maintain all of the BMPs that enabled the facility to meet the benchmark requirement.

If a facility does not meet at least one of the above criteria, then that facility has failed the benchmark requirement. Those facilities that do not pass the benchmark requirement for the first twelve (12) month sampling period may take up to one year to budget, select, design and construct/implement additional supplemental BMPs at the facility. Once the supplemental BMPs have been implemented, an additional twelve (12) month (two samples per quarter) period of sampling must be conducted as described in Part III.C.1.a above. Those facilities that pass the benchmark requirement, using the above pass/fail determination, after implementing supplemental BMPs may discontinue the Part

III.C sampling but must thereafter properly maintain all of the BMPs that enabled the facility to meet the benchmark requirement.

Facilities that are not able to pass the benchmark requirement, using the above pass/fail determination, after implementing supplemental BMPs must continue the process of implementing additional supplemental BMPs at the facility and conducting a subsequent twelve month (two samples per quarter) period of sampling until the facility meets the benchmark requirement using the pass/fail determination provided above. If a facility is unable to pass the benchmark requirement after the twelve (12) month sampling period following a second round of implementing supplemental BMPs, then EPD will determine what further action is required, which may include, but is not limited to, applying for an individual NPDES permit.

d. *Written justification to cease Part III.C sampling.*

If a facility provides a written justification after the first twelve (12) month period of sampling (or after any subsequent twelve (12) month period of sampling) and EPD concurs that the facility's storm water discharges associated with industrial activity do not have a reasonable potential to cause or contribute to a violation of an instream water quality standard, then EPD may conclude that additional sampling under Part III.C is not required. Facilities that have passed the benchmark requirement are not required to submit a written justification in order to cease Part III.C sampling.

2. Discharges into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment impaired for fecal coliform.

Facilities discharging into, or within one (1) linear mile upstream of and within the same watershed as, any portion of an Impaired Stream Segment for which the listing criterion is identified as fecal coliform must adhere to the following conditions if industrial materials or activities that are potential sources of fecal coliform (as defined in Part IV.D.9 of this permit) are, or may be, exposed to storm water at the facility during the term of this permit.

a. *List of BMPs for animal processing plants that may be potential sources of fecal coliform.*

A list of BMPs designed to reduce fecal coliform levels in storm water runoff has been developed for animal processing plants that may be potential sources of fecal coliform. Other facilities may find this list to be useful as well. The list is provided in Appendix C of this permit.

b. *Sampling schedule.*

Regulated industrial facilities that are subject to the requirements in Part III.C.2 of this permit must conduct storm water discharge sampling for TSS two times per quarter for a period of twelve (12) months. Two of the sampling events must include simultaneous testing of TSS and fecal coliform. The sampling will only be required for those outfalls at the facility that have the potential to discharge storm water associated with industrial activity where industrial materials or activities that are potential sources of fecal coliform (as defined in Part IV.D.9 of this permit) are, or may be, exposed to storm water at the facility during the term of this permit. The sampling must be conducted in accordance with Parts VI.A.3, 4, and 5 of this permit.

Except as provided below, the sampling must begin no later than ninety (90) days after the later of the effective date of the permit or the date the facility becomes subject to the sampling requirements in Part III.C. However, if a facility with an existing storm water discharge associated with industrial activity determines that additional time is needed to design and implement new or improved BMPs specifically for the pollutant(s) of concern, then that facility may delay commencement of the sampling program under this section of the permit for no more than twelve (12) months after the effective date of the permit in order to design and implement those BMPs. Facilities choosing this option must, no later than the date on which the Part III.C sampling would otherwise begin, provide a written notification, signed in accordance with Part VII.G of this permit, to EPD that they have elected to delay sampling and provide a schedule for BMP implementation. The Part III.C sampling program must begin immediately after the BMPs are required to have been implemented according to the schedule provided to EPD.

A summary of the sampling results for TSS and fecal coliform must be submitted to EPD's Watershed Protection Branch with the Annual Report (see Appendix B of this permit). The report must also identify the applicable benchmark value(s) and state whether the facility has passed or failed the benchmark requirement for the twelve (12) month sampling period.

If a facility is unable to conduct one or both of the Part III.C sampling event(s) during a certain quarter due to adverse climatic conditions (i.e. no qualifying rainfall event occurs), then the facility shall include a written explanation for the absence of the sampling event in the next Annual Report submitted to EPD.

c. *Applicable Benchmark Value*

A Total Suspended Solids (TSS) benchmark value of 100 mg/l will be used as a surrogate for evaluating fecal coliform levels in storm water discharges associated with industrial activity. Fecal coliform sampling data collected

simultaneously with TSS sampling data (as required in Part III.C.2.b) is not subject to the pass/fail determination for benchmark sampling as established in Part III.C.2.d below.

The TSS benchmark value is designed to assist permittees in determining if the implementation of the BMPs (as established in a facility's SWP3) is minimizing the concentration of the pollutant(s) of concern in storm water discharge(s) from their facility. These benchmark values are intended to be guideline concentrations rather than numeric effluent limitations or permit conditions. The exceedance of a benchmark value established in Part III.C of this permit is not a permit violation and does not of itself indicate a violation of instream water quality standards. However, an exceedance of a benchmark value may be used in conjunction with other information to demonstrate a violation of this permit or a violation of water quality standards.

d. *Evaluation of Part III.C sampling data.*

The Part III.C storm water discharge sampling is intended to measure the effectiveness of the Best Management Practices (BMPs) implemented at those facilities. If benchmark values are exceeded using the pass/fail determination provided below, then improved or additional BMPs are required at the facility.

The TSS sampling data for the twelve (12) month period must be evaluated using one of the following criteria. **This shall constitute the pass/fail determination for evaluating BMP effectiveness.**

(1). At least seventy-five (75) percent of the samples collected during the twelve (12) month period do not exceed the TSS benchmark value; or

(2). The average of the samples collected during the twelve (12) month period does not exceed the TSS benchmark value.

If a facility meets at least one of the above criteria then that facility has passed the TSS benchmark requirement and may discontinue the Part III.C sampling but must thereafter properly maintain all of the BMPs that enabled the facility to pass the TSS benchmark requirement.

If a facility does not meet at least one of the above criteria, then that facility has failed the TSS benchmark requirement. If a facility does not pass the TSS benchmark requirement for the first twelve (12) month sampling period then the facility may take up to one year to budget, select, design and construct/implement additional supplemental BMPs from the list provided in Appendix C, or other appropriate BMPs. Once the supplemental BMPs have been implemented at the facility, an additional twelve (12) month (two samples per quarter) period of sampling must be conducted as described in Part III.C.2.b

above. Those facilities that pass the benchmark requirement, using the above pass/fail determination, after implementing supplemental BMPs may discontinue the Part III.C sampling but must thereafter properly maintain all of the BMPs that enabled the facility to pass the TSS benchmark requirement.

Facilities that are not able to pass the TSS benchmark requirement after implementing supplemental BMPs must continue the process of implementing additional supplemental BMPs from the Appendix C list, or other appropriate BMPs, (within twelve (12) months after the end of the previous twelve (12) month sampling period) and conducting a subsequent twelve month (two samples per quarter) period of sampling until the facility passes the benchmark requirement using the pass/fail criteria provided above.

e. *Written justification to cease Part III.C monitoring.*

If a facility provides a written justification, after the first twelve (12) month period of sampling (or after any subsequent twelve (12) month period of sampling), and EPD concurs that the facility's storm water discharges associated with industrial activity do not have a reasonable potential to cause or contribute to a violation of an instream water quality standard, then EPD may conclude that additional sampling under Part III.C is not required. Facilities that have passed the benchmark requirement are not required to submit a written justification in order to cease Part III.C sampling.

f. *Demonstration of appropriate BMPs.*

If a facility with a storm water discharge associated with industrial activity that may be a potential source of fecal coliform has implemented all technologically and economically feasible BMPs in the Appendix C list (for animal processing facilities), or other appropriate BMPs (for other facilities), and is still unable to pass the TSS benchmark requirement, the owner or operator of that facility may submit a demonstration to EPD that the facility has properly designed, installed and maintained all of the BMPs that are technologically and economically feasible for the facility and still cannot meet the benchmark. If, after reviewing the demonstration and conducting a site inspection, EPD concurs with the facility's determination, then the facility will not be required to implement additional supplemental BMPs in order to comply with the permit. However, if new BMPs become technologically and economically feasible for the facility at a later date, then EPD may require the implementation of such BMPs at that time. EPD may also require an individual NPDES permit for a facility if that facility does not properly design, install and maintain technologically and economically feasible BMPs in a timely manner.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A Storm Water Pollution Prevention Plan (SWP3) shall be developed for each facility covered by this permit. The SWP3 shall be prepared in accordance with good engineering practices and certified by an individual with the education, experience, and accountability necessary for its implementation. The SWP3 shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. In addition, the SWP3 shall describe and ensure the implementation of best management practices (BMPs) which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the SWP3 under this Part as a condition of this permit. The SWP3 may be included as a separate element of an overall plan for the facility such as an Integrated Contingency Plan (ICP).

A. Deadlines for SWP3 Preparation and Compliance.

1. *Existing facilities.* Facilities with an existing storm water discharge associated with industrial activity prior to the effective date of this permit shall implement and maintain a current SWP3 in compliance with Part IV of this permit within ninety (90) days after the effective date of this permit.

2. *New facilities.* The SWP3 for any facility where industrial activity commences after the effective date of this permit shall be prepared and shall provide for compliance with the terms of the SWP3 and this permit on or before the date of commencement of industrial activity at the facility.

3. The SWP3 for storm water discharges associated with industrial activity from an oil and gas exploration, production, processing, or treatment operation or transmission facility, that was not required to submit a permit application as of October 1, 1992 in accordance with 40 CFR 122.26(c)(1)(iii), that has had or has a discharge of a reportable quantity of oil or a hazardous substance after October 1, 1992 for which notification was or is required pursuant to either Georgia's Oil or Hazardous Material Spills or Releases Act (O.C.G.A. 12-14-2), 40 CFR 110.6, 40 CFR 117.21 or 40 CFR 302.6 shall be prepared and, except as provided elsewhere in this permit, shall provide for compliance with the terms of the SWP3 and this permit on or before the sixtieth (60th) calendar day after the first knowledge of such release.

4. Upon a showing of good cause, EPD may establish a later date in writing for the preparation of and compliance with a SWP3 when a permittee submits a NOI in accordance with Parts II.A.1 and A.2.

B. Signature and SWP3 Review.

1. The SWP3 shall be signed in accordance with Part VII.G of this permit and be retained on-site at the facility that generates the storm water discharges associated with industrial activity in accordance with Part VI.C.

2. The permittee shall make the SWP3 available upon request to EPD within fifteen (15) days of the request and, in the case of storm water associated with industrial activity that discharges through a permitted municipal separate storm sewer system (MS4), to the operator of the MS4. Failure to do so is a violation of the permit. EPD may request a copy of the complete SWP3 or a version of the SWP3 that would be publicly available. The publicly available version would not contain any information that is exempt from public disclosure under the Georgia Open Records Act or other applicable law.

3. The EPD may notify the permittee at any time that the SWP3 does not meet one or more of the minimum requirements of this Part. Within thirty (30) days of such notification from the EPD (or as otherwise provided), the permittee shall make the required changes to the SWP3 and shall submit to EPD a written certification that the requested changes have been made. EPD may also require the SWP3 to be prepared, reviewed, or certified by a Georgia Registered Professional with the education, experience and accountability necessary for developing and implementing a SWP3 and who is authorized by State law to perform design work required by this permit if the Director concludes, based upon reliable evidence, that the SWP3 is not in substantial compliance with this permit.

C. Keeping the SWP3 Current. The permittee shall amend the SWP3 within thirty (30) days whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the State of Georgia, or if the SWP3 proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified in this SWP3, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the SWP3 may be reviewed by EPD in the same manner as Part IV.B. The SWP3 must be updated at least annually as specified in Part IV.D.4.

D. Contents of the SWP3. The SWP3 shall be prepared in accordance with the requirements of this permit. The SWP3 shall include, at a minimum, the following items:

1. *Pollution prevention team.* The SWP3 shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the SWP3 and assisting the facility or plant manager in it's implementation, maintenance, and revision. The SWP3 shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's

SWP3. One person must be designated as the "Team Leader" and serve as the facility's primary contact for storm water-related issues.

2. *Description of potential pollutant sources.* The SWP3 shall provide a description of potential sources that may reasonably be expected to add significant amounts of pollutants to storm water discharges or that may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. The SWP3 shall identify all activities and significant materials that may potentially be significant pollutant sources. The SWP3 shall include, at a minimum:

a. *Drainage.*

(1) A site map indicating the outline of the portions of the drainage area of each storm water outfall that are within the facility boundaries, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under IV.D.2.c have occurred, and the locations of the following activities are exposed to precipitation: fueling stations, vehicle and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage, or disposal of wastes, liquid storage tanks, processing areas, and storage areas.

(2) For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing pollutants, a prediction of the direction of storm water flow, and an identification of the types of pollutants that are likely to be present in storm water discharges associated with industrial activity. Factors to consider include the chemical toxicity; quantity of chemicals used, produced, or discharged; the likelihood of contact with storm water; the history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified as well.

(3) The site map shall be of sufficient scale and quality to be legible and readable.

b. *Inventory of exposed materials.* The SWP3 must include an inventory of the types of materials handled at the site that may potentially be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored, or disposed of in a manner that may allow exposure to storm water between the time of three years prior to the issuance of this permit and the present; the method and location of on-site storage and disposal activities; material management practices employed to minimize contact of materials with storm water runoff water between the time of three years prior to the issuance of this permit and the present; the location and description of

existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives (e.g., oil/water separator, detention pond, etc.).

c. *Spills and leaks.* The SWP3 shall include a list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas that are exposed to precipitation, or that otherwise drain to a storm water conveyance at the facility, after the date of three years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

d. *Sampling data.* The SWP3 shall include a summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

e. *Risk identification and summary of potential pollutant sources.* The SWP3 shall include a narrative description of potential pollutant sources at the following areas: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically identify any significant potential source of pollutants at the site and, for each potential source, any pollutant or pollutant parameter (e.g., biochemical oxygen demand, etc.) of concern shall be identified.

3. *Measures and controls.* Each facility covered by this permit shall develop a description of storm water management controls (i.e., Best Management Practices or BMPs) appropriate for the facility. Such measures and controls must be implemented as a requirement of this permit. The appropriateness and priorities of BMPs in the SWP3 shall reflect identified potential sources of pollutants at the facility. The description of storm water BMPs shall address the following minimum components, including a schedule for implementing such controls:

a. *Good housekeeping.* Good housekeeping requires the maintenance of areas that may contribute pollutants to storm water discharges in a clean, orderly manner.

b. *Preventive maintenance.* A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices and other BMPs (e.g., cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing equipment and systems to identify conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters (e.g., hydraulic leaks in motors

and pumps, etc.), and ensuring appropriate maintenance of such equipment and systems.

c. *Spill prevention and response procedures.* Areas where potential spills which contribute pollutants to storm water discharges can occur, and their accompanying drainage points shall be identified clearly in the SWP3. Where appropriate, the SWP3 should specify material handling procedures, storage requirements, and the use of equipment, such as diversion valves. Procedures for cleaning up spills shall be identified in the SWP3 and made available to the appropriate personnel. The necessary equipment to implement proper cleanup of a spill should be made readily available to facility personnel.

d. *Inspections.*

(1) In addition to, and as part of, the Comprehensive Site Evaluation required under Part IV.D.4 and the Monitoring and Reporting Requirements specified in Part VI, the Team Leader, or their designee, shall inspect designated equipment and areas of the facility for BMP deficiencies or other incidences of non-compliance at appropriate intervals specified in the SWP3, but no less than once per calendar quarter. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections and corrective actions taken shall be maintained in the SWP3.

(2) The permittee shall perform and document visual examinations of the storm water discharged from each outfall. The examination(s) must be made during normal facility operation at a frequency appropriate to the size and type of industrial activity conducted but no less than once each calendar quarter. Examination reports must be maintained on-site with the SWP3. Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff begins discharging. The examinations shall document obvious indicators of storm water pollution such as color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil, scum, turbidity, materials associated with municipal or domestic sewage and industrial waste, and other objectionable conditions. The examination of the collected samples must be conducted in a well-lighted area. No analytical tests are required to be performed on these samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 24 hours from the previously measurable (greater than 0.1 inch rainfall) storm event.

(3) When the permittee is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the permittee must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.)

(4) When a facility has four or more outfalls that the permittee reasonably believes (based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by an outfall) discharge substantially identical effluents, the permittee may perform the visual inspections and examinations of at least three outfalls and report that the observations also apply to the other substantially identical outfalls. The permittee must keep a record of which outfalls are substantially the same and the rationale for this decision. The permittee must examine and inspect the substantially identical outfalls on a rotational basis.

e. *Employee training.* Employee training programs shall inform personnel responsible for implementing activities identified in the SWP3 or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the SWP3. Training should address topics such as spill response, good housekeeping and material management practices. The SWP3 shall identify periodic dates for such training.

f. *Record keeping and internal reporting procedures.* A record keeping system must be established and implemented for the documents required to be kept by this permit. A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the SWP3. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the SWP3.

g. *Non-storm water discharges.*

(1) The SWP3 shall include a certification that all discharge points have been tested or evaluated at least once each year for the presence of non-storm water discharges other than the allowable non-storm water discharges currently identified under Part III.A.2 of this permit and in compliance with Part III.A.2.b of this permit. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm

water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Certifications shall be signed in accordance with Part VII.G. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the SWP3 shall indicate why the certification required by this Part was not feasible, along with the identification of potential significant sources of non-storm water at the site other than the allowable non-storm water discharges currently identified under Part III.A.2 of this permit and in compliance with Part III.A.2.b of this permit.

(2) Except for flows from fire fighting activities, sources of non-storm water listed in Part III.A.2 that are combined with storm water discharges associated with industrial activity must be identified in the SWP3. The SWP3 shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

h. *Sediment and erosion control.* The SWP3 shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization BMPs to be used to limit erosion.

i. *Management of runoff.* The SWP3 shall contain a narrative review of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) that will be used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the facility. The SWP3 shall ensure that measures determined to be reasonable and appropriate will be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges (see Part IV.D.2) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices.

4. *Comprehensive site evaluation/inspection.* The Team Leader or his/her designee shall conduct site compliance evaluations and inspections at least once per year or at more frequent intervals as specified in the SWP3 except as provided in Part IV.D.4.e. This comprehensive site evaluation and inspection is in addition to the quarterly inspections required by Part IV.D.3.d. Such evaluations shall provide:

a. Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, or other structural pollution prevention measures identified in the SWP3 shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the SWP3, such as spill response equipment, shall be made.

b. Based on the results of the inspection, the description of potential pollutant sources and BMPs identified in the SWP3 shall be revised as appropriate within thirty (30) days of such inspection and shall provide for implementation of any changes to the SWP3 in a timely manner, but in no case more than three (3) months after the inspection. A narrative summary identifying the scope of the inspection, the personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWP3, actions taken in accordance with Part IV.D.4.b, and a yearly summary of the quarterly inspections required by Part IV.D.3.d shall be made and retained as part of the SWP3 in accordance with Part VI.C.1 of the permit. The summary shall identify any instances of noncompliance and include a description of corrective actions taken in response. Where the summary does not identify any instances of noncompliance, the summary shall contain a certification that the facility is in compliance with the SWP3 and this permit.

c. *Annual Report*

Facilities sampling under Part III.C of this permit and facilities subject to a numeric effluent limitation in Part V of this permit must submit the Annual Report contained in Appendix B by the end of the fourteenth (14th) month after the beginning of the first quarter in which sampling is required under Part III.C and/or Part V (and on an annual basis thereafter). All other facilities must submit the Annual Report by the end of the twenty-sixth (26th) month after the effective date of the permit (and on an annual basis thereafter). The Annual Report must be certified in accordance with Part VII.G of this permit and a copy of the report must be kept with the SWP3.

d. Noncompliance with the Permit

When violations of the permit are determined by the permittee, a written report of all instances of noncompliance must be submitted to the EPD within thirty (30) days of becoming aware of such noncompliance. Any noncompliance with this permit that would endanger health or the environment must be reported to EPD, including an oral report within twenty-four (24) hours of the time the permittee becomes aware of the circumstances (by calling 800-241-4113 or 404-656-4300), followed by a written report within five (5) days of becoming aware of such circumstances.

e. Where annual site inspections are shown to be impractical for inactive mining sites due to the remote location and inaccessibility of the site, the site inspections required under this Part shall be conducted at appropriate intervals specified in the SWP3, but in no case less than once every three years.

5. *Additional requirements for storm water discharges associated with industrial activity through permitted municipal separate storm sewer systems (MS4s).*

   a. In addition to the applicable requirements of this permit, the permittee must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the MS4 that receives the facility's discharge.

   b. Permittees that discharge storm water associated with industrial activity through a permitted MS4 or when required by local ordinance shall make SWP3s available to the city or county upon request.

6. *Consistency with other plans.* Storm Water Pollution Prevention Plans may incorporate best management practices (BMPs) for the control of pollutants in storm water discharges which are summarized in Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under Section 311 of the CWA or Best Management Practices (BMP) Plans otherwise required by another NPDES permit for the facility, as long as such requirements are incorporated into the SWP3 by reference and copies of these other plans are kept with the SWP3.

7. *Additional requirements for salt storage.* Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity that is discharged to the waters of Georgia shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile. Dischargers shall demonstrate compliance with this provision as expeditiously as

practicable. Salt storage piles do not need to be enclosed or covered where storm water from the pile is not discharged to the waters of Georgia.

8. *Additional requirements for storm water discharges associated with industrial activity from facilities subject to EPCRA Section 313 reporting requirements.*

   Facilities with potential pollutant sources that are subject to the release reporting requirements under EPCRA Section 313 (SARA Title III) must identify any substances for which releases are required to be reported that are, or may be, exposed to precipitation in the SWP3. The SWP3 must include a narrative description of BMPs used to minimize contact of such substances with storm water runoff.

9. *Requirements for facilities with industrial sources of fecal coliform.*

   All industrial materials or activities that are potential sources of fecal coliform and that may be exposed to storm water at the facility must be identified in the SWP3. Such potential sources include, but are not limited to, any areas that contain or may contain live animals, animal matter, animal wastes, or human wastes that are directly related to current or previous industrial activity at the facility, within the current operator's knowledge, or that the current operator should have known about. The SWP3 must include, for each potential industrial source of fecal coliform, a detailed description of the installation and maintenance of BMPs used to minimize exposure and otherwise reduce and control fecal coliform in storm water discharges from the facility.

Part V. NUMERIC EFFLUENT LIMITATIONS

Facilities subject to numeric effluent limitations established in this section of the permit must include a summary of the sampling results for the applicable parameters along with the Annual Report submitted for each year of coverage under this permit. The failure to meet an applicable numeric effluent limitation is a violation of this permit.

A. **Coal Pile Runoff.** Any discharge composed of coal pile runoff shall not exceed a maximum concentration at any time of 50 mg/l Total Suspended Solids (TSS). Coal pile runoff shall not be diluted with storm water or other flows in order to meet this limitation. The pH of such discharges shall be within the range of 6.0 – 8.5. Any untreated overflow from the facilities designed, constructed and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the 50 mg/l limitation for Total Suspended Solids (TSS).

B. **Runoff from Asphalt Emulsion Facilities** (40 CFR Part 443 Subpart A). Any storm water discharge from asphalt emulsion facilities shall not exceed a daily

maximum concentration of 23.0 mg/l and a thirty (30) day average concentration of 15.0 mg/l for Total Suspended Solids (TSS) and a daily maximum concentration of 15.0 mg/l and a thirty (30) day average concentration of 10.0 mg/l for Oil and Grease. The pH of such discharges shall be within the range of 6.0 to 9.0.

C. **Runoff from Material Storage Piles at Cement Manufacturing Facilities** (40 CFR Part 411 Subpart C). Any discharge composed of runoff that derives from the storage of materials including raw materials, intermediate products, finished products, and waste materials that are used in or derived from the manufacture of cement shall not exceed a daily maximum concentration of 50 mg/l for Total Suspended Solids (TSS). The pH of such discharges shall be within the range of 6.0 to 9.0.

D. **Discharges Resulting from Spray Down or Intentional Wetting of Logs at Wet Deck Storage Areas** (40 CFR Part 429, Subpart I). The pH of such discharges shall be within the range of 6.0 to 9.0. No discharge may contain debris that will not pass through a 2.54 cm (1") diameter round opening.

E. **Runoff from Landfills.**

1. *Landfills subject to the requirements of 40 CFR Part 445 Subpart A.*

Runoff from landfills which are subject to the requirements of 40 CFR Part 445, Subpart A shall not exceed daily maximum of 220 mg/l and a monthly average maximum of 56 mg/l for Five – Day Biochemical Oxygen Demand (BOD5), a daily maximum of 88 mg/l and a monthly average maximum of 27 mg/l for Total Suspended Solids (TSS), a daily maximum of 10 mg/l and a monthly average maximum of 4.9 mg/l for Ammonia, a daily maximum of 0.042 mg/l and a monthly average maximum of 0.019 mg/l for Alpha Terpineol, a daily maximum of 0.024 mg/l and a monthly average maximum of 0.015 mg/l for Aniline, a daily maximum of 0.119 mg/l and a monthly average maximum of 0.073 mg/l for Benzoic Acid, a daily maximum of 0.059 mg/l and a monthly average maximum of 0.022 mg/l for Naphthalene, a daily maximum of 0.024 mg/l and a monthly average maximum of 0.015 mg/l for p-Cresol, a daily maximum of 0.048 mg/l and a monthly average maximum of 0.029 mg/l for Phenol, a daily maximum of 0.072 mg/l and a monthly average maximum of 0.025 mg/l for Pyridine, a daily maximum of 1.1 mg/l and a monthly average maximum of 0.54 mg/l for Total Recoverable Arsenic, a daily maximum of 1.1 mg/l and a monthly average maximum of 0.46 mg/l for Total Recoverable Chromium and a daily maximum of 0.535 mg/l and a monthly average maximum of 0.296 mg/l for Total Recoverable Zinc. The pH of such discharges shall be within the range of 6.0 to 9.0.

2. *Landfills subject to the requirements of 40 CFR Part 445 Subpart B.*

Runoff from landfills which are subject to the requirements of 40 CFR Part 445, Subpart B, shall not exceed a daily maximum of 140 mg/l and a monthly average maximum of 37 mg/l for Five – Day Biochemical Oxygen Demand (BOD5), a daily maximum of 88 mg/l and a monthly average maximum of 27 mg/l for Total Suspended Solids (TSS), a daily maximum of 10 mg/l and a monthly average maximum of 4.9 mg/l for Ammonia, a daily maximum of 0.033 mg/l and a monthly average maximum of 0.016 mg/l for Alpha Terpineol, a daily maximum of 0.12 mg/l and a monthly average maximum of 0.071 mg/l for Benzoic Acid, a daily maximum of 0.025 mg/l and a monthly average maximum of 0.014 mg/l for p-Cresol, a daily maximum of 0.026 mg/l and a monthly average maximum of 0.015 mg/l for Phenol, and a daily maximum of 0.20 mg/l and a monthly average maximum of 0.11 mg/l for Total Recoverable Zinc. The pH of such discharges shall be within the range of 6.0 to 9.0.

Part VI. ANNUAL SAMPLING AND REPORTING REQUIREMENTS

A. Annual Sampling Requirements.

1. *Limitations on sampling requirements.*

a. Those facilities identified in Parts VI.A.2.a. through t. of this permit are required to conduct annual sampling and analytical testing of their storm water discharges associated with industrial activity. Facilities are subject to the applicable numeric effluent limitations contained in Part V of this permit. Facilities other than those identified in Parts III.C. and VI.A.2.a. through t. are not required to perform analytical testing on their storm water discharges associated with industrial activity unless specifically required in writing by EPD. The EPD can provide written notice to any facility with coverage under this permit to conduct analytical testing of their storm water discharges associated with industrial activity on a schedule specified by EPD.

b. When a facility has industrial activities being conducted on-site that meet the description(s) of the sampling requirements shown in Parts VI.A.2.a. through t, the facility shall comply with any and all applicable sampling requirements. The sampling requirements and conditions of this permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which sampling requirements of this permit (if any) are applicable to the facility.

2. *Sampling requirements.* During the period beginning on the effective date and lasting through the expiration date of this permit, a permittee with a facility identified in Part VI.A.2.a. through t. must sample at least annually (once per calendar year), except as provided in Parts VI.A.4, and VI.A.5, those storm water discharges identified below to document the presence of any pollutants. The permittee is not to submit sampling results to EPD, unless specifically required by Parts III.C or V of this permit or otherwise in writing by the EPD. However, the permittee must retain sampling results in accordance with Part VI.C. In addition to the parameters listed below, the permittee shall record the date and duration (in hours) of the storm event(s) sampled; rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled;

a. *Primary metal industries.* Facilities with storm water discharges classified as Standard Industrial Classification (SIC) major group 33 (Primary Metal Industry) are required to sample such storm water that is discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; Dissolved Lead (mg/l); Dissolved Cadmium (mg/l); Dissolved Copper (mg/l); Dissolved Arsenic (mg/l); Dissolved Chromium (mg/l); and any pollutant limited in an effluent guideline to which the facility is subject.

b. *Landfills.*

(1). *Landfills subject to 40 CFR Part 445 Subpart A.*

Facilities with storm water discharges from any active or inactive landfill subject to 40 CFR Part 445 Subpart A that have received any industrial wastes (other than wastes from a construction site) are required to sample such storm water that is discharged from the facility for: Five–Day Biochemical Oxygen Demand (BOD5); Total Suspended Solids (TSS) (mg/l); Ammonia, Alpha Terpineol; Aniline; Benzoic Acid; Naphthalene; p-Cresol; Phenol; Pyridine; Total Recoverable Arsenic; Total Recoverable Chromium; Total Recoverable Zinc; and pH.

(2). *Landfills subject to 40 CFR Part 445 Subpart B.*

Facilities with storm water discharges from any active or inactive landfill subject to 40 CFR Part 445 Subpart B that have received any industrial wastes (other than wastes from a construction site) are required to sample such storm water that is discharged from the facility for: Five–Day Biochemical Oxygen Demand (BOD5); Total Suspended Solids (TSS) (mg/l); Total Recoverable Zinc; Ammonia; Alpha Terpineol; Benzoic Acid; p-Cresol; Phenol; and pH.

c. *Incinerators, boilers and industrial furnaces.* Facilities with storm water discharges from incinerators (including boilers and industrial furnaces) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to sample such storm water that is discharged from the facility for: Total Recoverable Magnesium (mg/l); Magnesium (dissolved) (mg/l); Total Kjeldahl Nitrogen (TKN) (mg/l); Five-day Biochemical Oxygen Demand (BOD5); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS); Total Dissolved Solids (TDS) (mg/l); Total Organic Carbon (TOC) (mg/l); Oil and Grease (mg/l); pH; Dissolved Arsenic (mg/l); Total Recoverable Barium (mg/l); Dissolved Cadmium (mg/l); Dissolved Chromium (mg/l); Total Cyanide (mg/l); Dissolved Lead (mg/l); Mercury (mg/l); Dissolved Selenium (mg/l); and Silver (mg/l).

d. *Wood waste and wood waste landfills.* Facilities with storm water discharges from areas that are used to store wood waste, active and inactive wood waste landfills, and open dumps for wood waste are required to sample such storm water that is discharged from the site for: Chemical Oxygen Demand (COD) (mg/l); and Total Suspended Solids (TSS) (mg/l).

e. *Wood treatment.* Facilities with storm water discharges from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to sample such storm water that is discharged from the facility for: Oil and Grease (mg/l); pH; Chemical Oxygen Demand (COD) (mg/l); and Total Suspended Solids (TSS) (mg/l). In addition to the above, facilities that use chlorophenolic formulations shall measure pentachlorophenol (mg/l). In addition to the above, facilities that use chromium-arsenic formulations shall measure Dissolved Arsenic (mg/l); Dissolved Chromium (mg/l); and Dissolved Copper (mg/l).

f. *Coal pile runoff.* Facilities with storm water discharges from coal pile runoff are required to sample such storm water that is discharged from the facility for: Oil and Grease (mg/l); pH; Total Suspended Solids (TSS) (mg/l); Dissolved Copper (mg/l); Dissolved Nickel (mg/l); and Dissolved Zinc (mg/l).

g. *Battery reclaimers.* Facilities that reclaim lead acid batteries with storm water discharges from areas used for storage of lead acid batteries, reclamation products, or waste products; and areas used for lead acid battery reclamation (including material handling activities) are required to sample such storm water that is discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; Dissolved Copper (mg/l); and Dissolved Lead (mg/l).

h. *Airports.* At airports with over 50,000 flight operations per year, facilities with storm water discharges from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to sample such storm water that is discharged from the facility when deicing activities are occurring for: Oil and Grease (mg/l); Five Day Biochemical Oxygen Demand (BOD_5) (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and the primary ingredient used in the deicing materials used at the site (e.g. ethylene glycol, urea, etc.).

i. *Coal-fired steam electric facilities.* Facilities with storm water discharges from coal handling sites at coal fired steam electric power generating facilities are required to sample such storm water that is discharged from the facility for: Oil and Grease (mg/l); pH; Total Suspended Solids (TSS) (mg/l); Dissolved Copper (mg/l); Dissolved Nickel (mg/l); and Dissolved Zinc (mg/l).

j. *Animal handling/meat packing.* Facilities with storm water discharges from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to sample such storm water that is discharged from the facility for: Five Day Biochemical Oxygen Demand (BOD_5) (mg/l); Oil and Grease (mg/l); Total Suspended Solids (TSS) (mg/l); Total Kjeldahl Nitrogen (TKN) (mg/l); Total Phosphorus (mg/l); pH; and Fecal Coliform (counts per 100 ml).

k. *SIC 28/30 facilities.* Facilities classified as SIC major group 30 (Rubber and Miscellaneous Plastics Products) or SIC major group 28 (Chemicals and Allied Products) with storm water discharges from storage piles for solid chemicals used as raw materials are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

l. *Automobile salvage yards.* Automobile salvage yards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) that are exposed to storm water; (B) over 500 auto/truck units (bodies with or without drivelines in whole or in parts) that are exposed to storm water; or (C) over 100 units per year are dismantled and automotive fluids are drained or stored in areas exposed to storm water are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total

Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

m. *Lime manufacturing facilities.* Lime manufacturing facilities (SIC 3274) with lime storage piles that are exposed to storm water are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

n. *Oil-fired steam electric power generating facilities.* Facilities with oil handling sites at oil fired steam electric power generating facilities are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

o. *Cement manufacturing/cement kilns.* Cement manufacturing facilities and cement kilns with storm water discharges are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

p. *Ready-mixed concrete facilities.* Ready-mixed concrete facilities with storm water discharges are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject.

q. *Ship building/repairing facilities.* Ship building and repairing facilities with storm water discharges are required to sample such storm water discharged from the facility for: Oil and Grease (mg/l); Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); pH; and any pollutant limited in an effluent guideline to which the facility is subject;

r. *Asphalt emulsion facilities.* Asphalt emulsion facilities with storm water discharges are required to sample such storm water that is discharged from the facility for: Total Suspended Solids (TSS) (mg/l), Oil and Grease (mg/l), and pH.

s. *Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas.* Facilities with discharges resulting from spray down or intentional wetting of logs at wet deck storage areas are required to sample storm water discharges for pH.

t. *Scrap metal recycling facilities.* Scrap metal recycling facilities with storm water discharges are required to sample such storm water discharged from the facility for: Chemical Oxygen Demand (COD) (mg/l); Total Suspended Solids (TSS) (mg/l); Aluminum (mg/l); Dissolved Copper (mg/L); Iron (mg//); Dissolved Lead (mg/l); Dissolved Zinc (mg/l). These requirements do not apply to recycling facilities that only receive source-separated recyclable materials primarily from non-industrial and residential sources (i.e., common consumer products including paper, newspaper, glass, cardboard, plastic containers, aluminum and tin cans). This includes recycling facilities commonly referred to as material recovery facilities (MRFs).

3. *Sample type.*

a. For all discharges data shall be reported for a grab sample. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72 hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall keep with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable. In the case where an insufficient quantity of sample is collected to perform all required analysis, it will be necessary to perform additional sampling during a different rainfall event. The permittee must ensure that the appropriate sample collection and analytical methods are used. All storm water sampling and analysis must be conducted in accordance with the requirements set forth in 40 CFR 136.

b. If storm water discharges commingle with process or non-process water, then where practicable, the permittee must attempt to sample the storm water discharge before it mixes with the non-storm water discharge. Where it is not practicable to sample the storm water separately, an explanation as to why it was not practicable must be made with the sampling report.

4. *Representative discharge.* When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfalls, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of these outfalls and report that the quantitative data also applies to the substantially identical outfall(s). In addition, for each outfall that the permittee believes is identical, an estimate of the size of the drainage area (in

square feet) and an estimate of the runoff coefficient of the drainage area, e.g., low (under 40 percent), medium (40 to 65 percent) or high (above 65 percent) shall be provided.

5. *Sampling waiver.* When the permittee is unable to collect samples due to adverse climatic conditions, the discharger must record, in lieu of sampling data, a description of why samples could not be collected, including available documentation of the event. Adverse weather conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc).

6. *Alternative certification.* The permittee is not subject to the sampling requirements of Part VI.A.2 provided the permittee makes a certification for a given outfall, on an annual basis, under penalty of law, signed in accordance with Part VII.G, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from industrial activity, or in the case of airports, deicing activities, that are located in the areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained with the SWP3, and must be submitted to the EPD upon request.

B. Reporting.

1. Except as provided in Part III.C, Part IV.D.4.c, Part IV.D.4.d, Part V and Part VI.C.2, the permittee is not to submit sampling results or certifications to the EPD, unless required in writing by the EPD.

2. Facilities with at least one storm water discharge associated with industrial activity through a permitted municipal separate storm sewer system must submit signed copies of any sampling reports, certifications, and data to the city or county upon request.

C. Retention of Records.

1. The permittee shall retain the Storm Water Pollution Prevention Plan developed in accordance with Part IV until at least one year after coverage under this permit terminates. The permittee shall retain all records of all visual monitoring information, copies of all reports required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, until at least one year after coverage under this permit terminates. This period may be explicitly modified by other provisions of this permit or extended by request of the EPD at any time.

2. For discharges subject to sampling and analytical testing requirements pursuant to Parts III.C and VI.A, in addition to the requirements of Part VI.C.1, the permittee is required to retain for a three year period from the date of sample collection or for the term of this permit, which ever is greater, records of all monitoring information collected during the term of this permit. The permittee must submit such monitoring results to the EPD as required by the permit or upon written request by EPD.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply.

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Georgia Water Quality Control Act (O.C.G.A. § 12-5-20 et. seq.) and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or for denial of a permit renewal application. Any instances of noncompliance must be reported to EPD as specified in Part IV.D.4.d of this permit.

2. *Penalties for violations of permit conditions.* The Federal Clean Water Act and the Georgia Water Quality Control Act (O.C.G.A. § 12-5-20 et. seq.) provide that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this permit, makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine or by imprisonment, or by both. The Georgia Water Quality Control Act (Act) also provides procedures for imposing civil penalties which may be levied for violations of the Act, any permit condition or limitation established pursuant to the Act, or negligently or intentionally failing or refusing to comply with any final or emergency order of the Director.

B. Continuation of the Expired General Permit. This permit will continue in effect until the date five (5) years after the effective date and will expire on the date shown on the cover page. However, an expired general permit continues in force and effect until a new general permit is issued. Any permittee who submitted a properly-completed Notice of Intent – Version 2006 form to obtain coverage under this permit prior to the expiration date will automatically remain covered under the continued permit until one of the following occurs:

1. Reissuance of this permit, at which time a new Notice of Intent (NOI) form will be required under the terms of the new permit in order to maintain authorization to discharge; or

2. Submittal of a properly completed Notice of Termination for the facility; or

3. An individual NPDES permit authorizing storm water discharges associated with industrial activity is issued for all of the permittee's discharges formerly covered by the continued permit; or

4. A formal permit decision is made by the Director not to reissue this general permit, at which time coverage under an individual permit or an alternate general permit will be required.

C. **Need to Halt or Reduce Activity not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. **Duty to Provide Information.** The permittee shall furnish to the EPD, within a specified time, any requested information which may be used to determine compliance with this permit. The permittee shall also furnish to the EPD upon request copies of records required to be kept by this permit. When the facility discharges storm water associated with industrial activity through a permitted municipal separate storm sewer system, the permittee shall also furnish to the city or county any information which is requested to determine compliance with this permit and other NPDES permits. In the case of information submitted to the EPD, such information shall be considered public information and available under the Georgia Open Records Act. The failure to provide information requested by EPD in accordance with this permit is a violation of this permit.

F. **Other Information.** When the permittee becomes aware of a failure to submit any relevant facts or of the submittal of incorrect information in the Notice of Intent or in any other report to the EPD, the permittee shall promptly submit such facts or information.

G. **Signatory Requirements.** All records and information such as Notices of Intent, Notices of Termination, Storm Water Pollution Prevention Plans, reports, certifications which are required to be kept by this permit, to be submitted to the EPD or to be submitted to the operator of a permitted municipal separate storm sewer system, shall be signed as follows:

1. All Notices of Intent shall be signed as follows:

   a. *For a corporation:* by a responsible corporate officer. For the purpose of this permit, a responsible corporate officer means: (1) a president,

secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. *For a partnership or sole proprietorship:* by a general partner or the proprietor, respectively; or

c. *For a municipality, State, Federal, or other public agency:* by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the EPD shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the EPD.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

c. *Changes in authorization.* If an authorization under Part VII.G.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of this Part must be submitted to the EPD prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. *Certification.* Any person signing documents under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act (CWA) or Section 106 of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

I. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

J. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. **Requiring an Individual Permit or an Alternative General Permit.** The EPD may require any permittee or person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit.

L. **State/Environmental Laws.**

1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Clean Water Act.

2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

M. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of the

SWP3. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

N. Monitoring and Records.

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. The permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of the reports required by this permit, and records of all data used to complete the application for this permit, for a period as specified in Part VI.C of this permit. This period may be extended by request of the EPD at any time.

3. *Records Contents.* Records of monitoring information shall include:

   a. The date, exact place, and time of sampling;

   b. The initials or name(s) of the individual(s) who performed the sampling or measurements;

   c. The date(s) analyses were performed;

   d. The time(s) analyses were initiated;

   e. The initials or name(s) of the individual(s) who performed the analyses;

   f. References and written procedures, when available, for the analytical techniques or methods used; and

   g. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.

4. Sampling must be conducted according to test procedures approved under 40 CFR 136, unless other test procedures have been specified in this permit.

O. Inspection and Entry. The permittee shall allow the EPD or an authorized representative of EPA, the State, or, in the case of a facility which discharges through a municipal separate storm sewer system, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

P. Permit Actions. The permit may be modified, revoked and reissued, or terminated for cause, including but not limited to changes in the law or regulations.

Part VIII. TERMINATION OF COVERAGE

A. Notice of Termination. Where all storm water discharges associated with industrial activity that are authorized by this permit are eliminated, the operator of the facility changes, or the facility closes, the permittee must submit a Notice of Termination (NOT) that is signed in accordance with Part VII.G. The NOT shall be submitted to the EPD no later than thirty (30) days after the discharge is eliminated, the facility closes, or the operator changes. The Notice of Termination shall include the following information:

1. Name, mailing address, street address (provide descriptive or narrative location if no address is available) and county of the facility for which the notification is submitted;

2. Up to four 4-digit SIC codes that best represent the principal manufacturing process or activity and an indication of whether the facility is a hazardous waste treatment, storage or disposal facility, a land disposal facility that receives or has received any industrial waste, a steam electric power generating facility, or a treatment works treating domestic sewage;

3. The legal name, address, telephone number of the operator of the facility. Indicate whether the facility is publicly or privately operated. Further indicate for a publicly operated facility if the facility is operated by a local, state or federal government;

4. The following certification signed in accordance with Part VII.G:

   "I certify under penalty of law that all storm water discharges associated with industrial activity from (the identified facility) that are authorized by the General NPDES Permit No. GAR000000 have been eliminated, the identified facility has closed or the operator of the identified facility has changed. I understand that by submitting this Notice of Termination, this facility is no longer authorized to

discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the State of Georgia is unlawful under the Georgia Water Quality Control Act and the Clean Water Act where the discharge is not authorized by a NPDES permit.";

5. The latitude and longitude, in degrees, minutes, and seconds, of the approximate center of the facility to nearest fifteen (15) seconds;

6. The name, title and telephone of the individual who will serve as the point of contact regarding this NOT; and

7. Any other information determined by the EPD to be necessary.

B. Where to Submit. All NOTs are to be sent, using the form provided by the EPD, to the EPD at the address shown in Part II.C.

APPENDIX A

DEFINITIONS

"Associated with Industrial Activity" means any industrial activity or industrial facility identified in 40 CFR Part 122.26(b)(14)(i) through (ix) and (xi).

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State of Georgia. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Coal pile runoff" means the rainfall runoff from or through any coal storage pile.

"Co-located industrial activity" means when a facility has industrial activities being conducted on-site that are described by more than one type of industrial activity. Facilities with co-located industrial activities shall comply with all applicable monitoring and pollution prevention plan requirements in which a co-located industrial activity is described.

"Commercial Treatment and Disposal Facilities" means facilities that receive, on a commercial basis, any produced hazardous waste (not their own) and treat or dispose of those wastes as a service to the generators. Such facilities treating and/or disposing exclusively residential hazardous wastes are not included in this definition.

"Commencement of Operations" means the date on which any raw material, intermediate product, finished product, by-product or waste product is first brought onto the facility and exposed to storm water.

"Construction Activity" means the disturbance of soils associated with clearing, grading, or excavating activities and exposed to storm water.

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972).

"Director" means the Director of the Georgia Environmental Protection Division or an authorized representative.

"EPD" or "Division" means the Environmental Protection Division of the Department of Natural Resources.

"Impaired Stream Segment" means any stream segment that is identified as "partially-supporting" or "not supporting" designated uses on Georgia's most current 303(d) list. Georgia's 303(d) list can be viewed on EPD's website at www.gaepd.org.

"Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

"Land application site or unit" means an area where wastes are applied onto or incorporated into the soil surface (excluding agricultural manure spreading operations) for treatment or disposal.

"NOI" means Notice of Intent as defined in Part II of this permit.

"NOT" means Notice of Termination as defined in Part VIII of this permit.

"Operator" means the entity that has the primary day-to-day operational control of those activities at the facility necessary to ensure compliance with the SWP3 requirements and permit conditions. Normally, the operator is the legal owner of the corporation or company, but in limited cases an individual.

"Owner" means the legal owner of the facility where an industrial activity takes place.

"Permitted municipal separate storm sewer system" means either a large, medium, or small municipal storm sewer system, or a municipal separate storm sewer system owned or operated by a city, county or authority which is regulated by a National Pollutant Discharge Elimination System Permit.

"Permittee" means the entity that has submitted a Notice of Intent and that is the owner or operator of an industrial activity.

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Pollutant of Concern" means a water quality parameter associated with the impairment of a stream segment, or other specified portion of a water of the State, that is identified on either Georgia's 303(d) list and/or in an approved TMDL.

"Receiving Waters" means waters of the State into which the runoff of storm water from a facility will actually discharge, either directly or indirectly.

"Section 313 water priority chemical" means a chemical or chemical categories which: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986); 2) are present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and 3) meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and

phenols) or Table V (certain toxic pollutants and hazardous substances; (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to EPCRA Section 313; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or Section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in paragraphs (i) through (x) of this definition, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State or municipally owned or operated that meet the description of the facilities listed in this paragraph (i) – (x) of this definition) include those facilities designated under 40 CFR 122.26(b)(14)(i)–(ix) and (xi). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this permit:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N;

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, and 373:

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator:

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093:

(vii) Steam electric power generating facilities, including coal handling sites:

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45 and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under (i) – (vii) or (ix) – (x) of this definition are associated with industrial activity.

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or those required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i) – (ix).

"Storm water point source" means a conveyance, a system of conveyances (including pipes, conduits, ditches, and channels) or sheet flow which is later conveyed via a point source to waters of the State.

"Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.

"Watershed" means a geographic area draining to a stream or stream segment. All of the land area that drains to a stream or stream segment is considered to be within the "watershed" of that stream or stream segment.

"Waters of Georgia" or "Waters of the State" means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, wetlands, and all other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not confined and retained completely upon the property of a single individual, partnership, or corporation.

APPENDIX B

Annual Report

NPDES General Permit No. GAR000000

For Storm Water Discharges Associated with Industrial Activity

Instructions: Complete the following checklist using the records compiled during the inspections required by Parts IV.D.3.d and IV.D.4 of NPDES General Permit No. GAR000000 (Permit), effective on _____. This form must be properly certified in accordance with Part VII.G of the Permit, and submitted to the Storm Water Unit, EPD Watershed Protection Branch, 4220 International Parkway, Suite 101, Atlanta, GA 30354.

Facilities sampling under Part III.C of the permit and facilities subject to a numeric effluent limitation in Part V of the permit must submit the Annual Report by the end of the fourteenth (14th) month after the beginning of the first quarter in which sampling is required under Part III.C and/or Part V (and on an annual basis thereafter).

All other facilities must submit the Annual Report by the end of the twenty-sixth (26th) month after the effective date of the permit (and on an annual basis thereafter).

Report for Reporting year: _____

1. Facility name and address: _____

   _____

2. Title and telephone number of Storm Water Pollution Prevention Team Leader:

   _____

3. Does the facility have a current Storm Water Pollution Prevention Plan (SWP3) that includes all elements required by the Permit? YES____ NO ____
4. Were the quarterly inspections and the Annual Comprehensive Site Evaluation (as required by Part IV.D.3.d of Permit) conducted? YES____ NO____
5. Are all elements of the SWP3 presently in place and in good repair and functioning properly, including all BMPs and any spill response equipment?
   YES_____ NO_____
6. Based on inspection results was the SWP3 adequate to meet applicable Permit requirements? YES_____ NO _____. If not, were necessary revisions made to the SWP3 within 30 days of the inspection? YES_____ NO_____ If SWP3 revisions were

necessary, were they implemented at the facility within three (3) months of the inspection? YES_____ NO_____ N/A_____

7. Describe any BMP additions or modifications planned, and those completed, during the prior calendar year (attach additional sheets if necessary).

Planned: _____

_____

_____

Completed: _____

_____

_____

8. Is the facility required to conduct sampling in compliance with Part III.C of the Permit? YES_____ NO_____. If "YES" provide a summary of the sampling results for the reporting year for which this report is being submitted (as required in Part III.C). Identify the applicable benchmark value for each parameter monitored and state whether the facility has passed or failed the benchmark requirement for the twelve (12) month sampling period.

_____

_____

Is the facility subject to a numeric effluent limitation in Part V of the permit? YES_____ NO_____ If "YES" provide a summary of the sampling results for the reporting year for which this report is being submitted, and the applicable effluent limitation for each parameter monitored. _____

_____

_____

Is the facility required to conduct annual sampling under Part VI of the Permit? YES_____ NO_____ If "YES", was such sampling conducted for the reporting year for which this report is being submitted? YES_____ NO_____

9. Provide any additional comments and/or explanations of any of the above answers (use a separate sheet if needed):

_____

_____

_____

_____

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed,

_____ _____

Name (type or print): Date

_____

Title (type or print):

APPENDIX C

BMP LIST FOR ANIMAL PROCESSING PLANTS

STORM WATER POLLUTION PREVENTION BEST MANAGEMENT PRACTICES FOR FECAL COLIFORM CONTROL AT ANIMAL PROCESSING PLANTS

INTRODUCTION. The following best management practices (BMPs) have been developed as consensus BMPs for animal processing plants under the "animal handling/meat packing facilities" classification defined in, and regulated by, the General Permit for Storm Water Discharges Associated with Industrial Activity in the State of Georgia ("general permit"). All BMPs contained in this document are accepted by the Georgia Environmental Protection Division under the terms of the general permit as appropriate BMPs for this industrial classification and may be appropriate and beneficial for other facilities that are potential sources of fecal coliform. Each permittee must decide which BMP, or combination of BMPs (whether operational, structural, Tier 1, Tier II or Tier III), is most appropriate to achieve the surrogate benchmark for fecal coliform, which has been set at 100 mg/l TSS. An iterative process has been established in the general permit that allows permittees to implement new BMPs and test the performance of these BMPs against the benchmark. If the benchmark is not achieved, then another round of BMPs must be implemented as provided in the general permit. If all technologically and economically feasible BMPs have been implemented after rounds of BMP implementation as provided in the general permit, and a facility is still unable to meet the TSS benchmark, then the facility may submit a demonstration to EPD under the general permit that allows the facility to rely on the BMPs implemented to date for compliance with the general permit, if EPD accepts the demonstration. In the event of any conflict between this document and the general permit, the general permit shall control.

I. OPERATIONAL BMPs

TIER I BMPs

- Perform dry cleanup of live animal holding, staging, storage, etc. areas according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan.

- Park loaded live haul trailers under cover or in live holding sheds to minimize exposure to storm water. If loaded live haul trailers cannot be parked under cover, the areas where these trailers are parked shall discharge to process sewer systems.

- Perform dry cleanup of paved driveways, parking areas, etc. where live animal and animal byproducts transport vehicles are staged, stored, moved across, etc. according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan.

- Collect escaped animals on a daily basis.

- Properly maintain air pollution control systems to prevent excessive dust emissions from rendering equipment, byproducts handling systems, etc.

- Properly maintain exposed animal byproducts and feed meal handling systems (screw conveyors, elevators, etc.) to ensure these systems are free of leaks, etc.

- Inspect storm water collection and discharge systems (manholes, underground storm sewers, sediment ponds/traps, etc.) and remove accumulated silt, sediment, organic materials, etc. according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan.

- Store animals dead on arrival (DOAs) in a manner which prevents the entry and release of storm water.

- Store refrigerated trailers with the potential for drainage of water contaminated with animal blood (red water) in containment areas with discharge to process sewer system.

- Perform equipment and vehicle washing activities in containment areas with discharge to process sewer system.

- Clean containment areas and remove accumulation of solids and organic materials (blood, litter, feed meal, animal byproducts, etc.) according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan.

- Remove solids and other contaminants on vehicles and equipment prior to long-term storage in outdoor areas (e.g., bone yards).

- Properly maintain (or ensure third party rendering companies properly maintain) gates and drain valves on offal trailers to prevent leakage.

TIER II BMPs

- Perform wash down of live animal holding, staging, storage, etc. areas according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan. Resulting wash water shall be collected and discharged to process sewer systems.

- Rinse live animal trailers, offal trailers, cages, etc. before long-term storage in outdoor areas (e.g., bone yards). Resulting rinse water shall be collected and discharged to process sewer systems.

- Implement and maintain operational measures which minimize/prevent attraction of excessive numbers of feral animals and birds to facility grounds.

TIER III BMPs

- Perform wash down of paved driveways, parking areas, etc. where live animal and animal byproduct transport vehicles are staged, stored, moved across, etc. paved driveways, parking areas, etc. according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan. Resulting wash water shall be collected and discharged to process sewer systems. This BMP may not be practical for all facilities due to sewer access.

II. STRUCTURAL BMPs

TIER I BMPs

- Provide containment areas and/or sewer connection for the following operations:
  - Loaded refrigerated trailer parking areas
  - Live Holding Sheds
  - Live Receiving Areas
  - Fresh product shipping docks
  - Exposed offal storage and handling systems
  - Exposed DOA storage areas
  - Vehicle and equipment washing areas

  Incidental spillage, wash down water, and storm water from these areas should be collected and discharged to process sewer systems.

- Install and maintain pavement and curbing, etc. in the areas identified above to allow routine dry cleanup and/or wash down.
- Cover Live Animal Holding/Staging areas and Live Receiving areas.

- Install silt fencing or other sediment barriers (storm drain catchment filter inserts, sediment traps, etc.) around, or in, drop inlets, above outfalls, etc. to impede the migration of silt, sediment and litter materials into storm water drainage systems. These systems shall be inspected and maintained as needed to remove collected materials (silt, sediment, trash, etc.) and according to a schedule to be developed as appropriate for the particular facility, taking into account significant rain events and production schedules. Such schedule and a log demonstrating compliance with such schedule shall be maintained as part of the facility's Storm Water Pollution Prevention Plan.

- Install and maintain collection and diversion structures (gutters, separate storm water drainage systems, etc.) to segregate "clean" storm water runoff from "sensitive" areas. Sensitive areas are defined as areas where live animals, litter materials, animal manures, animal byproducts, and other potential sources of fecal coliform may be present on surfaces.

- Install and maintain netting, curtains, etc. around Live Holding Sheds and Live Receiving Areas to contain feathers, litter material and associated dusts in containment areas.

TIER II BMPs

- Provide containment areas and/or sewer connection for the following operations:

    - Loaded offal trailer parking areas
    - Live haul trailer parking areas
    - Dirty cage storage areas
    - Trash compactor/dumpster areas, which can contain animal byproducts, litter/manure and other potential sources of fecal coliform

- Install and maintain pavement and curbing, etc. in the areas identified above to allow routine dry cleanup and/or wash down.

- Where allowed and appropriate, install filter strips adjacent to paved areas to treat sheet flow runoff from areas.

- Where allowed and appropriate, install and maintain grass buffer strips upgradient of drainage ways.

- Purchase mechanical pavement sweepers or vacuums, or contract with associated third party contractor for service, and clean applicable paved areas on an as needed basis.

TIER III BMPs

- Where allowed and appropriate, install first flush systems in other sensitive areas where incidental releases of manure, litter, red water, animal byproducts, etc. can occur. These systems should collect the first inch of rainfall and wash down water from areas. The first inch of rainfall and wash down water collected by these systems shall be discharged to process sewer. This BMP may not be practical for all facilities due to sewer access and/or limitations on storm water flow entry in sewer systems.

- If feasible, install air pollution control devices on ventilation exhaust from Live Hang areas.

Appendix

K

From: Drew Zurow
To: Taft, Andy
Date: 11/14/2007 10:45 AM
Subject: Re: Milliken & Company - Hillside Mill, 1300 Brownwood Ave., LaGrange, GA

EPA requires us to issue a general stormwater permit for all industries that are required to have coverage. Over 2000 facilities have coverage under this general permit. By applying for coverage, these industries are then required to follow the requirements of the permit.

>>> Andy Taft 11/14/2007 10:09 AM >>>
Thanks Drew. I noticed the Permit No. (GAR000000) is rather unspecific. Does this same permit apply to all facilities in the GA? If so, and if the all the requirements codified into law, why the necessity of a state-wide permit?

>>> Drew Zurow 11/14/2007 7:45 AM >>>
Andy,

The facility has coverage under the general industrial stormwater permit. The permit can be found at EPD's website, at:

http://www.gaepd.org/Files_PDF/techguide/wpb/Industrial_SW_General_Permit_GAR000000_Y2006_June8.pdf

>>> Andy Taft 11/13/2007 3:31 PM >>>
Hi Drew:

Hope you're doing well. Perhaps you remember me from EPD's Hazardous Waste Management Branch.

I'm doing a site assessment at the above referenced facility. Could you please provide me with a copy of the Storm Water Permit issued to this facility? The facility has a single storm water permit for the following three (3) co-located plants:

1. Hillside Plant
2. Valway Plant
3. Hillside Coating Plant

An electronic copy will suffice.

Thanks,
Andy Taft

Appendix

L

TROUP COUNTY ARCHIVES
Troup County History

Industrial History Of Troup County

Textiles at Center of Local History

From Introductory text of
Travels Through Troup County: A Guide to its Architecture and History.
Published by the Troup County Historical Society, 1996.
(This text was written by Julie Turner.)

Industrial Development. c.1847 -1920

The first industries in Troup County tended to be localized with small-scale production and appeared with the earliest settlement. Grist mills, saw mills, tanneries, and blacksmith shops developed along creeks and the Chattahoochee River providing services and goods needed by the first settlers. Grist mills often became a focal point for communities. As early as 1829, a grist mill operated on Flat Shoals Creek with a wooden dam. By 1834, a community developed around Daniel Norwood's grist mill in the northeast corner of the county. The influx of new settlers also required saw mills to provide lumber for building. Unlike grist mills, saw mills did not usually develop into communities. According to local historian Clark Johnson, "The wealthiest saw mill owners lived in LaGrange and were also in the construction business." Sometimes the early industries developed as complexes, such as Birds Mills and Shop north of LaGrange. John Bird established grist, flour, and saw mills on both sides of Beech Creek.

The textile industry developed slowly in the antebellum South, as did all industry. During the early nineteenth century, the economy of Troup County, like the South as a whole, remained firmly entrenched in agriculture dominated by the cotton plantation. Even so the South was not devoid of early cotton mills. In 1808, Dr. John Shecut established the South Carolina Homespun Company in Charleston on the Ashley River. In Georgia, the Wilkes Manufacturing Company was started near Washington in 1810. In the same year, the Antioch Factory was established between Madison and Monticello which would have been the western frontier at the time.

Before 1850, cotton mills in the South tended to move from one water source to another, lacking stability. Local blacksmiths often forged the machinery for these mills and they produced coarse cloth for a strictly local market. Individuals tended to own them rather than large corporations. Southern cotton mills of this period followed the Fall Line. (A geologic formation, the Fall Line was once the edge of the continent and is characterized by a distinct drop of hundreds of feet in a few miles.) Rivers and streams course over rapids and shoals creating the source of power harnessed by water wheels.

The cotton mill industry thrived in the South between 1850 and 1860, but production continued to be small-scale to meet the local needs of an agrarian society. Although in general the number of mills in the South decreased between 1840 and 1850, new mills were being built in the three states which would eventually dominate southern textiles: North Carolina, South Carolina, and Georgia. The

sharpest increase in mill building occurred in Georgia. The state contained only 19 mills in 1840 and 35 in 1850.

During this time, the Robertson Woolen Mill, established in 1847 on Turkey Creek, became the first textile mill in Troup County. Robert Robertson of Scotland started the enterprise and its success encouraged the development of the Troup Factory in 1848. To establish the Troup Factory, Robertson, Leslie and Company (James Madison Creed Robertson and Thomas Leslie) converted an 1845 grist mill building into a textile mill on Flat Shoals Creek near the road which led to Columbus. Troup Factory developed into a successful cotton mill producing osnaburgs (a course cloth) for markets as far away as Philadelphia and New Orleans. A village of around 500 residents grew up around the mill. The factory continued to operate successfully until 1902 when the business relocated to LaGrange as Park Cotton Mills.

The climate of Reconstruction influenced southern attitudes toward mill building. Southern leaders such as Benjamin H. Hill of LaGrange began calling for industrialization to help build a stronger and more progressive South. Between 1870 and 1880, the overall number of textile mills increased very little in the South. However, the number of spindles (which relate directly to production) increased by 60%. During the postbellum years, U.S. textile manufacturers typically continued to produce coarse cloths and many Southern mills continued to produce osnaburgs.

After the Civil War, rather than have a local blacksmith forge crude machinery for factories, southern mills began investing in secondhand machines purchased from the Northeast as New England mills updated their equipment. The South's Postbellum mills tended to operate on limited capital and the used equipment provided an affordable alternative to the blacksmiths' product.

Immediately after the Civil War, the Chattahoochee Manufacturing Company and the Alabama-Georgia Manufacturing Company were established in the Chattahoochee Valley through the leadership and capital of West Point residents. Through the leadership of Lafayette Lanier of West Point from 1873 to 1906, the Chattahoochee Manufacturing Company became the West Point Manufacturing Company. During the 1870s, before mill fever swept the South, Lanier led his company through several significant changes using only local capital. He switched from the production of osnaburgs to a canvas-type material called "flat duck." To market the new product beyond the local region, Lanier contracted with a Boston selling agent. To relieve production problems, he purchased new machinery and dispensed with the secondhand equipment the mill had been using. He also provided experienced management by importing an English supervisor for the mill. Although the mills and villages of the Chattahoochee Valley associated with the West Point Manufacturing Company are located across the state line in Alabama, the impact of the company's development on the West Point community cannot be understated. The company's offices have always been maintained in West Point and the industrial leaders have always lived in the community. From 1880 to 1920, mill fever swept the South. The number of textile mills in the South increased during this time from 161 to 731 (in 1910). At the beginning of the period, the southern states possessed only 21% of the nation's textile mills. By 1910, the South claimed a full 60% of U.S. mills. Troup County's location, progressive attitude and leadership created the perfect mix for large-scale textile mill development. Between 1888 and 1922, nine textile mills were built in the LaGrange, two in Hogansville and three additional mills were built by the West Point Manufacturing Company on the Alabama side of the river.

The relatively new cotton oil industry led the way for later textile development in Troup County. Local merchants established the Hogansville Cotton Oil Mill in 1881 and the LaGrange Oil and Manufacturing Company in 1883. Five years after its establishment, the LaGrange Oil and

Manufacturing Company began cotton textile manufacturing and became LaGrange Mills.

By 1895, "mill fever" had a firm grip on Troup County and the newspapers frequently spread the hype. As was typical throughout the South, northern investors boosted the interest of the local residents when it came to building mills. An 1895 visit to LaGrange by such investors gave rise to the establishment of Dixie Mills that year. Many LaGrange citizens invested in the mill, including Fuller E. Callaway, who would provide the most significant leadership for textile development in the county. Within a year Dixie Mills experienced serious financial and production problems. Fuller Callaway assumed a leadership role to pull the mill out of trouble. As Lafayette Lanier had done two decades earlier in West Point, Callaway replaced the secondhand machinery responsible for production problems and contracted with a northern selling agent to market the mills' products. Within two years, Dixie Mills recovered and Callaway sold his interest in the mill recovering his original investment which had been jeopardized by the shoddy equipment.

Fuller E. Callaway (1870-1928) epitomized the New South. Before the Civil War, his family had been quite prosperous. His father had established an academy near Greenville in neighboring Meriwether County and, in 1860, owned a prosperous estate with twenty slaves. At the end of the war, he invested his cash in land both in Meriwether and Troup Counties plus in 100 bales of stored cotton. By 1870 the family had moved to the land purchased in the Long Cane community in Troup County. With the death of his mother in 1878, Callaway quit school and, at eight years old, began peddling small goods such as thread in the Long Cane community. When he was twelve, he rented some farmland and bought a mule with the $60 he had saved. At fourteen, Callaway moved to LaGrange to work for merchant E. R. Bradfield. In 1888, he established his own mercantile business.

As a merchant, Callaway broke with conventional methods of doing business. He focused on stocking large quantities of one item which he could buy and sell more cheaply than the typical merchant. He also invested in aggressive sales and advertising, an unusual thing for the time. Most remarkably, Callaway ignored the crop lien system and dealt in cash sales only. Around 1890, he established a full scale department store in LaGrange with a wide selection and low prices.

After saving his original investment and divesting himself of Dixie Mills, Callaway returned to managing his mercantile business. However in 1900, J. H. Lane and Company, the northern selling agent for Dixie Mills, instigated the organization of a new mill. Once again, LaGrange merchants and residents responded with enthusiasm. Local investors included C. V. Truitt, a businessman and farm supplier; J. E. Dunson, a banker and merchant, and Fuller E. Callaway. Although Callaway's financial investment was relatively small, J. H. Lane and Company insisted he play an active management role. From the start, Unity Mill produced duck, a type of cloth. About the same time, a group of Hogansville merchants established the Hogansville Manufacturing Company without northern investment. However, Consolidated Duck of Delaware purchased the mill in 1905.

The development of three mills in LaGrange led investors to relocate the old Troup Factory in 1902 to a modern mill facility in LaGrange and renamed it Park Cotton Mills. Fuller Callaway's Elm City Cotton Mills became the fifth textile mill in LaGrange in 1905. Mill leadership in LaGrange clashed, leading Fuller Callaway to form the Calumet Company in 1907 to take over operations at Unity Mill. That same year, economic development in LaGrange received a big boost with the coming of Atlanta, Birmingham, and Coast Railroad. Callaway took the lead in securing this rail line through the City to resolve problems with high freight rates on existing rail lines. Since Reconstruction, complaints that high railroad rates were crippling the South had been common in communities such as LaGrange. The system used for calculating rates actually made it cheaper to ship goods to Hogansville and Opelika, Alabama than to LaGrange. Local merchants like Callaway viewed the system as stifling to

business and industrial development in LaGrange. A second line offered competitive rates and improved access for Troup County.

After the clash with Callaway, Joseph Eugene Dunson established his own enterprise, Dunson Mill, in 1910. Hillside Cotton Mills built by Callaway in 1915 became the seventh textile mill built in LaGrange. In 1922 Stark Mills in Hogansville became the last mill built in Troup County within the historic period. Unlike other Troup County mills which were built through local control (even if northern capital was involved), Lockwood, Greene, and Company of Boston built Stark Mills without local assistance. Through its 1913 purchase of Consolidated Duck, Lockwood, Greene had acquired the Hogansville Manufacturing Company (renamed International Cotton Mills).

Mill engineers, such as Lockwood, Greene, and Company, represent the increased professional specialization of the textile industry after 1880. Sometimes referred to as "mill doctors," the engineers became indispensable in mill building. The original founder, Amos Lockwood, made Stephen Greene a partner in the company in 1882 and for the next 40 years Lockwood, Greene was the most active organization engaged in textile engineering in New England and the South. Mill engineers, such as Lockwood, Greene of Boston; D. A. Tompkins of Charlotte; W. B. Smith Whaley of Columbia; and J. E. Sirrine became involved with every aspect of the textile industry including engineering, management, and capital investment.

This dramatic industrial growth significantly affected the development of Troup County's communities. The population of the county increased by 74% as employment in the mills attracted new residents. By and large, these new residents moved to the cities, particularly LaGrange. In LaGrange and Hogansville, large mill villages provided housing for the operatives associated with each mill. With the construction of Stark Mills in 1922, the dramatic period of textile development in Troup County was complete. Although no new mills were to be built during this era, the existing mills would expand and consolidate. The economy of the county had become firmly based in industry rather than agriculture.

Continued Industrial Prosperity, 1920-1950

The prosperity associated with Troup County's textile mill development continued into the twentieth century. The county grew at a steady pace. During the three decades after 1920, the overall county population increased by 38% reaching almost 50,000 in 1950. With the textile mill developments in LaGrange, West Point, and Hogansville, the population of Troup County's cities exceeded that of the rural areas for the first time in 1920.

The West Point Manufacturing Company prospered and expanded during the early twentieth century under the leadership of George Huguley Lanier. As Lafayette Lanier's son, George Lanier assumed leadership of the company in 1906 with his father's declining health. At the height of the Depression, he initiated large scale expansion of the textile company. In 1933 West Point Manufacturing expanded beyond the Chattahoochee Valley for the first time by acquiring the Dixie Cotton Mill in LaGrange.

The textile mills in LaGrange also expanded and enlarged. In 1923, Dunson Mills enlarged its facility, doubling its capacity and shifting production to include lighter fabrics. The mills associated with Fuller E. Callaway also entered a period of large scale expansion, buying existing mills. Callaway's sons, Cason and Fuller Callaway, Jr, assumed leadership of the mills in 1920 due to their father's declining health and retirement. They sold off the interests unrelated to textile production and concentrated on the mills. In 1932, they restructured and consolidated the mills into the single

corporation known as Callaway Mills, Inc.

World War II brought increased prosperity to the area's textile mills as they sought to meet wartime demands. The West Point Manufacturing Company added new facilities in Alabama and, through a surprising flip-flop in financing, acquired its northern selling agency, Wellington-Sears, in 1945. In doing so, the company also acquired Wellington-Sears subsidiaries which included other textile mills.

In response to wartime needs, the Hogansville Stark Mills constructed the Asbeston Plant in 1942. Originally, the plant manufactured asbestos pipe wrappings for the ship yards and it became the only plant to actually weave material from asbestos.

Callaway Mills established the Callaway Community Foundation in 1943 as a charitable organization. In 1945 the Foundation actually purchased all of Callaway Mills Properties from its stockholders and leased them back to the company to run the mills operations. Since that time, income from rent and dividends has been returned to the community through the Foundation's philanthropy.

Retooling for the Future: 1950 to Present

Troup County's textile industries suffered along with the national industry in the post-World War II decades. In the early 1950s, Pepperell, Inc., a northern textile giant which manufactured sheets, towels, and bath mats bought Dunson Mills in LaGrange. Then in 1965, Pepperell merged with the West Point Manufacturing Company creating West Point-Pepperell. A merger in 1993 made it WestPoint Stevens.

In 1968, Callaway Mills sold its operations to Milliken. With the industry's economic decline, the county's population decreased significantly. The community leaders of LaGrange reacted by actively and successfully seeking new industries for the area. By 1980, the county's population had recovered and the community continues to grow.

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Appendix

M

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Home » Advanced Search » Search Results

Search Results

Item: 1 of 5 | Prev Group | Next Group | Sort by select one: | Search again

Refine Your Search:
[Hillside Cotton Mills (Lagrange, Ga.)] > Hillside Cotton Mills Lagrange Ga

Collection
Troup County Digital Archives Project P... (5)

Media Type
Visual Works (5)
Picture Postcards (4)
Black-and-White Photographs (1)
Photographs (1)
Postcards (1)

City/County/State
Lagrange Ga (5)
Troup County Ga (5)

Subject
Georgia (5)
Hillside Cotton Mills Lagrange Ga (5)
Lagrange (5)
Lagrange Ga (5)
Troup County Ga (5)
Textile Factories (4)
Textile Factories--Georgia--Lagrange (4)
Cotton Manufacture (3)
Cotton Manufacture--Georgia--Lagrange (3)
Industrial Housing (2)
more »

Contributor
Troup County Archives (5)
Troup-Harris-Coweta Regional Library La...

1. **Benjamin Franklin Inn, LaGrange, Ga.** | 1910 | Troup County Digital Archives Project photograph database
2. **Front view, Hillside Cotton Mills, LaGrange, Ga.** | 1910 | Troup County Digital Archives Project photograph database
3. **Hillside and Valway plants** | 1930-1950 | Troup County Digital Archives Project photograph database
4. **Hillside Cotton Mills and village, LaGrange, Ga.** | 1924 | Troup County Digital Archives Project photograph database
5. **Rear view of Hillside Cotton Mills, LaGrange, Ga.** | 1910 | Troup County Digital Archives Project photograph database

Prev Group | Next Group | Search again

Go to ◯ Top ◯ Bottom 1 | Display in groups of: 10 | 25 | 50 | 100

Your search: (su: ("Hillside Cotton Mills (LaGrange, Ga.)")) Subject: "Hillside Cotton Mills Lagrange Ga"

(5)

Bookmark: http://dlg.galileo.usg.edu/query:%28su%3A+%28%22Hillside+Cotton+Mills+%28LaGrange%2C+Ga.%29%22%29%29+Subject%3A+%22Hillside+Cotton+Mills+Lagrange+Ga%22

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Benjamin Franklin Inn, LaGrange, Ga.

Click here to view the item (new window)

Type: Picture postcards | Visual works

Title: Benjamin Franklin Inn, LaGrange, Ga.

Date: 1910

Description: View of Inn

Subjects: Hotels--Georgia--LaGrange | Industrial housing--Georgia--LaGrange | Hillside Cotton Mills (LaGrange, Ga.) | Benjamin Franklin Inn (LaGrange, Ga.) | LaGrange (Ga.) | Troup County (Ga.)

Contributors: Troup County Archives | Troup-Harris-Coweta Regional Library (LaGrange, Ga.)

Online Publisher: [LaGrange, Ga.] : Troup County Archives and Troup-Harris-Coweta Regional Library , 2003

Original Material: 1 postcard : col. ; 3 x 6 in. | Postcard collection. Troup County Archives.

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Benjamin Franklin Inn, La Grange, Ga.

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Front view, Hillside Cotton Mills, LaGrange, Ga.

Click here to view the item (new window)

Type: Picture postcards | Visual works

Title: Front view, Hillside Cotton Mills, LaGrange, Ga.

Date: 1910

Description: View of cotton mill

Subjects: Textile factories--Georgia--LaGrange | Cotton manufacture--Georgia--LaGrange | Hillside Cotton Mills (LaGrange, Ga.) | LaGrange (Ga.) | Troup County (Ga.)

Contributors: Troup County Archives | Troup-Harris-Coweta Regional Library (LaGrange, Ga.)

Online Publisher: [LaGrange, Ga.] : Troup County Archives and Troup-Harris-Coweta Regional Library , 2003

Original Material: 1 postcard : col. ; 3 x 6 in. | Postcard collection. Troup County Archives.

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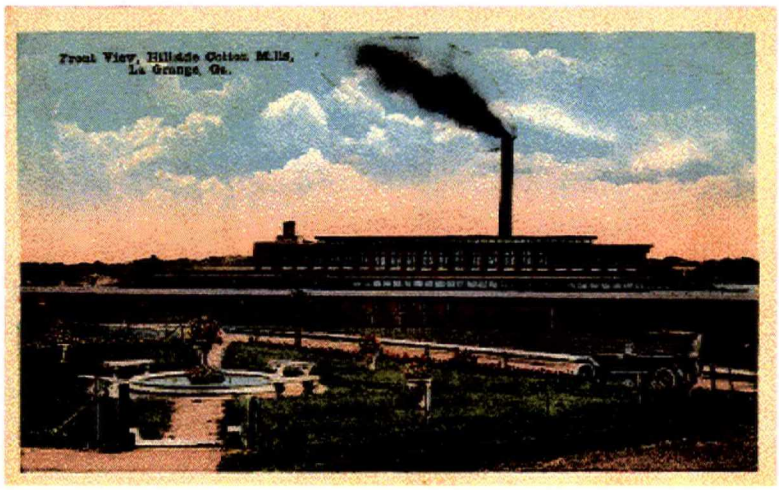
Front View, Hillside Cotton Mills,
La Grange, Ga.

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Hillside and Valway plants

Item: 3 of 5 | Prev Item | Next Item | Search Results

Click here to view the item (new window)

Type: Black-and-white photographs | Visual works

Title: Hillside and Valway plants

Date: 1930-1950

Description: Exterior and aerial views

Subjects: Hillside Cotton Mills (LaGrange, Ga.) | Callaway Mills Company (LaGrange, Ga.) | Textile factories--Georgia--LaGrange | LaGrange (Ga.) | Troup County (Ga.)

Contributors: Troup County Archives | Troup-Harris-Coweta Regional Library (LaGrange, Ga.)

Online Publisher: [LaGrange, Ga.] : Troup County Archives and Troup-Harris-Coweta Regional Library , 2003

Original Material: 1 photograph : b&w ; 8 x 10 in. | Callaway Educational Association records, Troup County Archives.

Rights and Usage: Cite as: [title of photograph], Callaway Educational Association records, Troup County Archives.

Persistent Link to Item: http://168.12.184.11/images/t412111.bmp

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Bookmark: http://dlg.galileo.usg.edu/id:trou_photo_13678

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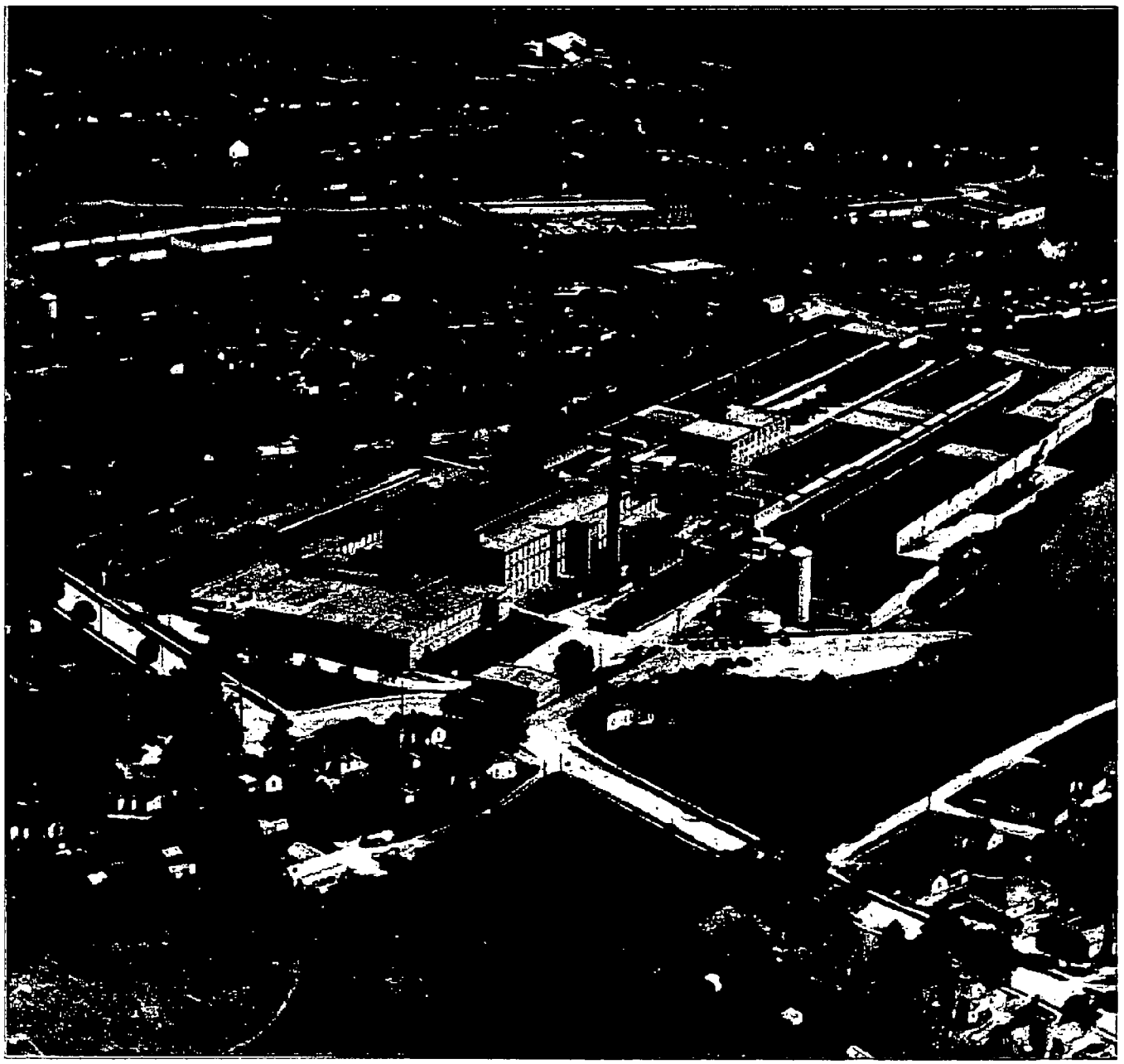

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Hillside Cotton Mills and village, LaGrange, Ga.

Item: 4 of 5 | Prev Item | Next Item | Search Results

Click here to view the item (new window)

Type: Postcards | Picture postcards | Visual works

Title: Hillside Cotton Mills and village, LaGrange, Ga.

Date: 1924

Description: View of cotton mill and surrounding houses

Subjects: Textile factories--Georgia--LaGrange | Cotton manufacture--Georgia--LaGrange | Hillside Cotton Mills (LaGrange, Ga.) | Industrial housing--Georgia--LaGrange | LaGrange (Ga.) | Troup County (Ga.)

Contributors: Troup County Archives | Troup-Harris-Coweta Regional Library (LaGrange, Ga.)

Online Publisher: [LaGrange, Ga.] : Troup County Archives and Troup-Harris-Coweta Regional Library , 2003

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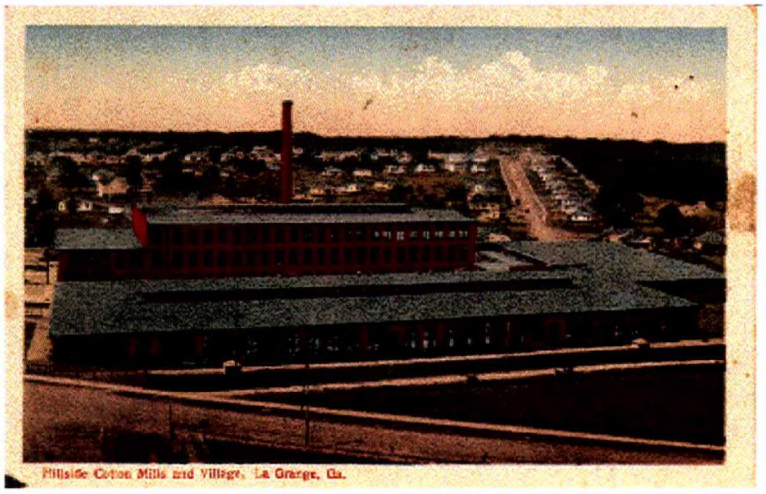
Hillside Cotton Mills and Village, La Grange, Ga.

DIGITAL LIBRARY of GEORGIA
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Rear view of Hillside Cotton Mills, LaGrange, Ga.

Click here to view the item (new window)

Type: Picture postcards | Visual works

Title: Rear view of Hillside Cotton Mills, LaGrange, Ga.

Date: 1910

Description: View of cotton mill

Subjects: Textile factories--Georgia--LaGrange | Cotton manufacture--Georgia--LaGrange | Hillside Cotton Mills (LaGrange, Ga.) | LaGrange (Ga.) | Troup County (Ga.)

Contributors: Troup County Archives | Troup-Harris-Coweta Regional Library (LaGrange, Ga.)

Online Publisher: [LaGrange, Ga.] : Troup County Archives and Troup-Harris-Coweta Regional Library , 2003

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Rear View of Hillside Cotton Mills, La Grange, Ga.

Appendix

N

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The Digital Library of Georgia is a gateway to Georgia's history and culture found in digitized books, manuscripts, photographs, government documents, newspapers, maps, audio, video, and other resources.

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The 1936 Gainesville Tornado: Disaster and Recovery

The thirty-two-and-a-half minute film, probably shot for insurance purposes, focuses on the devastation of the commercial and governmental center of Gainesville wrought by the multi-funnel tornado strike on April 6, 1936 and also includes footage of damage to nearby residential areas.

View the Web site »

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Precision Search

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Results:
264 matches

Citation:
137 of **264**

GALILEO Express Link

Vanishing Georgia: Citation

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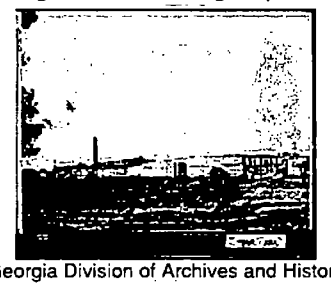
Image: trp176

Larger JPG image. | MrSID image.



Georgia Division of Archives and History

Descriptive Title: Photograph of Hillside Cotton Mills plant, LaGrange, Troup County, Georgia, 1933

Photographer/Studio Davis

Description LaGrange, 1933. Hillside Cotton Mills plant. It was built in ca. 1915.

Type of original Photographs

Subjects LaGrange | Troup County | Cotton textile industry--Georgia--LaGrange | Architecture | Business

Cite as Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Usage note Contact repository re: reproduction and usage.

Held by Georgia Archives, 5800 Jonesboro Road, Morrow, GA 30260

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all= (LaGrange)

Results:
264 matches

Citation:
137 of **264**

Vanishing Georgia: Photograph

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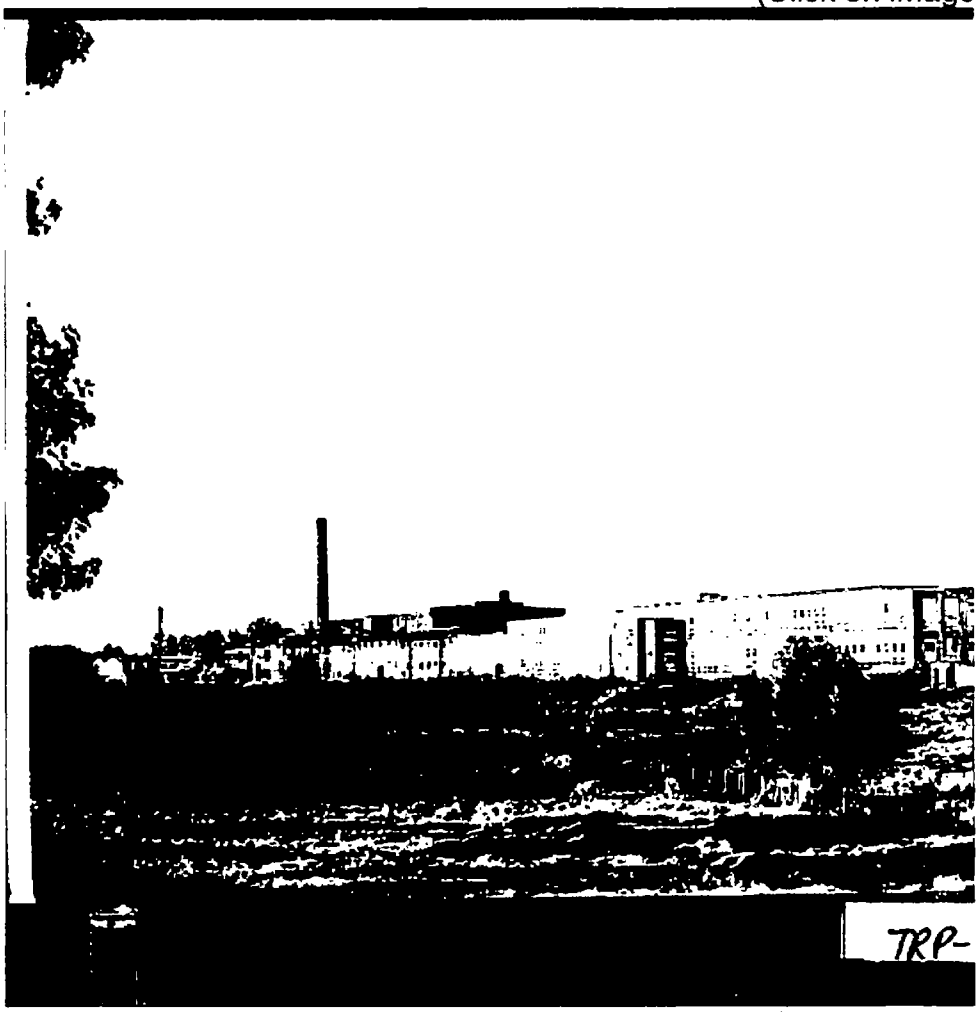

Georgia Division of Archives and History

Home/Basic Search

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Browse Search

Your search:
all= (LaGrange)

Results:
264 matches

Citation:
150 of **264**

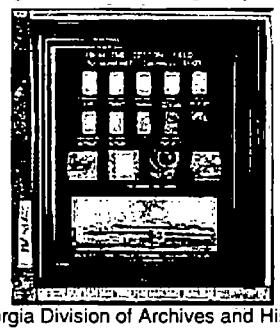
GALILEO Express Link

Vanishing Georgia: Citation

Save Results Prev Record Next Record

Image: trp194

Larger JPG image. | MrSID image.



Georgia Division of Archives and History

Descriptive Title: Photograph of Valway Rug Mills plaque, LaGrange, Troup County, Georgia, ca. 1925

Photographer/Studio Davis, Snelson (LaGrange, Ga.)

Description LaGrange, ca. 1925. Plaque which illustrates the process to take cotton from the fields and produce from it chenille rugs at Valway Rug Mills, a division of Callaway Mills. Valway Rug Mills is seen at the bottom of the plaque.

Type of original Photographs

Subjects LaGrange | Troup County | Cotton textile industry--Georgia--LaGrange | Agriculture | Business

Cite as Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Usage note Contact repository re: reproduction and usage.

Held by Georgia Archives, 5800 Jonesboro Road, Morrow, GA 30260

Home/Basic Search

Precision Search

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Your search:
all= (LaGrange)

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150 of **264**

Vanishing Georgia: Photograph

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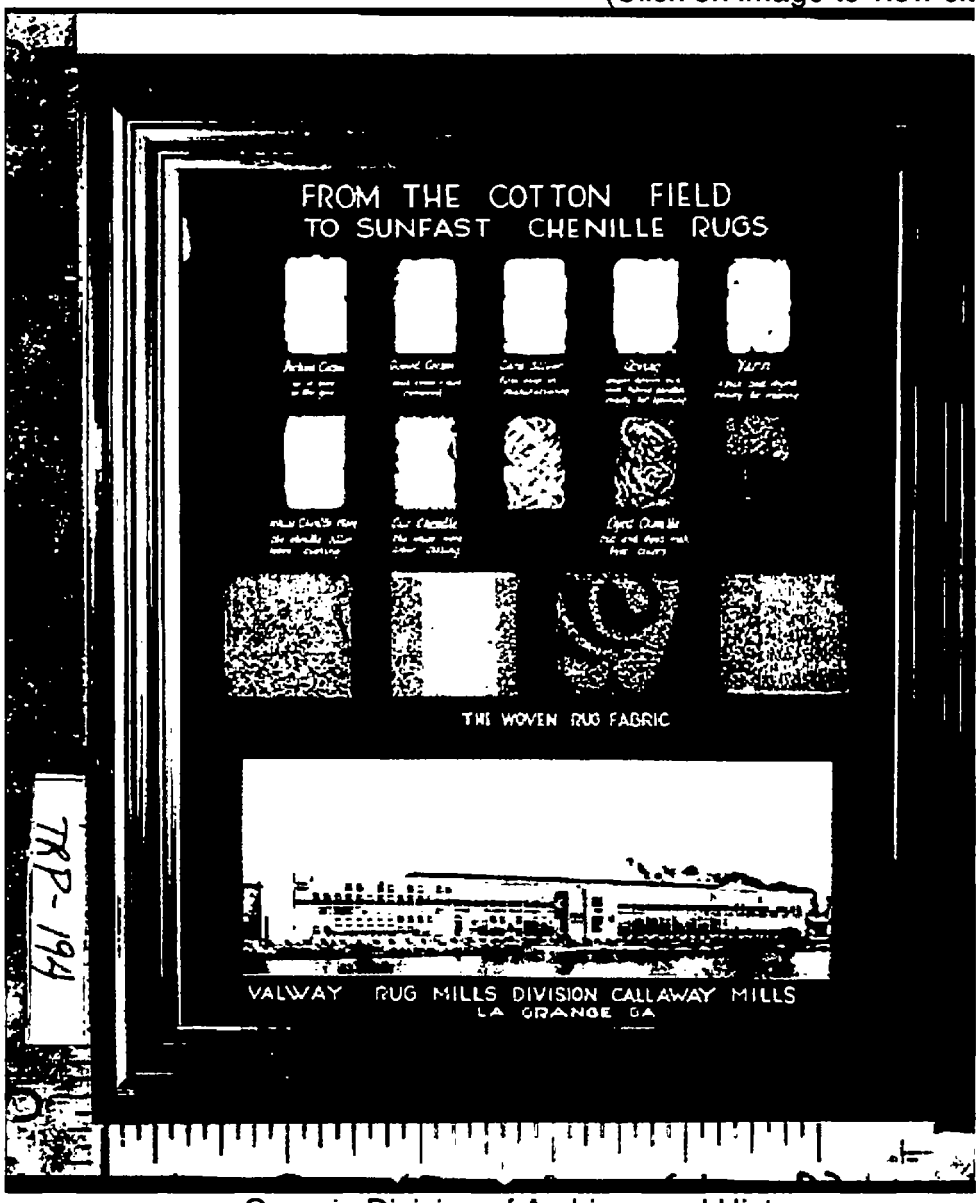

Georgia Division of Archives and History

Home/Basic Search

Precision Search

Browse Search

Your search:
all= (LaGrange)

Results:
264 matches

Citation:
190 of **264**

GALILEO Express Link

Vanishing Georgia: Citation

Save Results Prev Record Next Record

Image: trp242

Larger JPG image. | MrSID image.

Georgia Division of Archives and History

Descriptive Title: Photograph of Valway Rug Mills window display, LaGrange, Troup County, Georgia, ca. 1927-1929

Photographer/Studio Davis

Description LaGrange, ca. later 1920s. Window display of rugs and bath sets manufactured at Valway Rug Mills, a subsidiary of Callaway Mills. The display was probably in conjunction with National Cotton Week.

Type of original Photographs

Subjects LaGrange | Troup County | Cotton textile industry--Georgia--LaGrange | Business | Special events

Cite as Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Usage note Contact repository re: reproduction and usage.

Held by Georgia Archives, 5800 Jonesboro Road, Morrow, GA 30260

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Precision Search

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Your search:
all= (LaGrange)

Results:
264 matches

Citation:
190 of **264**

Vanishing Georgia: Photograph

Save Results Prev Rec

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Georgia Division of Archives and History

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Precision Search

Browse Search

Your search:
all= (LaGrange)

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264 matches

Citation:
191 of **264**

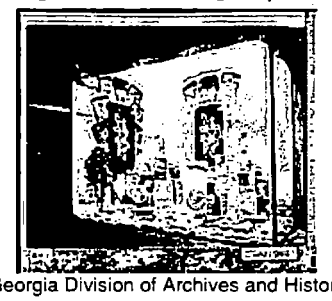
GALILEO Express Link

Vanishing Georgia: Citation

Save Results Prev Record Next Record

Image: trp244

Larger JPG image. | MrSID image.



Georgia Division of Archives and History

Descriptive Title: Photograph of Valway Rug Mills window display, LaGrange, Troup County, Georgia, ca. 1925

Photographer/Studio Davis

Description LaGrange, ca. 1925. Window display of rugs, bath sets, and yarns manufactured at Valway Rug Mills, a subsidiary of Callaway Mills. The display was in conjunction with National Cotton Week.

Type of original Photographs

Subjects LaGrange | Troup County | Cotton textile industry--Georgia--LaGrange | Business | Special events

Cite as Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Usage note Contact repository re: reproduction and usage.

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Home/Basic Search

Precision Search

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Results:
264 matches

Citation:
201 of **264**

GALILEO Express Link

Vanishing Georgia: Citation

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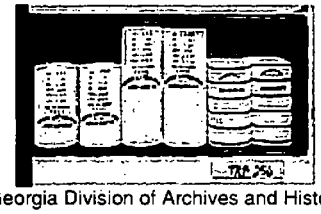
Image: trp256

Larger JPG image. | MrSID image.



Georgia Division of Archives and History

Descriptive Title: Photograph of wrapped bales of cotton from Hillside Cotton Mills, LaGrange, Troup County, Georgia, ca. 1927

Photographer/Studio Davis, Snelson

Description LaGrange, ca. 1927. Wrapped bales of cotton from Hillside Cotton Mills.

Type of original Photographs

Subjects LaGrange | Troup County | Cotton baling--Georgia--LaGrange | Business

Cite as Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Usage note Contact repository re: reproduction and usage.

Held by Georgia Archives, 5800 Jonesboro Road, Morrow, GA 30260

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201 of **264**

Vanishing Georgia: Photograph

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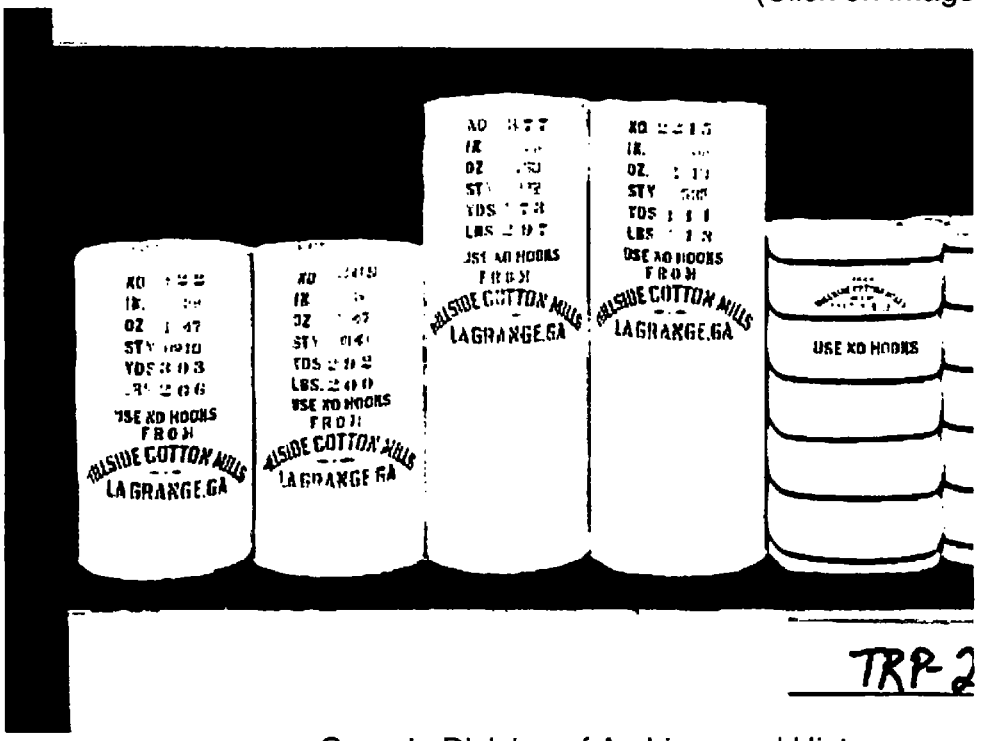

Georgia Division of Archives and History

Appendix

O

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
404/656-2833

November 1, 2007

RECORD OF PHONE COMMUNICATION

CALL BY:	Andrew S. Taft Environmental Specialist Georgia Environmental Protection Division Hazardous Waste Management Branch (404) 656-2833
INDIVIDUAL CONTACTED:	Joe Talley Former Employee Milliken & Company – Hillside Plant (706) 663-2823
DATE OF CALL:	November 1, 2007
SUBJECT:	Hillside Plant Operations

SUMMARY OF PHONE COMMUNICATION

Mr. Talley began work at the Hillside Plant (Valway Operations) back in 1990 and has since retired. Sometime in the early 1990s, Mr. Talley recalled that all floor drains and manholes were cemented shut to prevent unauthorized discharges to the sewer system.

Although unauthenticated, Mr. Talley recalled hearing the following stories from former employees that have likely past on by this time:

- Rusted drums and other debris were discovered at the bottom of the on-site pond when the pond was temporarily drained; and
- Fish that had been caught from the on-site pond were reported to have had a bad taste reminiscent of smells generated from on-site manufacturing processes.

Appendix

P

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
404/656-2833

November 1, 2007

RECORD OF PHONE COMMUNICATION

CALL BY:	Andrew S. Taft Environmental Specialist Georgia Environmental Protection Division Hazardous Waste Management Branch (404) 656-2833
INDIVIDUAL CONTACTED:	Alice Cavender Current and Past Resident City of LaGrange, Georgia (706) 882-3205
DATE OF CALL:	November 1, 2007
SUBJECT:	Historic Releases to Creek from the Hillside Mill

SUMMARY OF PHONE COMMUNICATION

In and around 1956 and 1957, Ms. Cavender recalled that the normally clear running stream that exited the Hillside Mill under Fourth Avenue frequently became murky and exhibited a terrible smell. Ms. Cavender described the odor as a strong chemical-like smell that would not normally be associated with sewage. Ms. Cavender further described the murkiness as cloudy, but not muddy.

Appendix

Q

MILLIKEN

July 28, 2007

Mr. Andrew Taft
Floyd Tower East, Suite 1154
2 Martin Luther King Drive, SE
Atlanta GA 30334

Re: Milliken & Company Hillside Plant
Response to Request for Follow-up Information
Non-hazardous Discharge From Stormwater Outfall (April 18, 2002)

Dear Mr. Taft:

I have enclosed relevant information from our files relating to the above-captioned event, as you requested during your recent visit.

If you need any further information regarding this matter please let me know. My telephone number is 706-880-3653.

Very truly yours,

Mark Thomas Moe
Senior Environmental Chemist
Valway/Hillside Coating
Milliken and Company

Enclosures:

Reports re incident and corrective actions taken (as submitted to Georgia EPD)

Correspondence with EPD regarding the compliance order

Milliken & Company
Valway & Hillside Coating Plant
1300 Fourth Ave LaGrange GA 30240

MILLIKEN

April 19, 2002

Mr. Mike Creason
Industrial Wastewater Unit
Georgia Environmental Protection Division
4220 International Parkway. Suite 101
Atlanta, GA 30354

Re: Incident Report
Milliken & Company – Valway Plant
LaGrange (Troup County)

Dear Mr. Creason:

This letter is intended as a follow-up to our telephone conversation this morning.

The Valway Plant of Milliken & Company is a textile manufacturing and finishing facility located alongside a small, unnamed tributary of Blue John Creek. The Valway Plant has no on-site wastewater treatment or pre-treatment facilities, and sends its wastewater to a sister facility (Hillside Plant), from which the wastewater is sent, together with Hillside Plant wastewater, to the City of LaGrange POTW.

Discoloration in the tributary adjacent to the Valway Plant was discovered mid-morning April 18 and investigated immediately. By 11:30 a.m., the source of the discoloration was traced to a 24-inch stormwater outfall from the Valway Plant. A small stream of a non-hazardous textile finishing chemical (an acrylic emulsion containing carbon black) was being discharged from the outfall at a rate of about 2-3 gpm; 80% of flow being normal ground water). Based upon tributary flow rates, the discharge was likely on-going for two hours or less before it was discovered. It was then immediately stopped.

The root cause of the discharge is still being investigated. Initial research points to a broken drain pipe under the plant floor. Efforts are underway to identify the location and extent of damaged pipe.

Valway Plant concurrently deployed four separate teams to address the situation. Immediately, all involved process equipment was shut down, all flow into the tributary was stopped, and steps were taken to contain tributary water at several locations downstream of Valway Plant. The extent of discoloration in the tributary was limited to approximately a one mile segment. Water recovered from the tributary was pumped (with authorization) to the City of LaGrange POTW with

no treatment problems. These actions resulting in no discernable discoloration reaching Blue John Creek (the receiving stream for the tributary).

At this time, the tributary has substantially returned to normal color and clarity, and Blue John Creek remains unaffected. Please let me know if further information is desired.

Very truly yours,

David Howard

Milliken & Company
Valway Plant
1300 Fourth Ave
LaGrange GA 30240
(706) 880-5661

September 3, 2002

Mr. Mike Creason
Industrial Wastewater Unit
Georgia Environmental Protection Division
4220 International Parkway, Suite 101
Atlanta GA 30354
Fax: (404) 362-2691

Re: Supplement to April 19, 2002 Incident Report
Milliken & Company – Valway Plant

Dear Mr. Creason:

This letter is a supplement to the Incident Report we submitted to you on April 19, 2002.

All Valway Plant industrial and sanitary wastewater is discharged to the City of LaGrange POTW. Mid-morning on April 18, a discoloration of the unnamed tributary adjacent to the Valway Plant was discovered and immediately investigated. Our first and foremost concern was the impact on the community and the environment. The plant shut down all potentially involved process equipment, then contained, recovered, and diverted to the sanitary sewer system (with appropriate notice to and permission of the POTW) over two million gallons of water from the tributary in a successful effort to prevent any downstream contamination of this unnamed tributary or of Blue John Creek. As a result of these efforts, no discoloration or other impact of any kind occurred in Blue John Creek.

The cause was determined to be the failure of a plug in an underground overflow line, allowing seepage into the unnamed tributary of wastewater containing very small quantities of a non-hazardous textile finishing chemical. Because the line was underground, the plant had no indications of plug failure prior to the incident.

The underground pipe has been abandoned and filled with concrete. The plant has upgraded its industrial wastewater system by rerouting wastewater into newly installed, highly capable overhead lines that will allow for easy leak detection, localization, containment, and repair. As a result of these preventive actions, no repeat incidents of this kind have occurred or are expected.

Please call Keith Lawrence (706) 880-5520 or myself if further information would be helpful. Thank you for your attention to this matter.

Sincerely,

Katrina Baker

Katrina Baker
Plant Manager
706-880-5413

MILLIKEN

Milliken & Company
Valway Plant
1300 Fourth Ave
LaGrange GA 30240

October 7, 2002

Mr. Jeffrey H. Larson
Georgia Department of Natural Resources
Environmental Protection Division
4420 International Parkway, Suite 101
Atlanta, GA 30354

Re: Expedited Enforcement Compliance Order Dated September 10, 2002

Dear Mr. Larson:

Attached is the Expedited Enforcement Compliance Order and Settlement Agreement issued to the Valway Plant on September 10, 2002, and executed on behalf of Milliken & Company's Valway Plant by Katrina Baker, the Plant Manager. Also included is Milliken & Company Check No. 235514 for $1200.00, made payable to Georgia Department of Natural Resources.

If you have any further questions, please contact me at (706) 880-5661.

Sincerely,

Keith Lawrence

Keith Lawrence
Environmental Engineer

Attachments (2)
Expedited Enforcement Compliance Order, signed 10/1/2002
Check 235514 for $1200.00

THIS DOCUMENT IS PRINTED IN TWO COLORS. DO NOT ACCEPT UNLESS BLUE AND GREEN ARE PRESENT

MILLIKEN

MILLIKEN

PHONE (864) 503-1661
P.O. BOX 1838 SPARTANBURG, S.C. 29304-1838

CRAFTED WITH PRIDE

CHECK NO. 235514

299

62-20
311

Citibank Delaware
A subsidiary of Citicorp
One Penn's Way
New Castle, DE 19720

DATE		AMOUNT
100302	EXACTLY *****1200 DOLLARS 00 CENTS	$1200.00

PAY TO THE ORDER OF

GEORGIA DEPT OF NATURAL RESOURCES
EPD TITLE 111 HAZARDOUS
PO BOX 101231
ATLANTA GA 30392

Milliken & Company
Paying Agent

John A. Eaves

⑈235514⑈ ⑆031100209⑆ 3869181 2⑈

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
PERMITTING, COMPLIANCE, AND ENFORCEMENT PROGRAM
4220 INTERNATIONAL PARKWAY, SUITE 101
ATLANTA, GEORGIA 30354

EXPEDITED ENFORCEMENT COMPLIANCE ORDER AND SETTLEMENT AGREEMENT

PART I: COMPLIANCE ORDER

Permit Nos.: _____

Name of Owner, Operator, or Responsible

Official: Katrina Baker, Plant Manager

Milliken & Company - Valway Plant

1300 Fourth Avenue

LaGrange, Georgia 30240

The Environmental Protection Division (EPD) is aware of the fact that Milliken & Company - Valway has reported an unpermitted discharge of wastewater containing a non-hazardous textile finishing chemical (an acrylic emulsion containing carbon black) from its facility at 1300 Fourth Avenue on April 18, 2002. This unpermitted discharge is a violation of Chapter 391-3-6. of the Georgia Rules and Regulations for Water Quality Control, and Title 12, Chapter 5 of The Official Code of Georgia Annotated (Code). The following violations noted, in accordance to sections 12-5-20. through 12-5-53 of the Code and its corresponding settlement amount, are listed below:

391-3-6-.06 [12-5- 52(a)]. Settlement, $ 1200.00

Nature of Violation: One unpermitted discharge of approximately 60 gallons of wastewater containing a non-hazardous textile finishing chemical (an acrylic emulsion containing carbon black) to an unnamed tributary of Blue John Creek on April 18, 2002.

TOTAL SETTLEMENT AMOUNT $1200.00

Milliken & Company - Valway is hereby ordered to pay the settlement amount.

This Compliance Order is issued solely with reference to the Settlement Agreement in Part II of this form. If the Settlement Agreement in Part II is not returned in correct form by Milliken & Company - Valway within 30 days of receipt, this Compliance Order can be withdrawn without prejudice to EPD's ability to file additional enforcement actions for the above violations or any other violation.

PART II: SETTLEMENT AGREEMENT

The Georgia Environmental Protection Division (EPD) offers this Settlement Agreement as an expedited enforcement procedure in order to settle the violation listed in the Compliance Order in Part I of this form subject to the following terms and conditions:

Milliken & Company - Valway, by signing below, certifies under penalty of law that: a) the information submitted in this and all attached documents have been personally examined and that Milliken & Company - Valway is familiar with the information; b) the CITED VIOLATIONS WILL BE CORRECTED immediately; and c) the Milliken & Company - Valway will remit payment of the settlement amount in the form of a check made payable to the Department of Natural Resources for $1200.00 is enclosed.

Upon EPD's final approval of this Settlement Agreement, EPD will take no further action against Milliken & Company - Valway for the specific violations described in this Compliance Order. EPD does not waive any enforcement action by EPD, the State, or any local agencies for any past, present or future violations of the Water Quality Control Rules.

This Settlement Agreement is binding on EPD and Milliken & Company - Valway once it is signed below. This Settlement Agreement is not negotiable and is effective upon EPD's final approval below. Upon final approval, EPD shall mail a copy of the approved Settlement Agreement to Milliken & Company - Valway.

Final approval of the Settlement Agreement is in the sole discretion of the Director of EPD, or authorized delegate.

BY (print name): KATRINA BAKER

TITLE: LOCATION MANAGER

SIGNATURE: Katrina Baker

DATE: 10/1/02

FINAL ORDER BY EPD this _____ day of _____ 2002.

_____
Harold F. Reheis, Director

COMPLIANCE ORDER NO:

Georgia Department of Natural Resources
Environmental Protection Division, Water Protection Branch
4220 International Parkway, Suite 101, Atlanta, Georgia 30354
Permitting, Compliance and Enforcement Program
404/362-2680
FAX: 404/362-2691

September 10, 2002

Ms. Katrina Baker
Plant Manager
Milliken & Company - Valway Plant
1300 Fourth Avenue
LaGrange, Georgia 30240

RE: Expedited Enforcement Compliance Order

Dear Ms. Baker:

Increasing growth and development in the State of Georgia are creating greater demands on existing wastewater treatment and conveyance systems. This can result in water quality impacts due to increased instances of sewer overflows and violations of effluent limitations from permitted wastewater treatment facilities. The zero tolerance strategy is designed to place proper emphasis on these issues and to ensure that owners of wastewater systems take the necessary actions to ensure that system failures are adequately addressed.

The Environmental Protection Division (EPD) has adopted this zero tolerance policy in certain identified areas (i.e. the Chattahoochee River Basin from its headwaters through Troup County, the Coosa River Basin, the Tallapoosa River Basin and the greater metropolitan Atlanta area) that are in violation of the Georgia Water Quality Control Act.

A review of the Environmental Protection Division (EPD) files indicates that Milliken & Company - Valway Plant experienced an unpermitted discharge of wastewater. This letter is being written to document the fact that this unpermitted discharge violated the Georgia Rules and Regulations for Water Quality Control and the Official Code of Georgia Annotated. Your facility is being cited for the following violation:

- An unpermitted discharge of approximately 60 gallons of wastewater containing a non-hazardous textile finishing chemical (an acrylic emulsion containing carbon black) to an unnamed tributary of Blue John Creek.

EPD is offering to resolve and settle this matter through the enclosed Expedited Enforcement Compliance Order and Settlement Agreement (Agreement). If you agree to the terms of the Order, please remit payment of the $1200.00 settlement amount in the form of a check made payable to the Georgia Department of Natural Resources, along with the signed Agreement within thirty (30) days of the date of this letter.

If you choose not to accept the terms of this Agreement, EPD may choose to address this matter through other formal enforcement methods.

EPD considers this settlement to be a reasonable resolution to this issue. We urge your prompt attentions to this matter.

Sincerely,

Jeffrey H. Larson, Manager
Permitting, Compliance and Enforcement Program

JHL/shg

Enclosure

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Dr. S.E., Suite 1152 East Floyd Tower, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
David Word, Assistant Director
Environmental Protection Division
404/656-4713

November 6, 2002

Ms. Katrina Baker
Plant Manager
Milliken & Company - Valway Plant
1300 Fourth Avenue
LaGrange, Georgia 30240

RE: Expedited Enforcement Compliance Order
No. EPD-PCEP-02-369

Dear Ms. Baker:

We have received the signed Expedited Enforcement Compliance Order (EECO) and a check in the amount of $1,200.00 from Milliken & Company - Valway Plant. Enclosed is a copy of the executed EECO. The Company will be expected to comply with all conditions of the EECO.

Your cooperation in this matter is appreciated.

Sincerely,

Harold F. Reheis
Director

HFR/shg

Enclosure

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
PERMITTING, COMPLIANCE, AND ENFORCEMENT PROGRAM
4220 INTERNATIONAL PARKWAY, SUITE 101
ATLANTA, GEORGIA 30354

EXPEDITED ENFORCEMENT COMPLIANCE ORDER AND SETTLEMENT AGREEMENT

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Permit Nos.: _____

Name of Owner, Operator, or Responsible

Official: Katrina Baker, Plant Manager

Milliken & Company - Valway Plant

1300 Fourth Avenue

LaGrange, Georgia 30240

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391-3-6-.06 [12-5- 52(a)], Settlement, $ 1200.00

Nature of Violation: One unpermitted discharge of approximately 60 gallons of wastewater containing a non-hazardous textile finishing chemical (an acrylic emulsion containing carbon black) to an unnamed tributary of Blue John Creek on April 18, 2002.

TOTAL SETTLEMENT AMOUNT $1200.00

Milliken & Company - Valway is hereby ordered to pay the settlement amount.

This Compliance Order is issued solely with reference to the Settlement Agreement in Part II of this form. If the Settlement Agreement in Part II is not returned in correct form by Milliken & Company - Valway within 30 days of receipt, this Compliance Order can be withdrawn without prejudice to EPD's ability to file additional enforcement actions for the above violations or any other violation.

PART II: SETTLEMENT AGREEMENT

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Milliken & Company - Valway, by signing below, certifies under penalty of law that: a) the information submitted in this and all attached documents have been personally examined and that Milliken & Company - Valway is familiar with the information; b) the CITED VIOLATIONS WILL BE CORRECTED immediately; and c) the Milliken & Company - Valway will remit payment of the settlement amount in the form of a check made payable to the Department of Natural Resources for $1200.00 is enclosed.

Upon EPD's final approval of this Settlement Agreement, EPD will take no further action against Milliken & Company - Valway for the specific violations described in this Compliance Order. EPD does not waive any enforcement action by EPD, the State, or any local agencies for any past, present or future violations of the Water Quality Control Rules.

This Settlement Agreement is binding on EPD and Milliken & Company - Valway once it is signed below. This Settlement Agreement is not negotiable and is effective upon EPD's final approval below. Upon final approval, EPD shall mail a copy of the approved Settlement Agreement to Milliken & Company - Valway.

Final approval of the Settlement Agreement is in the sole discretion of the Director of EPD, or authorized delegate.

BY (print name): KATRINA BAKER

TITLE: LOCATION MANAGER

SIGNATURE: Katrina Baker

DATE: 10/1/02

FINAL ORDER BY EPD this 4th day of Nov. 2002.

Harold F. Reheis

Harold F. Reheis, Director

COMPLIANCE ORDER NO: EPD-PCEP-02-369

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Dr. S.E., Suite 1152 East Floyd Tower, Atlanta, Georgia 30334
Lonnie C. Barrett, Commissioner
Harold F. Reheis, Director
David Word, Assistant Director
Environmental Protection Division
404/656-4713

June 14, 2002

MEMORANDUM:

TO: Board of Natural Resources

FROM: Harold F. Reheis, Director
Environmental Protection Division

RE: Use of a Comprehensive Consent Order to Address Sanitary Sewer Overflows (SSOs) in the Zero Tolerance Area

The Environmental Protection Division (EPD) is proposing to modify its zero tolerance strategy that was implemented in 1998 in response to a resolution adopted by the Board on January 28, 1998. The resolution addressed the need for increased EPD enforcement to address water quality issues in Georgia. A copy of the Board's resolution and EPD's zero tolerance strategy are enclosed as Attachment Nos. 1 and 2. Background on the issue and the proposed modification to the strategy are described below. Questions or comments by Board Members are welcomed.

The Zero Tolerance Strategy

Increasing growth and development in the State of Georgia are creating greater demands on existing wastewater treatment and conveyance systems. This can result in water quality impacts due to increased instances of sanitary sewer overflows (SSOs) and violations of effluent limitations from permitted wastewater treatment facilities. Systems in those areas may be reaching capacity, in poor condition and in need of upgrades. The zero tolerance strategy is designed to place proper emphasis on these issues and to ensure that owners of wastewater systems take the necessary actions to ensure that system failures are adequately addressed. To that end, the strategy sets up a rigorous enforcement response to documented SSOs and permit limit violations. Since the inception of the strategy, EPD has committed to addressing all SSOs and permit limit violations in a prescribed area through enforcement actions that include penalties. The areas effected by the strategy are 1) the Chattahoochee River Basin (from the headwaters of the river through Troup County); 2) the Coosa River Basin (northwest Georgia-north of the metro Atlanta area); 3) the Tallapoosa River Basin (southwest of the metro Atlanta area) and 4) the metropolitan Atlanta area consisting of the counties of Carroll, Cherokee, Cobb, Clayton, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Rockdale, Spalding, and the City of Atlanta. In the year 2001, EPD took approximately 85 enforcement actions against municipal systems in the zero tolerance area.

Background on Proposed Modification

The membership of the Georgia Water and Pollution Control Association (GW&PCA) has proposed to EPD an alternate approach for addressing SSOs in the zero tolerance area. In general, the draft order (attachment #3) will commit those system owners that qualify for coverage under the order to implement and sustain a high level sanitary sewer system operation and maintenance program. The system owner will be required to maintain funding of this program in areas as set forth in the Environmental Protection Agency's Comprehensive Capacity, Management, Operations and Maintenance (CMOM) program guidance. The CMOM program requires aggressive funding, planning and implementation of improvements/upgrades in specific areas of collection system operation that are designed to significantly reduce SSOs and failures of sanitary sewer systems. It is a long-term comprehensive program that must be adequately funded on an annual basis and must contain specific Capital Improvement Plans for system improvements. A description of the provisions of the draft Order is provided below along with a list of conditions that must be met before EPD would consider covering the owner of a sanitary sewer system under this Order.

Provisions of the draft CMOM Consent Order

I. It requires that a system owner develop a (CMOM) program for its sanitary sewer system based on EPA's CMOM guidance.

II. Each CMOM program should be an extensive plan for sewer system operation and maintenance which ensures that annual operating budgets are sufficient in critical key areas and that an overall goal is in place for prioritizing the reduction of SSOs. The CMOM program should also include short and long term Capital Improvement Plan provisions with specific compliance schedules and milestone dates;

III. The system owner should provide EPD with specific progress reports by which EPD can measure compliance with order conditions;

IV. With the understanding that the CMOM program will entail a significant outlay of capital expenditures in its implementation and administration, GW&PCA has requested that a stipulated penalty provision be implemented through the draft Order that provides tiered stipulated penalties to address SSOs. Stipulated penalties for SSO's are shown below. In general, the proposed stipulated penalties are lower than what EPD would collect through traditional consent orders. Spills over 200,000 gallons may be subject to separate enforcement actions if EPD so determines that the stipulated penalty is not sufficient. However, there is a clause in the Order that states that EPD can at anytime take a separate enforcement action for any size overflow should it be determined to

cause significant environmental damage (e.g., a fish kill).

0 - 30,000 gallons - no penalty
30,001 – 100,000 gallons - $2,200/overflow
100,001 – 150,000 gallons - $4,400/overflow
150,001 – 200,000 gallons - $6,600/overflow

Selection Criteria for Coverage Under the CMOM Consent Order

It is not recommended that the draft Order apply to all owners of sanitary sewer systems in the zero tolerance area. Instead an owner must qualify for consideration to be covered under the Order. The following are recommended qualifications that an owner must satisfy to be considered a candidate for this draft Order:

A. The sanitary sewer system must be located in the zero tolerance area; and

B. The system owner must agree to implement specific Capital Improvement Plans, with schedules, for system rehabilitation in key priority areas; and

C. The system owner agrees to implement and fund CMOM components at specific levels (26% of the sanitary sewer system annual operating budget); separate from long term capital cost outlays; and

D. The existing organizational structure is adequate to implement and sustain a CMOM effort (i.e., adequate management overview, staffing quantity and quality to ensure success); and

E. The system owner agrees to provide regular comprehensive status reports to EPD on implementation and administration of the CMOM program. Part of the reporting must include a methodology for evaluating CMOM success in reducing the occurrence of SSOs system-wide; and

F. The system owner must have demonstrated a high level of success in administering its existing sewer system program in the following areas prior to EPD consideration for coverage under a CMOM order:

1) All of the system's lift stations must be achieving a high level of operational efficiency, and

2) A complete and accurate map of the sanitary sewer system must be available and be updated in a timely manner as new lines are added or existing lines are replaced or repaired; and

3) Documentation that the entire sanitary sewer system (lines 12 inches in diameter and above) has been inspected through a walk through survey. Based on the inspection, a documented program should also be in place containing specific short and long term corrective actions necessary to ensure that identified problem areas are addressed; and

4) Documentation that an inflow/infiltration (I/I) reduction program has been initiated for the sanitary sewer system; and

5) The owner must have demonstrated consistent (100%) compliance with all spill reporting, publication/notification and sampling requirements as specified in EPD's Rules and Regulations for Water Quality Control (Endangerment to State Waters).

The system owner will be required to submit a report which certifies and documents that items F.1-5 above have been met.

Because the criteria for coverage under the draft Order are so stringent (i.e. the system must devote a lot of money to it and have a good record with EPD), at this time very few systems would qualify for coverage. Based on a preliminary file review of system owners, only 4 systems out of the approximately 109 systems in the zero tolerance area would qualify for coverage. These systems are Gwinnett County Utilities, Clayton County Water Authority, Douglasville – Douglas County Water and Sewer Authority, and the City of Rome.

Benefits of the CMOM Consent Order

- **To State Waters:** Implementation of a CMOM program should result in better sewer systems that operate with reduced SSOs thus affording enhanced protection of state waters. Penalties that EPD assesses currently in the zero tolerance area are not comparable to the significant cost of administering a CMOM program and a greater good is derived for the environment by ensuring that a CMOM program is in place versus collecting zero tolerance penalties.

- **To EPD:** By executing orders that provide CMOM provisions with automatic stipulated penalties, EPD will be reducing its administrative efforts on individual follow up actions for reported spills. This more aggressive approach to wastewater system management will also address issues concerning impaired water quality and be instrumental in addressing EPD's long term goals for water protection.

- **To the System Owners:** The system owner will benefit from the reduced penalty provided in the CMOM order when compared to traditional order amounts with the idea that this money is better used in CMOM implementation. System owners will not have to pay penalties for spills up to 30,000 gallons and the penalties they do pay will be reduced from traditional monetary settlement amounts. The majority of spills that occur in the metro area are under 30,000 gallons. The overall CMOM order will provide an incentive to system owners to continue with high level efforts that will result in Georgia's realization of more advanced and better operated systems.

As discussed above, very few systems qualify for the CMOM Order, so the original zero tolerance strategy will still be utilized in most cases. However, EPD believes that the CMOM Order presents a reasonable alternative enforcement action for those systems that do qualify. In addition, this option has been requested by responsible utility managers through GWPCA. Therefore, unless the Board objects to this amended zero tolerance strategy, EPD will begin to implement it immediately.

HFR/abs

January 20, 1998

Honorable Zell Miller
Governor
State Capitol
Atlanta, Georgia 30334

Dear Governor Miller:

This letter is to transmit to you a copy of a Resolution which was approved by the Board of Natural Resources at the January Board Meeting.

We commit to you and to the people of Georgia a strong commitment to protect Georgia's water, air and land resources. We very much appreciate and respect the strong leadership you have provided during your term as Governor.

Sincerely yours,

Joe Beverly, Chairman
Board of Natural Resources

JEB/dak

Enclosure

c: Lonice Barrett
Harold Reheis

404/656-
FAX: 404/656-

January 28, 1998

RESOLUTION

Whereas, the Georgia Board of Natural Resources is charged with the responsibility to preserve and protect Georgia's natural and environmental resources, and has statutory authority to appoint the Director of the Environmental Protection Division, adopt rules and regulations and approve legislative concepts for needed legislation designed to protect Georgia's environmental resources; and

Whereas, Georgia is richly blessed with natural resources that must be protected, conserved, allocated and managed wisely if Georgia is to maintain the outstanding quality of life desired by present and future citizens; and

Whereas, the metropolitan areas of Georgia are dependent upon the highest quality of water and the Atlanta region contains almost half of Georgia's population and is the hub of much of Georgia's activity that can affect the health and vitality of the state; and

Whereas, population increases, urban sprawl and concerns about essential needs such as drinking water, clean air, erosion and sedimentation, and waste disposal have grown to serious levels of concern; and

Whereas, Governor Zell Miller has demonstrated strong support of Georgia's needs to improve and expand its efforts to protect and manage the State's environmental resources by recommending additional, critically needed professional positions to address important environmental issues facing the State of Georgia, and in particular, the metropolitan areas of our state; and

Whereas, the Georgia Board of Natural Resources supports the demonstrated determination of Governor Miller to provide leadership to address these concerns and bring about the greatest possible environmental improvements in Georgia's metropolitan areas, including the Atlanta area; and

Whereas, the Board of Natural Resources wishes to have significant impact on promoting such environmental protection improvements that will be beneficial to the overall state.

NOW, THEREFORE, BE IT RESOLVED by the Georgia Board of Natural Resources that:

1. This Board resolves to identify and secure the necessary resources to address the environmental regulatory responsibilities assigned to the Environmental Protection Division of DNR in order that highest priority may be placed on correcting environmental problems throughout Georgia, and in particular, those in the metro-Atlanta region.

2. The Chattahoochee River, because of its impact not only on the metro area of Atlanta but the rest of the state, is specifically targeted as being an area of special concern to the Board and in need of special attention and focus by staff of this agency.

3. This Board insists that regulatory initiatives be put in place to ensure that polluters whether public or private are identified and that appropriate penalties are levied in order to correct problems; and

4. The staff of the Environmental Protection Division is hereby directed to provide the best quality of effort possible in enforcing Georgia's environmental laws. This Board commits to support and encourage such efforts.

Adopted this 28 day of January, 1998.

Joe Beverly, Chairman

Attest:

Secretary

JEB/dsk

cc: Lonice Barrett
Harold Reheis

ATTACHMENT A

PERMITTING, COMPLIANCE AND ENFORCEMENT PROGRAM (PCEP) ENFORCEMENT MANAGEMENT STRATEGY FOR THE SENSITIVE/HIGH GROWTH AREAS IN THE CHATTAHOOCHEE RIVER BASIN, COOSA RIVER BASIN AND METRO ATLANTA AREA

In order to respond to impacts to water quality that result from 1) increasing growth and development [i.e., extensions of new sewer lines thus increasing the potential for sanitary sewer overflows (SSOs)]; 2) SSOs associated with old sewer lines and lift stations; and 3) SSOs due to excessive I/I in specific collection systems, a new enforcement management strategy has been developed by the PCEP. Also, due to the high public profile that POTW discharges are having in the Chattahoochee River Basin (from the headwaters through Troup County), the Coosa River Basin, as well as the metropolitan Atlanta areas (the counties of Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Rockdale, Spalding and the City of Atlanta), it is necessary to develop this strategy to assign priority response to water quality violations, unpermitted discharges, and permit limit violations that occur in these sensitive areas.

The following are the major headers with associated procedures that provide enhanced monitoring and enforcement in the sensitive areas:

PERMIT/ORDER VIOLATIONS (NPDES, LAS, PRETREATMENT, CSO's)

PCEP will implement a zero tolerance strategy for permit violations in these sensitive areas, with the exception of flow, because flows are being removed from permits as they are being reissued. Compliance will be closely tracked in the sensitive areas. Expedited Enforcement Consent Orders (EECOs) (Attachment # 1) will be used to address most permit violations. However, traditional enforcement actions (Consent Orders) will be used to address those facilities meeting one of the following two criteria for each permit parameter:

1) Violations of the facility's monthly and/or weekly permitted effluent limitations (concentration and/or mass) for any eight months during any continuous twelve month period, or

2) Violations of the facility's permitted monthly effluent limitation (concentration and/or mass) by a factor of 1.4 or greater for any four months during any continuous twelve month period.

This strategy does not conflict with our responsibilities to EPA under the Federal Quarterly Noncompliance report enforcement requirements.

A Notice of Violation (NOV) letter will be sent to any permitee that is fifteen (15) days late in complying with any Order condition, discharge monitoring report submittal, or permit requirement, other than compliance with effluent limitations. If the permitee is thirty (30) days late in complying with these requirements, an EECO will be used to address the situation. For issues that go unresolved by the permitee, such as disregarding the EECO, PCEP will ensure that traditional

enforcement is taken within sixty (60) days from the due date for each required submittal.

SANITARY SEWER OVERFLOWS
(SSOs)

For the period July 1995 to the present, metro Atlanta has reported the following numbers of SSO's:

Location	Major	Minor	Location	Major	Minor
Atlanta	55	93	Douglas Co	0	8
Carroll Co.	2	1	Fayette Co.	4	5
Cherokee Co.	0	1	Forsyth Co.	2	4
Clayton Co.	11	1	Fulton Co.	112	31
Cobb Co.	53	8	Gwinnett Co.	40	3
Coweta Co.	0	1	Henry Co.	2	0
DeKalb Co.	19	1	Rockdale Co.	36	20
			Spalding Co.	14	0

The current procedure for determining the type of enforcement action to address SSOs is a combination of assessments of whether the overflow was avoidable, resulted in fecal coliform instream violations, was the result of mis-management on the part of the system owner, exceeded 10,000 gallons in flow and/or resulted in a fish kill. To address the impacts caused by excessive numbers of SSOs in these sensitive areas [which is numerically portrayed by the listing of overflows since July 1995], enforcement action will be taken on ANY SSO into the waters of the State that occur in these sensitive areas. The type of enforcement action and level of penalty will be based on the same assessment criteria discussed above and the results of the assessments will determine whether or not traditional enforcement or EECOs will be used. However, should four major spills, as defined in the NPDES permit, occur during any continuous six month period, this will be considered a chronic problem and traditional enforcement (consent order) will be used to establish long term corrective action. All attempts will be made to follow-up each reported spill with a field inspection to ensure that an independent investigation is made by EPD prior to initiating enforcement procedures.

FACILITY INSPECTIONS

Specific associates [2] will be assigned duties for not only managing this enforcement strategy for the sensitive areas but also to increase inspection and surveillance activities (generally non-sampling activities) for the following facilities:

ATLANTA NPDES AND CSO FACILITIES - Once every two weeks a visit will be made to a selected facility to assess a specific aspect of facility operation and maintenance. These inspections will be documented and appropriate follow-up action initiated. In Atlanta's case, in the pending joint EPA/EPD enforcement action, many deficiencies may already have been addressed in the referral so that additional state enforcement action may not be warranted or may actually conflict with the joint action. Any action the state may propose to address identified deficiencies based on the results of the increased inspection program will be coordinated with our Attorney General's Office (AGO) and

EPA when necessary to determine if a proposed action conflicts with the pending EPA/EPD joint action.

ALL OTHER FACILITIES IN THE CHATTAHOOCHEE AND COOSA RIVER BASINS AND METRO ATLANTA - Attachment #2 lists all facilities in the Chattahoochee River Basin, the Coosa River Basin and metro Atlanta. Those facilities under PCEP responsibility will be given high priority to ensure they receive a minimum of one inspection during each fiscal year.

NOTIFICATION LETTERS TO CITIES/COUNTIES IN THE SENSITIVE AREAS OF EPD'S GROWING CONCERNS ABOUT WATER QUALITY IMPACTS

Attachment #3 is a proposed letter for HFR's signature notifying the county and city governments, industrial CSO's, and owners of Private and Institutional Developments (PID's) in the sensitive basins and in metro Atlanta of EPD's growing concerns with impacts to water quality in these high growth areas. This letter gives the owners of these systems a warning that EPD will be stepping up surveillance and enforcement in these areas.

OTHER EPD INVOLVEMENT

A copy of this strategy will be given to the appropriate regional offices for use in their prioritization of facilities for inspection in the sensitive areas. The Emergency Response Program will also be given a copy of this strategy. The regional offices will be responsible for transmitting HFR's letter to their facilities located in the sensitive areas.

Got News?

We'd like to hear from you—keep us informed about your organization's projects, people, awards, and other newsworthy information our readers would be interested in. Our headquarters office mailing address is P.O. Box 2027, Winter Park, FL 32790-2027. Call us at (407) 671-7777, toll-free at 1-800-881-6822, fax at (407) 671-7767, or e-mail info@enviro-net.com. Visit our Web site at www.enviro-net.com.

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If your mailing label is inaccurate in any way, please contact us at the address above with the correct information. We appreciate your help in keeping our circulation database as current as possible. Thank you.

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ment of water protection laws suffers from regulatory staff shortages, a lack of legislative support and too-friendly relationships with violators.

"We have a culture of lax enforcement," said Scott Jackson, a spokesman for the non-profit organization.

But state officials have dismissed much of the criticism, saying that many of the allegations are unwarranted and inaccurate.

Research by the statewide organization shows that state facilities that dis-
charge [illegible] have
hundre[illegible]. But
the gro[illegible] ment
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"As [illegible] to re-
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try-proposed legislation to undermine accountability and environmental protections."

The group said the lack of legislative support has led to chronic funding shortfalls; low expectations for permitting, monitoring, inspection and penalty assessments; a failure to aggressively support penalty assessments, to seek injunctive relief or deny permits to chronic polluters, also like to see the regulators adopt a tougher attitude and not be as patient with these polluters."

In addition, he said that if a company wants to appeal a penalty, those appeals should be public. "They should not have private meetings with the regulators."

Jackson conceded that much of the enforcement problems are due to increased workload and staff shortages. "The amount of the budget cuts has had a demoralizing effect on the agency. Staff are overworked and not happy. The core of activities return to 2000 levels quickly.

As for DENR, the group wants to set a workload limit for permit writers and compliance staff to prevent new permits being issued until staff time allows adequate inspections and compliance monitoring. It also said that violators should have to meet deadlines to achieve compliance. There should be stipulated penalties and aggressive action by the Attorney Gen-

ENFORCEMENT
Continued on Page 16

GA DNR Board relaxes zero tolerance policy for sewage spills

By PRAKASH GANDHI

Georgia sewage systems that work hard to prevent spills can avoid being penalized by the state under some major policy changes approved by environmental regulators.

The board of the state's Department of Natural Resources has agreed to modify its zero tolerance policy for spills into the Chattahoochee and other metro Atlanta rivers.

The policy, implemented in 1998, was designed to ensure that owners of wastewater systems take the necessary measures to ensure that system failures are properly addressed.

Last year, the Georgia Environmental Protection Division took about 85 enforcement actions against municipal systems in the zero tolerance area, which includes the Chattahoochee River Basin, the Tallapoosa River Basin and others.

Now, state officials have agreed to modify the policy after members of the Georgia Water & Pollution Control Association proposed an alternative approach for addressing sanitary sewer overflows in the area.

Under the changes, system owners will have to implement and sustain a high-level sanitary sewer system operation and maintenance program. To qualify, systems must show they are aggressively working on sewer system improvements to avoid the risk of spills.

Under the new policy, sewage systems that meet certain qualifications will be exempt from paying fines for smaller spills. System owners will not have to pay penalties for spills up to 30,000 gallons. And, most spills that occur in metro Atlanta are less than that amount.

Qualifying systems must be located in the zero tolerance area. The system owner must agree to implement certain capital improvement plans, with schedules, for system improvements.

The system owner also must minimize the possibility of spills and respond right away when they occur and set aside at least one-quarter of their annual budget for capacity, management, operation and maintenance.

In addition, all the system's lift stations must achieve a high level of operational efficiency; and a complete and accurate map of the sanitary sewer system must be available, with updates as new lines are

SEWAGE
Continued on Page 16

Appendix

R

Report run on: November 15, 2007 - 4:49 PM

This report may contain enforcement sensitive data.

MILLIKEN HILLSIDE COATING County Name / Code: TROUP / GA285 **GAD981275993**

Location: 1300 BROWNWOOD AVE; LAGRANGE, GA 30240 **REGION 04**

Mailing: 1300 FOURTH AVE; LAGRANGE, GA 30240

Activity Location: GA State District: MTZ Accessibility: Non-Notifier: Extract Flag: Y Active Site: Y

Generator: LQG Transporter: N Operating TSDF: ---- IC In Place: N EI Indicator (HE / GW): N / N

Full Enforcement: ---- Converter: ---- State Unaddressed SNC: N EPA Unaddressed SNC: N

CA Wrkld: N State TSDF: ------ State Addressed SNC: N EPA Addressed SNC: N

Active State Gen: N State SNC w/Comp Sched: N EPA SNC w/Comp Sched N

CEI Evaluation 03/15/2006 Activity Location: GA By: STATE Identifier: 001 Person: GALLW Suborganization: GC Found Violation: YES

Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:

Eval. Notes: - Former Eval Owner and Type: HQ CEI. Former Reason Owner and Code: GA 60

Violation: Activity Location: GA Type: 262.A Determined Date: 03/15/2006 Determined by Agency: STATE Responsible Agency: STATE

Scheduled Compliance Date: Actual Compliance Date: 06/23/2006 RTC Qualifier: DOCUMENTED Sequence Number: 1

Former Citation - SR - 265.52(d)

Viol. Notes: LIST HOME ADDRESSES OF EMERGENCY COORDINATORS IN CONTINGENCY PLAN

Enforcement: Activity Location: GA Type: 120 Action Date: 05/25/2006 Identifier: 001

Docket: Agency: STATE Responsible Person: GALLW Branch: GC

CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Enf. Notes:

Violation: Activity Location: GA Type: 262.A Determined Date: 03/15/2006 Determined by Agency: STATE Responsible Agency: STATE

Scheduled Compliance Date: Actual Compliance Date: 06/23/2006 RTC Qualifier: DOCUMENTED Sequence Number: 2

Former Citation - SR - 273.13(d)(1)

Viol. Notes: KEEP USED LAMP BOXES SEALED (X2)

Enforcement: Activity Location: GA Type: 120 Action Date: 05/25/2006 Identifier: 001

Docket: Agency: STATE Responsible Person: GALLW Branch: GC

CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Enf. Notes:

Violation: Activity Location: GA Type: 262.A Determined Date: 03/15/2006 Determined by Agency: STATE Responsible Agency: STATE

Scheduled Compliance Date: Actual Compliance Date: 06/23/2006 RTC Qualifier: DOCUMENTED Sequence Number: 3

Former Citation - SR - 273.14(e)

Viol. Notes: LABEL 1 BOX OF USED LAMPS

Enforcement: Activity Location: GA Type: 120 Action Date: 05/25/2006 Identifier: 001

Docket: Agency: STATE Responsible Person: GALLW Branch: GC

CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Enf. Notes:

Violation: Activity Location: GA Type: 262.A Determined Date: 03/15/2006 Determined by Agency: STATE Responsible Agency: STATE

Scheduled Compliance Date: Actual Compliance Date: 06/23/2006 RTC Qualifier: DOCUMENTED Sequence Number: 4

Former Citation - SR - 262.11

Viol. Notes: HW DETERMINATION ON BROKEN LAMPS

Enforcement: Activity Location: GA Type: 120 Action Date: 05/25/2006 Identifier: 001

Docket: Agency: STATE Responsible Person: GALLW Branch: GC

CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Enf. Notes:

Comprehensive Compliance Monitoring and Enforcement Report

Report run on: November 15, 2007 - 4:49 PM

Version: 3.0

User Selection Criteria

Location:	Georgia, all activities	**Activity Location:**	None Chosen
Handler ID:	GAD981275993	**Group of IDs:**	None Chosen
Handler Name:			
Handler Universe:	No Additional Restrictions		
Evaluation Date Range:	From Date: 10/01/1990 To Date: 11/15/2007	**Extract Flag:**	Include All Sites
Location County Code:		**Evaluation Suborganization:**	
Location City:		**Evaluation Person:**	
Location Zip Code:		**Evaluation Focus Area:**	
State District:		**Federal Facilities:**	No, Show All
		Only Eval's with Viol's:	No, All Evaluations
Evaluating Agencies:	None Chosen		
Evaluation Types:	None Chosen		
Violation Types:	None Chosen		
Sort Order:	Region, State, Handler Name		
Display Code Descrip.:	Yes		

Results

Data meeting the criteria you selected follows.

Total Pages: 6 Handler Count: 1

Report Description

This report provides a complete listing of evaluation, violation and enforcement activities for each Handler, including all orphan records. Below the Handler ID information, the data is presented in three sections; evaluations, violations and enforcements. Comments, referred to as Notes, are provided in each respective section. Since evaluations are included regardless of whether or not violations are identified, this report also serves as a useful management tool for tracking progress made towards meeting RECAP commitments.

Report Information

Name:	cmecomp.rdf
Developed by:	EPA Headquarters, Office of Enforcement and Compliance Assurance
Deployed Date:	November 2005
Last Updated:	April 2006
Contact:	rcrainfo.help@epa.gov
Tables Used:	cmecomp3, hreport_univ3, ccitation3, hhandler2, lu_state, hid_groups
Libraries:	none

This report may contain enforcement sensitive data.

MILLIKEN HILLSIDE COATING, GAD981275993, LAGRANGE, GA, continued -

CEI Evaluation 10/09/2003 Activity Location: GA By: STATE Identifier: 001 Person: GAGTT Suborganization: GC Found Violation: NO
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: - Former Eval Owner and Type: HQ CEI. Former Reason Owner and Code: GA 60

No Linked Violations

CEI Evaluation 10/22/1998 Activity Location: GA By: STATE Identifier: 001 Person: GAGTT Suborganization: GC Found Violation: NO
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: - Former Eval Owner and Type: HQ CEI. Former Reason Owner and Code: GA 60

No Linked Violations

NRR Evaluation 05/04/1998 Activity Location: GA By: STATE Identifier: 001 Person: GAGTT Suborganization: GC Found Violation: NO
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: - Former Eval Owner and Type: HQ NRR. Former Reason Owner and Code: GA 40

No Linked Violations

NRR Evaluation 05/22/1996 Activity Location: GA By: STATE Identifier: 001 Person: GABJB Suborganization: HW Found Violation: NO
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: - Former Eval Owner and Type: HQ NRR. Former Reason Owner and Code: GA 40

No Linked Violations

Total Number of Handlers: 1
Total Number of Activity Locations: 1
*** End of Report ***

This report may contain enforcement sensitive data.

Description of codes used on the report:

Universes	Description of Universes
Generator	Indicates that the facility is a Large Quantity Generator (LQG), Small Quantity Generator (SQG), Conditionally Exempt Small Quantity Generator (CEG), or not a generator (N).
Transporter	Indicates that the facility Transports waste subject to RCRA regulations. ('Y' indicates that the facility is in this universe).
Operating TSDF	Indicates that the facility is a Treatment, Storage or Disposal facility subject to any type of enforcement. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
IC In Place	Indicates that the facility has Institutional Controls in place. ('Y' indicates that the facility is in this universe).
EI Indicator (HE / GW)	Indicates that the facility has controls in place for Environmental Indicators. HE - Human Exposures ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist) GW - Groundwater Release ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist)
Full Enforcement	Indicates that the facility is a Treatment, Storage or Disposal facility which is part of the Full Enforcement universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
CA Workload	Indicates that the facility is part of the Corrective Action Workload universe. ('Y' indicates that the facility is in this universe).
Active State Gen	Indicates that the facility is an Active State Generator. ('Y' indicates that the facility is in this universe).
Converter	Indicates that the facility is a Converter Treatment, Storage or Disposal facility. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
State TSDF	Indicates that the facility is a State Treatment, Storage or Disposal facility. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
State Unaddressed SNC	Indicates that the facility is a State Unaddressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
State Addressed SNC	Indicates that the facility is a State Addressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
State SNC w/ Compl. Sched	Indicates that the facility is a State Significant Non-Complier with a Compliance Schedule. ('Y' indicates that the facility is in this universe).
EPA Unaddressed SNC	Indicates that the facility is an EPA Unaddressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
EPA Addressed SNC	Indicates that the facility is an EPA Addressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
EPA SNC w/ Compl. Sched	Indicates that the facility is a EPA Significant Non-Complier with a Compliance Schedule. ('Y' indicates that the facility is in this universe).

This report may contain enforcement sensitive data.

Description of codes used on the report:

ACCESSIBILITY - indicates the reason why the handler is not accessible for normal RCRA tracking and processing (previously called Bankrupt Indicator):

Code	Description
B	indicates that the handler has filed for bankruptcy and bankruptcy litigation is in process.
C	indicates that all RCRA responsibilities for permitting/closure, corrective action, and compliance monitoring and enforcement at the facility have been formally transferred to the CERCLA program or state equivalent.
F	indicates that all responsible parties (owners/operators) for the handler have fled the country or are otherwise not available for prosecution.
L	indicates that the handler's case is tied up in litigation to the extent that further progress in achieving RCRA compliance through normal enforcement is not possible.

NON-NOTIFIER - indicates that the handler has been identified through a source other than Notification and is suspected of conducting RCRA-regulated activities without proper authority:

Code	Description
E	indicates that the handler was initially a non-notifier, subsequently determined to be exempt from requirements to notify.
O	indicates that the handler is a former non-notifier
X	indicates that the handler is a non-notifier

BY

By indicates the agency who performed the evaluation/inspection.

FOUND VIOLATION - indicates whether or not the evaluation discovered a violation.

Code	Description
Yes	indicates that the evaluation did find violations.
No	indicates that the evaluation did not find violations.
U	indicates that it is undetermined at this time. The agency may still be determining whether violations existed.

Evaluation Type	Description
CEI	COMPLIANCE EVALUATION INSPECTION ON-SITE
NRR	NON-FINANCIAL RECORD REVIEW

Violation Type	Description
262.A	GENERATORS - GENERAL

This report may contain enforcement sensitive data.

Description of codes used on the report:

Enforcement Type	Description
120	WRITTEN INFORMAL

Appendix

S

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1066 East, Atlanta, Georgia 30334-9000
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
Office: 404/657-8831 Fax: 404/463-6676

GENERATOR INSPECTION REPORT

SECTION I: FACILITY INFORMATION

Facility Name:	Milliken Hillside Coating				
EPA Identification Number:	GAD981275993			NAICS Code:	31311/31331
Location Address:	1300 Brownwood Avenue				
City:	LaGrange	County:	Troup	Zip Code:	30240
Mailing Address:	Same				
Generation Status:	LQG				
Additional Checklists:	Tank		Transporter		Used Oil		Subpart CC	
Estimated Quantity of Hazardous Waste Generated (lbs./gal. monthly):	12,000 pounds				
Basis for Estimate:	Manifests				
Officials Contacted:	Name:	Mark Moe	Rochelle Bradford		
	Title:	Senior Environmental Chemist	Plant Chemist		
	Phone:	706-880-3653	706-880-3539		

SECTION II: SUMMARY OF FINDINGS

The following violations of the Rules were observed:

40 CFR 262.11
40 CFR 265.52(d)
40 CFR 273.13(d)(1)
40 CFR 273.14(e)

This facility coats the nylon fabric used to make air bags for vehicles. Either a polyurethane or liquid silicone rubber coating is applied to the fabric on knife-over-roll coaters. Both coatings use Toluene as the solvent. Identification numbers are printed on the finished product using an ink jet printer. All hazardous waste generated is combined into one stream (D001, F003, F005, U220) and sent to Teris in Arkansas for burn/energy recovery. This includes coating and solvent waste, the empty ink cartridges, and solvent contaminated rags.

Milliken operates three facilities in the same area, and all three have different EPA ID Numbers. Valway is an SQG and coats industrial fabric. Hillside is a CESQG and coats carpeting. Hillside Coating coats the air bag fabric. Mr. Moe is the environmental engineer for all three plants.

Samples:	Yes		No	X	Photographs:	Yes		No	X
Inspected by:	LLW LLW		Inspection Date:	3/15/06		Submittal Date:	3/24/06	
Reviewed by:	J. Dempsey				Review Date:	5/23/06		
Attachments:								
File Name:	Milliken Hillside Coating, LaGrange							

SECTION III: PRE-INSPECTION REVIEW

A. GENERAL INFORMATION

1. Regulated Waste Activity Notification Form on File:	Yes
2. Most Recent Date of Notification Form:	6/19/05

Facility notified as a:

X	LQG (>1,000 kg/mo.)		TRANSPORTER
	SQG (>100 kg/mo. or <1,000kg/mo.)		TSD
	CESQG (<100 kg/mo.)		

MOST RECENT EPA HAZARDOUS WASTE CODES DOCUMENTED BY FILES:

D001	D008	F003	F005	U220					

SOURCE OF ABOVE INFORMATION/DATE:	Notification		
LAST INSPECTION DATE:	10/9/03		
DATE OF LAST ENFORCEMENT:	NA		
VIOLATIONS NOTED: NA			
ON FILE	**YES**	**NO**	**REQ. YEAR**
BIENNIAL REPORT(S)	X		2005
HAZARDOUS WASTE REDUCTION PLAN(S	X 4/4/06.		2006
EXCEPTION REPORT(S)		X	NA

Note: If this inspection includes sampling, a Site Safety Plan must be approved prior to the Inspection and attached to this report.

(N/A – Not applicable)

COMMENTS: The facility has submitted a request for a 30-day extension to complete their 2006 Reduction Plan. The 2004 Plan was on file.

ECTION IV: FIELD OBSERVATION DATA

A. WASTE GENERATION

Is there hazardous waste generation? **Yes**

WASTE GENERATION		SATELLITE ACCUMULATION			
PROCESS GENERATING HAZARDOUS WASTE	HOW THE FACILITY CLASSIFIED THE WASTE (waste code)	IS THERE SATELLITE ACCUMULATION? §262.34(c)(1) (Est.Volume in Gallons)	LABELING OF CONTAINER(S) §262.34(c)(1)(ii)	CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172	CONTAINER(S) CLOSED §265.173
Waste generated from the coating process	D001, F003, F005, U220	2 @ < 55	Yes	Metal Drum	Yes

Does the facility manage any of the following items? NO [ ] YES [X]

Check all that apply:

Mercury-containing lamps	X	**Mercury-containing thermostats**		**Batteries**	X	**Pesticides**	

If yes, how are they handled? Lamps, ballasts and batteries are managed as universal waste and sent to AERC in West Melbourne for recycling (FLD984262782). A violation was noted for two boxes of 8-foot lamps that were not closed; in addition, one of the boxes was not labeled. Another violation was noted for accumulating broken lamps as universal waste without conducting a hazardous waste determination to determine if the broken lamps were hazardous waste (262.11). None of the broken lamps had been shipped as universal waste. Mr. Moe was unaware of the requirements for broken lamps.

Does the facility accumulate solvent contaminated rags? NO [ ] YES [X]

If yes, how are they handled? Solvent-contaminated wipers are combined with the waste coating stream and managed as hazardous waste.

SECTION IV: CONTINUED

B. HAZARDOUS WASTE STORAGE AREA

Is there hazardous waste storage? **No**

WASTESTREAM (Waste codes)	NUMBER OF CONTAINER(S) (Specify Volume if not 55-Gallon)	CONTAINER(S) MARKED HAZARDOUS WASTE §262.34(a)(3)	CONTAINER(S) MARKED WITH ACCUMULATION DATE §262.34(a)(2)	CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172	CONTAINER(S) CLOSED §265.173	ADEQUATE AISLE SPACE §265.35

IGNITABLE OR REACTIVE WASTE STORED >50 FEET FROM PROPERTY LINE? (§265.176)	YES		NO		N/A	
ARE INCOMPATIBLE WASTE SEPARATED BY DIKE, BERM, WALL OR OTHER DEVICE? §265.177)	YES		NO		N/A	

COMMENTS: No drums were in storage during the inspection.

SECTION IV: CONTINUED

	YES	NO	N/A	VIOLATION
C. TANK STORAGE/TREATMENT				
1. Does the facility use tanks to store or treat hazardous waste? If yes, see Tank Systems Checklist for Generator		X		
D. EMERGENCY EQUIPMENT				
1. Is the facility operated and maintained to minimize possibility of fire, explosion, or release of hazardous waste to the environment? (§265.31)	X			
2. Does the facility have the following equipment to deal with hazards posed by waste handled: (§265.32)				
a. Alarm system? (internal communication)	X			
b. Telephone or 2 way radio? (external communication)	X			
c. Fire extinguisher?	X			
d. Water? (If applicable)	X			
e. Are facility communication system, spill control equipment, fire protection equipment and decontamination equipment tested and maintained to ensure proper operation? (§265.33)	X			
f. Do personnel have immediate access to communication device or alarm system? (§265.34)	X			

List type of device or if verbal communication used:

Telephone, Cell Phone, 2-way Radio

COMMENTS:

The facility has an elementary neutralization system for their alkaline scour wastewater used to clean their vent stacks.

SECTION V: GENERAL RECORDS

	YES	NO	N/A	VIOLATION
1. Has the facility notified of correct hazardous waste activity? (§262.12)	X			
2. Does the facility conduct the weekly inspections of containers storing hazardous waste? (§262.34) (§265.174)	X			
3. Are waste profiles, waste analysis, or supporting documentation of waste determination per §262.11 in the facility's records? [§262.11, §262.40)(c)]		X		X
4. Were Biennial Reports and Waste Reduction Plans submitted? (§262.41)	X			
5. Are copies of the biennial reports in the facility's records? (§262.40)	X			
6. Have arrangements with the local authorities been made to familiarize them with the facility, types of waste handled, and hazards posed? (§265.37)	X			
7. Does generator package waste in accordance with 49 CFR Parts 173, 178, and 179 (DOT requirements)? (§262.30)	X			
a. Does generator follow DOT labeling requirements in accordance with 49 CFR 172? (§262.31)	X			
b. Does generator mark each package in accordance with 49 CFR 172? [§262.32(a)]	X			
c. Is each container of 110 gallons or less marked with the following label? [§262.32(b)]	X			

Hazardous Waste-Federal Law Prohibits Improper Disposal.
If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator Name and Address _____
Manifest Document Number _____

d. Is hazardous waste placarded before shipping off-site In accordance with the Department of Transportations regulations for hazardous materials under 49 CFR part 172, subpart F? (§262.33)	X			
8. Have fees been paid?	X			
a. Have the fee records (LQG) and fee report (LQG,SQG) been signed by a responsible corporate official? [391-3-19-.03(5)]	X			

SECTION V: CONTINUED

	YES	NO	N/A	VIOLATION
b. Have the fee records (LQG) and the fee report (LQG,SQG), along with supporting documentation, been maintained on-site for a period of at least three years from the end of the calendar year for which they were completed (enacted July 1992)? [391-3-19-.03(5)]	X			
c. Does the fee record (LQG) contain the following: [391-3-19-.03(5)]				
1. Manifest number for each shipment?	X			
2. Date of each shipment?	X			
3. Name and EPA I.D. Number of the final receiving facility for each shipment?	X			
4. By EPA hazardous waste number and method of management at the final receiving facility, the tons of hazardous waste for each shipment and the total tons of hazardous waste for the calendar year?	X			
d. Have any discrepancies been noted between the fee records, fee reports, and the manifests for the subject period?		X		

COMMENTS:

The facility did not have a hazardous waste determination for broken mercury-containing fluorescent lamps.

The facility had the 2003 and 2005 Biennial Reports on file, but has requested an extension to complete the 2006 Reduction Plan. The 2004 Reduction Plan was on file.

The facility was an SQG in 2002 and paid the SQG fee. The facility was an LQG in 2003 but has no record of paying their fees. Our database indicates they did not pay any fees for 2003. They did pay the correct fees for 2004 and had the fee records on file. A referral will be made to the ~~Administrative Support~~ Unit regarding the year 2003.

(memo to Donney Hannah 3/29/06). JD

SECTION VI: CONTINGENCY PLAN

A. LARGE QUANTITY GENERATOR

	YES	NO	N/A	VIOLATION
1. Does the facility have a written Contingency Plan (§265.51) or a written Spill Prevention, Control, and Countermeasures Plan (SPCC)? [§265.52(b)]	X			
2. Does the Contingency Plan/SPCC Plan include:				
a. Facility personnel action responses? §265.52(a)	X			
b. Description of agreement with the local authorities? [§265.52(c)]	X			
c. List of names, addresses, and phone numbers of emergency coordinators. Designates primary emergency coordinator, and list other coordinators in order of assumption of responsibility? [§265.52(d)]		X		X
d. List of emergency equipment at the facility, including location, physical description and capabilities? [§265.52(e)]	X			
e. An evacuation plan for facility personnel? [§265.52(f)]	X			
3. Have copies of the Contingency Plan/SPCC Plan been submitted to police, fire department, hospital, local emergency response teams? (§265.53)	X			
4. Is the Contingency Plan/SPCC Plan amended when necessary? (§265.54)	X			
5. Is at least one emergency coordinator on facility premises or on call? (§265.55)	X			
6. Does the emergency coordinator respond immediately to emergencies, keep a record of these responses, and the report made to Federal, State, and local authorities, if required? (§265.56)	X			

COMMENTS: A violation was noted for not having the home addresses of the emergency coordinators in the Contingency Plan.

The facility has both an SPCC and an Emergency Response Plan (ERP). The facility evacuation plan is in their ERP. The fire department makes annual visits and receives a copy each time. The facility had no documentation that they had given them the plan, so I recommended that they get the Fire Department to sign a letter stating they have received it. The facility has it's own hazmat team.

SECTION VI: CONTINUED

B. SMALL QUANTITY GENERATOR

	YES	NO	N/A	VIOLATION
1. Is the following information posted next to the telephone: [§262.34(d)(5)]				
a. Name and telephone number of emergency coordinator?			X	
b. Location of fire extinguishers, spill control material and, if present, fire alarm?			X	
c. Telephone of the fire department if no direct alarm exists?			X	
2. Is at least one emergency coordinator on facility premises or on call? [§262.34(d)(5)(i)]			X	
3. Does emergency coordinator respond immediately to emergencies as expressed by [§262.34(d)(5)(iv)]?			X	

COMMENTS:

SECTION VII: PERSONNEL TRAINING

A. LARGE QUANTITY GENERATOR

	YES	NO	N/A	VIOLATION
1. Does facility have a personnel training program for hazardous waste management, consisting of classroom instruction or on the job training? [§265.16(a)(1)] (Note in Comment Session)	X			
a. Is training directed by a person trained in hazardous waste management procedures? [§265.16(a)(2 and 3)]	X			
b. Do personnel complete training within 6 months of employment or job assignments? [§265.16(b)]	X			
c. Do personnel take part in annual review of hazardous waste training? [§265.16(c)]	X			
d. Are the following documents maintained per §265.16(d):				
1. Job title and name of employee? [§265.16(d)(1)]	X			
2. Job description? [§265.16(d)(2)]	X			
3. Amount and type of initial and continuing training to be given to each person filling a position? [§265.16(d)(3)]	X			
2. Are records that document training and job experience given to and completed by personnel? [§265.16(d)(4)]	X			
3. Are records kept until closure of facility or 3 years past employment of individual personnel? [§265.16(e)]	X			

B. SMALL QUANTITY GENERATOR

1. Are employees thoroughly familiar with proper waste handling and emergency procedures as relevant to their responsibilities during normal facility operations and emergencies? [§262.34(d)(5)(iii)]			X	

COMMENTS: Mr. Moe conducts the annual hazardous waste training. He receives annual external training from the corporate office via an on-line course. I checked the logs for the names of several employees who manage hazardous waste and they had all received training within the past year. I reminded Mr. Moe that he is overdue for his annual training by two months. He is planning on taking the course within the next month. Job titles and descriptions are in the facility's EMS manual under procedure 4.4.2 "Training, Awareness & Competence."

SECTION VIII: MANIFEST/LAND DISPOSAL RESTRICTION

	YES	NO	N/A	VIOLATION
1. Are manifests kept in the facility's records for three years? [§262.40(a)]	X			
2. Did generator retain one copy of manifest signed by the generator and transporter for three years or until the facility received a signed copy from the designated permitted facility, which received the waste? [§262.23(a)(3)]	X			
3. Are manifests completed to include: (Part 262, Subpart B)				
a. Manifest Document Number?	X			
b. Generator's name, mailing address, telephone number?	X			
c. Generator's EPA ID Number?	X			
d. Transporter's name and EPA ID Number?	X			
e. TSD's facility name, address, and EPA ID Number?	X			
f. Waste information required by DOT: proper shipping name, quantity of waste, and type of container?	X			
4. Did generator sign and date all manifests? (Part 262, Appendix)	X			
5. Did generator obtain original carbon copy with handwritten signature and date of acceptance from initial transporter and the receiving TSD? [§262.23 (a)2 and (a)3]	X			
6. Did the generator file any exception reports? (§262.42)		X		
7. Are exception reports kept for three years? (§262.40)			X	
8. Has the generator determined that the facility is managing (§268.7):				
a. A land disposal restricted waste?	X			
b. A land disposal restricted waste that can be land disposed without any further treatment?		X		
c. A waste that is subject to an exemption from the land disposal restriction prohibition (i.e., A case-by-case exemption)?		X		

SECTION VIII: CONTINUED

	YES	NO	N/A	VIOLATION
9. Does the land disposal restriction notification/ certification include: (§268.7)				
a. EPA Hazardous Waste Numbers? (i.e. characteristics, listed waste) (§268.9)*	X			
b. Manifest number?	X			
c. Certification that the waste meets the treatment standards found in Part 268, Subpart D?		X	X	
d. Certification that the waste can be land disposed without any further treatment?		X	X	
e. Certification that the waste is exempt from land disposal restriction requirements and includes date, which this exemption applies?		X	X	

***If a hazardous waste determination consists of both Listed and Characteristic EPA waste codes, the applicable LDR waste code can exclude the Characteristic waste code if the specific hazardous constituent responsible for that Characteristic is already addressed by the treatment standard for the Listed waste code (i.e., an ignitable, spent acetone solvent characterized as F003, D001 would have a LDR waste code of F003). Otherwise, all EPA waste codes subject to LDR must be cited.**

10. Has facility notified designated TSD facility per requirements? [§268.7(a)(2)]	X			
11. Does facility maintain copies of LDR determinations, notifications, waste analysis, etc. relating to requirements in records for three years? [§268.7(a)(8)]	X			
12. Are any lab pack waste(s) shipped off-site? [§268.7(a)(9)]		X		
13. Does generator treat waste(s) in tanks or containers to comply with land disposal restriction requirements? [§268.7(a)(5)]		X		
a. Does Waste Analysis Plan include detailed chemical and physical analysis and all information to treat the waste(s)? [§268.7(a)(5)(i)]			X	

SECTION VIII: CONTINUED

	YES	NO	N/A	VIOLATION
b. Has a copy of Waste Analysis Plan been submitted to Regional Administrator and Environmental Protection Division? [§268.7(a)(4)(ii)]			X	
i. Has submittal been verified? [§268.7(a)(4)(ii)]			X	
ii. Has facility notified designated TSD per Requirement? [§268.7(a)(3), §268.7(a)(4)]			X	
c. Does the generator treat wastes which exhibit a characteristic to render the waste non-hazardous and ships this waste to a subtitle D facility? [§268.9(d)]		X		
i. Was notice made to EPD?			X	
ii. Are copies of the notices kept in the facility's records?			X	
iii. Do the notices comply with the requirements in (§268.9)?			X	
14. Is this facility a small quantity generator whose waste is reclaimed under a contractual agreement [§262.20(e)]?		X		
a. Are the type(s) of waste and frequency of removal specified in the contract agreement?			X	
b. Is the vehicle used to transport waste to recycling facility and to deliver regenerated material back to the generator owned and operated by the reclaimer of the waste?			X	
c. Did generator maintain a copy of the reclamation agreement in the facility records for at least three years after termination or expiration of there agreement?			X	
d. Did generator maintain a copy of the initial land disposal restriction notification in the facility's records for at least three years after the termination or the expiration of the contract? [§268.7(a)(10)]			X	

COMMENTS:

SECTION IX: USED OIL MANAGEMENT

	YES	NO	N/A	VIOLATION
A. USED OIL ACTIVITIES				
1. Does this facility burn used oil fuel for energy recovery or market used oil fuel directly to such a burner? If yes, see Used Oil Management Checklist, (Section IX)		X		
2. Does the facility generate used oil?		X		
B. USED OIL STORAGE (279.22, 279.45, 279.54, 279.64)				
1. Does the facility store used oil?		X		
2. Is the used oil stored in tanks, containers, or units subject to regulation under 40 CFR Parts 264 or 265?			X	
3. Are the containers and aboveground tanks in good condition with no leaks?			X	
4. Are containers, aboveground tanks, and fill pipes for underground storage tanks labeled or marked clearly with the words "Used Oil?"			X	
5. Have any releases of used oil to the environment occurred? (describe in comment section)			X	
a. Did the facility stop the release?			X	
b. Did the facility contain the released used oil?			X	
c. Did the facility clean up and manage properly the released used oil and other materials?			X	
d. Did the facility repair or replace any leaking storage containers or tanks to prevent future releases prior to returning them to service?			X	
C. HAZARDOUS WASTE MIXING (279.21)				
1. Does the generator mix hazardous waste with the used oil?			X	
a. Does the mixture exhibit any characteristics of hazardous waste? (If yes, regulated as hazardous waste under Part 262)			X	

	YES	NO	N/A	VIOLATION
b. Does the used oil contain greater than 1,000 ppm total halogens? (If yes, presumed to be hazardous)			X	
D. ON-SITE BURNING IN SPACE HEATERS (279.23)				
1. Does the generator burn used oil in used oil-fired space heaters?			X	
a. Does the generator burn only used oil generated at the facility or received from household do-it-yourself used oil generators?			X	
b. Is the heater designed to have a maximum capacity of not more than 0.5 million Btu per hour?			X	
E. OFF-SITE SHIPMENTS (279.24)				
1. Does the generator transport the facility's used oil or used oil from do-it-yourselfers to a used oil collection center?			X	
a. Is the used oil transported in a vehicle owned by the facility or an employee?			X	
b. Does the generator transport more than 55 gallons at any time?			X	
c. Is the collection center registered, licensed, permitted, or recognized by a state/county/ municipal government to manage used oil?			X	
2. Does the generator transport the facility's used oil to an aggregation point?			X	
a. Is the used oil transported in a vehicle owned/ operated by the facility or an employee?			X	
b. Does the generator transport more than 55 gallons at any time?			X	
c. Is the aggregation point owned and/or operated by the same generator?			X	

SECTION IX: CONTINUED

	YES	NO	NA	VIOLATION
3. Does the generator have a contractual agreement pursuant to which reclaimed oil is returned by the processor/re-refiner to the generator for use as a lubricant, cutting oil, or coolant?			X	
a. Does the contract indicate the type of used oil and the frequency of shipments?			X	
b. Does the contract indicate that the vehicle used to transport the used oil to the processing/re-refining facility and to deliver recycled used oil back to the generator is owned and operated by the used oil processor/re-refiner?			X	
c. Does the contract indicate that reclaimed oil will be returned to the generator?			X	
4. Does the generator ensure that the used oil is transported only by transporters who have obtained EPA identification numbers?			X	

F. USED OIL FILTER EXCLUSION [261.4(b)(13)]

1. Does the generator manage used oil filters?		X		
a. Are the filters non-terne plated?			X	
b. Are the filters gravity hot-drained?			X	

Please list all businesses that handle the facility's used oil. Include the address(es) and EPA Identification Number(s).

COMMENTS:

SECTION X: OTHER ACTIVITIES

A. How long has the company been at this site? Since 1989

B. Is there one or more septic tanks on-site?

YES		NO	X

1. If yes, how many?
2. How old are they?
3. Where are they?
4. Are they still in use?
5. What is the purpose of these septic tanks?

C. Is the facility on the Hazardous Sites Inventory?

YES		NO	X

1. If yes, what is the Hazardous Sites Inventory number?
2. Why is the facility listed on the Hazardous Sites Inventory?

D. Does the facility generate, transport, receive, store, recycle, treat or process solid waste?

YES	X	NO	

1. If yes, describe the solid waste activities at the site: C&C Sanitation in LaGrange (PBR-141-11COL) takes the facility's trash to Vopak in either Mauldin, South Carolina for landfilling, or Vopak in Savannah for incineration. Fabric scraps are sold to employees.

E. Does the facility dispose of any waste materials on-site?

YES		NO	X

1. If yes, explain and include whether the disposal site is open or closed, how many sites there are, and permit number for each. Obtain a copy of the permit and permit conditions to attach to the report.

   The facility does have a wastewater discharge permit (#101) with the City of LaGrange under 40 CFR 403 to discharge neutralized alkaline scour water from their emission stacks. The stacks are cleaned with liquid NaOH. The alkaline wastewater from the stacks is drained to a tank where acetic acid is added and the contents agitated. The contents are pumped to a second tank where the pH is tested (5-12) prior to being released to the sewer by way of pits in the floor in the containment area. The system is automatic, so if the pH varies, an alarm sounds and the system shuts down, stopping any discharge.

Appendix

T

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1066 East, Atlanta, Georgia 30334-9000
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
Office: 404/657-8831 FAX: 404/463-6676

May 25, 2006

Mr. Mark Moe
Senior Environmental Chemist
Milliken Hillside Coating
1300 Brownwood Avenue
LaGrange, Georgia 30240

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

FILE COPY

SUBJECT: NOTICE OF VIOLATION
Large Quantity Generator Requirements
Milliken Hillside Coating
LaGrange/Troup County
EPA Identification Number: GAD981275993

Dear Mr. Moe:

On March 15, 2006, Linda Weglewski of the Generator Compliance Program conducted a compliance evaluation inspection at the subject facility. Hazardous waste generators in Georgia are required to comply with Georgia's Hazardous Waste Management Act (O.C.G.A. 12-8-60 et. seq.), and the Georgia Rules of Hazardous Waste Management, (Chapter 391-3-11). The following violations of the Rules were observed during the inspection:

1. 40 CFR 262.11 – "Hazardous Waste Determination" – for failure to conduct a hazardous waste determination on broken mercury-containing lamps;

2. 40 CFR 265.52(d) – "The Contingency Plan" – for failure to list the home addresses of the emergency coordinators in the Contingency Plan;

3. 40 CFR 273.13(d)(1) – "Waste Management" – for failure to keep closed two boxes of used mercury-containing lamps when not in use; and

4. 40 CFR 273.14(e) – "Labeling/Marking" – for failure to label one box of used mercury-containing lamps as "Used Lamps."

These violations should be corrected immediately. Please submit to this office a written explanation for these violations and corrective actions taken, no later than **June 23, 2006**. Included in this response should be any documentation that shows correction of these violations and compliance with the rules.

Enclosed is a copy of the Generator Inspection Report. Please direct inquiries and correspondence on this subject to Linda Weglewski at 404/657-8831. Thank you for your cooperation in this matter.

Sincerely,

Jack N. Dempsey
Unit Coordinator
Generator Compliance Unit

JND/LLW
Enclosure: Generator Inspection Report
c: Renée Hudson Goodley
Jeffrey T. Pallas, EPA
File: Milliken Hillside Coating, LaGrange
S:\Rdrive\Lindaw\Facility Checklists & Correspondence\Milliken Hillside Coating NOV FY2006.doc

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PS Form 3800, June 2002 See Reverse for Instructions

Appendix

U

MILLIKEN

file

Milliken & Company
Valway & Hillside Coating Plant
1300 Fourth Ave
LaGrange GA 30240
706 880 5661

RECEIVED
JUN 23 2006
GENERATOR COMPLIANCE PROGRAM
HAZARDOUS WASTE MANAGEMENT BRANCH

June 21, 2006

Linda Weglewski
Georgia Department of Natural Resources
Generator Compliance Program
Suite 1066 East Tower
2 Martin Luther King Jr. Drive
Atlanta, GA 30334-9000
404/657-8831

This package contains the response to the Notice of Violations dated May 25, 2006 for Milliken and Company Hillside Coating Plant, EPA ID GAD981275993.

I have included the following items to address each finding.

Finding 1) 40 CFR 262.11 – "Hazardous Waste Determination" – for failure to conduct a hazardous waste determination on broken mercury-containing lamps – Addressed by included TCLP analysis of the types of lamps sent for recycling which indicates the lamps are below the regulatory level for mercury.

Finding 2) 40 CFR 265.52(d) – " The Contingency Plan" – for failure to list the home addresses of the emergency coordinators in the Contingency Plan – Addressed by included revised page from the plant procedure "4.4.7 Spill & Release Contingency with Emergency Response Plan."

Finding 3) 40 CFR 273.13(d)(1) – "Waste Management" – for failure to keep closed two boxes of used mercury-containing lamps when not in use – Addressed by included procedure "Universal Waste Procedure." Boxes found at time of audit were closed immediately.

Finding 4) 40 CFR 273.14(e) – "Labeling/Marking" – for failure to label one box of used mercury-containing lamps as "Used Lamps." – Addressed by included procedure "Universal Waste Procedure." Labeling was immediately corrected on box found during audit.

If you have any questions or comments regarding the corrective measures implemented, please feel free to contact me. I plan to call you next week to provide any clarification or answer any questions you may have about this correspondence.

Mark Thomas Moe
Senior Environmental Chemist
Valway/Hillside Coating
Milliken and Company
706-880-3760

PENTA
NEERING GROUP, INC.

May 23, 2006

Mr. Mark Moe
Sr. Environmental Engineer
Milliken – Valway Plant
1300 Fourth Avenue
LaGrange, Georgia 30240
Phone: (706) 880-3653
Fax: (706) 880-5849

Subject: **Letter of TCLP Sample Analysis for Mercury**
Milliken – Valway Plant
Atlanta, Georgia
PENTA Project No. 06-5-00238

Dear Mr. Moe:

PENTA Engineering Group, Inc. (PENTA) is pleased to submit the results of the sample of fluorescent light tubes collected by representatives of Milliken Valway Plant (Milliken) located at the Milliken. Mr. Mark Moe representing Milliken hand delivered a sample of the fluorescent light tube material to Matt LaMarsh of PENTA on May 15, 2005. PENTA forwarded the sample along with a chain of custody to Analytical Environmental Services, Inc. (AES) in Atlanta, Georgia for analysis using Toxicity Characteristic Leachate Procedure (TCLP) to document the concentration of mercury in the fluorescent light tube solid waste. Laboratory TCLP sample analysis documented the concentration of mercury in the fluorescent light tube solid waste at 0.109 milligrams per Liter (mg/L). Regulatory limit for mercury in a solid waste is 0.2 mg/L.

Should you have any questions or comments concerning this letter, or if we can be of further assistance, please contact us.

Sincerely,

PENTA ENGINEERING GROUP, INC.

Ralph D. Leptrone
Project Engineer

Mark J. Stahr, P.G.
Principal Geologist

Attachments:
Summary of laboratory results

6755 Peachtree Industrial Blvd.
Suite 150
Atlanta, Georgia
30360
Phone: 678-282-1999
Fax: 678-282-1993
www.pentaeng.com

Analytical Environmental Services, Inc.

Date: *18-May-06*

CLIENT:	Penta Engineering Group	**Client Sample ID:**	M1
Lab Order:	0605915	**Tag Number:**	
Project:	Milliken	**Collection Date:**	5/15/2006
Lab ID:	0605915-001A	**Matrix:**	SOLID

Analyses	Result	Limit	Qual	Units	BatchID	DF	Date Analyzed
MERCURY, TCLP		**SW1311/7470A**			**(SW7470A)**		Analyst: **LKW**
Mercury	0.109	0.0200		mg/L	70932	5	5/17/2006 2:53:15 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

4.4.7– SPILL & RELEASE CONTINGENCY WITH EMERGENCY RESPONSE PLAN

IN THE EVENT OF AN EMERGENCY BEGIN ON PAGE FIVE OR CLICK HERE

OBJECTIVE:

The information contained herein is submitted in accordance with the requirements for a **Contingency and Emergency Response Plan**, as contained in 40CFR265 Subpart D and 29CFR1910.120. Valway / Hillside Coating store and processes hazardous materials. Hillside Coating generates hazardous wastes. This procedure outlines the necessary planned steps if an emergency situation occurs.

SCOPE:

This procedure covers Valway & Hillside Coating Plant. Facility contact information is listed below. Both plants finish, dye, and/or coat broad woven textile fabrics on continuous equipment. Supporting chemical mixing and storage equipment are on-site. Plant layouts are provided as part of this procedure.

Milliken & Company **Hillside Coating Plant** 1300 Fourth Avenue LaGrange GA 30240	Milliken & Company **Valway Plant** 1300 Fourth Avenue LaGrange GA 30240

EMERGENCY COORDINATORS:

Primary Emergency Coordinator	**Backup Emergency Coordinator**
Mr. Mark Moe	Mr. Mike Gilbert
Office: (706) 880-3653	Office: (706) 880-5282
Home: (706) 883-8769	Home: (706) 882-2498
3029 Old Westpoint Rd.	101 Plymouth Place
LaGrange, GA 30240	LaGrange, GA 30240
Pager: 1-706-880-0098	Cell: 1-706-302-5296

Also included is a list of organizations that could possibly be contacted by the Emergency Coordinator in the event of an emergency (LAST PAGE).

BACKGROUND:

Valway Plant Hazardous Chemicals

Chemical	**Chemical Hazard**	**Storage Location**	**Maximum Quantity**
Aqueous ammonia	Corrosive (base)	Upstairs chemical services	10 @ 55-gal. drums
Formaldehyde	Corrosive	Upstairs chemical services	10 @ 55-gal. drums
Acetic acid	Corrosive (acid)	Downstairs chemical services	6 @ tote (2,250 lb per tote)
Caustic soda	Corrosive (base)	Tank farm; downstairs chemical services	10,000 gallon tank
Triton	Flammable	Upstairs chemical services	2 @ 55-gal. drums

UNIVERSAL WASTE PROCEDURE

This procedure covers the accumulation and disposal of Fluorescent Lamps, Incandescent lamps, batteries, and ballasts.

Fluorescent lamps that are not broken must be placed in the cardboard boxes supplied by EPSI. The boxes must remain closed when they are not being filled and must be labeled as indicated below.

Universal Waste
Mercury Containing Lamps
USED LAMPS

For Recycling by:
Earth Protection Services, Inc.
102 Twentynine Court
Williamston, SC 29697
864-847-7700

'very effort should be made to keep from breaking tubes. However, if a tube should be inadvertently broken, broken tubes must be placed in a compatible UN approved drum or approved container provided by EPSI with the following requirements.
The drum should have:

1) **The drum must be located in the "Broken Tube Satellite Area"**
2) **Lid that is in place with bolt facing down when not being filled.**
3) **The drum should be labeled as shown below.**
4) **Drum should be undamaged and free of chemical residue.**
5) **When the drum is full, it should be shipped to EPSI with the other Universal Waste.**

Universal Waste
Mercury Containing Lamps
USED BROKEN LAMPS

For Recycling by:
Earth Protection Services, Inc.
102 Twentynine Court
Williamston, SC 29697
864-847-7700

*Operator Certification:*_____ *Date:*_____

Training Instructor: _____ *Date:* _____

Batteries are to be separated by the following types:

Alkaline, Lead Acid, Lead Calcium, Nickel Cadmium(NiCad), Nickel Metal Hydride(Nimh), Lithium

Each type should be placed in a separate bucket that is labeled with the appropriate battery type and must remain closed when not being filled.
For example:

Universal Waste
Alkaline Batteries

For Recycling by:
Earth Protection Services, Inc.
102 Twentynine Court
Williamston, SC 29697
864-847-7700

Ballasts that are known to not contain PCBs shall be placed in buckets that must remain closed when not being filled and labeled as shown below

Universal Waste
Non PCB Ballast

For Recycling by:
Earth Protection Services, Inc.
102 Twentynine Court
Williamston, SC 29697
864-847-7700

Operator Certification: _____ *Date:* _____

Training Instructor: _____ *Date:* _____

Appendix

V

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite1066 East, Atlanta, Georgia 30334-9000
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
Office: 404/657-8831 FAX: 404/463-6676

July 12, 2006

FILE COPY

Mr. Mark Moe
Senior Environmental Chemist
Milliken Hillside Coating
1300 Brownwood Avenue
LaGrange, Georgia 30240

SUBJECT: LARGE QUANTITY GENERATOR REQUIREMENTS
Milliken Hillside Coating
LaGrange/Troup County
EPA Identification Number: GAD981275993

Dear Mr. Moe:

Thank you for your response received June 23, 2006. Based upon the information submitted, we have concluded that the previous violations of Georgia's Rules for Hazardous Waste Management and the Code of Federal Regulations cited in our Notice of Violation letter dated May 25, 2006, have been addressed.

Should you have any questions or if I can be of any assistance, please feel free to contact me at (404)657-8843.

Sincerely,

Linda Weglewski
Environmental Specialist
Generator Compliance Unit

LLW/
c: Jack Dempsey
Renée Hudson Goodley
File: Milliken Hillside Coating, LaGrange
S:\Rdrive\Lindaw\Facility Checklists & Correspondence\Milliken Hillside Coating CSL FY2006.doc

Appendix

W

Hazardous Substance Research Center South & Southwest

Environmental Update #24

Published by the Hazardous Substance Research Centers/South & Southwest Outreach Program

June 2006

Environmental Hazards of the Textile Industry

The Southeast and Northeast United States once enjoyed a thriving textile manufacturing industry. Although approximately 6,000 textile mills continue to operate in the U.S., many historic textile mills are inactive, creating threats to the surrounding communities' health and economic vitality. While abandoned textile mills may contain residual contamination, active mills continue to produce noxious byproducts that may be legally or illegally released into the environment. Textile manufacturing, for the purposes of this fact sheet, includes woven fabric and wool processing, knitting, dyeing and finishing, and floor covering operations.

Air quality, water quality, and solid waste generation are affected greatly by the textile industry, and employees of textile mills are also subjected to indoor air quality issues. Not all textile manufacturing industries produce hazardous waste; however, contaminants of concern generated by many textile manufacturing plants include spent solvents and surfactants, polychlorinated biphenyls (PCBs) from transformers and other machinery, asbestos from spinning machines or structures, bleaching products such as hydrogen peroxide, phosphates from detergents or water softeners, insecticides, phenol (a manmade substance used to make synthetics such as nylon), underground storage tank contents, waste oil, and other petroleum products. Solvents comprise the majority of hazardous waste generated by textile mills. Spent solvents are used to clean machinery and for dyeing, finishing, dry-cleaning, and other specialty operations, and they include tetrachloroethylene (PCE), trichloroethylene (TCE), benzene, and ethylene dichloride (1,2-dichloroethane). When released into soil or water or evaporated into the air, these substances can be harmful to humans. Health effects due to overexposure by inhalation, ingestion, or contact with these solvents include dizziness, headache, nausea, lung effects, liver and kidney diseases, unconsciousness, and even death. PCE and TCE have the potential to cause cancer based on laboratory testing. For more information on the effects of specific contaminants, please visit the Envirotools website at www.envirotools.org/pollutantsoverview.shtml.

Other contaminants of concern are produced during the dyeing of fabrics or other fibers. Dyebath effluents may contain heavy metals, ammonia, alkali salts, toxic solids, and large amounts of pigments. Additionally, extremely hot water is often discharged into nearby bodies of water. Salt is the most destructive byproduct of the dyeing process, as it contaminates water and destroys fish, native plants, and crops. Wastewaters are subject to the Toxicity Characteristic Leaching Procedure (TCLP) tests to determine the effects on human health and the environment. Any waste that results in a TCLP leachate containing a toxicity characteristic constituent equal to or above regulatory levels is considered hazardous.

Textile mills that produce hazardous waste are subject to U.S. Environmental Protection Agency (EPA) standards for handling and disposal of these materials. The Resources Conservation and Recovery Act (RCRA), the Toxic Release Inventory (TRI) Program, the Clean Water Act, the Safe Drinking Water Act, and the Clean Air Act regulate active textile mills to ensure that human and environmental health is protected. Table 1 lists facility activities that use hazardous materials and

The HSRC is an EPA-funded consortium led by Louisiana State University, with the cooperation of the Georgia Institute of Technology, Rice University, Texas A&M University, and the University of Texas at Austin.

might generate hazardous waste. Table 2 lists a number of regulated wastes that are potentially generated during textile mill operations. Neither table is a comprehensive list of all contaminants of concern. The TRI Explorer website (http://www.epa.gov/triexplorer/) can be used to generate reports or maps of chemical releases from all monitored facilities by state, county, or ZIP code. Using the Facility link, this website will list all facilities in a given industry by Standard Industrial Classification (SIC) code by geographic area. The SIC code for the textile industry is 22.

Table 1: Typical Textile Manufacturing Operations, Materials Used, and Hazardous Wastes that Might be Generated

Process/Operation	Materials Used	General Types of Waste Generated
Wool Scouring	Disinfectants, Insecticides, Solvents	Spent Solvents, Toxic Wastes
Fabric and Floor Covering Finishing	Dyes, Solvents, Lacquers, Bleaches, Finishing Agents, Adhesives	Spent Solvents, Toxic Wastes, Wastewaters and Wastewater Treatment Sludges with Toxic Constituents
Stock and Yarn Processing, Dyeing, and Finishing	Solvents, Dyes	Spent Solvents, Toxic Wastes

Table 2: Controlled Textile Manufacturing Wastes

Waste Solvent: Still Bottom Residues and Other Toxic Wastes

- Tetrachloroethylene or Perchloroethylene
- Trichloroethylene
- Dichloromethane or Methylene chloride
- 1,1,1-Trichloroethane
- Chlorobenzene
- Toluene or Toluol
- Benzene or Benzol
- Xylene (Xylol)
- Ethylene Dichloride
- Naphtha (Varsol)
- White Spirits
- Mineral Spirits

Other Wastes

- Ignitable Flammable Liquids Not Otherwise Specified
- Ignitable Combustible Liquids Not Otherwise Specified
- Ignitable Flammable Solids Not Otherwise Specified
- Hazardous Waste, Liquids or Solids Not Otherwise Specified

Many defunct textile mills have been successfully redeveloped, suggesting that the cost of cleanup is not prohibitive to a site's economic viability. Bates Mill in Lewiston, Maine, helped to revitalize a stagnant downtown and combat high unemployment. A similar redevelopment is planned for the Burlington Mill in Mooresville, North Carolina. South Carolina recently initiated the Textiles Communities Revitalization Act to stimulate redevelopment of its many defunct mills. Fortunately, abandoned mills are increasingly seen as historic assets worthy of redevelopment rather than toxic eyesores.

Sources

U.S. Environmental Protection Agency (2002). RCRA in Focus: Textile Manufacturing. Retrieved June 1, 2006 from http://www.epa.gov/epaoswer/hazwaste/id/infocus/k02028.pdf.

U.S. Environmental Protection Agency (1997). EPA Office of Compliance Notebook Project: Profile of the Textile Industry. Retrieved June 1, 2006 from http://www.epa.gov/oecaerth/resources/publications/assistance/sectors/notebooks/textilsn.pdf.

U.S. Environmental Protection Agency (1996). EnviroSense: An Industry Overview of Textile Manufacturing. Retrieved June 1, 2006 from http://es.epa.gov/techinfo/facts/textile.html.

For more information , contact Ann Carpenter at 404/407-8044 or by e-mail at ann.carpenter@gtri.gatech.edu.

Appendix

X

Textile Process Wastewater Permits: An Update And Strategies

By Karen K. Leonas, Ph.D, Michael L. Leonas, P.E.* The Univ. of Georgia, Athens, GA

Note:-(Michael *L. Leonas is affiliated with M. R. Chasman & Assoc.. Athens. GA.)*

Introduction

Over the past twenty years increased attention has been directed toward the environment. Efforts to clean up the environment and keep it clean have been made by government agencies at national, state and local levels by establishing guidances and regulations. Industries and individuals are also more aware of those conditions that negatively impact the environment. One of the primary concerns is water quality. Because of the high quantity of water and the number of metals used in the processing of textiles, the textile industry will be significantly impacted by the recent regulations.

1990 EPA issued a technical guidance document for use in water quality control. These guidelines more than tripled the number of toxic pollutants of interest and include chemical constituents commonly found in textile processing. To successfully comply with these regulations, those in the textile industry must be knowledgeable of permitting strategies and participate in the process before the issuance of the permit.

Historical perspective

The Clean Water Act (CWA) was passed as public law in 1972 and the National Pollutant Discharge Elimination System (NPDES) permit system was established to ensure that industries and Publicly Owned Treatment works (POTW) were monitoring and complying with the stipulations of this legislation. Since 1972 the public has been requesting federal and state regulatory agencies to increase the scope of environmental protection and control to provide a more pristine environment.

In response to public demand, the Water Quality Act (WQA) was authorized by Congress in 1987. The purpose of the water quality act focused on the control of substances toxic to aquatic and human life. This differed drastically from the CWA which was primarily concerned with maintaining a minimum dissolved oxygen level in receiving waters. The WQA was extensive and the United States Environmental Protection Agency (EPA) was charged with implementing guidelines for state and local regulatory agencies to follow.

EPA, pursuant to its authority under Section 304(a) of the Clean Water Act, has published water quality criteria to help develop permit conditions for toxic pollutants. These criteria are intended for national application but may be replaced, when appropriate by site specific criteria.

The guidance document, EPA Quality Criteria for Water issued in 1987 by EPA, significantly altered the permit writing process.[1] The NPDES permitting system originally introduced in 1972 still remains as the method for control of discharges. The 1987 document identified 129 chemical constituents to be monitored where previously there had been only approximately 30. In addition, thus document specified detection limits, test methods to be used and utilized stream models for the determination of discharge limits.

All states were to incorporate the criteria into their water quality rules by March 1990. This forced many states to adopt the criteria without investigation or adjustment of the natural criteria.[2] One primary area of concern for the textile industry is the increased number of metals now identified by the new criteria.

Across all industries, the cost to comply with treatment for the metals is overwhelming and has been estimated at 90 to 105 billion dollars. It has been estimated that 6000 to 8000 U.S. dischargers will receive stringent metals limitations if historical application of EPA's metal criteria continues. In addition, approximately 30 to 50% of the dischargers will need to install alternate processes (i.e. reverse osmosis and ion exchange) to meet the new limitations."

Impact on the Industry

Factors that make the textile industry extremely susceptible to significant changes include the high quantity of discharge, metals used in textile processing and metals found inherently in the natural fibers. A number of metals now identified the 129 chemical constituents are used in textile processing, therefore textile facilities will be particularly impacted. Whether the mill operates its own treatment system or discharges to a POTW facility, they will be held accountable for their discharges as everyone struggles to comply with the new regulations.

Prior to 1990 NPDES permits controlled items such as pH. temperature, sulfides, chromium, etc. for the textile industries. With the implementation of the WQA via the 1987 criteria, textile facilities will particularly be Impacted due to the high quantity of discharge, the metals used in typical textile processes and metals inherent in natural fibers.

Quantity of Discharge

In North Carolina the textile industry is the largest water user and wastewater producer.[4] The historical data of water usage and discharge has been presented and discussed by Smith.' A large mill could produce over two million gallons of wastewater per day, which is discharged into treatment systems then to the environment.

Use of Metals

Metals are used in a variety of processing techniques throughout the textile industry, Including oxidizers for vat and sulfur dyes, aftertreatment of direct dyes, metal catalyst used for

curing resins, finishes (i.e., flame retardant, soil release, and water repellent), dye stripping agents, and various classes of dyes.[5]

Of the six common dye classes, acid, basic, direct, disperse, fiber reactive and vat all contain metals including chromium, arsenic, cadmium, mercury, copper, lead and zinc, all of which are now targeted by the new criteria. Prior to 1990 these chemicals may have been subcategory specific, however today they are equally applied to all subcategories. Table I lists various dye categories which contain metals that are controlled via the new water quality criteria.[6]

Table I: Average metal content of selected dyes (ppm).

	Dye Class					
Metal	Acid	Basic	Direct	Disperse	Fiber Reactive	Vat
Arsenic	<1	<1	<1	<1	1.4	<1
Cadmium	<1	<1	<1	<1	<1	<1
Chromium	9	2.5	3.0	3.0	24	83
Cobalt	3.2	<1	<1	<1	<1	<1
Copper	79	33	35	45	71	110
Lead	37	6	28	37	52	6
Mercury	<1	0.5	0.5	<1	0.5	1.0
Zinc	<13	32	8	3	4	4

Metals Inherent in natural fibers

In some cases the greige goods also contain metals; this is from metals inherent in the fibers (Table II).[4] Of the 36 elements found in cotton, half are targeted by the new water quality criteria. Although it is not a metal, chlorine was also detected and is controlled by the NPDES permits.

Given the potential for substantial impacts to textile facilities from the parameters controlled in the NPDES permits, it is important for permit applicants to modify their approach and strategies to the application process. It is necessary to become familiar with the permitting process and the techniques being used by the permitting agency in response to the Water Quality Act and the criteria created by the Act. In May 1992, EPA issued the document "Interim Guidance on Interpretation and Implementation of Aquatic Life Criteria for Metals". In this document EPA attempts to clarify its position on implementation of water quality criteria for metals.[2] Even with this guidance, many facilities can still be affected by the complicated NPDES permit conditions.

Given the complexities of determining the permit limits and the potential financial and operational impacts on the facility, it is necessary to give more time and thought to the application process. This article provides information which may be helpful as industries revise their current permitting application processes.

Permitting processes

Initially, a review of the Water Quality Standards that pertain to your industrial subcategory as defined in the Code of Federal Regulations (CFR) (Table III) is necessary.' Also, an understanding of the techniques used by the regulatory agency to determine limits, is helpful. One technique which has seen increased usage is stream modeling.

Use of Strem modeling

The evolution of mathematical modeling techniques has resulted in significant advancements in water quality-based permitting. Statistical modeling has eliminated the need to make assumptions regarding the likelihood of remote events occurring simultaneously. Permit limitations established using mathematical modeling techniques do not include multiple and duplicate conservative assumptions. These models include the necessary safety factors built into the permit process such as a facility to perform at a fraction of its permit limit. They produce both cost-effective and realistic permit limitations while adequately protecting the environment.

The advantages to the permittee of such a model are the more complex modeling procedures often produce effluent limitations higher than steady state procedures. Applicants may avoid the higher costs of facilities designed to meet steady state-model.[8]

Applicants should review the water-quality model used by the permit writer to derive permit limitations. Considera-

tion should be given to whether the model assumptions reflect expected conditions in the receiving stream.

The use of probablistic modeling in its new water quality criteria has been promoted by EPA. However, applicants must ensure that these procedures are allowed in state rules and used in calculating the permit limitations.

Designated use also influences the determination of permit limits. Designated use classifications include drinking water, wild and scenic, recreation, and fish reserves, which have varying water quality criteria.

Characterization of discharge *water*

Identifying the sources in the plant that produce discharge waters and determining the approximate quantity discharged from each source is critical. Identifying those chemicals that are used in various processes is critical in evaluating the discharge.

Effluent monitoring

Data collected up to 18 months prior to the permit application can be submitted with the application. It is typical to submit only one data point and then the permit is prepared based on that information. However, with the more stringent limitations it is advantageous to provide a mean value from which the permit limit is established.

The location of sample collection should be reviewed to ensure that it reflects what is being discharged after all treatment processes. Sometimes it may also be appropriate to collect the sample downstream of the mixing zone but within the established regulatory guidelines.

Sample analysis

It is critical to use approved analytical methods and laboratory (sometimes referred to as a contract lab) as specified by the regulatory agency. In some cases the test methods do not accurately simulate site conditions, therefore, it is advantageous to provide additional data to correct skewness inherent in the methods by the permitting agency.

Review results

Test results should be reviewed for accuracy prior to submission to the permitting agency. Evaluation to determine if additional testing is necessary can be completed, and it may be appropriate to apply for a site specific discharge request.

Fabric (ppm)

Metal	Sample1	Sample 2
Titanium	2.11 ± 5%	<0.5
Iodine	0.140 ± 7%	0.104 ± 7%
Manganese	1.632 ± 0.5%	1.741 ± 0.5%
Magnesium	7.24 ± 15%	9.80 ± 15%
Copper	2.29 ± 8%	3.16 ± 8%
Vanadium	0.070 ± 10%	0.032 ± 10%
Chlorine	24.16 ± 5%	21.32 ± 5%
Aluminum	33.91 ± 1%	29.45 ± 1%
Mercury	<0.010	<0.010
Samarium	<0.005	<0.005
Uranium	<0.001	<0.001
Lanthanum	<0.4	<0.4
Cadmium	<0.8	<0.8
Gold	<0.0001	<0.0001
Arsenic	<0.2	<0.2
Antimony	<0.05	<0.06
Bromine	1.08 ± 1%	0.131 ± 5%
Sodium	<500.0	<500.0
Potassium	<500.00	<500.00
Cerium	<0.2	<0.2
Calcium	<100.0	<100.0
Selenium	<0.1	<0.1
Thorium	<0.004	<0.004
Chromium	0.095 ± 7%	0.142 ± 3%
Europium	<0.001	<0.001
Ytterbium	<0.03	<0.03
Barium	<5.0	<5.0
Cesium	0.0076 ± 10%	0.0083 ± 10%
Silver	<0.005	<0.005
Nickel	<5.0	<5.0
Scandium	0.0038 ± 2%	0.0038 ± 2%
Rubidium	<20.0	<30.0
Iron	68.29 ± 10%	60.04 ± 10%
Zinc	7.38	7.35
Cobalt	0.017	0.024
Molybdenum	<1.0	<1.0

Site Specific standards

Where one or more assumptions underlying the standard are not applicable to the receiving stream, application for site specific standards may be appropriate. EPA has issued guidance on how to derive site-specific standards.[9] Using one of the three methodologies approved in that guidance should be acceptable to the regulatory agency.

In developing site-specific standards, it is first necessary to review the receiving stream's designated use, which defines the receiving stream's actual and potential beneficial uses. Water-quality criteria and standards are intended to protect the uses identified. Applicants may find that the state's designated use is outdated or otherwise inadequate. The applicant should then consider providing additional information.

This information could include identification of current uses, causes of use impairment, and potential uses given the chemical, physical and biological characteristics of the stream. EPA then recommends the important chemical, physical, and biological factors that should be considered when establishing site-specific standards.

The *Water Quality Standards Handbook* identifies three alternate approaches for developing site-specific water-quality standards. The appropriate approach will depend on whether it is the biological, chemical, or physical assumptions of the state-wide standards that should not apply to the receiving stream.

An example presented by Hall, Raider and Grafton is a situation where elevated hardness or TOC are present, the pH and temperature vary significantly from the EPA laboratory conditions used to develop the water-quality criteria.[9] In this situation, the receiving and effluent stream may be allowed as use as the test water.

Another concern is whether the test species could reasonably inhabit the receiving stream. Temperature, pH, or other chemical and physical limitations of the receiving stream may be such that the test species is not likely to populate the stream. In this case, the applicant should use a substitute species that probably populate the re-

ceiving stream.

For each of the three protocols, EPA has provided guidelines to identify when each is appropriate and the implementation of that protocol. Each approach requires the permittee to assemble sitespecific data and to recalculate a water-quality standard. Once the standard is recalculated and approved, the regulatory agency must apply the permitting rules to translate the water-quality standard into effluent limitations.

The site specific discharge request must include data sufficient to calculate a reasonable alternate limit and information showing the requested limit will result in no degradation of the water quality. This effort should be coordinated with the permitting agency prior to the submission to prevent delays and misunderstandings.

The implementation of the water quality criteria has been difficult for various reasons. Some of those include inadequacies in test methods, calculation of limits, inadequacy of technology to monitor and control. The methodologies commonly used by per--nit writers drastically overstate the bioavailable fraction of heavy metals in effluent and receiving waters. As a result, the permit restricts the discharge of metals that could pose no threat to he environment. The permit limitations are intended to regulate only bioavailable metals. However, many state permitting authorities and EPA regions do not reflect this.

Table III: Industrial Subcategory as in 40CFR 410 Textile Mills Point Source Category

a.	Wool scouring
b.	Wool finishing
c.	Low water use processing
d.	Woven fabric finishing
e.	Knit fabric finishing
f.	Carpet finishing
g,	Stock and yarn finishing
i.	Felted fabric processing

Due to increased public awareness of environmental issues and public demand for a cleaner environment, future environmental regulations are inevitable. One example would be issues pertaining to the reauthorization of the clean Water Act.[9,10] There continues to be advocates in the U.S. Senate and U.S. House of Representatives as demonstrated by the Senate Bill entitled "Water Pollution Prevention and Control Act of 1993" introduced in June, 1993.[11] In November 1992, the EPA proposed the National Toxics Rule that would implement water quality criteria for states which have not adopted such criteria.[1] This could result in the imposition of further limitations and conditions on NPDES Permits. Recently, legislation was introduced, H.R. 2199, that proposes a tax ranging from 6 cents to $63 per pound on discharges of 307 different chemicals.

The cost is based on the toxicity of the chemical. Industrial and commercial consumers would pay a tax of 1.95 cents for each 1000 gallons of water used.[12]

All taxes collected would be contributed to a clean water trust fund Major areas of concern include water pollution prevention, water quality sci ence, toxic water pollutant control, accurate assessment of compliance and water pollution control funding.

EPA continues to set water enforcement records in convictions, administrative orders, and civil and criminal penalties. This includes company officials serving prison sentences and monetary assessments in the millions of dollars. The enforcement office has stepped up its efforts to crack down on polluters earlier in the enforcemenl cycle and are developing a criminal enforcement program that will include a larger staff of criminal investigators who will be better trained in investigaive techniques.

According to LaJuana Wilcher of EPA "the states tell us that 75% of heir waters meet water quality standards. That is not enough. This year we're going after the remaining 25% using all of our tools."

Summary

EPA has recently recognized probems with the implementation of the toxic criteria. Many states have not adopted the toxic criteria which EPA imposed. Some states have adopted toxic criteria but are not fully implenenting them. This has created an unlevel playing field in which industries literally face closure and relocation to other states and in which municipalies have been issued NPDES permits with limits that are unattainable and innecessary for toxicity control.

The EPA-imposed toxic criteria for metals are an ineffective and detrimenal tool for eliminating toxicity. There are three fundamental problems with these criteria:

1. Many of the criteria are below laboratory detection limits and consequently states cannot determine if rivers are in compliance with standards. Also, NPDES permit effluent limitations resulting from the standards are below detection limits and are unenforceable.

2. Achievement of the standards and resulting effluent limitations are unattainable in many instances. The metals in municipal effluent come from plumbing (primarily copper, zinc and lead). Technology is not available to reduce the concentrations to meet the effluent limits resulting from the water quality standards

3. The criteria are over-protective. There are many streams in the Southeast which have natural metal concentrations (especially zinc) which far exceed EPA's criteria, yet always support a healthy and balanced fish population. Also streams below municipalities and industries with calculated execeedances of toxic criteria also support fish life. Finally, many of the supposedly toxic effluents routinely pass acute and chronic bioassays.

Fortunately, the Interim Guidance on Intrepretation and Implementatior of Aquatic Life Criteria for Metals is providing some assistance to all parties in the permitting process. In fact the interim guidance recognized that current procedures may result in over estimating toxicity.

One solution recommended by EPA is the water-effect ratio. This involve! measuring a pollutant's water-effect ratio into the receiving water coverer by the water quality standard. As a result of the complexity of metal chemistry, there is not one chemical analytical method that can accurately determine the metals that are bioavailable and toxic. Therefore, EPA's guidance allows an adjustment in the numeric metals criteria. The water-effect ratio compares the toxicity of a pollutant in actual site water to its toxicity in laboratory water for two or more aquatic species. Since the metal's toxicity in laboratory water is the basis of a states numeric criteria, the water-effect ratio could be used to derive a site-specific criteria.

In the 1987 Clean Water Amendments, Congress anticipated that numeric criteria will not be applicable for all streams. Paragraph 303(C)(2)(B) provides that States shall adopt numeric criteria for pollutants "the discharge or presence of which in the affected waters could reasonably be expected to interfere with those designated uses adopted the state."

To date many state permitting agencies have not addressed this congressional directive in its water quality standards. □ □ □

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Appendix

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TEXTILE TECHNOLOGY

Cotton Textile Processing: Waste Generation and Effluent Treatment

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ABSTRACT

This review discusses cotton textile processing and methods of treating effluent in the textile industry. Several countries, including India, have introduced strict ecological standards for textile industries. With more stringent controls expected in the future, it is essential that control measures be implemented to minimize effluent problems. Industrial textile processing comprises pretreatment, dyeing, printing, and finishing operations. These production processes not only consume large amounts of energy and water, but they also produce substantial waste products. This manuscript combines a discussion of waste production from textile processes, such as desizing, mercerizing, bleaching, dyeing, finishing, and printing, with a discussion of advanced methods of effluent treatment, such as electro-oxidation, bio-treatment, photochemical, and membrane processes.

The textile dyeing industry consumes large quantities of water and produces large volumes of wastewater from different steps in the dyeing and finishing processes. Wastewater from printing and dyeing units is often rich in color, containing residues of reactive dyes and chemicals, and requires proper treatment before being released into the environment. The toxic effects of dyestuffs and other organic compounds, as well as acidic and alkaline contaminants, from industrial establishments on the general public are widely accepted. Increasing public concern about environmental issues has led to closure of several small-scale industries.

Interest in ecologically friendly, wet-processing textile techniques has increased in recent years because of increased awareness of environmental issues throughout the world. Consumers in developed countries are demanding biodegradable and ecologically friendly textiles (Chavan, 2001). Cotton provides an ecologically friendly textile, but more than 50% of its production volume is dyed with reactive dyes. Unfortunately, dyes are unfavorable from an ecological point of view, because the effluents generated are heavily colored, contain high concentrations of salts, and exhibit high biological oxygen demand/chemical oxygen demand (BOD/COD) values.

In dyeing textiles, ecological standards are strictly applied throughout processing from raw material selection to the final product. This has become more critical since the German environmental standards regarding dye effluents became effective (Robinson et al., 1997). The main challenge for the textile industry today is to modify production methods, so they are more ecologically friendly at a competitive price, by using safer dyes and chemicals and by reducing cost of effluent treatment/disposal. Recycling has become a necessary element, not because of the shortage of any item, but because of the need to control pollution. There are three ways to reduce pollution: (1) use of new, less polluting technologies; (2) effective treatment of effluent so that it conforms to specified discharge requirements; and (3) recycling waste several times over before discharge (Sule and Bardhan, 1999), which is considered the most practical solution.

The objective of this review is to discuss the various processing stages in the textile industry and the methodologies adopted for treating textile wastewater. A variety of water treatment techniques (Table 1) are discussed from an environmental point of view. Conventional and novel techniques discussed include electro-oxidation, biological treatment, photochemical processing, ion-exchange, and a variety of membrane techniques.

TEXTILE OPERATIONS

The textile industry comprises a diverse and fragmented group of establishments that produce and/or process textile-related products (fiber, yarn, and fabric) for further processing into apparel, home furnishings, and industrial goods. Textile establishments receive and prepare fibers; transform fibers

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Table 1. Possible treatments for cotton textile wastes and their associated advantages and disadvantages

Processes	Advantages	Disadvantages	References
Biodegradation	Rates of elimination by oxidizable substances about 90%	Low biodegradability of dyes	Pala and Tokat, 2002; Ledakowicz et al., 2001.
Coagulation–flocculation	Elimination of insoluble dyes	Production of sludge blocking filter	Gaehr et al., 1994.
Adsorption on activated carbon	Suspended solids and organic substances well reduced	Cost of activated carbon	Arslan et al., 2000.
Ozone treatment	Good decolorization	No reduction of the COD	Adams et al., 1995; Scott and Ollis, 1995.
Electrochemical processes	Capacity of adaptation to different volumes and pollution loads	Iron hydroxide sludge	Lin and Peng, 1994; Lin and Chen, 1997.
Reverse osmosis	Removal of all mineral salts, hydrolyzes reactive dyes and chemical auxiliaries	High pressure	Ghayeni et al., 1998.
Nanofiltration	Separation of organic compounds of low molecular weight and divalent ions from monovalent salts. Treatment of high concentrations	—	Erswell et al., 1998; Xu et al., 1999; Akbari et al., 2002; Tang and Chen, 2002.
Ultrafiltration–microfiltration	Low pressure	Insufficient quality of the treated wastewater	Watters et al., 1991; Rott and Mike, 1999; Ciardelli and Ranieri, 2001; Ghayeni et al., 1998.

into yarn, thread, or webbing; convert the yarn into fabric or related products; and dye and finish these materials at various stages of production (Ghosh and Gangopadhyay, 2000).

The process of converting raw fibers into finished apparel and non-apparel textile products is complex, so most textile mills specialize. There is little difference between knitting and weaving in the production of man-made cotton and wool fabrics (Hashem et al., 2005). Textiles generally go through three or four stages of production that may include yarn formation, fabric formation, wet processing, and textile fabrication. Some of the steps in processing fibers into textile goods are shown in Figure 1. A list of some wastes that may be generated at each level of textile processing are provided in Table 2.

Desizing. The presence of sizing ingredients in the fabric hinders processes, such as dyeing, printing, and finishing. For example, the presence of starch can hinder the penetration of the dye into the fiber, which necessitates removal of starch prior to dyeing or printing. Starch is removed or converted into simple water-soluble products either by hydrolysis (by enzymatic preparations or dilute mineral acids) or by oxidation (by sodium bromide, sodium chlorite, etc.) (Batra, 1985).

In general, about 50% of the water pollution is due to waste water from desizing, which has a high BOD that renders it unusable. The problem can be mitigated by using enzymes that degrade starch into ethanol rather to anhydroglucose. The ethanol can be recovered by distillation for use as a solvent or fuel, thereby reducing the BOD load. Alternatively, an oxidative system like H_2O_2 can be used to fully degrade starch to CO_2 and H_2O.

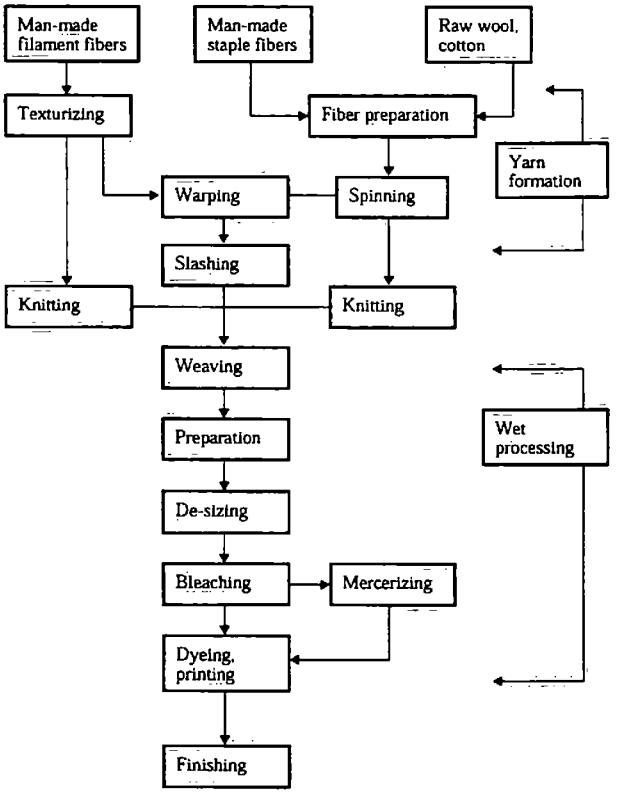

Figure 1. A flow diagram for various steps involved in processing textile in a cotton mill.

Electro-oxidation on RuO_2/Ti or PbO_2/Ti electrodes is an effective method for the treatment of starch effluent. An anaerobic plate-column reactor capable of retaining high concentrations of biomass was studied using a synthetic wastewater that contained starch. The total organic carbon (TOC)-loading rate, hydraulic retention time (HRT), and temperature were kept constant. The initial conditions were a biomass concentration of approximately 0.5 mg/ml N (5 mg/ml volatile suspended solids), 20 °C, an HRT of 30 h, and a TOC-loading rate of 0.8 g/l/day. A removal efficiency of dissolved organic carbon exceeding 90% was realized. At the end of the treatment, the removal efficiency reached a steady-state value of 98%, at which the biomass concentration in the reactor was 2.3 mg/ml N.

Table 2. List of some of the waste materials generated at each level of cotton textile processing

Process	Air emissions	Wastewater	Residual wastes
Fiber preparation	Little or no air emissions generated	Little or no wastewater generated	Fiber waste; packaging waste; hard waste.
Yarn spinning	Little or no air emissions generated	Little or no wastewater generated	Packaging waste; sized yarn; fiber waste; cleaning and processing waste.
Slashing/sizing	Volatile organic compounds	BOD; COD; metals; cleaning waste, size	Fiber lint; yarn waste; packaging waste; unused starch-based sizes.
Weaving	Little or no air emissions generated	Little or no wastewater generated	Packaging waste; yarn and fabric scraps; off-spec fabric; used oil.
Knitting	Little or no air emissions generated	Little or no wastewater generated	Packaging waste; yarn and fabric scraps; off-spec fabric.
Tufting	Little or no air emissions generated	Little or no wastewater generated	Packaging waste; yarn and fabric scraps; off-spec fabric.
Desizing	Volatile organic compounds from glycol ethers	BOD from water-soluble sizes; synthetic size; lubricants; biocides; anti-static compounds	Packaging waste; fiber lint; yarn waste; cleaning materials, such as wipes, rags and filters; cleaning and maintenance wastes containing solvents.
Scouring	Volatile organic compounds from glycol ethers and scouring solvents	Disinfectants and insecticide residues; NaOH; detergents; fats; oils; pectin; wax; knitting lubricants; spin finishes; spent solvents	Little or no residual waste generated.
Bleaching	Little or no air emissions generated	Hydrogen peroxide, sodium silicate or organic stabilizer; high pH	Little or no residual waste generated.
Singeing	Small amounts of exhaust gasses from the burners.	Little or no wastewater generated.	Little or no residual waste generated.
Mercerizing	Little or no air emissions generated.	High pH; NaOH.	Little or no residual waste generated.
Heat setting	Volatilization of spin finish agents applied during synthetic fiber manufacture.	Little or no wastewater generated.	Little or no residual waste generated.
Dyeing	Volatile organic compounds	Metals; salt; surfactants; toxics; organic processing assistance; cationic materials; color; BOD; sulfide; acidity/ alkalinity; spent solvents.	Little or no residual waste generated.
Printing	Solvents, acetic acid from dyeing and curing oven emissions; combustion gasses; particulate matter.	Suspended solids; urea; solvents; color; metals; heat; BOD; foam.	Little or no residual waste generated.
Finishing	Volatile organic compounds; contaminants in purchased chemicals; formaldehyde vapor; combustion gasses; particulate matter.	BOD; COD; suspended solids; toxics; spent solvents.	Fabric scraps and trimmings; packaging waste.
Product fabrication	Little or no air emissions generated.	Little or no wastewater generated.	Fabric scraps.

Cornstarch waste is easily degraded by treatment in a mixed activated sludge system. The bio-kinetic coefficients were calculated from the two-level activated sludge operational processes using influent COD concentrations and four values of solid retention time. The results indicate that the effluent COD is related to the influent COD concentration. It is also proportional to the product of the influent COD and the specific growth rate. A multiple-substrate model was developed to predict the effluent COD under variable influent COD concentrations (Bortone et al., 1995). There was no sludge-bulking problem apparently because of high dissolved oxygen (DO) concentrations, a buffered system, and a balanced C:N:P ratio; however, the critical DO concentration at which the sludge volume index began to rise increased as the food for microorganism (F/M) ratio increased. A cost analysis was provided for a hypothetical wastewater plant with a flow rate of $300m^3$/day (Vanndevivera and Bianchi, 1998). Synthetic sizing formulations based on polyvinyl acrylic (PVA) and acrylic resins, instead of starch, are expensive. Considering the cost of effluent treatment, the cost of synthetic sizing formulations is negligible. Today, advances in nano-filtration and ultra-filtration techniques allow recovery and reuse of PVA (Meier et al., 2002; Yu et al., 2001).

Compared with reverse osmosis, nanofiltration is less energy intensive and can be used for the treatment of various industrial effluents (Meier et al., 2002). Moreover, a higher retention of dyes and other low molecular weight organic compounds (MW: 200=1000) is achievable by nanofiltration. The salt-rich permeate can be reused in the preparation of dye baths, which minimizes the amount of wastewater that needs to be processed. The basic problems involved in any membrane-based process are a drop in flux and membrane fouling. To overcome this problem and to achieve a high quality separation, combinations of various separation methods have been adopted in recent years (Pigmon et al., 2003; Abdessemed and Nezzal, 2002; Dhale et al., 2000; Xu et al., 1999).

Mercerization. In order to impart luster, increase strength, and improve dye uptake, cotton fiber and fabric are mercerized in the gray state after bleaching. Essentially, mercerization is carried out by treating cotton material with a strong solution of sodium hydroxide (about 18–24%) and washing-off the caustic after 1 to 3 min, while holding the material under tension. Cotton is known to undergo a longitudinal shrinkage upon impregnation with this solution. This can be prevented by stretching it or holding it under tension. The material acquires the desired properties of luster, increased strength, dye uptake, and increased absorbency. The large concentrations of NaOH in the wash water can be recovered by membrane techniques. Use of $ZnCl_2$ as an alternative method leads to an increase in the weight of fabric and in dye uptake, and allows easy recovery of NaOH. Moreover, the process is ecologically friendly and does not require neutralization by acetic or formic acid (Karim et al., 2006).

Bleaching. Natural color matter in the yarn imparts a creamy appearance to the fabric. In order to obtain white yarn that facilitates producing pale and bright shades, it is necessary to decolorize the yarn by bleaching. Hypochlorite is one of the oldest industrial bleaching agents. The formation of highly toxic chlorinated organic by-products during the bleaching process is reduced by adsorbable organically bound halogen (AOX).

Over the last few years, hypochlorite is being replaced by other bleaching agents (Rott and Minke, 1999). An environmentally safe alternative to hypochlorite is peracetic acid. It decomposes to oxygen and acetic acid, which is completely biodegradable. One of the advantages of peracetic acid is higher brightness values with less fiber damage (Rott and Minke, 1999). Recently, a one-step preparatory process for desizing, scouring, and bleaching has helped to reduce the volume of water. The feasibility of a one-step process for desizing, scouring, bleaching, and mercerizing of cotton fabric followed by dyeing with direct dyes has been discussed by Slokar and Majcen (1997).

Cooper (1989) suggested an economical and pollution-free process for electrochemical mercerization (scouring) and bleaching of textiles. The process does not require conventional caustic soda, acids, and bleaching agents. The treatment is carried out in a low-voltage electrochemical cell. The base required for mercerization (scouring) is produced in the cathode chamber, while an equivalent amount of acid is produced in the anode chamber, which is used for neutralizing the fabric. Gas diffusion electrodes simultaneously generate hydrogen peroxide for bleaching. With a bipolar stack of electrodes, diffusion electrodes can be used as anode or cathode or both. The process does not produce hydrogen bubbles at the cathode, thereby avoiding hazards involving the gas (Lin and Peng, 1994).

An electrochemical treatment was developed for the treatment of cotton in aqueous solution containing sodium sulphate. In this technique, the current

density was controlled between two electrodes. At the cathode, water is reduced to hydrogen and base, while at the anode it is oxidized to oxygen and acid. Favorable results on mercerization (scouring) and electrochemical sanitation of unmercerized (grey) cotton have been reported (Naumczyk et al., 1996).

Neutralization. According to Bradbury et al. (2000), replacement of acetic acid by formic acid for neutralization of fabric after scouring, mercerizing, bleaching, and reduction processes is effective, economical, and environment-friendly. The procedure also allows a sufficient level of neutralization in a short period of time, needs low volumes of water, and results in low levels of BOD.

Dyeing. Treatment of fiber or fabric with chemical pigments to impart color is called dyeing. The color arises from chromophore and auxochrome groups in the dyes, which also cause pollution (Azymezyk et al., 2007). In the dyeing process, water is used to transfer dyes and in the form of steam to heat the treatment baths. Cotton, which is the world's most widely used fiber, is a substrate that requires a large amount of water for processing. For example, to dye 1 kg of cotton with reactive dyes, 0.6–0.8 kg of NaCl, 30–60 g of dyestuff, and 70–150 L of water are required (Chakraborty et al., 2005). More than 80,000 tonnes of reactive dyes are produced and consumed each year. Once the dyeing operation is over, the various treatment baths are drained, including the highly colored dye bath, which has high concentrations of salt and organic substances. The wastewater must be treated before reuse. Coagulation and membrane processes (nanofiltration or reverse osmosis) are among processes suggested for treatment of this water; however, these treatments are effective only with very dilute dye baths. Dye baths are generally heavily polluted. For example, wastewater produced by reactive dyeing contains hydrolyzed reactive dyes not fixed on the substrate (representing 20 to 30% of the reactive dyes applied on an average of 2 g/L). This residual amount is responsible for the coloration of the effluents, and cannot be recycled. Dyeing auxiliaries or organic substances are non-recyclable and contribute to the high BOD/COD of the effluents.

Membrane technologies are increasingly being used in the treatment of textile wastewater for the recovery of valuable components from the waste stream, as well as for reusing the aqueous stream. A number of studies deal with application of various pressure-driven membrane filtration processes in the treatment wastewater from the dyeing and finishing process (Chen et al., 2005).

Measures adopted for the abatement of pollution by different dyes are 1) use of low material-to-liquor ratios, 2) use of trisodiumcitrate (Fiebig et al., 1992), 3) replacement of reducing agent (sodium hydrosulphite) with a reducing sugar or electrochemical reduction (Maier et al., 2004), and 4) use of suitable dye-fixing agents to reduce water pollution loads.

Padma et al. (2006) first reported the concept of totally ecologically friendly mordents or natural mordents during dyeing with natural dyes. Deo and Desai (1999) were the first to point out that natural dye shades could be built-up by a multiple dip method that renders natural dyeing more economical. Dyeing of natural and synthetic fibers with natural dyes has been the subject of several studies. Development of ecologically friendly non-formaldehyde dye fixative agents for reactive dyes was recently reported (Bechtold et al., 2005; Sekar, 1995).

Printing. Printing is a branch of dyeing. It is generally defined as 'localized dyeing,' i.e. dyeing that is confirmed to a certain portion of the fabric that constitutes the design. It is really a form of dyeing in which the essential reactions involved are the same as those in dyeing. In dyeing, color is applied in the form of a solution, whereas in printing color is applied in the form of a thick paste of the dye. Table 3 shows the pollution loads for a printing and finishing operation (50 polyester/50 cotton). The fixation of the color in printing is brought about by a suitable after-treatment of the printed material (El-Molla and Schneider, 2006).

Table 3. Pollution loads for printing and finishing operations for 50% polyester/50% cotton blend fabric

Process	pH	Biological oxygen demand		Total dissolvable solids	
		per 1000 kg of product			
Printing					
Pigment (woven goods)	6–8	1.26	5.0	0.13	2.5
Pigment (knot goods)	6–8	1.26	5.0	0.13	2.5
Vat dye (woven goods)	10.0	21.5	86	25	34
Vat dye (knit goods)	10.0	21.5	86	25	35
Resin finishing (woven goods)	6–8	-	-	-	22
Resin finishing flat curing (woven goods)	6–8	6.32	25	12	17.3

or sizing bath can also promote microbial growth. An ideal anti-bacterial finish should 1) not support growth of bacteria or fungi on the cloth, 2) be effective over the lifetime of the treated sample, 3) be durable against wash and bleaching, 4) pose no risk of adverse dermal or systemic effects, 5) have no detrimental influence on fabric properties, such as yellowing, handle, and strength, 6) be compatible with colorants and other finishes, such as softeners and resins, and 7) have low environmental impact of heavy metals, formaldehyde, phenols, and organic halogens.

There are few anti-bacterial fibers. There are a number of antibacterial chemicals are available (Son et al., 2006; Singh et al., 2005; El-Tahlawya et al., 2005), but they are man-made. There are many natural plant products that are known to slow down bacterial growth. Anti-bacterial properties have been detected in chemicals extracted from the root, stem, leaves, flowers, fruits, and seeds of diverse species of plants (Kannan and Geethamalini, 2005). Sachan and Kapoor (2004) used natural herbal extracts for developing bacteria-resistant finishes for cotton fabric and wool felting. Years ago, wool was treated with chlorine, hypochlorite, and sulfuryl chloride. Bio-polishing using cellulose enzymes is an environmentally friendly method to improve soft handling of cellulose fibers with reduced piling, less fuzz, and improved drape (Thilagavathi et al., 2005).

EFFLUENT TREATMENTS

Dyes in wastewater can be eliminated by various methods. The wastewater from the dye house is generally multi-colored. The dye effluent disposed into the land and river water reduces the depth of penetration of sunlight into the water environment, which in turn decreases photosynthetic activity and dissolved oxygen (DO) (Table 4). The adverse effects can spell disaster for aquatic life and the soil. Figure 2 shows a flow diagram for treatment of cotton textiles, and the water and COD balance are depicted in Figure 3. Many dyes contain organic compounds with functional groups, such as carboxylic (–COOH), amine (–NH_2), and azo (–N=N–) groups, so treatment methods must be tailored to the chemistry of the dyes. Wastewaters resulting from dyeing cotton with reactive dyes are highly polluted and have high BOD/COD, coloration, and salt load. For example, this ratio for Drimaren HF (a cellulosic product from Clariant Chemicals, India) is constant and around 0.35 for each dyeing step (bleaching step BOD: 1850 mg/l; bleaching step COD: 5700 mg/l; neutralization step BOD: 290 mg/l; neutralization COD: 830 mg/l; dyeing step BOD: 500 mg/l; dyeing step COD: 1440 mg/l; soaping step BOD: 310 mg/l; soaping step COD: 960 mg/l). Because aquatic organisms need light in order to develop, any deficit in the light reaching the aquatic life due to water coloration results in an imbalance in the ecosystem. Moreover, river water meant for human consumption that is colored will increase treatment costs. Obviously, when legal limits are specified (although not in all countries), they are justified.

Table 4. Composition of cotton textile mill waste

Characteristics	Values
pH	9.8–11.8
Total alkalinity	17–22 mg/l as $CaCO_3$
BOD	760–900 mg/l
COD	1400–1700 mg/l
Total solids	6000–7000 mg/l
Total chromium	10–13 mg/l

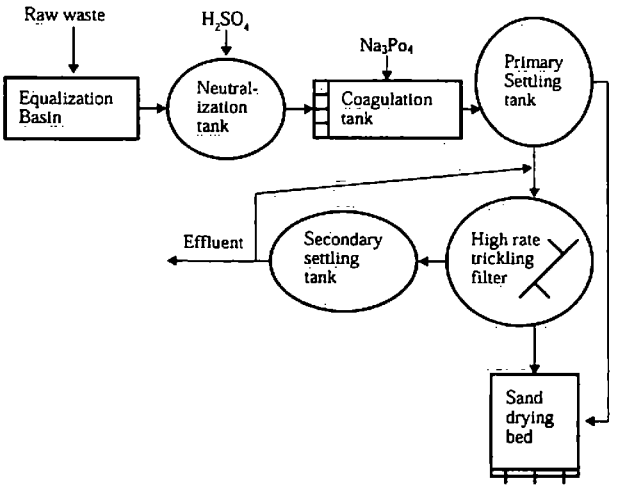

Figure 2. A flow diagram for treatment of cotton textile mill waste.

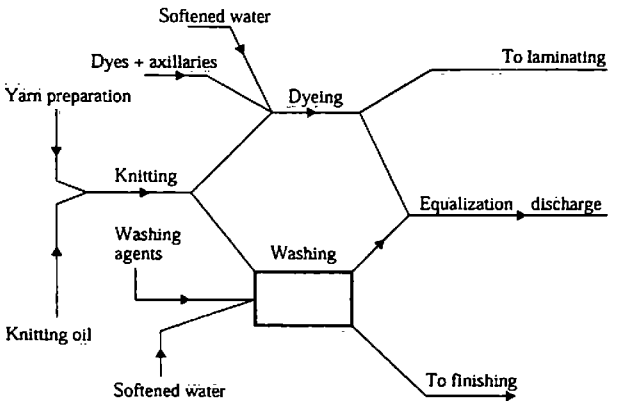

Figure 3. Activites involving water in textile processing.

Marrot and Roche (2002) have given more than 100 references in a bibliographical review of textile wastewater treatment. Treatment operation and decision structure are shown in Figure 4. The physical methods include precipitation (coagulation, flocculation, sedimentation) (Lin and Peng, 1996; Solozhenko et al., 1995; Lin and Liu, 1994; McKay et al., 1987), adsorption (on activated carbon, biological sludges) (Pala and Tokat, 2002), filtration, or reverse osmosis membrane processes (Ghayeni et al., 1998; Treffry-Goatley et al., 1983, Tinghui et al., 1983).

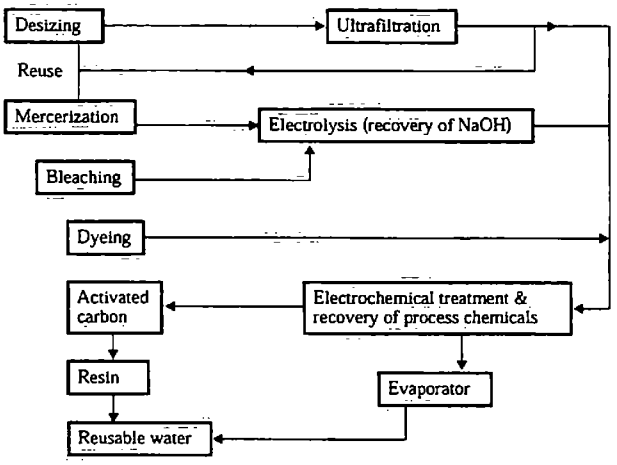

Figure 4. Electrochemical treatment and recovery of chemicals from the textile effluent.

Azo dyes constitute the largest and the most important class of commercial dyes used in textile, printing, tannery, paper manufacture, and photography industries. These dyes are inevitably discharged in industrial effluents. Azo dyes have a serious environmental impact, because their precursors and degradation products (such as aromatic amines) are highly carcinogenic (Szymczyk et al., 2007). Numerous biodegradability studies on dyes have shown that azo dyes are not prone to biodegradation under aerobic conditions (O'Neill et al., 2000; Basibuyuk and Forster, 1997). These dyes are either adsorbed or trapped in bioflocs, which affects the ecosystem of streams, so they need to be removed from wastewater before discharge. Removal of dyes from wastewater can be effected by chemical coagulation, air flotation, and adsorption methods (Malik and Sanyal, 2004; Seshadri et al., 1994). These traditional methods mainly transfer the contaminants from one phase to another phase without effecting any reduction in toxicity. Therefore, advance oxidation is a potential alternative to degrade azo dyes into harmless species.

Biological treatments. Biological treatments reproduce, artificially or otherwise, the phenomena of self-purification that exists in nature. Self-purification is the process by which an aquatic environment achieves the re-establishment of its original quality after pollution. Biological treatments are different depending on the presence or absence of oxygen (Bl'anquez et al., 2006). 'Activated sludge' is a common process by which rates of elimination by oxidizable substances of the order of 90% can be realized (Pala and Tokat, 2002). Because of the low biodegradability of most of the dyes and chemicals used in the textile industry, their biological treatment by the activated sludge process does not always achieve great success. It is remarkable that most of these dyes resist aerobic biological treatment, so adsorbents, such as bentonite clay or activated carbon, are added to biological treatment systems in order to eliminate non-biodegradable or microorganism-toxic organic substances produced by the textile industry (Pala and Tokat, 2002; Marquez and Costa, 1996; Speccia and Gianetto, 1984).

Oxidative chemical treatment, or sometimes the use of organic flocculants (Pala and Tokat, 2002), is often resorted to after the biological treatment (Ledakowic et al., 2001). These methods, which only release effluents into the environment per legal requirements, are expensive (around €2.5/kg for polyamide coagulant: a factor 10 compared with mineral coagulants).

Biological aerated filters (BAF) involve the growth of an organism on media that are held stationary during normal operation and exposed to aeration. In recent years, several BAF-based technologies have been developed to treat wastewater. Effluents from textile industry are among wastewaters that are hard to treat satisfactorily, because their compositions are highly variable. The strong color is most striking characteristic of textile wastewater. If unchecked, colored wastewater can cause a significantly negative impact on the aquatic environment primarily arising from increased turbidity and pollutant concentrations.

Coagulation–flocculation treatments. Coagulation–flocculation treatments are generally used to eliminate organic substances, but the chemicals normally used in this process have no effect on the elimination of soluble dyestuffs. Although this process effectively eliminates insoluble dyes (Gaehr et al., 1994), its value is doubtful because of the cost

of treating the sludge and the increasing number of restrictions concerning the disposal of sludge.

Adsorption on powdered activated carbon. The adsorption on activated carbon without pretreatment is impossible because the suspended solids rapidly clog the filter (Matsui et al., 2005). This procedure is therefore only feasible in combination with flocculation–decantation treatment or a biological treatment. The combination permits a reduction of suspended solids and organic substances, as well as a slight reduction in the color (Rozzi et al., 1999), but the cost of activated carbon is high.

Electrochemical processes. Electrochemical techniques for the treatment of dye waste are more efficient than other treatments (Naumczyk et al., 1996). Electrochemical technology has been applied to effectively remove acids, as well as dispersed and metal complex dyes. The removal of dyes from aqueous solutions results from adsorption and degradation of the dye-stuff following interaction with iron electrodes. If metal complex dyes are present, dye solubility and charge are important factors that determine the successful removal of heavy metals. In order to maximize dye insolubility, pH control is crucial (Chakarborty et al., 2003; Vedavyasam, 2000; Nowak et al., 1996; Calabro et al., 1990). Conventional methods involve generation of secondary pollutants (sludge), but sludge formation is absent in the electrochemical method (Ganesh et al., 1994). Electrochemical treatment and recovery of chemicals from the effluent are shown in Fig. 4. In this process, the recovery of metals or chemicals is easily carried out. At the same time, the following environmental advantages are realized; emission of gases, solid waste, and liquid effluent are minimized.

The use of an electrolytic cell in which the dye house wastewater is recirculated has been described (Lin and Chen, 1997; Lin and Peng, 1994). The advantage of this process seems to be its capacity for adaptation to different volumes and pollution loads. Its main disadvantage is that it generates iron hydroxide sludge (from the iron electrodes in the cell), which limits its use. Electro-coagulation has been successfully used to treat textile industrial wastewaters. The goal is to form flocs of metal hydroxides within the effluent to be cleaned by electro-dissolution of soluble anodes. Three main processes occur during electro-coagulation; electrolytic reactions at the electrodes; formation of coagulants in the aqueous phase and adsorption of soluble or colloidal pollutants on coagulants; and removal by sedimentation and floatation. Electro-coagulation is an efficient process, even at high pH, for the removal of color and total organic carbon. The efficiency of the process is strongly influenced by the current density and duration of the reaction. Under optimal conditions, decolorization yields between 90 and 95%, and COD removal between 30 and 36% can be achieved.

Ozone treatment. Widely used in water treatment, ozone (either singly or in combinations, such as O_3-UV or O_3-H_2O_2) is now used in the treatment of industrial effluents (Langlais et al., 2001). Ozone especially attacks the double bonds that bestow color. For this reason, decolorization of wastewater by ozone alone does not lead to a significant reduction in COD (Coste et al., 1996; Adams et al., 1995). Moreover, installation of ozonation plants can entail additional costs (Scott and Ollis, 1995).

MEMBRANE PROCESSES

Increasing cost of water and its profligate consumption necessitate a treatment process that is integrated with in-plant water circuits rather than as a subsequent treatment (Machenbach, 1998). From this standpoint, membrane filtration offers potential applications. Processes using membranes provide very interesting possibilities for the separation of hydrolyzed dye-stuffs and dyeing auxiliaries that simultaneously reduce coloration and BOD/COD of the wastewater. The choice of the membrane process, whether it is reverse osmosis, nanofiltration, ultrafiltration or microfiltration, must be guided by the quality of the final product.

Reverse osmosis. Reverse osmosis membranes have a retention rate of 90% or more for most types of ionic compounds and produce a high quality of permeate (Ghayeni et al., 1998; Treffry-Goatley et al., 1983; Tinghui et al., 1983). Decoloration and elimination of chemical auxiliaries in dye house wastewater can be carried out in a single step by reverse osmosis. Reverse osmosis permits the removal of all mineral salts, hydrolyzed reactive dyes, and chemical auxiliaries. It must be noted that higher the concentration of dissolved salt, the more important the osmotic pressure becomes; therefore, the greater the energy required for the separation process.

Nanofiltration. Nanofiltration has been applied for the treatment of colored effluents from the textile industry. A combination of adsorption and nanofiltration can be adopted for the treatment of textile dye effluents. The adsorption step precedes

nanofiltration, because this sequence decreases concentration polarization during the filtration process, which increases the process output (Chakraborty et al., 2003). Nanofiltration membranes retain low-molecular weight organic compounds, divalent ions, large monovalent ions, hydrolyzed reactive dyes, and dyeing auxiliaries. Harmful effects of high concentrations of dye and salts in dye house effluents have frequently been reported (Tang and Chen, 2002; Koyuncu, 2002; Bruggen et al., 2001; Jiraratananon et al., 2000; Xu et al., 1999; Erswell et al., 1988). In most published studies concerning dye house effluents, the concentration of mineral salts does not exceed 20 g/L, and the concentration of dyestuff does not exceed 1.5 g/L (Tang and Chen, 2002). Generally, the effluents are reconstituted with only one dye (Tang and Chen, 2002; Koyuncu, 2002; Akbari et al., 2002), and the volume studied is also low (Akbari et al., 2002). The treatment of dyeing wastewater by nanofiltration represents one of the rare applications possible for the treatment of solutions with highly concentrated and complex solutions (Rossignol et al., 2000; Freger et al., 2000; Knauf et al., 1998; Peuchot, 1997; Kelly and Kelly, 1995).

A major problem is the accumulation of dissolved solids, which makes discharging the treated effluents into water streams impossible. Various research groups have tried to develop economically feasible technologies for effective treatment of dye effluents (Karim et al., 2006; Cairne et al., 2004; Rott and Mike, 1999). Nanofiltration treatment as an alternative has been found to be fairly satisfactory. The technique is also favorable in terms of environmental regulation.

Ultrafiltration. Ultrafiltration enables elimination of macromolecules and particles, but the elimination of polluting substances, such as dyes, is never complete (it is only between 31% and 76%) (Watters et al., 1991). Even in the best of cases, the quality of the treated wastewater does not permit its reuse for sensitive processes, such as dyeing of textile. Rott and Minke (1999) emphasize that 40% of the water treated by ultrafiltration can be recycled to feed processes termed "minor" in the textile industry (rinsing, washing) in which salinity is not a problem. Ultrafiltration can only be used as a pretreatment for reverse osmosis (Ciardelli and Ranieri, 2001) or in combination with a biological reactor (Mignani et al., 1999).

Microfiltration. Microfiltration is suitable for treating dye baths containing pigment dyes (Al-Malack and Anderson, 1997), as well as for subsequent rinsing baths. The chemicals used in dye bath, which are not filtered by microfiltration, will remain in the bath. Microfiltration can also be used as a pretreatment for nanofiltration or reverse osmosis (Ghayeni et al., 1998).

CONCLUSIONS

Waste minimization is of great importance in decreasing pollution load and production costs. This review has shown that various methods can be applied to treat cotton textile effluents and to minimize pollution load. Traditional technologies to treat textile wastewater include various combinations of biological, physical, and chemical methods, but these methods require high capital and operating costs. Technologies based on membrane systems are among the best alternative methods that can be adopted for large-scale ecologically friendly treatment processes. A combination methods involving adsorption followed by nanofiltration has also been advocated, although a major drawback in direct nanofiltration is a substantial reduction in pollutants, which causes permeation through flux.

It appears that an ideal treatment process for satisfactory recycling and reuse of textile effluent water should involve the following steps. Initially, refractory organic compounds and dyes may be electrochemically oxidized to biodegradable constituents before the wastewater is subjected to biological treatment under aerobic conditions. Color and odor removal may be accomplished by a second electro-oxidation process. Microbial life, if any, may be destroyed by a photochemical treatment. The treated water at this stage may be used for rinsing and washing purposes; however, an ion-exchange step may be introduced if the water is desired to be used for industrial processing.

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Appendix

Z

Environment Canada
Quebec Region

Environnement Canada
Région du Québec

TOWARDS BETTER MANAGEMENT OF TEXTILE MILL EFFLUENTS

Fact Sheet
August 2001

A five-year study has confirmed that the wastewater discharges from wet processing textile mills are harmful to the environment. Environment Canada will therefore require these mills to reduce the toxicity of their effluents. A regulation or other risk management instrument will be proposed under the *Canadian Environmental Protection Act, 1999* (CEPA) no later than June 2003.

Between 1996 and 1999, Canadian **textile mill effluents** (TMEs) were subject to a risk assessment under the *Canadian Environmental Protection Act* to determine if TMEs were harmful to the environment.

The TME risk assessment considered only the wastewater discharges from **wet processing** operations. Effluents resulting from dry processing or from the manufacturing of synthetic fibres using chemical processes were not considered, nor were the effects of air emissions or solid waste.

Definition of "Wet Processing"
"Wet processing" refers to operations that require the use of a large quantity of water. These include textile finishing processes such as scouring, neutralizing, desizing, mercerizing, carbonizing, fulling, bleaching, dyeing and printing.

A family of substances known as **nonylphenol and its ethoxylates** (NPEs), which are widely used in the textile industry and found in TMEs, were the focus of a separate and distinct risk assessment.

THE LEGAL CONTEXT

The ***Canadian Environmental Protection Act, 1999*** (CEPA) is Canada's main legislative tool for the assessment and management of toxic substances. At present, there are no regulations under the Act for controlling TMEs and NPEs.

TMEs and NPEs figure on the second Priority Substances List of CEPA. This list identifies 25 substances — including chemicals, mixtures and effluents — that have all undergone priority assessment to determine whether or not they are "toxic" in accordance with Section 64 of CEPA.

Section 64 stipulates that:
a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that:

a) have or may have an immediate or long-term harmful effect on the environment or on its biological diversity;
b) constitute or may constitute a danger to the environment on which life depends;
c) constitute or may constitute a danger in Canada to human life or health.

When, after a priority assessment, a substance is declared toxic under CEPA, the federal government has the legal obligation to institute the appropriate regulations or other risk management instruments to reduce or eliminate the substance's harmful effects on human health and on the environment.

Risk management instruments
For each toxic substance, CEPA (paragraph 77 (6)c)) requires that a regulation or instrument respecting preventive or control actions in relation to the substance be published in the *Canada Gazette*. Examples of risk management instruments include : regulations, pollution prevention plan, environmental emergency plans, guidelines and codes of practice, etc.

WHAT ARE TEXTILE MILL EFFLUENTS?

TMEs are complex chemical mixtures whose composition varies over time and from one mill to another. Untreated TMEs may contain high concentrations of suspended solids, metals, NPEs and other organic substances. Untreated TMEs can also exhibit extreme pH variations and elevated temperatures.

Many chemical products such as detergents, surfactants, plasticizers, mineral oils, dyes, dye carriers and auxiliary products are used in textile mill operations. A large proportion of these products does not figure in the finished fabric, but ends up instead in the wastewater in the form of organic pollutants. Also discarded to the wastewater are NPEs, which are found in detergents, emulsifiers, wetting and dispersing agents.

Toxic metals such as arsenic, cadmium, chromium, mercury, zinc, and lead, among others, can also be found in untreated TMEs. Dyes and pigments are thought to be the main source of metals in TMEs.

In most cases, a well designed and operated secondary or tertiary treatment plant significantly reduces the organic pollutants generated by textile mills. Metals and other inorganic pollutants, however, are not completely eliminated by a secondary or tertiary treatment.

In 1999, 145 wet processing textile mills were operating in Canada. Almost all of these mills (96%) discharged their effluents into municipal wastewater collection systems and 99% received some form of wastewater treatment: 28% received primary treatment, 61% underwent secondary treatment, and 9% tertiary treatment. One percent (1%) of TMEs received no treatment whatsoever (the total percentage does not add up to 100% because the figures were rounded off).

Textile mills per province and type of wastewater treatment

Province and type of treatment	Untreated	Primary	Secondary	Tertiary	Total
British-Columbia	0	2	0	0	2 (1%)
Ontario	0	2	40	8	50 (34%)
Quebec	2	36	41	5	84 (58%)
New-Brunswick	0	1	2	0	3 (2%)
Prince Edward Island	0	0	1	0	1 (1%)
Nova Scotia	1	1	3	0	5 (3%)

-**Untreated**: raw wastewater discharged by a facility (may be subject to primary treatment such as screening, desilting, flow regulation or neutralizing pH levels).

-**Primary treatment**: consists of eliminating suspended or settled pollutants from wastewater. This process includes sedimentation, aeration and filtration.

-**Secondary treatment**: usually consists of a biological treatment and includes processes such as activated sludge, bacterial digestion and various types of basins.

-**Tertiary treatment:** consists of various forms of treatment such as activated carbon absorption, chemical oxidization, air stripping, ion exchange, polymer absorption, inverse osmosis, etc.

RISK ASSESSMENTS

The objective of the TME and NPE risk assessment process was to determine how these substances enter the environment and if they affect the living organisms exposed thereto. To this end, Environment Canada examined existing studies and surveyed the textile industry. The Department also conducted toxicity analyses of treated and untreated TMEs. The impacts of TME discharges on aquatic life in rivers was studied by means of multitrophic bioassays (on fish, microcrustaceans, bacteria, algae). In addition, samples of treated and untreated TMEs were collected to determine the concentrations of NPEs therein.

The biological assays evaluated the acute toxicity (short-term effects such as death of test organisms) and the chronic toxicity (long-term effects on growth and reproduction) of the effluents on aquatic organisms.

Textile Mill Effluents

Because TMEs are composed of several hundred different chemicals, it would have been virtually impossible to identify each one of these substances and determine its respective contribution to the overall toxicity of TMEs. The sheer number of mills in Canada further complicated the task. The TME risk assessment therefore focused on the toxicity of *whole effluents* rather than on the individual chemical constituents of TMEs. The risk assessment process also took account of the various levels of wastewater treatment applied to TMEs.

According to a conservative risk assessment, there is no evidence that TME discharges from well designed and operated secondary or tertiary wastewater treatment plants cause environmental harm.

Nonylphenol and its Ethoxylates (NPEs)

NPEs primarily enter the environment via effluents and sludge from industrial and municipal wastewater treatment plants. TMEs account for a significant portion of the NPEs released by wastewater treatment plants.

The NPE risk assessment revealed unsafe concentrations of NPEs in untreated and primary-treated industrial effluents, including TMEs. These concentrations exceeded levels above which chronic effects are observed in aquatic life.

The concentrations of NPEs found in secondary- or tertiary-treated effluents are usually low because the NPEs degrade into by-products. Some of these by-products, such as the lower ethoxylated products or nonylphenol itself, however, are more persistent and more toxic than higher ethoxylated NPEs.

Risk Assessment Conclusions

Data from the TME risk assessment indicates that TMEs meet the CEPA definition of toxicity because they "enter the environment in a quantity or a concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or on its biological diversity." Consequently, the Ministers of the Environment and of Health recommended that TMEs be declared toxic under Section 64*a)* of CEPA on June 23, 2001. NPEs were also declared toxic under CEPA on the same day.

RISK MANAGEMENT

Once a substance has undergone priority assessment and been declared toxic, CEPA requires the Minister of the Environment to propose a regulation or other risk management instrument for this substance within 24 months. The Minister then has 18 months to finalize the proposed management instrument.

Before choosing a risk management instrument, it is advised that Environment Canada first establish environmental goals for each TME and NPE. These goals will be set in consideration of the risk assessment results, the best available technologies and the *Canadian Environmental Quality Guidelines*.

To this end, Environment Canada has mandated experts to review the best available technologies that are economically feasible in the textile industry. This study includes pollution prevention technologies and practices (chemical substitution, wastewater reuse, process modifications, improved maintenance, etc.) as well as pollution control technologies (end-of-pipe wastewater treatment). The experts will then determine the impact of the application of the technologies on the quality of the effluent.

Canadian Environmental Quality Guidelines
The *Canadian Environmental Quality Guidelines* are recommended limits for a variety of substances, which, if exceeded, may impair the health of Canadian ecosystems and their beneficial uses. The Guidelines are science-based and do not take account into socio-economic factors. They provide targets towards which environmental control measures and pollution prevention efforts can be directed.

At the same time, the *Canadian Environmental Quality Guidelines* for water will be used to evaluate the desired TME quality needed to protect the environment in the long term. Unlike the best-available-technology study, this evaluation does not take into account socio-economic considerations.

Following this analysis, Environment Canada will propose environmental goals for TMEs and NPEs by balancing environmental concerns with socio-economic considerations.

When the environmental goals for TMEs and NPEs are set, Environment Canada will be able to determine which risk management instrument, or combination of instruments, is best suited to the achievement of these goals. Each relevant management instrument will be evaluated based on various factors such as the instrument's effectiveness, socio-economic impacts, implementation costs, and public acceptability.

Environment Canada will consult with the provincial, territorial and aboriginal governments, industry, non-governmental organizations and other interested stakeholders about the environmental objectives and the most promising management instruments.

The selected risk management instruments will then be developed and published in the *Canada Gazette* no later than June 2003. Stakeholders will have another opportunity to comment on the proposed instruments. Taking these comments into consideration, the final instrument will be published in the *Canada Gazette* and implemented no later than December 2004.

Environment Canada strongly encourages all interested parties to participate in the development of the risk management instruments. To obtain more information, please contact Environment Canada's Quebec Regional Office, which is responsible for developing the risk management process for TMEs and NPEs.

For further information

The Canadian Environmental Protection Act, 1999
www.ec.gc.ca/cepa/english/index.html

Textile Mill Effluents Risk Assessment
www.ec.gc.ca/cceb1/eng/final/tme_e.html

Backgrounder : Textile Mill Effluents
http://www.ec.gc.ca/CEPARegistry/subs_list/TME_E.pdf

Nonylphenol and its Ethoxylates Risk Assessment
www.ec.gc.ca/cceb1/eng/final/npe_e.html

Backgrounder : Nonylphenol ethoxylates (NPEs)
http://www.ec.gc.ca/CEPARegistry/subs_list/NPE_E.pdf

Canadian Water Quality Guidelines
http://www.ec.gc.ca/ceqg-rcqe/water.htm

Environment Canada
Environmental Protection Branch - Quebec
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Canada H2Y 2E7
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1-800-463-4311
E-mail : quebec.dpe@ec.gc.ca

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Canada

APPENDIX AA

;AD080090889 MILLIKEN & CO HILLSIDE PLANT

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Small Quantity Generator; State:

Transfer Facility:	Unknown
Other Hazardous Waste Generator Activities	
Importer Activity:	Unknown
Mixed Waste Generator:	Unknown
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No
Exempt Boiler and/or Industrial Furnace	
Small Quantity Onsite Burner Exemption:	Unknown
Smelting, melting, Refining Furnace Exemption:	Unknown

Used Oil Activities

Used Oil Transporter Activity		Off-Specification Used Oil Burner:	No
Transporter:	No	Used Oil Fuel Marketer Activity	
Transfer Facility:	No	Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Used Oil Processor and/or Re-refiner Activity			
Processor:	No	Marketer who first claims the used oil meets the specifications:	No
Refiner:	No		
Underground Injection Control:	No	Destination Facility for Universal Waste:	

*** End of Report ***

GAD080090889 MILLIKEN & CO HILLSIDE PLANT

EPA Region 04 **Extract Flag:** Y **Facility Identifier:** **County:** TROUP

Universes

Generator: SQG Transporter: N Active: Y
Operating TSDF: ---- IC In Place: N EI Indicator (HE / GW): N / N

Activity Location: GA Source Type: Notification Seq. Number: 2 Receive Date: 02 MAR 2005

Other/Previous Site Name: MILLIKEN & CO HILLSIDE PLANT

Location Address: BROWNWOOD AVENUE
LAGRANGE, GA 30240

Mailing Address: PO BOX 2996
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information RUSS BETHEA (706) 880-5567
PO BOX 2996
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
OWNERNAME
From: 01/01/0001 To:
OWNERSTREET
OWNERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Operator (current)
OPERNAME
From: 01/01/0001 To:
OPERSTREET
OPERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Geometric Type Code:
Horizontal Accuracy Measure:
Horizontal Collection Method:
Horizontal Reference Datum:
Reference Point Code:
Source Map Scale Numbers: 0

Land Type: Not Indian/Unkno Non Notifier: No Commercial Availability: Unknown Tsd Date:
Accessibility: No. Employees: 0 State District: SDW

Notes: 2/21/05 MAIL OUT.

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Small Quantity Generator; State:

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity
Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity
Processor: No
Refiner: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity
Marketer who directs shipment off-specification used oil to off-specification used oil burner: No
Marketer who first claims the used oil meets the specifications: No

Underground Injection Control: No
Destination Facility for Universal Waste: No

Activity Location: GA Source Type: Notification Seq. Number: 1 Receive Date: 25 MAR 1992

Other/Previous Site Name: MILLIKEN & CO HILLSIDE PLANT

Location Address: BROWNWOOD AVENUE
LAGRANGE, GA 30240

Mailing Address: PO BOX 2996
LAGRANGE, GA 30241

Contact Person For Source Information ROBBIE MOMON (404) 883-5158
PO BOX 2996
LAGRANGE, GA 30241

Owner (current)
OWNERNAME
From: To:
OWNERSTREET
OWNERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Operator (current)
OPERNAME
From: To:
OPERSTREET
OPERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Land Type: Bad code - Non Notifier: No Commercial Availability: Other - U Tsd Date:
Accessibility: No. Employees: State District: BB

List of Hazardous Waste Code Descriptions

Please run the lookup table report for LU_WASTE_CODES for description of federal and state waste codes in this report.

List of Handler Universe Abbreviations

Generator	Indicates that the facility is a Large Quantity Generator (LQG), Small Quantity Generator (SQG), Conditionally Exempt Small Quantity Generator (CEG), or not a generator (N).
Transporter	Indicates that the facility Transports waste subject to RCRA regulations. ('Y' indicates that the facility is in this universe).
Operating TSDF	Indicates that the facility is a Treatment, Storage or Disposal facility subject to any type of enforcement. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
IC in Place	Indicates that the facility has Institutional Controls in place. ('Y' indicates that the facility is in this universe).
EI Indicator (HE/GW)	Indicates that the facility has controls in place for Environmental Indicators. HE - Human Exposures ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist) GW - Groundwater Release ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist)

RCRA Site Detail

Report run on: November 15, 2007 - 4:45 PM

Version 3.0

User Selection Criteria

Handler EPA ID: GAD080090889

Activity Location: GEORGIA

History: All records

WAR Cycles: Show all

Results

Data meeting the criteria you selected follows.
Total Pages: 4

Report Description

The RCRA Site Detail report provides "all available details" from the handler module and summarized information from the waste activity monitoring module for one RCRA site. The report integrates National Biennial RCRA Hazardous Waste Report data with Site Identification data.

Details reported about the RCRA site include basic handler module information; the standard suite of universes; information about each source record received for the facility, including basic information, location and mailing address, source record and permit contact person (including historical records), list of NAICS codes, complete list of regulated waste activities; and summarized National Biennial RCRA Hazardous Waste Report information by reporting cycle year, including quantity totals (generated, managed, shipped, received), and top ten GM forms by quantity generated. Top ten GM form list shows reported waste description, quantities, onsite and offsite system types, and EPA and State waste codes.

Information listed for the RCRA site can be limited by activity location, latest historical information, and most recent BR cycle.

Data is sorted by Activity Location, most recent Received Date, and highest sequence number, with the exception that the activity location matching the site's location state is sorted to the top.

Report Information

Name:	sitedetail.rdf
Developed by:	EPA Headquarters, Office of Solid Waste
Deployed:	November 2002
Last Revised:	June 2007
Contact:	rcrainfo.help@epa.gov
Tables Used:	hbasic, hreport_univ3, hprevious_id, hhandler2, lu_country, howner_operator2, hnaics, lu_naics, hstate_activity, hother_permit2, huniversal_waste, lu_universal_waste, hwaste_code, bgm_basic, bgm_onsite_treatment, bgm_offsite_shipment, bwr_basic, bwr_waste_code, lu_management_method, gpra_ca, aevent, aln_area_event, aarea, lu_state, hid_groups
Libraries:	decodes.pll

NOTE: Some data is suppressed if it is null or blank. See documentation in RCRAInfo Help for details.

RCRA Site Detail

Report run on: November 15, 2007 - 4:46 PM

AD000821835 MILLIKEN VALWAY

EPA Region 04 **Extract Flag:** Y **Facility Identifier:** **County:** TROUP

Universes

Generator: SQG Transporter: N Active: Y
Operating TSDF: ----- IC In Place: N EI Indicator (HE / GW): N / N

Activity Location: GA Source Type: Notification Seq. Number: 3 Receive Date: 14 JUN 2005

Other/Previous Site Name: MILLIKEN VALWAY

Location Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240

Mailing Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information MARK T. MOE
(706) 880-3653 ext. 3539
1300 FOURTH AVENUE
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
MILLIKEN & COMPANY
From: 04/09/1968 To:
, Type: Private
Phone:

Operator (current)
MILLIKEN & COMPANY
From: 04/09/1968 To:
, Type: Private
Phone:

Operator (current)
OPERNAME
From: 01/01/0001 To:
OPERSTREET
OPERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Geometric Type Code: Horizontal Collection Method: Reference Point Code:
Horizontal Accuracy Measure: Horizontal Reference Datum: Source Map Scale Numbers: 0

Land Type: Private Non Notifier: No Commercial Availability: Unknown Tsd Date:
Accessibility: No. Employees: 0 State District: BB

SIC Codes:
313111 Yarn Spinning Mills
313311 Broadwoven Fabric Finishing Mills
31332 Fabric Coating Mills

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Small Quantity Generator; State:

Transfer Facility: No

Other Hazardous Waste Generator Activities
Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace
Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity
Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity
Processor: No
Refiner: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity
Marketer who directs shipment off-specification used oil to off-specification used oil burner: No
Marketer who first claims the used oil meets the specifications: No

Underground Injection Control: No
Destination Facility for Universal Waste: No

Description of Hazardous Wastes (as reported on Site Identification Form)
EPA Waste Codes: D001, F003, F005, U007, U188, U220

Activity Location: GA Source Type: Notification Seq. Number: 2 Receive Date: 18 JUN 2003

Other/Previous Site Name: MILLIKEN VALWAY

Location Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240

Mailing Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240
UNITED STATES

Contact Person Source Information ROCHELLE F. BRADFORD
(706) 880-3539 ext. 3539
1300 FOURTH AVENUE
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
MILLIKEN & COMPANY
From: 04/09/1968 To:
, Type: Private
Phone:

GAD000821835 MILLIKEN VALWAY

Continued...

Operator (current)
MILLIKEN & COMPANY
From: 04/09/1968 To:
Type: Private
Phone:

Operator (current)
OPERNAME
From: 01/01/0001 To:
OPERSTREET
OPERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Geometric Type Code:
Horizontal Accuracy Measure:
Horizontal Collection Method:
Horizontal Reference Datum:
Reference Point Code:
Source Map Scale Numbers: 0

Land Type: Private
Non Notifier: No
Commercial Availability: Unknown
Tsd Date:
Accessibility:
No. Employees: 0
State District: BB

NAICS Codes:
313111 Yarn Spinning Mills
313311 Broadwoven Fabric Finishing Mills
31332 Fabric Coating Mills

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Conditionally Exempt SQG; State:

Transfer Facility: No

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity
Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity
Processor: No
Refiner: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity
Marketer who directs shipment off-specification used oil to off-specification used oil burner: No
Marketer who first claims the used oil meets the specifications:

Underground Injection Control: No
Destination Facility for Universal Waste: No

Activity Location: GA Source Type: Notification Seq. Number: 1 Receive Date: 29 JUN 1998

Other/Previous Site Name: MILLIKEN & CO VALWAY PLANT

Location Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240

Mailing Address: 1300 FOURTH AVENUE
LAGRANGE, GA 30240

Contact Person For Source Information
MICHAEL CAMERON
(706) 880-3539
1300 FOURTH AVENUE
LAGRANGE, GA 30240

Owner (current)
MILLIKEN & COMPANY
From: To:
920 MILLIKEN ROAD
SPARTANBURG, SC 29304
Type: Private
Phone: (864) 503-1569

Operator (current)
OPERNAME
From: To:
OPERSTREET
OPERCITY, WY 99999
Type: Private
Phone: (404) 555-1212

Land Type: Private
Non Notifier: No
Commercial Availability: Other - U
Tsd Date:
Accessibility:
No. Employees:
State District: BB

NAICS Codes: 313311 Broadwoven Fabric Finishing Mills

AD000821835 MILLIKEN VALWAY

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Conditionally Exempt SQG; State:

Transfer Facility:	Unknown
Other Hazardous Waste Generator Activities	
Importer Activity:	Unknown
Mixed Waste Generator:	Unknown
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No
Exempt Boiler and/or Industrial Furnace	
Small Quantity Onsite Burner Exemption:	Unknown
Smelting, melting, Refining Furnace Exemption:	Unknown

Used Oil Activities

Used Oil Transporter Activity		Off-Specification Used Oil Burner:	No
Transporter:	No	Used Oil Fuel Marketer Activity	
Transfer Facility:	No	Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Used Oil Processor and/or Re-refiner Activity			
Processor:	No	Marketer who first claims the used oil meets the specifications:	No
Refiner:	No		
Underground Injection Control:	No	Destination Facility for Universal Waste:	

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D008

*** End of Report ***

GAD981275993 MILLIKEN HILLSIDE COATING

EPA Region 04 **Extract Flag:** Y **Facility Identifier:** **County:** TROUP

Universes

Generator: LQG Transporter: N Active: Y
Operating TSDF: ----- IC In Place: N EI Indicator (HE / GW): N / N

Activity Location: GA Source Type: Biennial Report Seq. Number: 4 Receive Date: 28 FEB 2006 Report Cycle: 2005

Other/Previous Site Name: MILLIKEN HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 FOURTH AVE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information
MARK T. MOE
(706) 880-3653
MARK.MOE@MILLIKEN.COM
UNITED STATES

Owner (current)
MILLIKEN & COMPANY
From: 03/01/1990 To:
1300 FOURTH AVE
LAGRANGE, GA 30240
LAGRANGE
Type: Private
Phone:

Operator (current)
MILLIKEN & COMPANY
From: 03/01/1990 To:
Type: Private
Phone:

Land Type: Private Non Notifier: No Commercial Availability: Unknown Tsd Date:
Accessibility: No. Employees: State District:

NAICS Codes:
31311 Fiber, Yarn, and Thread Mills
31331 Textile and Fabric Finishing Mills
31332 Fabric Coating Mills

gulated Waste Activities

ardous Waste Generator Status - Federal: Large Quantity Generator; State: GA-F FEDERALLY DEFINED GENERATOR

Transfer Facility:

Other Hazardous Waste Generator Activities
Importer Activity: No
Mixed Waste Generator: No

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace
Small Quantity Onsite Burner Exemption: No
Smelting, melting, Refining Furnace Exemption: No

Used Oil Activities

Used Oil Transporter Activity
Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity
Processor: No
Refiner: No

Underground Injection Control: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity
Marketer who directs shipment off-specification used oil to off-specification used oil burner: No
Marketer who first claims the used oil meets the specifications: No

Destination Facility for Universal Waste: No

Universal Waste Activities:

Description	Generated	Accumulated/ Managed
Batteries	N	N
Lamps	N	N
Pesticides	N	N
Mercury containing equipment	N	N

Description of Hazardous Wastes (as reported on Site Identification Form)
EPA Waste Codes: D001, F003, F005, U220

Biennial Report Information

Total Quantity Reported (Tons): Generated: 87 Managed: 0 Shipped: 87 Received: 0

Top 10 GM Forms Summary by Largest Quantity of Hazardous Waste Generated (All quantities are in tons)

Generated	Managed	Onsite Management Methods	Shipped	Offsite Management Methods

Activity Location: GA Source Type: Notification Seq. Number: 5 Receive Date: 14 JUN 2005

Other/Previous Site Name: MILLIKEN HILLSIDE COATING

GAD981275993 MILLIKEN HILLSIDE COATING

Continued...

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information MARK T. MOE
(706) 880-3653 ext. 3539
1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
MILLIKEN & CO
From: 03/01/1990 To:
,
Type: Private
Phone:

Operator (current)
MILLIKEN & COMPANY
From: 03/01/1990 To:
,
Type: Private
Phone:

Geometric Type Code:
Horizontal Accuracy Measure:
Horizontal Collection Method:
Horizontal Reference Datum:
Reference Point Code:
Source Map Scale Numbers: 0

Land Type: Private
Non Notifier: No
Commercial Availability: Unknown
Tsd Date:
Accessibility:
No. Employees: 0
State District: MTZ

NAICS Codes:
313111 Yarn Spinning Mills
313311 Broadwoven Fabric Finishing Mills
31332 Fabric Coating Mills

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State: GA-F FEDERALLY DEFINED GENERATOR

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity

Processor: No
Refiner: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: No

Marketer who first claims the used oil meets the specifications: No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, D008, F003, F005, U220

Activity Location: GA Source Type: Notification Seq. Number: 4 Receive Date: 28 FEB 2005

Other/Previous Site Name: MILLIKEN HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information MARK T. MOE
(706) 880-3653 ext. 3539
1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
MILLIKEN & CO
From: 03/01/1990 To:
,
Type: Private
Phone:

Operator (current)
MILLIKEN & COMPANY
From: 03/01/1990 To:
,
Type: Private
Phone:

Geometric Type Code:
Horizontal Accuracy Measure:
Horizontal Collection Method:
Horizontal Reference Datum:
Reference Point Code:
Source Map Scale Numbers: 0

Land Type: Private
Non Notifier: No
Commercial Availability: Unknown
Tsd Date:
Accessibility:
No. Employees: 0
State District: GTT

NAICS Codes: 313111 Yarn Spinning Mills

AD981275993 MILLIKEN HILLSIDE COATING

Continued...

313311 Broadwoven Fabric Finishing Mills
31332 Fabric Coating Mills

Notes: 2/21/05 MAIL OUT.

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State:

Transfer Facility: No

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity

Processor: No
Refiner: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: No

Marketer who first claims the used oil meets the specifications: No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, F003, F005, U220

Activity Location: GA Source Type: Biennial Report Seq. Number: 3 Receive Date: 02 APR 2004 Report Cycle: 2003

Other/Previous Site Name: MILLIKEN HILLSIDE COATING

Location Address: 1200 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information
MARK MOE
(706) 880-3653
MARK.MOE@MILLIKEN.COM
UNITED STATES

Owner (current)
MILLIKEN & CO
From: 03/01/1990 To:
1300 BROWNWOOD AVE
LAGRANGE, GA 30240
LAGRANGE
Type: Private
Phone:

Operator (current)
MILLIKEN & CO
From: 03/01/1990 To:
Type: Private
Phone:

Land Type: Private
Non Notifier: No
Commercial Availability: Unknown
Tsd Date:
Accessibility:
No. Employees:
State District:

NAICS Codes:
31311 Fiber, Yarn, and Thread Mills
31331 Textile and Fabric Finishing Mills
31332 Fabric Coating Mills

GAD981275993 MILLIKEN HILLSIDE COATING

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State: GA-F FEDERALLY DEFINED GENERATOR

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption:	No
Smelting, melting, Refining Furnace Exemption:	No

Used Oil Activities

Used Oil Transporter Activity

Transporter:	No
Transfer Facility:	No

Used Oil Processor and/or Re-refiner Activity

Processor:	No
Refiner:	No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Marketer who first claims the used oil meets the specifications:	No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Universal Waste Activities:

Description	Generated	Accumulated/ Managed
Batteries	N	N
Lamps	N	N
Pesticides	N	N
Mercury containing equipment	N	N

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, F003, F005, U220

Biennial Report Information

Total Quantity Reported (Tons): Generated: 34 Managed: 0 Shipped: 34 Received: 0

Top 10 GM Forms Summary by Largest Quantity of Hazardous Waste Generated (All quantities are in tons)

Generated	Managed	Onsite Management Methods	Shipped	Offsite Management Methods
FABRIC COATING PROCESS WASTE				
0	0		0	H050 - ENERGY RECOVERY
EPA Waste Codes: D001, D002, D035, U154, U239				
BROKEN FLUORESCENT BULBS				
0	0		0	H050 - ENERGY RECOVERY
EPA Waste Codes: D009				

Activity Location: GA Source Type: Notification Seq. Number: 3 Receive Date: 18 JUN 2003

Other/Previous Site Name: MILLIKEN HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Contact Person For Source Information ROCHELLE F. BRADFORD
(706) 880-3539 ext. 3539
1300 BROWNWOOD AVE
LAGRANGE, GA 30240
UNITED STATES

Owner (current)
MILLIKEN & CO
From: 03/01/1990 To:
Type: Private
Phone:

Operator (current)
MILLIKEN & COMPANY
From: 03/01/1990 To:
Type: Private
Phone:

Geometric Type Code:
Horizontal Accuracy Measure:
Horizontal Collection Method:
Horizontal Reference Datum:
Reference Point Code:
Source Map Scale Numbers: 0

Land Type: Private
Non Notifier: No
Commercial Availability: Unknown
Tsd Date:
Accessibility:
No. Employees: 0
State District: GTT

NAICS Codes:

313111	Yarn Spinning Mills
313311	Broadwoven Fabric Finishing Mills
31332	Fabric Coating Mills

AD981275993 MILLIKEN HILLSIDE COATING

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State:

Transfer Facility: No

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity

Processor: No
Refiner: No

Underground Injection Control: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: No

Marketer who first claims the used oil meets the specifications: No

Destination Facility for Universal Waste: No

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, F003, F005, U220

Activity Location: GA Source Type: Notification Seq. Number: 2 Receive Date: 18 OCT 2002

Other/Previous Site Name: MILLIKEN & CO HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Contact Person For Source Information KEITH LAWRENCE
(706) 880-5661
1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Owner (current)
MILLIKEN & CO
From: 01/01/0001 To:

920 MILLIKEN RD/PO BOX 1926
SPARTANBURG, SC 29304

Type: Private
Phone: (864) 563-5025

Land Type: Private
Non Notifier: No
Commercial Availability: Other - U
Tsd Date:
Accessibility:
No. Employees:
State District: GTT

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State:

Transfer Facility: Unknown

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity

Processor: No
Refiner: No

Underground Injection Control: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: No

Marketer who first claims the used oil meets the specifications: No

Destination Facility for Universal Waste:

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, F003, F005, U220

Activity Location: GA Source Type: Biennial Report Seq. Number: 2 Receive Date: 10 DEC 1998 Report Cycle: 1997

Other/Previous Site Name: MILLIKEN & CO. HILLSIDE COATING PLANT

Location Address: 1300 Brownwood Avenue
LaGrange, GA 30240

Mailing Address: 1300 Brownwood Avenue
LaGrange, GA 30240

Contact Person For Source Information David W. Howard
(706) 880-3361

GAD981275993 MILLIKEN HILLSIDE COATING

Continued...

Land Type: Bad code - U | Non Notifier: No | Commercial Availability: Other - U | Tsd Date:

Accessibility: | No. Employees: | State District:

NAICS Codes: 326299 All Other Rubber Product Manufacturing

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State:

Transfer Facility: Unknown

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: Unknown
TSD Activity: No
Recycler Activity: Unknown

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: Unknown
Transfer Facility: Unknown

Used Oil Processor and/or Re-refiner Activity

Processor: Unknown
Refiner: Unknown

Underground Injection Control: Unknown

Off-Specification Used Oil Burner: Unknown

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: Unknown

Marketer who first claims the used oil meets the specifications: Unknown

Destination Facility for Universal Waste: Unknown

Biennial Report Information

Total Quantity Reported (Tons): Generated: 10 Managed: 0 Shipped: 11 Received: 0

Top 10 GM Forms Summary by Largest Quantity of Hazardous Waste Generated (All quantities are in tons)

Generated	Managed	Onsite Management Methods	Shipped	Offsite Management Methods
FLAMMABLE INK AND INK THINNER WITH CLEANING MATERIALS AND DEBRIS CONTAINING CYCLOHEXONE FROM IDENTIFICATION LABEL PRINTING.				
0	0		0	H040 - INCINERATION

EPA Waste Codes: D001, F003

Activity Location: GA Source Type: Biennial Report Seq. Number: 1 Receive Date: 27 FEB 1996 Report Cycle: 1995

Other/Previous Site Name: MILLIKEN & CO - HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Contact Person For Source Information JAMES P RENSENHOUSE
(706) 880-5940

Land Type: Bad code - U | Non Notifier: No | Commercial Availability: Other - U | Tsd Date:

Accessibility: | No. Employees: | State District:

NAICS Codes: 326299 All Other Rubber Product Manufacturing

GAD981275993 MILLIKEN HILLSIDE COATING

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State:

Transfer Facility: Unknown

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: Unknown
TSD Activity: No
Recycler Activity: Unknown

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: Unknown
Transfer Facility: Unknown

Used Oil Processor and/or Re-refiner Activity

Processor: Unknown
Refiner: Unknown

Underground Injection Control: Unknown

Off-Specification Used Oil Burner: Unknown

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: Unknown

Marketer who first claims the used oil meets the specifications: Unknown

Destination Facility for Universal Waste: Unknown

Biennial Report Information

Total Quantity Reported (Tons): Generated: 18 Managed: 0 Shipped: 18 Received: 0

Top 10 GM Forms Summary by Largest Quantity of Hazardous Waste Generated (All quantities are in tons)

Generated	Managed	Onsite Management Methods	Shipped	Offsite Management Methods
ETHYLENE THIOUREA MIXED WITH OTHER RUBBER COMPOUNDING MATERIALS.				
1	0		1	H040 - INCINERATION
EPA Waste Codes: U116				
SPENT SOLVENT, INK THINNER, CYCLOHEXANONE AND DEBRIS FROM LOT PRINTERS.				
0	0		0	
EPA Waste Codes: D001, F003, U057				

Activity Location: GA Source Type: Notification Seq. Number: 1 Receive Date: 10 MAY 1995

Other/Previous Site Name: MILLIKEN & CO HILLSIDE COATING

Location Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Mailing Address: 1300 BROWNWOOD AVE
LAGRANGE, GA 30240

Land Type: Private Non Notifier: No Commercial Availability: Other - U Tsd Date:

Accessibility: No. Employees: State District: GTT

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Small Quantity Generator; State:

Transfer Facility: Unknown

Other Hazardous Waste Generator Activities

Importer Activity: Unknown
Mixed Waste Generator: Unknown

Transporter Activity: No
TSD Activity: No
Recycler Activity: No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption: Unknown
Smelting, melting, Refining Furnace Exemption: Unknown

Used Oil Activities

Used Oil Transporter Activity

Transporter: No
Transfer Facility: No

Used Oil Processor and/or Re-refiner Activity

Processor: No
Refiner: No

Underground Injection Control: No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner: No

Marketer who first claims the used oil meets the specifications: No

Destination Facility for Universal Waste:

End of Report *

APPENDIX BB

RECEIVED

MAR

HAZARDOUS WASTE MANAGEMENT BRANCH

MAIL THE COMPLETED FORM TO:
The Appropriate State or EPA Regional Office

United States Environmental Protection Agency

RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (see instructions on page 9)

MARK ALL BOX(ES) THAT APPLY

A. Reason for Submittal:

- ☐ To provide initial notification (to obtain an EPA ID Number for hazardous waste, universal waste, or used oil activities).
- ☐ To provide subsequent notification (to update site identification information).
- ☐ As a component of a First RCRA Hazardous Waste Part A Permit Application.
- ☐ As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment#_____).
- ☑ As a component of the Hazardous Waste Report.

2. Site EPA ID Number (page 10)

EPA ID Number: GAD981275993

3. Site Name (page 10)

Name: Milliken Hillside Coating

4. Site Location Information (page 10)

Street Address: 1300 Brownwood Ave

City, Town, or Village: LaGrange | **State:** GA

County Name: Troup | **Zip Code:** 30240

5. Site Land Type (Page 10)

Site Land Type: ☑ Private ☐ County ☐ District ☐ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other

6. North American Industry Classification System (NAICS) Code(s) for the Site (page 10)

A. 31311 | B. 31331

C. 31332 | D.

7. Site Mailing Address (page 11)

Street or P.O. 1300 Fourth Ave

City, Town, or Village: LaGrange

State: GA

Country: UNITED STATES | **Zip Code:** 30240

8. Site Contact Person (page 11)

First Name: Mark | **MI:** T | **Last Name:** Moe

Phone Number: 7068803653 **Extension:** | **Email Address:** mark.moe@milliken.com

9. Operator Legal Owner of the Site pages 11 and 12)

B. Name of Site's Operator: Milliken & Company | **Date Became Operator (mm/dd/yyyy):** 03/01/1990

Operator Type: ☑ Private ☐ County ☐ District ☐ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other

A. Name of Site's Legal Owner: Milliken & Company | **Date Became Owner (mm/dd/yyyy):** 03/01/1990

Owner Type: ☑ Private ☐ County ☐ District ☐ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other

EPA ID No: GAD981275993

9. Legal Owner (Continued) Address		
	Street or P. O. Box: 1300 Fourth Ave	
	City, Town, or Village: LaGrange	
	State GA	
	Country: United States	Zip: 30240

10. Type of Regulated Waste Activity

Mark "Yes" or "No" for all activities; complete any additional boxes as instructed. (See instructions on pages 12 to 16.)

A. Hazardous Waste Activities

Complete all parts for 1 through 6.

Y ☑ N ☐ **1. Generator of Hazardous Waste**

If "Yes", choose only one of the following -a, b, or c.

☑ a. LQG: Greater than 1,000 kg/mo (2,200 lbs./mo.) of non-acoute hazardous waste; or

☐ b. SQG: 100 to 1,000 kg/mo (200 - 2,200 lbs./mo.) of non-acute hazardous waste; or

☐ c. CESQG: Less than 100 kg/mo (220lbs./mo.) of non-acoute hazardous waste

In addition, indicate other generator activities

Y ☐ N ☑ d. United States Importer of Hazardous Waste

Y ☐ N ☑ e. Mixed Waste (hazardous and radioactive) Generator

Y ☐ N ☑ 2. Transporter of Hazardous Waste

Y ☐ N ☑ **Treater,Storer, or Disposer of Hazardouse Waste (at your site) Note:** A hazardous waste permit is required for this activity

Y ☐ N ☑ **Recycler of Hazardous Waste (at your site)**

Y ☐ N ☑ **5. Exempt Boiler and/or Industrial Furnace**

If "Yes" mark each that applies.

☐ a. Small Quantity On-site Burner Exemption

☐ b. Smelting, Melting, Refining Furnance Exemption

Y ☐ N ☑ **6. Underground Injection Control**

B. Universal Waste Activities

MH

Y ☑ N ☑ **1. Large Quantity Handler of Universal Waste (accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste generated and/or accumulated at your site. If "Yes", mark all boxes that apply:**

or lark Mae 8/12/06

	Generated	Accumulated
a. Batteries	☑	☑
b. Pesticides	☐	☐
c. Thermostats	☐	☐
d. Lamps	☑	☑
e. Other (specify) _____	☐	☐
f. Other (specify) _____	☐	☐
g. Other (specify) _____	☐	☐

Y ☐ N ☑ **2. Destination Facility for Universal Waste**

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

Mark all boxes that apply.

Y ☐ N ☑ **1. Used Oil Transporter**

If "Yes, mark each that applies.

☐ a. Transporter

☐ b. Transfer Facility

Y ☐ N ☑ **2. Used Oil Processor and/or Re-refiner**

If "Yes", mark each that applies.

☐ a. Processor

☐ b. Re-refiner

Y ☐ N ☑ **3. Off-Specification Used Oil Burner**

Y ☐ N ☑ **4. Used Oil Fuel Marketer**

If "Yes", mark each that applies.

☐ a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

☐ b. Marketer Who First Claims the Used Oil Meets the Specifications

EPA ID NO: GAD981275993

11. Description of Hazardous Wastes(see instructions on page 16)

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	F003	F005	U220			

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed for waste codes.

12. Comments (see instructions on page 17)

13. Certification I certify under penalty of law that this document and all attatchments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information,including the the possibility of fine and imprisonment for knowing violations.
(see instructions on page 17)

Signature of owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm-dd-yyyy)
	John C Glover, Plant Manager	02/28/2000

SITE NAME: Milliken Hillside Coating

EPA ID NO: GAD981275993

FORM GM

U.S. ENVIRONMENTAL PROTECTION AGENCY

2005 Hazardous Waste Report

WASTE GENERATION AND MANAGEMENT

Instructions: Please see the detailed instructions on pages 17 to 25 of this booklet before completing this form.

Sec.1

A. Waste description (page 22): RQ Waste Toluene Mixture, 3, UN1294, II

B. EPA hazardous waste code (page 22): D001 F005 F003 U220

C. State hazardous waste code:

D. Source code (page23): G06
Management Method code for Source code G25

E. Form code (page23): W609

F. Quantity generated in 2005: 173395

G. UOM (page 23): 1
Density
☐ lbs/ga ☐ sg

Sec. 2

Was any of this waste managed on site ? (page22)

☐ 1 Yes (CONTINUE TO ON-SITE PROCESS SYSTEM 1)
☑ 2 No (SKIP TO SEC.3)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
On-site Management Method code	Quantity treated, disposed, or recycled onsite in 2005	On-site Management Method code	Quantity treated, disposed, or recycled on site in 2005

Sec. 3

A. Was any of this waste shipped off site in 2005 for treatment, disposal, or recycling? (pages25 and 26)

☑ 1Yes (CONTINUE TO BOX B) ☐ 2 No (FORM IS COMPLETE)

	B. EPA ID No. of facility to which waste was shipped	C. Off-site Management Method code Shipped to	D. Total quantity shipped in 2005
Site 1	ARD069748192	H040	173395
Site 2			
Site 3			

Comments:
Solvated Silicone mixture from coating operation, Cleanup materials, residual ink jet diluent

APPENDIX CC

U.S. Environmental Protection Agency

Toxics Release Inventory (TRI)

Recent Additions | Contact Us | Print Version EF Search: GO

EPA Home > Envirofacts > TRI > Envirofacts Report

TRI

Envirofacts Report

Query executed on AUG-23-2007
Results are based on data extracted on AUG-09-2007

Click on "View Facility Information" to view EPA Facility information for the facility.

Facility Name:	MILLIKEN & CO HILLSIDE PLANT	Mailing Name:	MILLIKEN & CO HILLSIDE PLANT
Address:	1300 BROWNWOOD AVE LAGRANGE GA 30240	Mailing Address:	1300 BROWNWOOD AVE LAGRANGE GA 30240
County:	TROUP	Region:	4
Facility Information:	View Facility Information	TRI ID:	30240HLLSD1300B
		FRS ID	110000357060
TRI Preferred Latitude:	33.022778	TRI Preferred Longitude:	85.049167
Public Contact:	RICHARD DILLARD	Phone:	8645032546
Parent Company:	MILLIKEN & CO	Parent DUNS:	002017440

SIC Codes for 2005

SIC CODE	SIC DESCRIPTION
2281	YARN SPINNING MILLS
2273	CARPETS AND RUGS

The above information comes from 2005, which is the latest reporting year on file for this facility. The ear for this facility is 1987.

Map this facility

Map this facility using one of Envirofact's mapping utilities.

Besides TRI, this facility also does the following:

- has reported air releases under the Clean Air Act

More information about these additional regulatory aspects of this facility can be found by pressing the other regu

Other Regulatory Data

Total Aggregate Releases of TRI Chemicals to the Environment:

For all releases estimated as a range, the mid-point of the range was used in these calculations. This table sumn by the facility. ***NR*** *- signifies nothing reported by this facility for the corresponding medium.*

Total Aggregate Releases of TRI Chemicals excluding Dioxin and Dioxin-like Comp (Measured in Pounds)

Media	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
Air Emissions	14195	13721.2	15977	11555	6201	4130	2040	2937	10667	17871	18150	13438	6760	3983
Surface Water Discharges	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Releases to Land	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Underground Injection	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total On-Site Releases	14195	13721.2	15977	11555	6201	4130	2040	2937	10667	17871	18150	13438	6760	3983
Transfer Off-Site to Disposal	NR	NR	NR	NR	NR	NR	NR	250	NR	NR	NR	184	90	40
Total Releases	14195	13721.2	15977	11555	6201	4130	2040	3187	10667	17871	18150	13622	6850	4023

Graphic Summary of this Table

Total Aggregate Releases of Dioxin and Dioxin-like Compounds (Measured in Grams)

Media	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
Air Emissions	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Surface Water Discharges	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Releases to Land	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Underground Injection	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total On-Site Releases	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Transfer Off-Site to Disposal	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total Releases	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Graphic Summary of this Table

TRI Chemicals Reported on Form A:

Please note that there were no chemicals reported on Form A for this facility

---

NOTE:
All chemicals reported below have release or transfer amounts greater than zero. To see a list of all chemicals reported by this facility click here.

Names and Amounts of Chemicals Released to the Environment by Year.

*For all releases estimated as a range, the mid-point of the range was used in these calculations. **NR** - signifies nothing reported for this facility by the corresponding medium. Rows with all "0" or "NR" values were not listed.*

Chemical Name	Media	Unit Of Measure	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
METHANOL (TRI Chemical ID: 000067561)	AIR FUG	Pounds	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
TOLUENE (TRI Chemical ID: 000108883)	AIR FUG	Pounds	409	363.7	428	313	166	250	250	250	250	250	250
TOLUENE (TRI Chemical ID: 000108883)	AIR STACK	Pounds	13786	13357.5	15549	11242	6035	3880	1790	2687	10417	17593	17900
TOLUENE (TRI Chemical ID: 000108883)	DISP NON METALS	Pounds	NR	NR	NR	NR	NR	NR	NR	250	NR	NR	NR
XYLENE (MIXED ISOMERS) (TRI Chemical ID: 001330207)	AIR FUG	Pounds	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ZINC COMPOUNDS (TRI Chemical ID: N982)	AIR STACK	Pounds	NR	NR	NR	NR	NR	NR	NR	NR	NR	28	NR

Discharge of Chemicals into Streams or Bodies of Water:

Please note that either there were no releases of chemicals into streams or bodies of water reported by this facility or the facility did not file a TRI form R for the years 1987 to 2005. Rows with Release Amount equal to "0" were not listed.

Transfer of Chemicals to Off-Site Locations other than POTWs:

Please note that transfer amounts are not included in release totals shown above. For all releases estimated as a range, the mid-point of the range was used in these calculations. Rows with Total Transfer Amount equal to "0" were not listed.

Chemical Name	Year	Unit Of Measure	Total Transfer Amount	Transfer Site Name and Address	Type Of Waste Management
TOLUENE (TRI Chemical ID: 000108883)	2005	Pounds	102753	TERIS 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	2004	Pounds	101643	TERIS 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	2003	Pounds	15477	TERIS 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	2002	Pounds	19613	TERIS 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	2001	Pounds	5065	ENCCO 309 AMERICAN CIRCLE ELDORADO, AZ 71730	Solidification/Stabilization
TOLUENE (TRI Chemical ID: 000108883)	2000	Pounds	15200	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1999	Pounds	7520	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1998	Pounds	250	ASHLAND 4550 NORTHEAST EXPRESSWAY DORAVILLE, GA 30340	Unknown
TOLUENE (TRI Chemical ID: 000108883)	1998	Pounds	1636	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1997	Pounds	8653	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1996	Pounds	12697	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1995	Pounds	20400	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
TOLUENE (TRI Chemical ID: 000108883)	1994	Pounds	184	ASHLAND CHEMICAL 4550 N.E. EXPRESSWAY DORAVILLE, GA 30340	Other Off-Site Management
TOLUENE (TRI Chemical ID: 000108883)	1994	Pounds	25238	MILLIKEN CHEMICAL - DEWEY PLAN, T 1440 CAMPTON RD.	Transfer to Waste Broker-Waste Treatment

				INMAN, SC 29349	
TOLUENE (TRI Chemical ID: 000108883)	1993	Pounds	90	ASHLAND CHEMICAL 4550 N.E. EXPRESSWAY DORAVILLE, GA 30340	Other Off-Site Management
TOLUENE (TRI Chemical ID: 000108883)	1993	Pounds	6200	MILLIKEN CHEMICAL-DEWEY PLANT 1440 CAMPTON RD. INMAN, SC 29349	Transfer to Waste Broker-Waste Treatment
TOLUENE (TRI Chemical ID: 000108883)	1992	Pounds	40	VAN WATERS &ROGERS INC. 2145 SKYLAND CT. NORCROSS, GA 30071	Other Off-Site Management
TOLUENE (TRI Chemical ID: 000108883)	1992	Pounds	4463	MILLIKEN CHEMICAL, DEWEY PLANT 1440 CAMPTON RD. INMAN, SC 293499	Transfer to Waste Broker-Waste Treatment
TOLUENE (TRI Chemical ID: 000108883)	1991	Pounds	3400	MILLIKEN CHEMICAL, DEWEY PLANT 1440 CAMPTON RD. INMAN, SC 29349	Transfer to Waste Broker-Waste Treatment
ZINC COMPOUNDS (TRI Chemical ID: N982)	1996	Pounds	250	ALL-WASTE RECOVERY SYSTEMS 8025 SPENCE RD. FAIRBURN, GA 30213	Solidification/Stabilization
ZINC COMPOUNDS (TRI Chemical ID: N982)	1996	Pounds	250	ENSCO 309 AMERICAN CIRCLE EL DORADO, AR 71730	Incineration/Thermal Treatment
ZINC COMPOUNDS (TRI Chemical ID: N982)	1996	Pounds	250	SAVANNAH ENERGY SYSTEMS COMPAN, Y PRESIDENT ST. EXTENSION, OFF CAMIRA RD. SAVANNAH, GA 31404	Incineration/Insignificant Fuel Value

Summary of Waste Management Activites

Please note that chemical amounts shown here are not included in Total Aggregate Releases shown above.

Summary of Waste Management Activites excluding Dioxin and Dioxin-like Compounds (Measured in Pounds)

Year	On-Site Recycling	Off-Site Recycling	On-Site Energy Recovery	Off-Site Energy Recovery	On-Site Treatment	Off-Site Treatment	Total Amount
2004	0	0	1099772	0	0	101643	1201415
2005	0	0	1135034	0	0	102753	1237787
2006 (Projected)	0	0	1200000	0	0	120000	1320000
2007 (Projected)	0	0	1200000	0	0	120000	1320000

Summary of Waste Management Activites for Dioxin and Dioxin-like Compounds (Measured in Grams)

This facility did not report any waste management activites for Dioxin and Dioxin-like Compounds.

Chemicals Under Waste Management:

Please note that chemical amounts shown here are not included in the Total Aggregate Releases shown above. Transfers to Publicly Owned Treatment Works are listed on a seperate table.

Chemical Name	Year	Unit Of Measure	On-Site Recycling	Off-Site Recycling	On-Site Energy Recovery	Off-Site Energy Recovery	On-Site Treated	Off-Site Treated	Total Amount
TOLUENE	2004	Pounds	0	0	1099772	0	0	101643	1201415
	2005	Pounds	0	0	1135034	0	0	102753	1237787
	2006 (Projected)	Pounds	0	0	1200000	0	0	120000	1320000
	2007 (Projected)	Pounds	0	0	1200000	0	0	120000	1320000

Transfer of Chemicals to Publicly Owned Treatment Works (POTW):

Please note that transfer amounts are not included in the Total Aggregate Releases shown above. For all releases estimated as a range, the mid-point of the range was used in these calculations.

Chemical Name	Year	Unit Of Measure	Total Transfer Amount
AMMONIUM SULFATE (SOLUTION)	1987	Pounds	176700
AMMONIUM SULFATE (SOLUTION)	1988	Pounds	148400
AMMONIUM SULFATE (SOLUTION)	1989	Pounds	93000
AMMONIUM SULFATE (SOLUTION)	1990	Pounds	55762
AMMONIUM SULFATE (SOLUTION)	1991	Pounds	14698
TOLUENE	1991	Pounds	13
TOLUENE	1992	Pounds	12
ZINC COMPOUNDS	1996	Pounds	14

Publicly Owned Treatment Works (POTW) that Chemicals were Transferred to:

Chemical Name	Year	POTW Name and Address
AMMONIUM SULFATE (SOLUTION)	1987	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL ROAD LAGRANGE, GA 30240
		LONG CANE CREEK WPCP

AMMONIUM SULFATE (SOLUTION)	1988	1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
AMMONIUM SULFATE (SOLUTION)	1989	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD LA GRANGE, GA 30240
AMMONIUM SULFATE (SOLUTION)	1990	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
AMMONIUM SULFATE (SOLUTION)	1991	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
BENZO(G,H,I)PERYLENE	2000	NA ,
BENZO(G,H,I)PERYLENE	2001	NA ,
BENZO(G,H,I)PERYLENE	2002	NA ,
METHANOL	1988	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
METHANOL	1989	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD LA GRANGE, GA 30240
METHANOL	1990	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
POLYCYCLIC AROMATIC COMPOUNDS	2000	NA ,
POLYCYCLIC AROMATIC COMPOUNDS	2001	NA ,
POLYCYCLIC AROMATIC COMPOUNDS	2002	NA ,
SODIUM HYDROXIDE (SOLUTION)	1987	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL ROAD LAGRANGE, GA 30240
SODIUM HYDROXIDE (SOLUTION)	1988	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
TOLUENE	1991	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
TOLUENE	1992	LONG CANE CREEK 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
TOLUENE	1997	NA ,
TOLUENE	1998	NA ,
TOLUENE	1999	NA ,
TOLUENE	2000	NA ,

TOLUENE	2001	LONG CANE CREEK WPC PLANT 1514 OLD HUTCHINSON RD. LAGRANGE, GA 30240
TOLUENE	2002	NA
XYLENE (MIXED ISOMERS)	1987	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL ROAD LAGRANGE, GA 30240
XYLENE (MIXED ISOMERS)	1988	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD. LA GRANGE, GA 30240
XYLENE (MIXED ISOMERS)	1989	LONG CANE CREEK WPCP 1514 OLD HUTCHINSON MILL RD LA GRANGE, GA 30240
ZINC COMPOUNDS	1996	LONG CANE CREEK WPC PLANT 1514 OLD HUTCHINSON MILL RD. LAGRANGE, GA 30240

Non Production Releases:

This facility did not report any Non-Production releases.

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- National Library of Medicine (NLM) EXIT EPA TOXMAP
- The Environmental Defense Fund's (EDF) Chemical Scorecard has on-line environmental information regarding this EXIT EPA facility's reported TRI releases.

APPENDIX DD

GROUND-WATER RESOURCES OF THE MIDDLE CHATTAHOOCHEE RIVER BASIN IN GEORGIA AND ALABAMA, AND UPPER FLINT RIVER BASIN IN GEORGIA—*SUBAREA 2* OF THE APALACHICOLA-CHATTAHOOCHEE-FLINT AND ALABAMA-COOSA-TALLAPOOSA RIVER BASINS

U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the

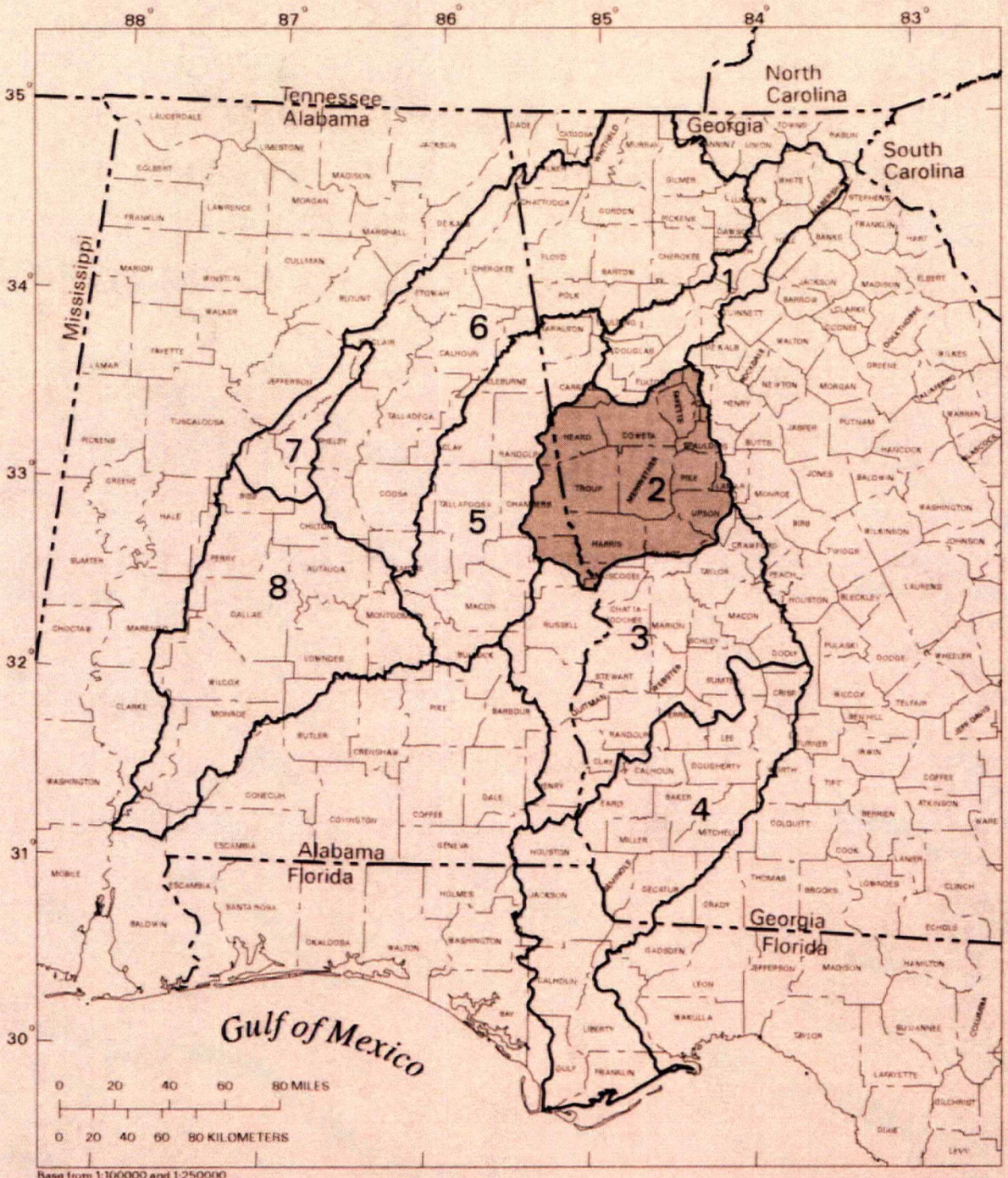
ALABAMA DEPARTMENT OF ECONOMIC AND COMMUNITY AFFAIRS
OFFICE OF WATER RESOURCES

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

U.S. ARMY CORPS OF ENGINEERS, MOBILE DISTRICT

Open-File Report 96-492



Base from 1:100000 and 1:250000
USGS Digital Line Graph

Location of subareas in the Apalachicola–Chattahoochee–Flint and Alabama–Coosa–Tallapoosa River basins. Subarea described in this report is shaded.

GROUND-WATER RESOURCES OF THE MIDDLE CHATTAHOOCHEE RIVER BASIN IN GEORGIA AND ALABAMA, AND UPPER FLINT RIVER BASIN IN GEORGIA—*SUBAREA 2* OF THE APALACHICOLA-CHATTAHOOCHEE-FLINT AND ALABAMA-COOSA-TALLAPOOSA RIVER BASINS

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U.S. ARMY CORPS OF ENGINEERS, MOBILE DISTRICT

Atlanta, Georgia

1997

U.S. DEPARTMENT OF THE INTERIOR

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U.S. GEOLOGICAL SURVEY

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CONVERSION FACTORS, ABBREVIATIONS AND ACRONYMS, AND VERTICAL DATUM

CONVERSION FACTORS

Multiply	by	to obtain
	Length	
inch (in.)	25.4	millimeter
inch per year (in/yr)	25.4	millimeter per year
foot (ft)	0.3048	meter
square foot (ft^2)	0.0929	square meter
mile (mi)	1.609	kilometer
feet per mile (ft/mi)	0.1894	meter per kilometer
	Area	
acre	4,047	square meter
square mile (mi^2)	2.59	square kilometer
	Volumetric rate and volume	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
	448.831	gallon per minute
	0.6463	million gallons per day
cubic foot per second per square mile ($ft^3/s/mi^2$)	0.01093	cubic meter per second per square kilometer
gallon per minute (gal/min)	6.309×10^{-5}	cubic meter per second
	2.228×10^{-3}	cubic foot per second
	0.06308	liter per second
	1,440	gallon per day
gallon per day (gal/d)	3.785×10^{-3}	cubic meters per day
million gallons per day (Mgal/d)	1.547	cubic foot per second
	63.09	cubic meter per second
	694.44	gallons per minute
gallon per minute per foot of drawdown (gal/min/ft)	1.24×10^{-2}	cubic meters per minute per minute per meter of drawdown
acre-foot	325,900	gallon
	Transmissivity	
foot squared per day (ft^2/d)	0.0929	meter squared per day

Temperature

Temperature in degrees Fahrenheit (° F) can be converted to degrees Celsius as follows:

$$° C = 5/9 \times (° F - 32)$$

ABBREVIATIONS AND ACRONYMS

ACF	Apalachicola-Chattahoochee-Flint River basin
ACT	Alabama-Coosa-Tallapoosa River basin
ADAPS	Automated Data Processing System
Corps	U.S. Army Corps of Engineers
MOA	Memorandum of Agreement
GWSI	Ground Water Site Inventory database
RORA	A computer program (Rutledge, 1993)
SWGW	Surface Water-Ground Water—a computer program (Mayer and Jones, 1996)
USGS	U.S. Geological Survey

VERTICAL DATUM

Sea Level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NVGD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

GLOSSARY

Alluvium—Sediment transported and deposited by flowing water.

Altitude—As used in this report, refers to the distance above sea level.

Anisotropic—Condition having varying hydraulic properties of an aquifer according to flow direction.

Annual—As used in this report, refers to a water year.

Aquifer—A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian—Synonymous with confined.

Baseflow—That part of the stream discharge that is not attributable to direct runoff from precipitation or melting snow; it is usually sustained by ground-water discharge.

Bedrock—A general term for the consolidated rock that underlies soils or other unconsolidated surficial material.

Clastics—Rocks composed of fragments of older rocks, for example, sandstone.

Colluvium—Heterogeneous aggregates of rock detritus resulting from the transporting action of gravity.

Cone of depression—A depression of the potentiometric surface, often in the shape of an inverted cone, that develops around a well which is being pumped.

Confined aquifer—An aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself; ground water in the aquifer is under pressure significantly greater than that of the atmosphere.

Continuous-record gaging station—Complete records of discharge obtained using a continuous stage-recording device through which either instantaneous or mean-daily discharge may be computed for any time, or any period of time, during the period of record.

Crystalline rock—A general term for igneous and metamorphic rocks.

Darcian flow—Flow that is laminar and in which inertia can be neglected.

Dendritic drainage—A branching stream pattern that resembles the branching of trees.

Drought—There is no accepted definition of drought. As used in this report, a period of deficient rainfall extending long enough to cause streamflow to fall to unusually low levels for the period of record.

Evapotranspiration—The combined evaporation of water from the soil surface and transpiration from plants.

Faults—Fractures in the Earth along which there has been displacement parallel to the fault plane.

Foliation—A planar or layered structure in metamorphic rocks that is caused by parallel orientation of minerals or bands of minerals.

Fluvial—Pertaining to the actions of rivers.

Fracture—Breaks in rocks due to intense folding or faulting.

Geologic contact—The boundary surface between one body of rock or sediment and another.

Ground-water recharge—The process of water addition to the saturated zone or the volume of water added by this process.

Head, static—The height above a standard datum of the surface of a column of water (or other liquid) that can be supported by the static pressure at a given point. The static head is the sum of the elevation head and the pressure head.

Head, total—The total head of a liquid at a given point is the sum of three components:
(a) the elevation head, which is equal to the elevation of the point above a datum, (b) the pressure head, which is the height of a column of static water that can be supported by the static pressure at the point, and (c) the velocity head, which is the height to which the kinetic energy of the liquid is capable of lifting the liquid.

Heterogeneous—Pertaining to a substance having different characteristics in differing locations.

Hydraulic conductivity—The capacity of a rock to transmit water. It is expressed as the volume of water that will move through a medium in a unit of time under a unit hydraulic gradient through a unit area measured perpendicular to the direction of flow.

Hydraulic gradient—A change in the static pressure of ground water, expressed in terms of the height of water above a datum, per unit of distance in a given direction.

Hydrograph separation—Division of the stream hydrograph into components of aquifer discharge and surface runoff.

Igneous rock—Rocks which have solidified or crystallized from a hot fluid mass called magma.

Intergranular porosity—Porosity resulting from space between grains.

Intrusive igneous rocks—Masses of igneous rock formed by magma cooling beneath the surface.

Isotropic—Condition in which hydraulic properties of an aquifer are equal in all directions.

Joints—Fractures in rocks, often across bedding planes, along which little or no movement has taken place.

Mafic—Applied to the ferromagnesian minerals or to igneous rocks relatively rich in such minerals.

Mean annual—As used in this report, refers to the average of the annual values for a specified period of record.

Metamorphic rock—Rocks derived from pre-existing rocks by mineralogical, chemical, and structural alterations due to endogenetic processes.

Partial-record gaging station—Is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years.

Permeability—The property of a porous medium to transmit fluids under an hydraulic gradient.

Porosity—The amount of pore space and fracture openings, expressed as the ratio of the volume of pores and openings to the volume of rock.

Potentiometric surface—An imaginary surface representing the static head of ground water and defined by the level to which water will rise in a tightly cased well.

Primary porosity—Porosity due to the soil or rock matrix; the original interstices created when a rock was formed.

Recession index—The number of days required for discharge to decline one complete log cycle.

Regolith—Loose, unconsolidated and weathered rock and soil covering bedrock.

Residuum—The material resulting from the decomposition of rocks in place and consisting of the nearly insoluble material left after all the more readily soluble constituents of the rocks have been removed.

Rock—Any naturally formed consolidated material consisting of two or more minerals.

Run-off—Precipitation that flows from the surface of the land and into streams and rivers.

Saprolite—Surficial deposits produced by the decay of rocks and remaining as residuals.

Secondary openings—Voids produced in rocks subsequent to their formation through processes such as solution, weathering, or movement.

Secondary porosity—Porosity due to such phenomena as dissolution or structurally controlled fracturing.

Soil—The layer of unconsolidated material at the land surface that supports plant growth.

Specific capacity—The rate of discharge of water from the well divided by the related drawdown of the water level within the well.

Specific yield—The ratio of the volume of water which the porous medium after being saturated, will yield by gravity to the volume of the porous medium.

Storage coefficient—The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head (virtually equal to the specific yield in an unconfined aquifer).

Stream discharge—The volume of water flowing past a given point in a stream channel in a given period of time.

Transmissivity—The rate at which water of the prevailing kinematic viscosity is transmitted through a unit width of an aquifer under a unit hydraulic gradient. It equals the hydraulic conductivity multiplied by the aquifer thickness.

Trellis drainage—A river system resembling a trellis or rectangular pattern and characteristic of areas of folded sedimentary rocks where tributaries cut channels through less resistant beds.

Unconfined aquifer—An aquifer in which the water table is a free surface at atmospheric pressure.

Unit-area discharge—Stream or ground-water discharge divided by the drainage area.

Water table—Upper surface of a zone of saturation under atmospheric pressure.

Water year—The standard water-year used by the U.S. Geological Survey is from October 1 to September 30 of the second calendar year.

GROUND-WATER RESOURCES OF THE MIDDLE CHATTAHOOCHEE RIVER BASIN IN GEORGIA AND ALABAMA, AND UPPER FLINT RIVER BASIN IN GEORGIA—*SUBAREA 2* OF THE APALACHICOLA-CHATTAHOOCHEE-FLINT AND ALABAMA-COOSA-TALLAPOOSA RIVER BASINS

By Melinda J. Chapman and Michael F. Peck

ABSTRACT

Drought conditions in the 1980's focused attention on the multiple uses of the surface- and ground-water resources in the Apalachicola-Chattahoochee-Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT) River basins in Georgia, Alabama, and Florida. State and Federal agencies also have proposed projects that would require additional water resources and revise operating practices within the river basins. The existing and proposed water projects create conflicting demands for water by the States and emphasize the problem of water-resource allocation. This study was initiated to describe ground-water availability in the middle Chattahoochee River in Georgia and Alabama, and upper Flint River in Georgia, Subarea 2 of the ACF and ACT River basins, and to estimate the possible effects of increased ground-water use within the basin.

Subarea 2 encompasses about 4,100 square miles (mi^2), which includes about 2,250 mi^2 of the Chattahoochee River basin and 1,850 mi^2 of the Flint River basin in the Piedmont physiographic province of west-central Georgia and eastern Alabama. Subarea 2 includes about 26 percent of the total 8,740 square-mile area of the Chattahoochee River basin and about 22 percent of the total 8,460 square-mile area of the Flint River basin. The study area is underlain by a two-component aquifer system composed of a fractured, crystalline-rock aquifer characterized by little or no primary porosity or permeability; and the overlying weathered regolith (saprolite), which generally behaves as a porous-media aquifer. In some areas, a transition zone lies between the regolith and unweathered crystalline bedrock.

The conceptual model described for this study qualitatively subdivides the ground-water flow system into local (shallow), intermediate, and regional (deep) flow regimes. Ground-water discharge to tributaries mainly is from local and intermediate flow regimes and varies seasonally. The regional flow regime probably represents steady-state conditions and discharges chiefly to major drains such as the Chattahoochee and Flint Rivers. Ground-water discharge to major drains originates from all flow regimes. Mean-annual ground-water discharge to streams (baseflow) is considered to represent the long-term, average recharge to ground water. The mean-annual baseflow was estimated using an automated hydrograph-separation method, and represents discharge from the local, intermediate, and regional flow regimes of the ground-water flow system. Mean-annual baseflow exiting Subarea 2 was estimated to be 5,800 cubic feet per second. Mean-annual baseflow represented about 68 percent of total mean-annual stream discharge in the Chattahoochee River basin and 49 percent in the Flint River basin at the Subarea 2–Subarea 3 boundary.

Stream discharge for selected sites on the Chattahoochee River and its tributaries were compiled for the years 1941, 1954, and 1986, during which sustained severe droughts occurred throughout most of the ACF-ACT area. Stream discharge was assumed to be sustained entirely by baseflow during the latter periods of these droughts. Estimated baseflow (unregulated) near the end of the individual drought years averaged about 13 percent of the estimated mean-annual baseflow in the Chattahoochee River basin and 8.7 percent in the Flint River basin in Subarea 2.

The potential exists for the development of ground-water resources on a regional scale throughout Subarea 2. Estimated ground-water use in 1990 was about 1.2 percent of the estimated mean-annual baseflow in Georgia and 1.7 percent in Alabama; and 11.4 and 14.5 percent of the average drought flow in Georgia and Alabama, respectively. Because ground-water use in Subarea 2 represents a relatively minor percentage of ground-water recharge, even a large increase in ground-water use in Subarea 2 in one State is likely to have little effect on ground-water and surface-water occurrence in the other. Indications of long-term ground-water level declines were not observed; however, the number and distribution of observation wells for which long-term water-level measurements are available in Subarea 2 are insufficient to draw conclusions.

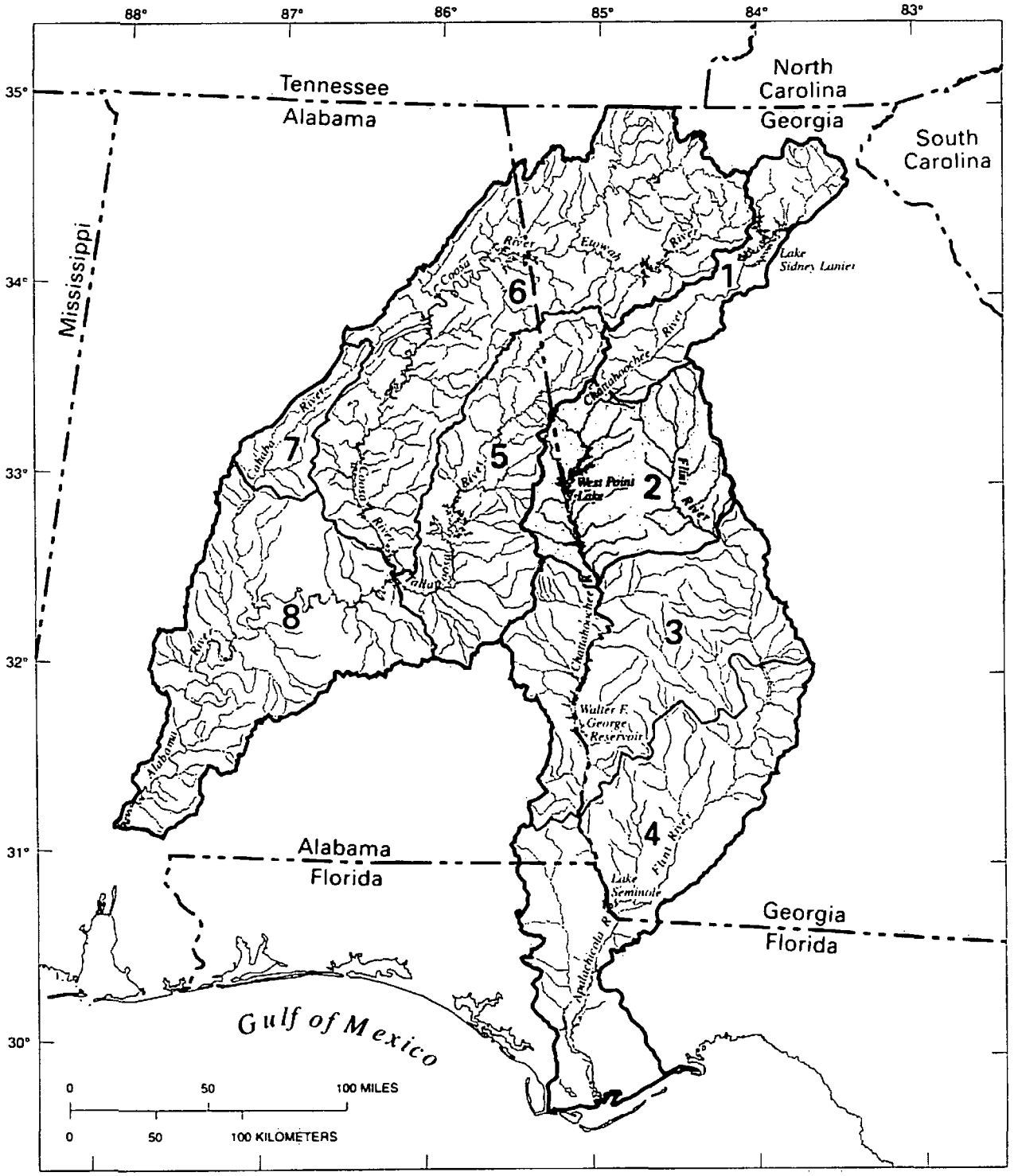
INTRODUCTION

Increased and competing demands for water and the droughts of 1980-81, 1986, and 1988 in the Apalachicola-Chattahoochee-Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT) River basins have focused the attention of water managers and users in Alabama, Florida, and Georgia, on the water resources in the two basins. The ACF-ACT River basins encompass about 42,400 square miles (mi^2) and extend from near the Georgia-Tennessee State line, through most of central and southern Alabama and Georgia and part of the Florida panhandle to the Gulf of Mexico (fig. 1). Ground- and surface-water systems of the ACF-ACT River basins behave as an integrated, dynamic flow system comprised of an interconnected network of aquifers, streams, reservoirs, control structures, floodplains, and estuaries. The degree of hydrologic interaction between ground water and surface water suggests that the water resources be investigated and managed as a single hydrologic entity, to account for the climatic and anthropogenic factors that influence the flow systems.

Recent water projects and resource allocations, and other actions proposed by Federal, State, and local agencies, have resulted in conflicts among the States of Alabama, Florida, and Georgia, and the U.S. Army Corps of Engineers (Corps). The Corps has been given the authority to regulate the Nation's surface waters through the Rivers and Harbors Act of 1927, in accordance with the U.S. House of Representatives Document Number 308, 69th U.S. Congress. Proposed projects designed to increase development and to re-allocate surface-water supplies in Georgia, based on revised operating practices of control structures for flood control, navigation, and hydropower generation, and a proposal to construct a dam and reservoir have met with opposition from Alabama and Florida. As a result, in 1991, the U.S. Congress authorized the Corps to initiate a Comprehensive Study of the ACF-ACT River basins that would "develop the needed basin and water-resources data and recommend an interstate mechanism for resolving issues" (Draft Plan of Study, Comprehensive Study, Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River basins, prepared by: The Comprehensive Study Technical Coordination Group, July 1991, U.S. Army Corps of Engineers, Mobile District).

In 1992, the Governors of Alabama, Florida, and Georgia; and the U.S. Army, Assistant Secretary for Civil Works, signed a Memorandum of Agreement (MOA) establishing a partnership to address interstate water-resource issues and promote coordinated systemwide management of water resources. An important part of this process is the Comprehensive Study of the ACF and ACT River basins. Since this signing, the Study Partners defined scopes of work to develop relevant technical information, strategies, and plans, and to recommend a formal coordination mechanism for the long-term, basinwide management and use of water resources needed to meet environmental, public health, and economic needs (U.S. Army Corps of Engineers, written commun., 1993). The U.S. Geological Survey (USGS) was requested to assist in the development of a scope of work for the ground-water-supply element of the Comprehensive Study, and in June 1993, was asked to conduct that study element.

Eight subareas of the ACF-ACT River basins were identified by the Study Partners and the USGS on the basis of hydrologic and physiographic boundaries. Addressing the study at the smaller, subarea scale within the ACF-ACT River basins facilitated evaluation of the ground-water resources on a more detailed scale. This report is one of a series of eight reports that present results of ground-water studies of the ACF-ACT subareas.



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USGS Digital Line Graph

Figure 1. Subareas and major streams in the Apalachicola–Chattahoochee–Flint and Alabama–Coosa–Tallapoosa River Basins.

Purpose and Scope

This report describes the ground-water resources of the middle Chattahoochee River in Georgia and Alabama, and upper Flint River in Georgia—Subarea 2 of the ACF-ACT River basins. The report provides an analysis of ground-water resources that can be used to address resource-allocation alternatives created by existing and proposed uses of the water resources in the river basins. Specific objectives of this study were to:

- describe a conceptual model of ground-water flow and stream-aquifer relations;
- describe the hydrologic setting of Subarea 2;
- quantify mean-annual and drought period ground-water contributions to the Chattahoochee River from Whitesburg, Ga., to Columbus, Ga., and to the Flint River from the headwaters to Culloden, Ga., and the ground water exiting Subarea 2; including separate computations of the contributions from Georgia and from Alabama; and
- describe and evaluate ground-water utilization and general development potential.

Findings contained herein are but one component of a multidiscipline assessment of issues related to the basinwide utilization and management of water. This report is not intended to provide definitive answers regarding the acceptability of ground-water-resource utilization or the potential for additional resource development. Such answers are dependent on the synthesis of results from all components of the Comprehensive Study and on subsequent consideration by the State and Federal water managers responsible for decision making within the basin.

The report scope includes literature and data searches and an assessment of existing geologic data. A conceptual model that describes the hydrologic processes governing the ground- and surface-water flow was developed, and an evaluation of ground-water utilization was made by compiling and evaluating existing hydrologic, geologic, climatologic, and water-use data. Field data were not collected during this study.

Physical Setting of Study Area

The Subarea 2 study area encompasses about 4,100 mi^2 in west-central Georgia and eastern Alabama (fig. 1). The study area is bounded to the northeast by the upper Chattahoochee River basin (Subarea 1) in Georgia, to the south by the lower Chattahoochee and Flint River basins (Subarea 3) in Georgia and Alabama, to the east by the Altamaha River basin, and to the west by the Tallapoosa River basin of the ACT River basins (Subarea 5) in Alabama and Georgia (fig. 1).

Physiography

Ninety-nine percent of Subarea 2 lies within the Piedmont Province (fig. 2). A small part of Subarea 2 along the downstream section of the Chattahoochee River, is located in the Coastal Plain Province. For purposes of this discussion, Subarea 2 is considered to be comprised entirely of a Piedmont hydrologic setting. Land-surface altitudes in the study area range from about 360 feet (ft) above sea level in southern Talbot County, Ga., to 1,395 ft in Harris County, Ga. The altitude of intermountain plateaus within the province ranges from about 1,600 to 1,700 ft (Brackett and others, 1991). Most streams are characterized by a dendritic drainage pattern. Piedmont topography is characterized by low, rolling hills in the north and a broad rolling upland or plateau in the south (Cressler and others, 1983). The Piedmont is comprised of metamorphic and igneous rocks that are overlain by regolith of varying thickness. The regolith in the study area is composed of semi-consolidated to unconsolidated saprolite (weathered bedrock), soil, and other surficial deposits (Clarke and Peck, 1991).

Climate

The climate in Subarea 2 is moist and temperate. The area receives an average of 51 inches (in.) of precipitation annually (Cressler and others, 1983; Carter and Stiles, 1983). Precipitation occurs primarily during the winter and early spring. The average annual temperature is about 63 ° F. Average daily temperature ranges from about 44 ° F during the winter to 83 ° F during the summer (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1992).

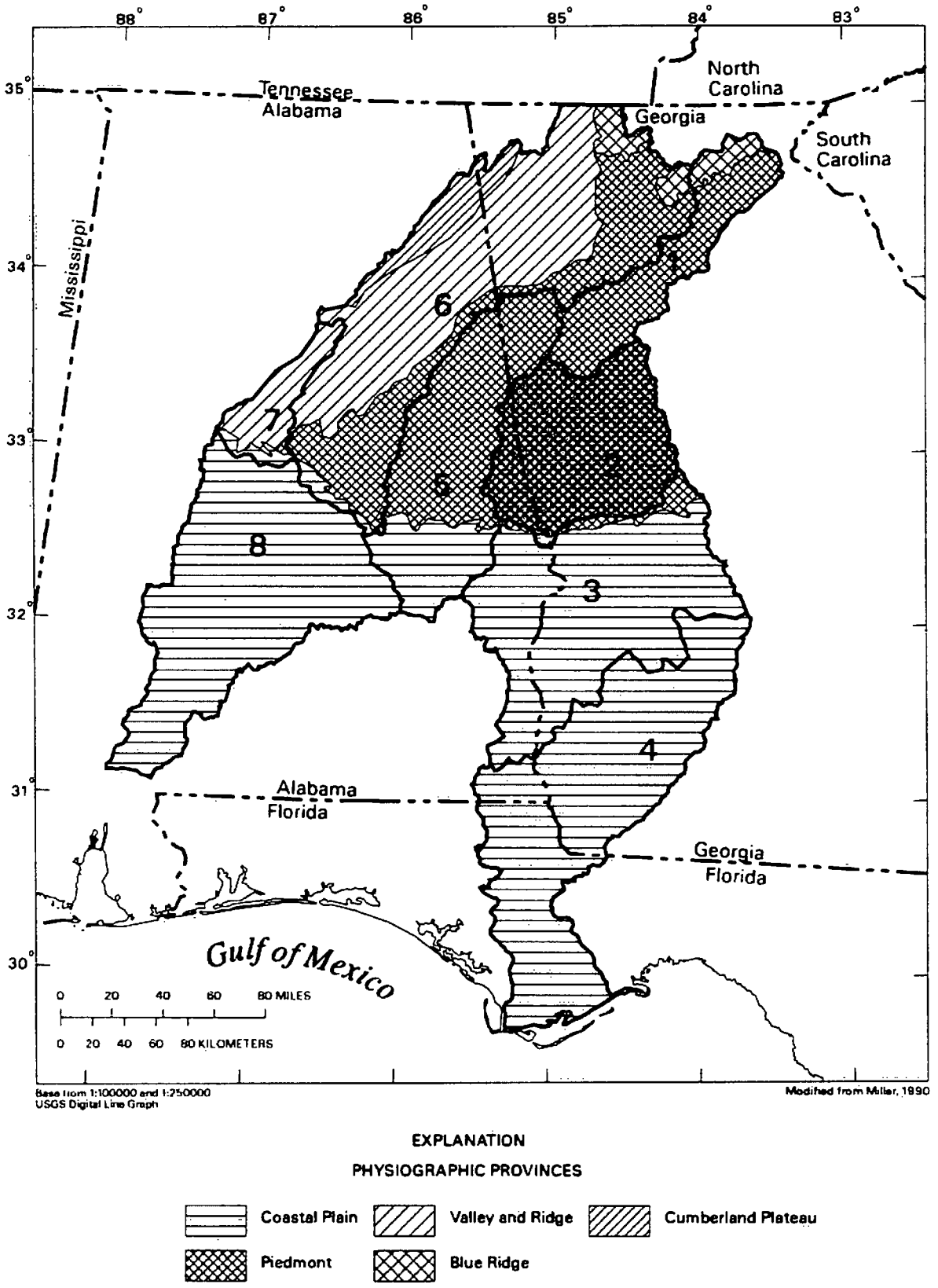


Figure 2. Physiographic provinces and subareas in the Apalachicola–Chattahoochee–Flint and Alabama–Coosa–Tallapoosa River basins.

Ground-Water Use

The estimated ground-water use in Subarea 2 during 1990 was about 26 million gallons per day (Mgal/d) or about 40 cubic feet per second (ft^3/s) (Marella and others, 1993). Of this total, about 18 percent was for public water supply, about 36 percent for domestic water supply, 5 percent for self-supplied industrial and commercial activities, and 41 percent for agricultural use. The largest ground-water use in the middle Chattahoochee River basin in Georgia, Subarea 2, is for domestic water supply and in Alabama, is for agricultural supply. For the upper Flint River basin, Georgia, Subarea 2, both domestic and agricultural use is about 8 percent (table 1).

Table 1. Estimated ground-water use, by category, Subarea 2, 1990
[Mgal/d, million gallons per day; ft^3/s, cubic feet per second]

	Public water supply		Self-supplied industrial and commercial		Agricultural		Domestic		Total	
	(Mgal/d)	(ft^3/s)	(Mgal/d)	(ft^3/s)	(Mgal/d)	(ft^3/s)	(Mgal/d)	(ft^3/s)	(Mgal/d)	(ft^3/s)
Chattahoochee River basin										
Georgia	1.1	1.7	0.6	0.9	0.9	1.4	4.0	6.3	6.6	10.2
Alabama	.8	1.2	.1	.2	4.6	7.1	.4	0.6	5.9	9.1
Flint River basin										
Georgia	2.8	4.3	.6	.9	5.2	8.0	4.9	7.6	13.4	20.7
Subarea 2 total	**4.7**	**7.2**	**1.3**	**2.0**	**10.6**	**16.5**	**9.3**	**14.5**	**25.9**	**40.0**

Ground-water use reported by Marella and others (1993) is by county; ground-water use in those counties that are partially in Subarea 2 are reported herein for Subarea 2 only. Ground-water use for public water supply, and self-supplied industrial and commercial uses were determined by using site-specific data. Ground-water pumpage for domestic purposes was determined by subtracting the population served by public supply facilities from the total population of the county or hydrologic unit, then multiplying that number by a water-use coefficient of 75 gallons per day (gal/d) per person. Agricultural ground-water use was estimated by multiplying the reported county use by the percentage of the land area of the county in Subarea 2.

Most small communities outside the Metropolitan Atlanta area use ground water as their primary water supply. Rapid increases in population in the Metropolitan Atlanta area, along with the variability of surface-water supplies during drought conditions, have caused some municipalities to investigate the possibility of supplementing surface-water supplies with ground water. The city of Fayetteville, Fayette County, Ga., installed three wells in 1988 to supplement their surface-water supply during periods of peak demand and during droughts.

Previous Investigations

The results of several regional studies have described ground-water resources in crystalline-rock hydrogeologic settings in the Piedmont Province of the southeastern United States. The major objectives of regional studies were to formulate concepts regarding the availability of ground water and to determine possible controlling factors that affect or control well yield and ground-water quality. Conceptual models of hydrogeologic frameworks of the crystalline-rock aquifers in this region evolve as information increases (Chapman and others, 1993).

Some of the earliest reports describing ground-water resources in the crystalline rocks of the Piedmont were by McCallie (1898, 1908), who concluded that the yield of wells completed in bedrock would be sufficient only for rural use, and would not be a viable source for large cities such as Atlanta and Macon. In urban areas, wells would be susceptible to contamination from "local drainage"; an Atlanta public supply well (2,175 ft deep), apparently was contaminated after only a few years of use (McCallie, 1898).

Herrick and LeGrand (1949) inventoried a large number of wells in the Atlanta region and conducted regional geologic mapping to determine possible factors influencing ground-water availability and quality. They concluded that the occurrence of ground water in the Metropolitan Atlanta area depended largely on factors, such as rock type, structural features, degree of weathering, and topography. Geologic settings considered to be favorable for developing high-yielding wells were discussed for a variety of rock types, geologic structural conditions, and

topographic settings. Although the study represented a reconnaissance rather than a detailed evaluation, Herrick and LeGrand (1949) recognized that variations in the rock character and attitude strongly influence the availability of ground water, and distinct differences could be observed within intervals of feet in the Piedmont region. Herrick and LeGrand (1949) also related the quality of ground water to rock type. Ground water from granitic rocks was substantially less mineralized compared to water from amphibolites and hornblende gneisses, which contained elevated concentrations of calcium and magnesium.

Carter and Herrick (1951) evaluated water use and sources of water supply (including surface water) in the Metropolitan Atlanta area and estimated future water-supply needs. Historically, dug wells were the primary sources of water supply in the Atlanta area until the late 1800's, when surface-water sources were developed to meet increasing water-supply demands. The study examined the relation between ground-water availability and certain geologic factors, such as joints, faults, and other fractures. The investigators evaluated well yield, total depth of wells, and the importance of aquifer tests in assessing sustained yield and potential well interference. The report concluded that the potential for ground-water development in the Atlanta area was considerable, and that wells could serve as sole sources of water supply for rural communities and some industries throughout the Piedmont region. Carter and Herrick (1951) related hardness of ground water to mafic rocks, such as amphibolites and hornblende gneisses, and determined that granitic rocks contained softer water.

Thomson and Carter (1955) presented streamflow data for the 1954 drought throughout Georgia, including the Chattahoochee and Flint Rivers in Subarea 2. The authors included a discussion of the lack of rainfall—the rainfall deficit in most areas was at least 15 in. Streamflow was below normal in the Piedmont region by July 1954. Record low flows were recorded during September and early October.

A later report by Thomson and Carter (1963) continued a discussion of the 1954 drought streamflow data for Georgia. The authors stated that the 1954 data may be the last available extreme drought streamflow data representing natural flow conditions. For the Chattahoochee and Flint Rivers in Subarea 2, the 1954 drought was the second most severe in 57 years. The most severe drought for the West Point station occurred in 1925 (Thomson and Carter, 1963).

Stewart and others (1964) and Stewart (1962, 1964) conducted an investigation to determine the effects of waste-disposal migration in weathered crystalline rocks at the Georgia Nuclear Laboratory, Dawson, Ga. Infiltration tests were conducted in a saprolite disposal pit to determine the rate and areal extent of possible waste leakage into the shallow ground-water system. The purpose of the study was to determine the feasibility of using infiltration pits constructed in weathered crystalline rocks for the disposal of liquid wastes. The three water-bearing units evaluated were near-surface alluvium, regolith, and unweathered crystalline bedrock. The investigation of regolith material included estimates of saprolite porosity and permeability and ion-exchange capacity from core samples, the measurement of infiltration rates, and shallow aquifer testing. Bedrock wells also were drilled and estimates of transmissivity were made from aquifer-test data. A noticeable increase in ground-water mounding was observed along the strike of schistosity in the regolith. Other fieldwork included surficial geologic mapping and the collection of ground-water quality samples, streamflow data, and continuous ground-water levels in wells. During aquifer testing, the largest drawdowns in the saprolite wells were along the strike of schistosity. Rates of ground-water movement were calculated from hydraulic gradient data and estimates of porosity and permeability in the saprolite.

LeGrand (1967) proposed a rating system, based on topographic setting and soil (regolith) thickness, to assess ground-water conditions in the Piedmont and Blue Ridge Provinces of the southeastern United States. LeGrand (1967) developed the concept of a statistical percentage chance of obtaining a certain yield under various conditions. Actual quantifiable yields were said to be difficult to estimate because well yields were shown to vary substantially within 100 ft of lateral distance. LeGrand (1967) also stated that fractures seemed to diminish with increasing depth, and that the relation between well yield and depth was complex.

Cressler and others (1983) conducted a study of ground-water in the Atlanta area to assess the availability, quality, and quantity of ground water in crystalline rocks and to devise methods for locating sites for high-yielding wells that could serve as alternative or supplemental sources of water supply. Results from that study indicated that the highest well yields in the Atlanta area seemed to be associated with wells tapping contact zones between rocks of contrasting lithology, fault zones, stress-relief (horizontal) fractures, drainage features controlled by local structural characteristics, concentrated jointing within folded rocks, and shear zones. Results of this study indicated that topographic drainage features may or may not be related to underlying water-bearing features in the rocks. From data gathered using borehole geophysical logs of wells, Cressler and others (1983) determined that the size, spacing, and

interconnection of water-bearing openings differed greatly from one rock type to another. The range in well yield within an identified water-bearing unit was highly variable, and high-yielding wells were present in each unit. Local features in the rocks were recognized as generally controlling well yield. The authors also noted that water from wells open to mafic rock types contained higher concentrations of iron, magnesium, manganese, dissolved solids, and possibly chloride, than water from wells open to granitic rocks in the Metropolitan Atlanta area. The pH of water samples collected from wells completed in mafic rocks also was relatively high compared to samples collected from wells completed in granitic rocks.

Hale and others (1989) presented streamflow data for the 1986 drought in Alabama, Georgia, North Carolina, South Carolina, Tennessee, and Virginia. Minimum flows occurred in midsummer during 1986, which was several months earlier than the regional droughts of 1954 and 1981. The source of this drought was a rainfall deficit that began in 1985 and persisted until late summer 1986. The range of 7-month precipitation totals was about 30 to 85 percent of normal. The authors reported minimum low flows for 1, 7, 30, 60, and 90 days from April 1, 1986 through March 31, 1987.

Gorday (1989) conducted a study of ground-water resources in Lamar County, near the eastern boundary of Subarea 2. Gorday described ground-water occurrence in discontinuities, (such as faults, geologic contacts, stress-relief fractures, foliation, and joints), in the crystalline bedrock. A survey of well yields provided information on a low-yielding schist and gneiss unit. Gorday (1989) also noted that water from wells open to mafic rock types had higher concentrations of iron, manganese, dissolved solids, and possibly chloride, and a higher pH than water from wells open to granitic rocks in the Metropolitan Atlanta area. Recommendations for well site selection were made in relation to topography and topographic lineaments. The Towaliga fault zone was identified as being the most favorable area for ground-water exploration due to the highly fractured texture of the mylonite within the fault zone. The thickness of the regolith, which provides storage for ground water, was noted to be thicker within the fault zone (Gorday, 1989).

Clarke and Peck (1991) conducted a study of a nine-county area south of the Metropolitan Atlanta area. The study consisted of a general evaluation of the existing and possible future development of ground-water resources. Data collection consisted of the compilation of geologic, hydrologic, and water-quality data. An extensive inventory of wells and springs was assembled. The study followed the same method as that used by Cressler and others (1983). Many high-yielding wells were inventoried; reported yields for two of which were 600 and 700 gallons per minute (gal/min). Clarke and Peck (1991) concluded that ground water is a viable resource that had been underutilized in the variety of hydrogeologic settings in the area. Ground-water quality problems included elevated concentrations of iron, manganese, fluoride, and radon.

As part of an investigation of the hydrogeologic controls on the occurrence and movement of ground water in the Piedmont and Blue Ridge physiographic provinces of Georgia, the Georgia Geologic Survey conducted local investigations at 10 hydrologic test sites (Brackett and others, 1991). Two of the sites were located in Subarea 2. Geologic and aquifer-test data were collected at a well site in Newnan, Coweta County, Ga. Another study conducted in Coweta County, included the collection of geologic data, surface and borehole geophysical data, and aquifer-test data (Brackett and others, 1991).

A study conducted by the Georgia Geologic Survey (O'Connor and others, 1993) assessed ground-water availability in Carroll, Douglas, Haralson, Polk, and Paulding Counties, Ga., located at the northwestern boundary of Subarea 2. Objectives of the study were to estimate the quantity of the ground-water resource that would be available to municipal and industrial users, and identify favorable areas for ground-water exploration. The estimated availability of ground water for the Piedmont in the five-county West-Georgia study area was 24 Mgal/d (37 ft^3/s). The authors used geographic information system (GIS) methods to overlay hydrogeologic and environmental data. Considered hydrogeologic factors included topographic slope, soils, geology, topographic lineaments, and perennial streams. Environmental factors included population density, solid-waste disposal sites, hazardous-waste disposal sites, land application sites, wastewater treatment plants, and abandoned sulfide mines and other heavy metal anomalies. Favorable ground-water exploration areas were identified based on the ranking of those factors.

The most recent investigation of ground-water resources near the study area was by Chapman and others (1993). A study of the relation of geologic controls, well yields, and ground-water quality was conducted in the area of Zebulon, Pike County, Ga. Well yields and potential ground-water quality problems were similar to those indicated by Cressler and others (1983) and Clarke and Peck (1991).

The Geological Survey of Alabama recently developed a ground-water database of bedrock wells drilled in the Alabama Piedmont to statistically evaluate the effects of well construction, topography, and hydrogeologic factors on well yields. The distribution of well yields was mapped (Guthrie and others, 1994). More than 1,200 well records were evaluated for that study. Well yields varied significantly with total depth, use, diameter, topographic setting, depth to the water table, hydrogeologic unit, and tectonic belt. Well use and diameter were determined to be the most significant factors controlling the variation in reported yields. High-yielding wells appeared to be located in areas characterized by structurally-controlled surface drainage and less than 100 ft of regolith cover, in topographic settings such as slopes, draws, and valleys, and in areas generally coinciding with lineaments observed from regional satellite images. The distribution of high-yielding wells (more than 50 gal/min) suggests a correlation with regional geologic trends (Guthrie and others, 1994).

Most recently, Steele and others (1994) conducted a local-scale study at a research site in Lamar County, Ga., near the eastern boundary of Subarea 2. The major study objective was to determine the influence of pumping from a test production well for the city of Barnesville. Observation wells were installed within the regolith and bedrock near the pumping well and across a stream. Field studies included geologic mapping, geologic core collection, magnetometer surveys, ground-water level monitoring, collection of aquifer-test data, and the collection of ground-water-quality data. The regolith was determined to provide primary storage for water that supplies the production well. The primary pathway for recharge was in the transition zone between the regolith and the bedrock; the production well taps both the transition zone and the bedrock. Pumping of the production well caused drawdown in both the regolith and bedrock wells located across Big Towaliga Creek. The features controlling ground-water flow to the production well in the bedrock were determined to be parallel to the strike of the rocks along foliation and in the direction of the dip of foliation. Another general conclusion of the study was that water that recharges the aquifer under pumping conditions may not reach the aquifer under unstressed conditions. Delineation of the recharge area of the fractured bedrock and transition-zone aquifer was determined to be more complex than the general assumptions of the area of influence coinciding with drainage basin boundaries. Under pumping conditions, the area of influence of the production well extended across the creek (Steele and others, 1994)

Reports describing methods of estimating streamflow and ground-water discharge to streamflow include Bingham (1982), Hirsch (1982), Hoos (1990), Rorabaugh (1960, 1964), Rutledge (1991, 1992, 1993), and Mayer and Jones (1996). Data collected as part of the ongoing surface-water monitoring program of the USGS are published annually in the reports "Water-Resources Data, Georgia." Other reports containing information about the surface- and ground-water resources of the ACF-ACT River basin area are listed in the "Selected References" section of this report.

Well and Surface-Water Station Numbering Systems

Wells in Georgia are numbered by a system based on U.S. Geological Survey topographic maps. Each 7 1/2-minute topographic quadrangle map in Georgia has been assigned a number and letter designation beginning at the southwest corner of the State. Numbers increase sequentially eastward through 39; letters advance northward through "Z," then double-letter designations "AA" through "PP" are used. The letters "I," "O," "II," and "OO" are not used. Wells and springs inventoried in each quadrangle are numbered sequentially beginning with "1." Thus, the second well inventoried in the Zebulon quadrangle (designated 11Y) is designated 11Y002.

Wells in the USGS Ground-Water Site Inventory (GWSI) data base are assigned a 15-digit identification number based on the latitude and longitude grid system. The first six digits denote the degrees, minutes, and seconds of latitude. The next seven digits denote the degrees, minutes, and seconds of longitude. The last two digits (assigned sequentially) identify wells within a one-second grid.

The USGS established a standard identification numbering system for all surface-water stations in 1950. Stations are numbered according to downstream order. Stations on a tributary entering upstream of a main-stream station are numbered before and listed before the main-stream station. No distinction is made between continuous-record and partial-record stations. Each station has a unique eight-digit number that includes a two-digit part number (02 refers to natural drainage into the Eastern Gulf of Mexico) and a six digit downstream order number. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete number for each station includes a two-digit part number "02" plus the downstream-order number, which can be from 6 to 12 digits. All records for a drainage basin, encompassing more than one State, can easily be correlated by part number and arranged in downstream order.

Approach and Methods of Study

This study included several work elements used to appraise the ground-water resources of Subarea 2, including the description of a conceptual model of ground-water flow and stream-aquifer relations, and an assessment of ground-water availability. The approach and methods used to accomplish these tasks included:

- compilation of information and data from pertinent literature, including geologic, ground-water, streamflow, and ground-water use data;
- separation of streamflow hydrographs to estimate mean-annual ground-water contribution to the Chattahoochee and upper Flint Rivers and their tributaries;
- evaluation of streamflow records and periodic discharge measurements during drought periods to estimate "worst-case" streamflow conditions; and
- comparison of 1990 ground-water use with mean-annual and drought-flow conditions to evaluate ground-water availability.

Literature and data reviews provided information necessary to describe a conceptual model of ground-water/surface-water relations. Much of the conceptual model is based on results of previous investigations by Toth (1962, 1963), Freeze (1966), Freeze and Witherspoon (1966, 1967, 1968), Winter (1976), Heath (1984, 1989), Faye and Mayer (1990), and Miller (1990). These studies suggest that large rivers, such as the Chattahoochee, and their tributaries function as hydraulic drains for ground-water flow, and that during significant droughts, most of the discharge in these streams is contributed by ground water.

Streamflow data were compiled from the USGS Automated Data Processing System (ADAPS) database. Streamflow records from continuous-record and miscellaneous discharge-measurement stations were used for hydrograph-separation analyses and drought streamflow evaluation.

Stream-aquifer relations were quantified using two approaches: (1) the hydrograph-separation method of Rorabaugh (1960, 1964) and Daniel (1976), called the recession-curve-displacement method; and (2) a drought-flow mass-balance analysis of streamflow. The hydrograph-separation method was used to estimate the mean-annual discharge of ground water (baseflow) to the basins. An estimate also was made of the mean-annual volume of ground water discharged from Subarea 2 to Subarea 3 as baseflow in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin, Georgia. The mean-annual baseflow was used as a base or reference with which to compare and evaluate droughts under "worst-case" conditions. The mass-balance analysis was used to estimated the baseflow contributions to the surface-water system during historically significant droughts and the ground water delivered as baseflow from Subarea 2 to Subarea 3 near the end of these droughts.

Mean-Annual Baseflow Analysis

Discharge data from continuous-record gaging stations along the Chattahoochee and Flint Rivers and their tributaries were selected for baseflow analysis based on the period of record of unregulated flow. Streamflow representative of low, average, and high years of stream discharge were evaluated by hydrograph-separation methods to estimate annual baseflow. The mean-annual baseflow was then computed as the average baseflow of the three representative flow years.

The selection process for the most representative year of low, average, and high stream discharge involved objective statistical examination of the discharge data, followed by some subjectivity in the final choice of the water year selected. Hydrographs acceptable for separation were characterized by relatively normal distributions of daily stream discharge, small ranges of discharge, and the absence of extremely high, isolated peak stream discharge. For each station, the mean annual stream discharge was computed for the period of record of unregulated flow and used as a reference mean for low-, average-, and high-flow conditions for that station. The mean- and median-annual stream discharge for those water years identified as acceptable were compared to the reference mean. Because extremely high discharge during a water year could greatly influence the mean but not the median (which is similar to the geometric mean for positively skewed data sets, such as discharge), the process of selecting representative water years for low-, average-, and high-flow conditions considered the position of the mean discharge for the selected year relative to the median and the reference mean. The hydrographs for these representative water years were examined and separated. True subjectivity in the selection process entered only at this point, such that, if acceptable hydrographs were available for several years, one year arbitrarily was chosen over the others.

The separation analyses were conducted using the computer program SWGW (Mayer and Jones, 1996); which is an automated version of the recession-curve-displacement method, often referred to as the Rorabaugh or Rorabaugh-Daniel method. The SWGW program was applied to a water-year period of streamflow data. SWGW utilizes daily mean discharge data collected at unregulated stream-gaging sites and requires at least 10 years of record to accurately estimate a recession index necessary for hydrograph-separation analysis.

The hydrograph-separation method estimates the ground-water component of total streamflow. In general, the streamflow hydrograph can be separated into two components — surface runoff and baseflow (ground-water discharge to streams). Figure 3 shows the graphical output from the SWGW program. Surface runoff is the quick response (peaks) of stream stage to precipitation and nearby overland flow.

Application of the recession-curve-displacement method requires the use of the streamflow recession index. The streamflow recession index is defined as the number of days required for baseflow to decline one order of magnitude (one log cycle), assuming no other additional recharge to the ground-water system. The streamflow recession index is a complex number that reflects the loss of ground water to evapotranspiration (Daniel, 1976) or leakage, and the influence of geologic heterogeneities in the basin (Horton, 1933; Riggs, 1963). The slope of the streamflow recession is affected by evapotranspiration, such that the streamflow recession index varies from a maximum during the major rise period to a minimum during the major recession period (fig. 3). The major rise period of streamflow generally occurs from November through March or April, when precipitation is greatest and evapotranspiration is least. The major recession period occurs during late spring through fall and coincides with a period of lesser precipitation, higher temperatures, and greater evapotranspiration (fig. 3). Two recession indices were estimated for streamflow observed at each continuous-record gaging station used in the mean-annual baseflow analysis; one index for the major rise period and one for the major recession period.

Available ground-water-level data indicate that long-term changes in ground-water storage are minimal in Subarea 2. Because long-term storage changes are minimal, mean-annual ground-water discharge, estimated using the hydrograph-separation method, is considered an estimate of minimum mean-annual recharge. Also, aquifers at a regional scale in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, Subarea 2 are considered, for purposes of analysis, to respond as homogeneous and isotropic media.

Results of the mean-annual baseflow analysis are based on measured and estimated data, and the analytical methods to which they are applied. Drainage areas were measured using the most accurate maps available at the time of delineation (Novak, 1985), and are reported in units of square miles. Drainage areas are reported to the nearest square mile for areas greater than 100 mi^2; to the nearest tenth of a square mile for areas between 10 and 100 mi^2; and to the nearest hundredth of a square mile for areas less than 10 mi^2, if the maps and methods used justify this degree of accuracy (Novak, 1985). Annual stream discharge, the sum of the daily mean stream discharges for a given water year, is reported in units of cubic foot per second (ft^3/s), to the nearest cubic foot per second. Daily mean discharge is reported to the nearest tenth of a cubic foot per second for discharge between 1.0 and 9.9 ft^3/s; to the nearest unit for discharge between 10 and 100 ft^3/s; and is reported using three significant figures for discharge equal to or greater than 100 ft^3/s (Novak, 1985).

The accuracy of stream-discharge records depends primarily on: (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of measurements of stage and discharge, and the interpretation of records. Accuracy of records of streamflow data used in this report can be found in annually published USGS data reports, for example, Stokes and McFarlane (1994). The accuracy attributed to the records is indicated under "REMARKS" in the annual data reports for each station. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true discharge; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet these criteria are rated "poor." The accuracy of streamflow records at a station may vary from year to year. In addition, different accuracies may be attributed to different parts of a given record during a single year (Novak, 1985).

Results of the mean-annual baseflow analyses are inherently uncertain. The hydrograph-separation method of analysis is partly subjective, relying on the input of several user-selected variables. As such, the results of the analyses derived and reported herein, are difficult to independently confirm and are presented as estimates of unknown quality and confidence. However, because the values in this report are used in several water budgets, not only within Subarea 2 but also from subarea to subarea, hydrograph-separation results may be reported to a greater significance than the data and analyses warrant to maintain the numerical balance of the water budget; implication of accuracy to the extent shown is not intended.

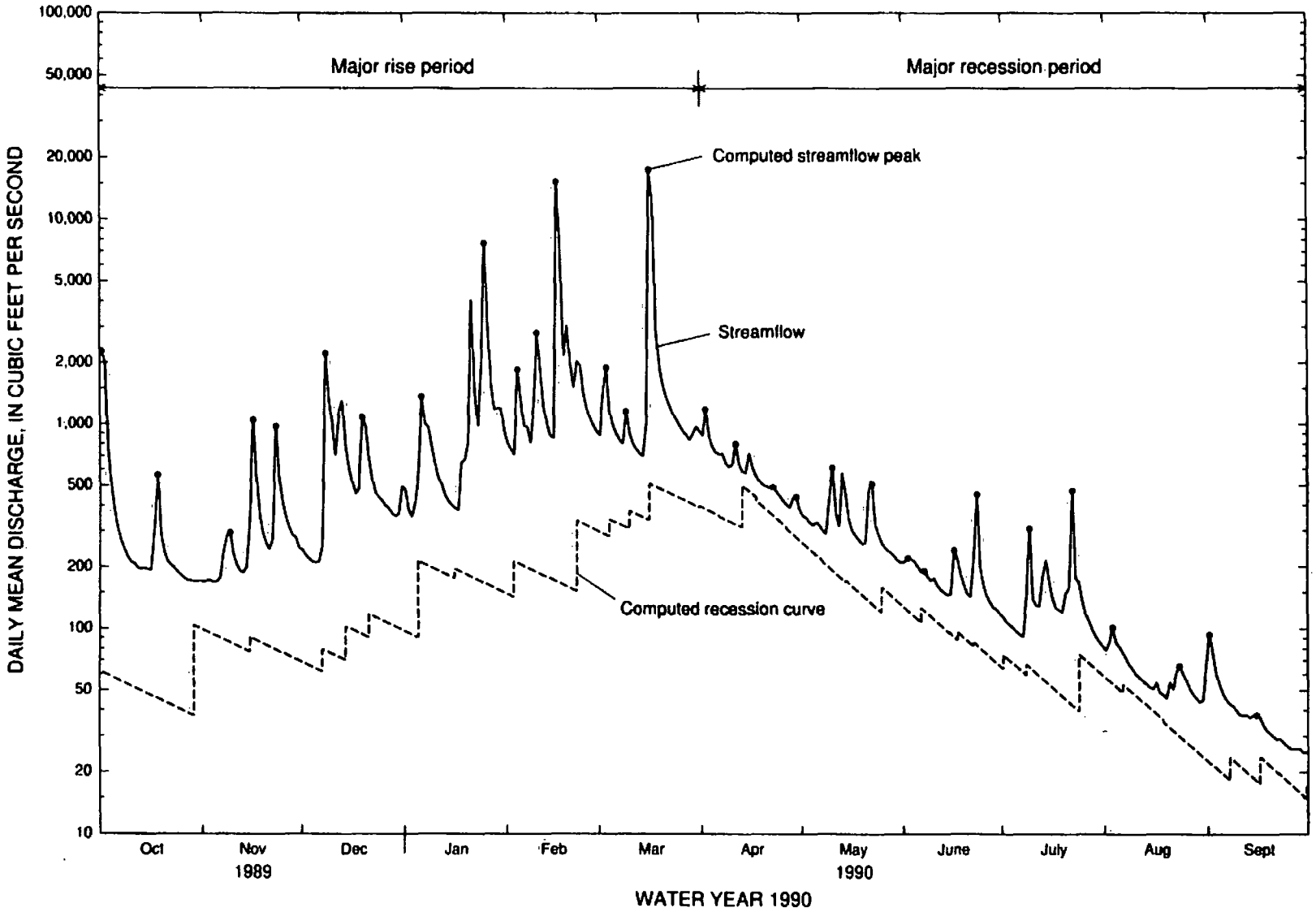


Figure 3. Streamflow hydrograph, separated by program SWGW.

Drought-Flow Analysis

Daily mean streamflow data collected at gaging stations during periods of low flow and corresponding periodic measurements of stream discharge collected at partial-record stations were compiled for the drought years 1941, 1954, and 1986. These data included nearly concurrent daily measurements of streamflow in the Chattahoochee River and periodic measurements of tributary discharge. Data from the Flint River basin were too sparse for a detailed analyses of tributary discharge.

Standard periods of analyses for drought studies were selected for all ACF-ACT subareas. The period of analysis selected for compiling 1954 drought data was September 15 through November 1, 1954. The selected period for the 1986 drought was July 1 through August 14, 1986. Streamflow during these periods was considered to represent the "worst-case" of ground-water storage and availability throughout the ACF-ACT study area. Discharge data were sparse during the 1941 drought; therefore, a standard period of analysis was not selected for the entire ACF-ACT study area.

The period of "worst-case" conditions may not include the minimum streamflow that occurred during a drought at a streamflow measurement site. Minimum drought flows typically occur at different times at different stations within large watersheds, such as the Chattahoochee and Flint River basins. Rather, the "worst-case" evaluation was designed to describe streamflow during the advanced stages of each drought; thus, providing a near-contemporaneous summary of streamflow conditions during periods of low flow throughout the ACF–ACT study area.

The estimated "worst-case" distribution of Chattahoochee River streamflow near the end of the 1941, 1954, and 1986 drought periods was determined by balancing mass in the stream network in a general downstream direction during a relatively short interval of time. The tributary discharge to the Chattahoochee River during drought periods was calculated using a unit-area discharge extrapolated to the entire drainage area of the tributary. Unit-area discharges are based on streamflow measurements that generally are inclusive of only part of the tributary drainage, and may not be representative of an average unit-area discharge for the entire tributary drainage. Therefore, most unit-area discharges used to estimate discharge at ungaged and unmeasured tributaries were based on streamflow data measured at the most downstream point of tributaries to better represent the entire tributary contributing area.

Acknowledgments

The authors appreciate BCI Geonetics of Laconia, New Hampshire; and HydroSource Associates of Ashland, New Hampshire, for providing information on the results of the ground-water exploration program in Fayetteville, Ga.

CONCEPTUAL MODEL OF GROUND-WATER FLOW AND STREAM-AQUIFER RELATIONS

The conceptual model of the ground-water flow and stream-aquifer relations in middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, Subarea 2, is based on previous work done in other areas by Toth (1962, 1963), Freeze (1966), Freeze and Witherspoon (1966, 1967, 1968), Winter (1976), and Faye and Mayer (1990). These studies suggest that recharge originates from precipitation that infiltrates the land surface, chiefly in upland areas, and percolates directly, or leaks downward to the water table. Ground water subsequently flows through the aquifer down the hydraulic gradient and either discharges to a surface-water body or continues downgradient into confined parts of an aquifer. Major elements of this conceptual model include descriptions of flow regimes, stream-aquifer relations, recharge to ground water, and ground-water discharge to streams.

Toth (1963) observed that most ground-water flow systems could be qualitatively subdivided into paths of local (shallow), intermediate, and regional (deep) flow. Local flow regimes are characterized by relatively shallow and short flow paths that extend from a topographic high to an adjacent topographic low. Intermediate flow paths are longer and somewhat deeper than local flow paths and contain at least one local flow path. Regional flow paths (fig. 4) begin at or near the major topographic (drainage) divide and terminate at regional drains, which are the Chattahoochee and Flint Rivers in Subarea 2. Depending on local hydrogeologic conditions, all three flow regimes may not be present everywhere within the subarea.

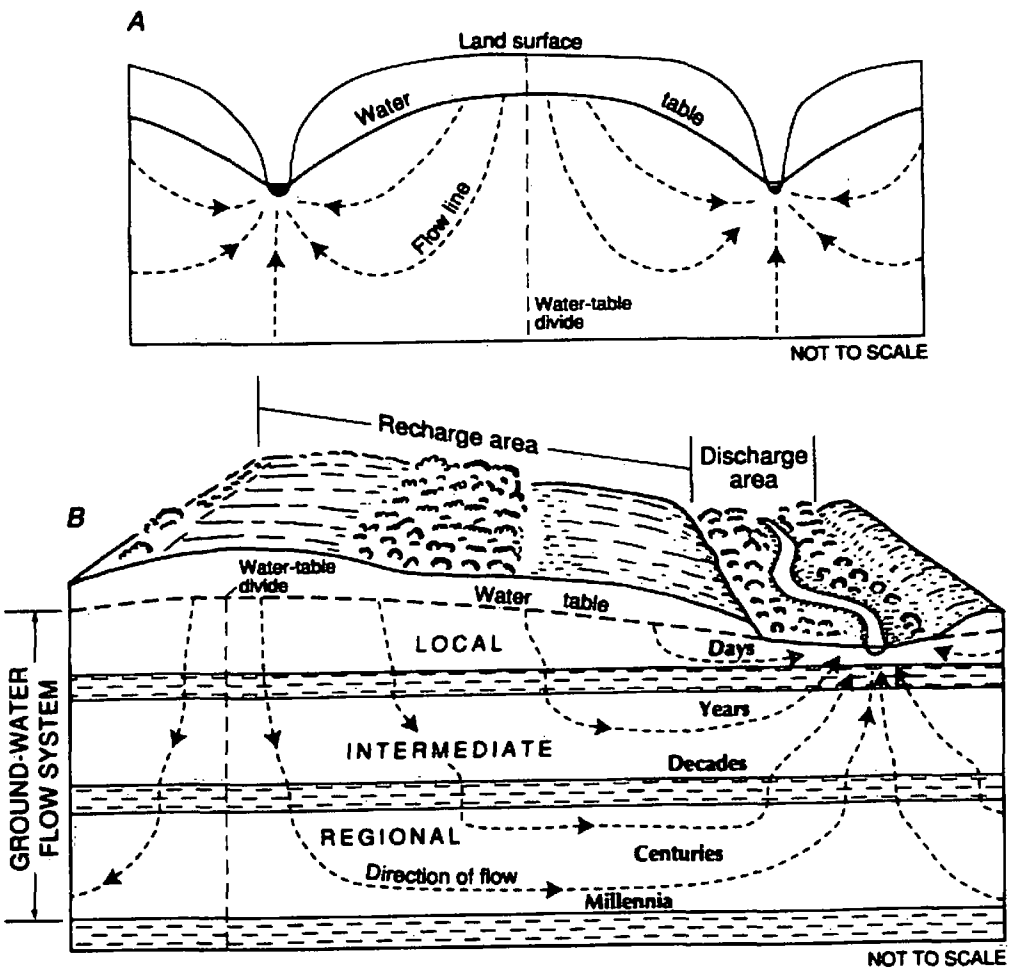


Figure 4. (*A*) Distribution of ground-water flow in an areally extensive, isotropic, homogeneous aquifer system (modified from Hubbert, 1940, and Heath, 1984) and (*B*) example of local, intermediate, and regional ground-water flow (modified from Heath, 1984).

The water table in Subarea 2 probably is a subdued replica of the land-surface topography but generally has less relief. The presence of ground-water flow regimes depends largely on the configuration of the water table, such that recharge occurs in highland areas and discharge occurs in lowland areas. Quantities of recharge to the water table and ground-water discharge to streams are variably distributed throughout the local, intermediate, and regional flow regimes. Local regimes receive the greatest ground-water recharge from the water table and provide the most ground-water discharge to streams. Ground-water discharge to tributary drainages primarily is from local and intermediate flow regimes; ground-water discharge to regional drains, such as the Chattahoochee and Flint Rivers, includes contributions from the regional as well as local and intermediate regimes.

Seasonal variation in rainfall affects the local ground-water flow regime most significantly, and affects the regional flow regime least significantly. Generally, regional flow probably approximates steady-state conditions, and long-term recharge to and discharge from this regime will not vary significantly.

Continuum methods of analysis of ground-water flow, such as hydrograph separation, are based on assumptions of laminar flow through a medium characterized by systematic changes in primary porosity and permeability. Such media generally are classified as porous media. Ground-water flow through porous media is commonly termed Darcian flow. Fractured rock media in the Blue Ridge and Piedmont Provinces contain virtually no primary porosity or permeability and virtually all ground-water flow occurs through secondary openings. For purposes of analysis, continuum methods based on assumptions of Darcian flow are applied to ground-water flow through fractured rock media. Such approaches commonly are justified on a regional scale because fracture systems typically are ubiquitous and intersecting.

Results of smaller-scale studies also demonstrate the continuity of ground-water flow through fractured media. For example, long-term ground-water pumping operations near Ridgeway, S.C., began in the fall of 1988 to dewater fractured Piedmont rocks to accommodate open-pit mining of gold-bearing ore (Glenn and others, 1989). Detailed ground-water monitoring around and within the mined areas indicated that after less than one year of pumping, drawdown extended in an oblong distribution for more than 1 mi beyond the center of pumping. Drawdown decreased uniformly with distance from pumped wells. Nelson (1989) used water-level data from numerous monitoring wells at a 120-acre study site constructed in fractured Piedmont rocks to describe stream-aquifer relations (non-pumping conditions) near the Rocky River in North Carolina. Nelson (1989) concluded that the Rocky River was a drain for ground water discharged from Piedmont rocks, and that observed hydraulic relations between the fractured-rock aquifer and the river and within the aquifer at various depths, were consistent with porous-media concepts of ground-water flow, as described by Toth (1962, 1963). Under pumping conditions, drawdown can extend across surface-water drainage divides in a fractured-rock aquifer, similar to drawdown conditions observed in porous media. As part of an ongoing ground-water-resources investigation in the Lawrenceville, Ga., area (in the Piedmont Province), drawdown across drainage divides was observed at a distance of about 0.9 mi during a 96-hour constant-discharge aquifer test (U.S. Geological Survey, unpublished data from 1995). A study of 18 bedrock wells in the Piedmont Province in Virginia showed the influence of a pumping well across drainage-basin divides, where significant drawdown was observed in a nonpumping well located 1,900 ft from a pumping well in an adjacent drainage basin (Tinkham and others, 1989).

HYDROLOGIC SETTING

The hydrologic framework of Subarea 2 contains dynamic hydrologic systems consisting of aquifers, streams, reservoirs, and floodplains. These systems are interconnected and form a single hydrologic entity that is stressed by natural hydrologic and climatic factors and by anthropogenic factors. For this discussion, the hydrologic framework is separated into two systems: the ground-water system and surface-water system.

Ground-Water System

The ground-water system forms as geology and climate interact. Geology primarily determines the aquifer types present, as well as the natural quality and quantity of ground water. Climate primarily influences the quantity of ground water.

Geology

A detailed description of the diverse and complex geology of Subarea 2 is beyond the scope of this study; however, a brief description of the geology of the subarea is presented, based on selected published descriptions of various geologic investigations. The "Selected References" section of this report lists selected geologic investigations.

The Piedmont Province is characterized by complex sequences of igneous rocks of Precambrian to Paleozoic age, and metamorphic rocks of late Precambrian to Permian age (Miller, 1990); in the Piedmont, isolated igneous rocks of Mesozoic age also are present (D.C. Prowell, U.S. Geological Survey, oral commun., 1996). Collectively, these rocks are called crystalline rocks. The metamorphic rocks originally were sedimentary, volcanic, and volcaniclastic rocks that have been altered by several stages of regional metamorphism to slate, phyllite, schist, gneiss, quartzite, and marble; a variety of cataclastic rocks also are present. The metamorphic rocks are extensively folded and faulted. The intrusive igneous rocks, dominantly granites and lesser amounts of diorite and gabbro, occur as widespread plutons. The rocks are characterized by a complex outcrop and subsurface distribution pattern, as shown on geologic maps of various scales (Szabo and others, 1988). Because rock characteristics can vary significantly on the scale of a few tens of feet within the same lithologic unit, detailed geologic-unit differentiation can be accomplished only on the scale of a topographic quadrangle, or larger. The Piedmont contains major fault zones that generally trend northeast-southwest and form the boundaries between major rock groups (Georgia Geologic Survey, 1976). One such fault is the Brevard Zone of Cataclasis, which extends from Cornelia in northwestern Georgia, through the Metropolitan Atlanta area; and to Whitesburg, near the boundary with Subareas 1 and 2 (Georgia Geologic Survey, 1976). The Chattahoochee River generally is within or parallel to the Brevard Zone of Cataclasis in the upper Chattahoochee River basin (Subarea 1) having trellised and rectangular drainage patterns which reflect geologic control. However, the middle Chattahoochee River basin in Georgia and Alabama, and the upper Flint River basin in Georgia, generally exhibit a dendritic pattern, indicating a superimposed drainage. Regional fault structures mapped in Subarea 2 include the Brevard Zone of Cataclasis near Whitesburg, Ga., and the Towaliga, and Goat Rock Faults near Lake Harding (Georgia Geologic Survey, 1976).

The crystalline igneous and metamorphic rocks largely are covered by a layer of weathered rock and soil known as regolith. The regolith ranges in thickness from a few to more than 150 ft, depending upon the type of parent rock, topography, and hydrogeologic history. From the land surface, the regolith consists of a porous and permeable soil zone that grades downward into a clay-rich, relatively impermeable zone that overlies and grades into porous and permeable saprolite, generally referred to as a transition zone (Heath, 1989). The transition zone grades downward into unweathered bedrock. Regolith thickness generally is less in the Blue Ridge Province than in the Piedmont because of the steeper slopes (Schmitt and others, 1989; Brackett and others, 1991). In general, the massive granite and gabbro rocks are poorly fractured and are characterized by a thin soil cover; in contrast, the schists and gneisses are moderately to highly fractured. The weathering of the rocks is erratic and usually deep; remnants of the original texture and foliation are retained in the saprolite in many places (Clarke, 1963).

The ground-water system in the crystalline rocks of the Piedmont Province of Georgia and Alabama is controlled largely by geology. Various textural and structural properties in the rocks control permeability characteristics; however, hydraulic head gradients and recharge may be influenced by topography and climatic factors.

Aquifers

The principal aquifers in Subarea 2 are fracture-conduit aquifers in igneous and metamorphic rocks of the Piedmont Province (fig. 5); the general physical characteristics of these aquifers are given in table 2. As a result of intense heat and pressure during metamorphism and structural deformation, bedrock aquifers of the Piedmont Province contain little or no primary porosity (less than two percent), and are poorly permeable. In the bedrock, water-bearing zones occur in areas where differential weathering along geologic features produces openings that enhance permeability and enable the storage and flow of ground water (Chapman and others, 1993). Geologic features favorable for the development of secondary openings include lithologic contacts, foliation, joints, fractures, faults, folds, quartz veins, and pegmatites.

Table 2. Generalized geologic units in Subarea 2, and water-bearing properties, chemical characteristics, and well yields
[—, no available data]

Physiographic province	Geologic age and lithology	Aquifer type	Water-bearing properties and chemical characteristics	Well yield
Piedmont and Blue Ridge	regolith: soil, alluvium, colluvium, and saprolite derived from various-aged rocks	porous-media; preferential flow	generally suitable for domestic use only	—
	Precambrian to Paleozoic—bedrock: quartzite, slate, gneiss, schist, marble, phyllite, granite, amphibolite	fracture-conduit	local, discontinuous properties, well yields variable, water quality generally good	1 to 25 gallons per minute typical; may exceed 700 gallons per minute (Kidd, 1989; Clarke and Peck, 1991)

Fracture-conduit aquifers in the Piedmont Province consists of two water-bearing zones—a shallow, regolith zone and a deeper, bedrock zone (fig. 6). The regolith may consist of soil, alluvium, colluvium, and saprolite (weathered bedrock retaining geologic structural characteristics). In general, the regolith consists of a porous, permeable soil at land surface, grading downward into a highly weathered, clay-rich relatively impermeable zone that overlies a less-weathered and more permeable transition zone (Heath, 1989). In some instances, ground water in the regolith is similar to that in porous media, where intergranular porosity is present in the soil or alluvium, or where rocks have been deeply weathered, and retain few structural characteristics. Porosity of the regolith can range from 20 to 30 percent (Heath, 1984). The transition zone between the saprolite and bedrock contains weathered material and boulders, and along structural features, such as foliation and jointing, generally is more permeable than the saprolite. Ground-water flow can be preferential in saprolite, where weathered rock retains relict structural features (Stewart, 1962, 1964; Stewart and others, 1964).

The fracture-conduit aquifers are anisotropic and heterogeneous because of the highly complex and locally variable geologic characteristics controlling the presence of the water-bearing units in the bedrock and regolith. Rock type, structural features, and regolith thickness vary locally and affect the storage capacity and hydraulic conductivity of an aquifer (LeGrand, 1967, 1989; Daniel, 1987; Guthrie and DeJarnette, 1989; Schmitt and others, 1989; Chapman and others, 1993; Guthrie and others, 1994).

Recent studies have shown that a thorough evaluation of hydrogeologic settings in areas characterized by fracture-conduit aquifers can lead to an increased likelihood of successful development of ground-water resources. Most municipal, industrial, and commercial ground-water exploration plans now include consultation with hydrogeologists, who evaluate surficial geology, including structural features, topographic relations to geologic features, existing well information, and land use. Surface and borehole geophysical surveys also may be conducted to delineate subsurface features that indicate the sources of water to wells and the water-bearing properties of the rocks.

Ground water in the study area is obtained from either shallow, bored wells that are completed in the regolith, or deeper, drilled wells that are completed in the bedrock. Public supply wells are completed in the bedrock and casing is grouted about 5 ft into the bedrock to avoid possible contamination from surface runoff and direct infiltration through the weathered regolith. Wells drilled for industrial or commercial use generally also are completed in the bedrock primarily due to the potential for higher yields. Domestic wells are completed in both the regolith (bored wells) and bedrock (drilled wells) (fig. 6). Shallow bored wells that are completed in the regolith can be susceptible to contamination and to water-level decline during droughts.

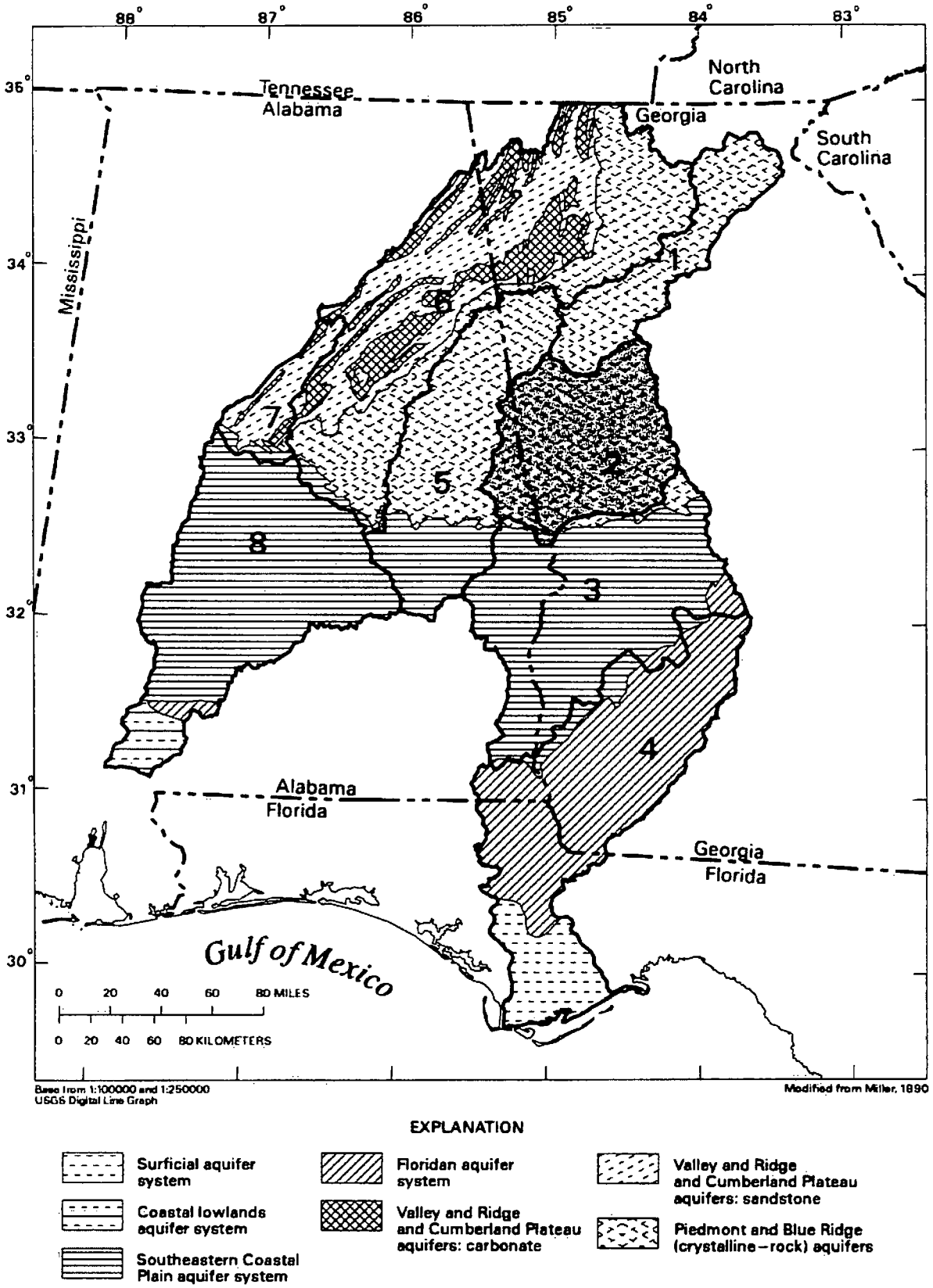


Figure 5. Major aquifers and subareas in the Apalachicola–Chattahoochee–Flint and Alabama–Coosa–Tallapoosa River basins.

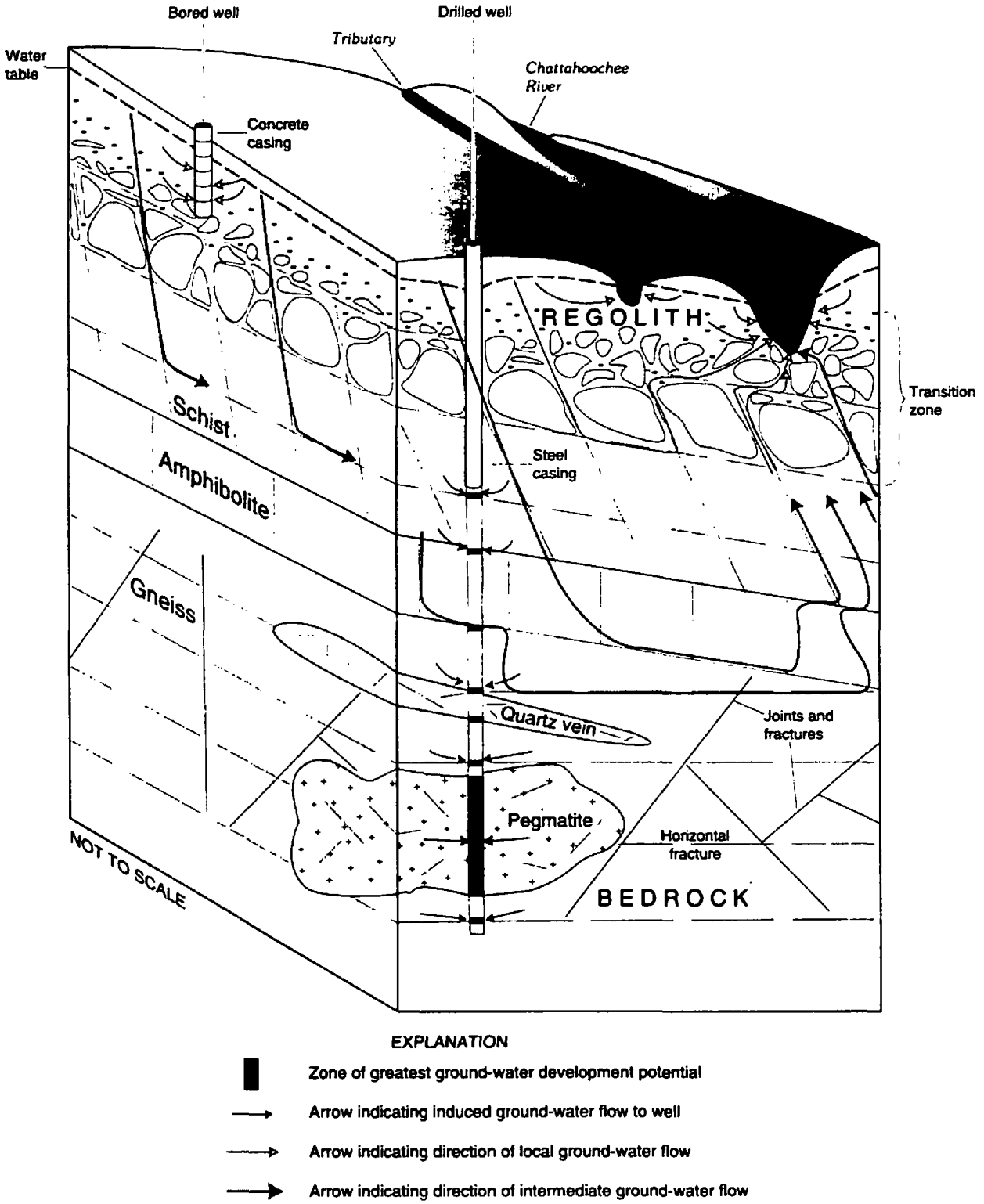


Figure 6. Conceptual ground-water and surface-water systems in Subarea 2— fracture-conduit aquifer in the igneous and metamorphic rocks of the Piedmont Province.

Well depth in Subarea 2 generally ranges from 100 to 700 ft. Wells may yield water from several fractures throughout a borehole, or from a single productive fracture. Conversely, a borehole may not intersect a fracture, or the fracture may not be water bearing, and thus, may yield little or no water. Because of the complex nature of the secondary permeability in fracture-conduit aquifers, production zones generally are of limited extent. Quantitative estimates of aquifer properties such as transmissivity, hydraulic conductivity, and storage coefficient are difficult to assess because of the highly localized geologic controls on secondary permeability.

Fracture-conduit aquifers formed in crystalline rocks may yield quantities of water suitable for public or industrial supply. Yields from wells completed in the fractured crystalline-rock aquifers of Subarea 2 are highly variable. A high-yielding well produces 100 gal/min or greater and yields of as much as 550 gal/min have been reported in Subarea 2; typical well yields, however, are 1 to 25 gal/min (table 2). Bedrock wells often are more able to sustain yields during droughts.

Ground-water movement in fracture-conduit aquifers mainly is through secondary openings, such as fractures and joints, or other enhanced openings along lithologic contacts. Secondary porosity is created by faulting and fracturing and is enhanced by weathering along these openings. The bedrock below the weathered zone and laterally beyond fractures typically has little or no matrix porosity or primary permeability. Ground-water storage primarily is in the overlying weathered rock (regolith or saprolite, which behaves like a porous-media aquifer). The volume of water in storage in the regolith is controlled by the porosity and thickness. To a lesser degree, the volume of water in storage in the bedrock is controlled by the degree of fracturing. Because of the limited storage in fractures, water levels in fracture-conduit aquifers typically respond rapidly to pumping.

Ground water pumped from fracture-conduit aquifers in Subarea 2 generally is suitable for drinking. However, elevated concentrations of iron, manganese, sulfate, dissolved solids, and nitrates are known to occur in some areas. Other potential problems include acidic water that can corrode copper water lines, and the presence of radon gas in the water from the decay of elemental radium in the rocks.

Ground-Water Levels

Ground-water levels fluctuate in response to natural and anthropogenic processes, such as seasonal changes in rainfall, interaction with the surface-water system, and ground-water withdrawal. These fluctuations indicate changes in the amount of water in storage in an aquifer. In the Piedmont Province, ground-water levels in wells may represent differing degrees of confinement. Because of their shallow depth, wells completed in the regolith are highly influenced by climatic changes, such as variations in evapotranspiration and precipitation. During droughts, shallow bored wells temporarily may go dry when the water table falls. Water-level changes in bedrock wells may exhibit both semiconfined and confined behavior; the former responding most directly to recharge. Flowing bedrock wells, however, exhibit more confined conditions and related yields probably are less influenced by climatic variability.

As part of the evaluation of ground-water levels, observation well data were analyzed for wells completed in regolith and fractured bedrock. Long-term ground-water-level data are available for only one regolith well in Subarea 2, and one bedrock well in Subarea 1 near the boundary with Subarea 2. Figures 7 and 8 show water levels in wells 11AA01 and 08CC08, located in the Piedmont Province in Georgia (fig. 9).

Regolith Wells

Regolith wells respond to recharge from precipitation, and the highest ground-water levels generally occur during the winter and spring. Long-term, ground-water-level data are available for a shallow, regolith well 11AA01, located at Griffin, Spalding County, Ga., east of the Subarea 2 boundary (figs. 7 and 9). The water level in well 11AA01 has been monitored continuously since 1943 (fig. 7a). Ground-water levels tend to decline during the late spring through fall, as losses to evapotranspiration increase and recharge is less. However, if significant and numerous storms occur during the summer months, ground-water levels may rise. Annual fluctuations in ground-water levels range from 5 to 10 ft in well 11AA01.

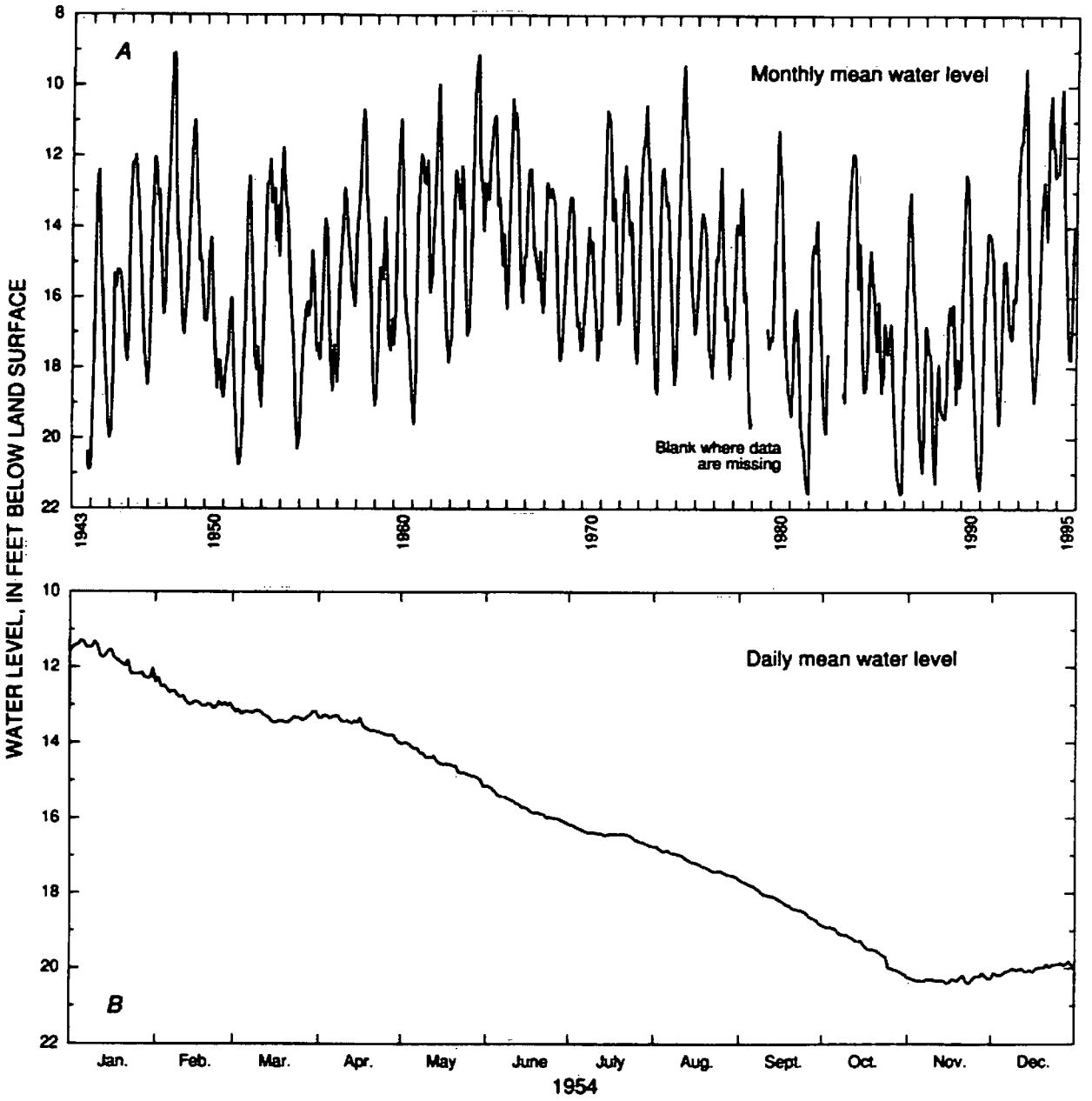


Figure 7. Water-level fluctuations in regolith well 11AA01, Spaulding County, Georgia, during (*A*) 1943–95; and (*B*) the drought of 1954.

During droughts in 1981 and 1986, water levels were the lowest of the period of record in well 11AA01 (fig. 7a). Overall seasonal water levels fluctuated about 4 to 6 ft. Comparing the annual high water levels for various hydrologic conditions (high, average, and low mean annual water levels); high water levels for the drought year, 1988, were about 16.5 ft below land surface; high water levels were about 13 ft below land surface during an average year, 1969; and high water levels were about 9.5 ft below land surface for a wetter year, such as 1975. Many regolith wells in the Piedmont were dry during the later months of the droughts of the 1980's. An example of the annual water-level decline during a drought year is shown for well 11AA01 for 1954 (fig. 7b). A continuous water-level decline was observed as a result of decreased precipitation and increased evapotranspiration losses during the year.

Bedrock Wells

Although continuous ground-water-level data were not available for bedrock wells within Subarea 2, a well located near the boundary with Subarea 1 is considered to be representative. Well, 08CC08 (fig. 9) in southern Fulton County, Ga., was drilled as part of an investigation by Cressler and others (1983) and water-level data were collected from 1979 through 1986 (fig. 8a). The well is located on the flood plain of a tributary to the Chattahoochee River.

The major rock type tapped by well 08CC08 is a biotite gneiss interlayered with a minor schist unit. The biotite gneiss is weathered deeply and casing was set at 78 ft. Total depth of the well is 243 ft. The initial well yield was estimated to be 45 gal/min, with most of the water being derived from fractures at depths of 103 and 176 ft. Geologic core collected at this site confirmed the presence of horizontal fractures and weathering along foliation near lithologic contacts (Cressler and others, 1983).

The water level in well 088CC08 ranged from slightly above land surface to about 4.5 ft below land surface during the period of record (fig. 8a). During the 1981 drought, the water level in the well declined only about 3.5 ft, and the minimum water level occurred in late July (coincident with the period of minimum streamflow throughout the ACF basin). The 1981 water-level hydrograph for this bedrock well is very different from ground-water levels observed in the regolith well (fig. 8b) during the 1954 drought. Water levels in the bedrock well (08CC08) exhibited sharp peaks, possibly in response to nearby stream levels or rainfall. The drought years of 1980 and 1986 produced the lowest water levels observed during the period of record; however, the lowest water levels were only about 1 ft below average-year minimums. The relatively small fluctuation in water levels probably is due to the location of the well in a floodplain, an area of ground-water discharge.

Surface-Water System

The two major river systems in Subarea 2 are the Chattahoochee and Flint Rivers (fig. 9). Headwaters of the Chattahoochee are located near Helen, Ga. (Subarea 1) (fig. 1), and the river enters Subarea 2 near Whitesburg, Ga., along the Carroll and Coweta County line. Headwaters of the Flint River are in Subarea 2 in Clayton County, Ga. In Subarea 2, the Chattahoochee River forms the State line with Alabama in Heard County, Ga., and Randolph County, Ala. The Subarea 2-3 boundary (figs. 1, 2) is near the Columbus, Ga., gaging station on the Chattahoochee River (02341500), and near the Culloden, Ga., gaging station on the Flint River (02347500) (fig. 9). Gaging stations on rivers discussed in this report are listed in table 3.

Table 3. Selected active and discontinued continuous-record stream-gaging stations in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, Subarea 2
[I, fracture-conduit aquifer in igneous or metamorphic rock; —, not applicable]

Station number	Station name	Drainage area (square miles)	Type of stream	Major aquifer drained	Period of record of unregulated flow (water years)	Mean-annual stream discharge[1/] (cubic feet per second)
			Chattahoochee River basin			
02338000	Chattahoochee River near Whitesburg, Ga.	2,420	regional	I	1939-53	[2/]3,740
02338660	New River near Corinth, Ga.	127	tributary	I	1978-present	152
02338840	Yellowjacket Creek near Hogansville, Ga.	91.0	do.	I	1979-85	116
02339000	Yellowjacket Creek near LaGrange, Ga.	182	do.	I	1951-71	225
02339500	Chattahoochee River at West Point, Ga.	3,550	do.	I	1897-1955	[2/]5,625
02340500	Mountain Oak Creek near Hamilton, Ga.	61.7	do.	I	1943-71.	82.3
02341500	Chattahoochee River at Columbus, Ga.	4,670	do.	I	—	[3/]6,794
			Flint River basin			
02347500	Flint River near Culloden, Ga.	1,850	regional	I	1912-22 1929-31 1938-present	2,344

[1/]Stokes and McFarlane (1994).
[2/]Unregulated flow.
[3/]Regulated flow.

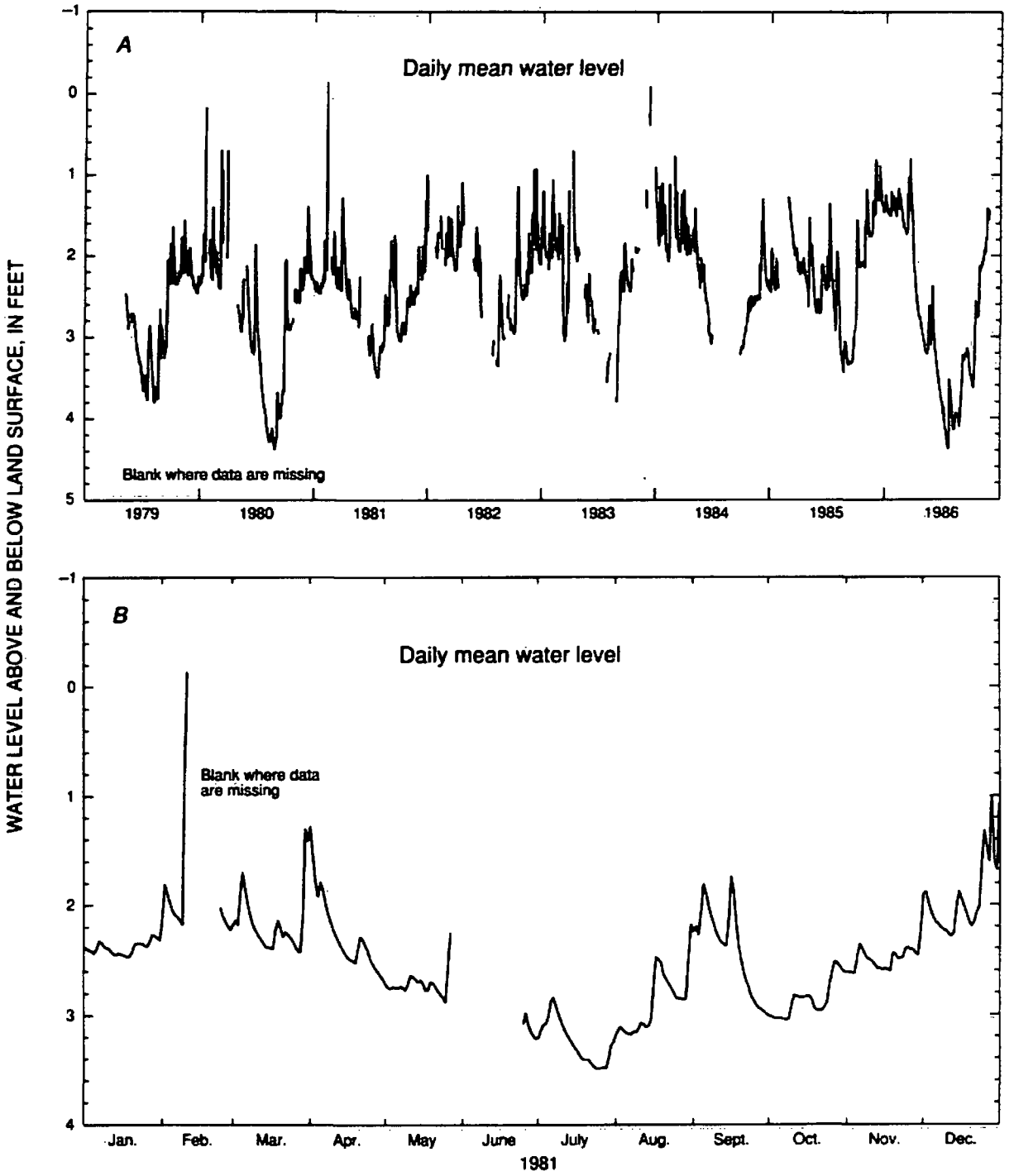
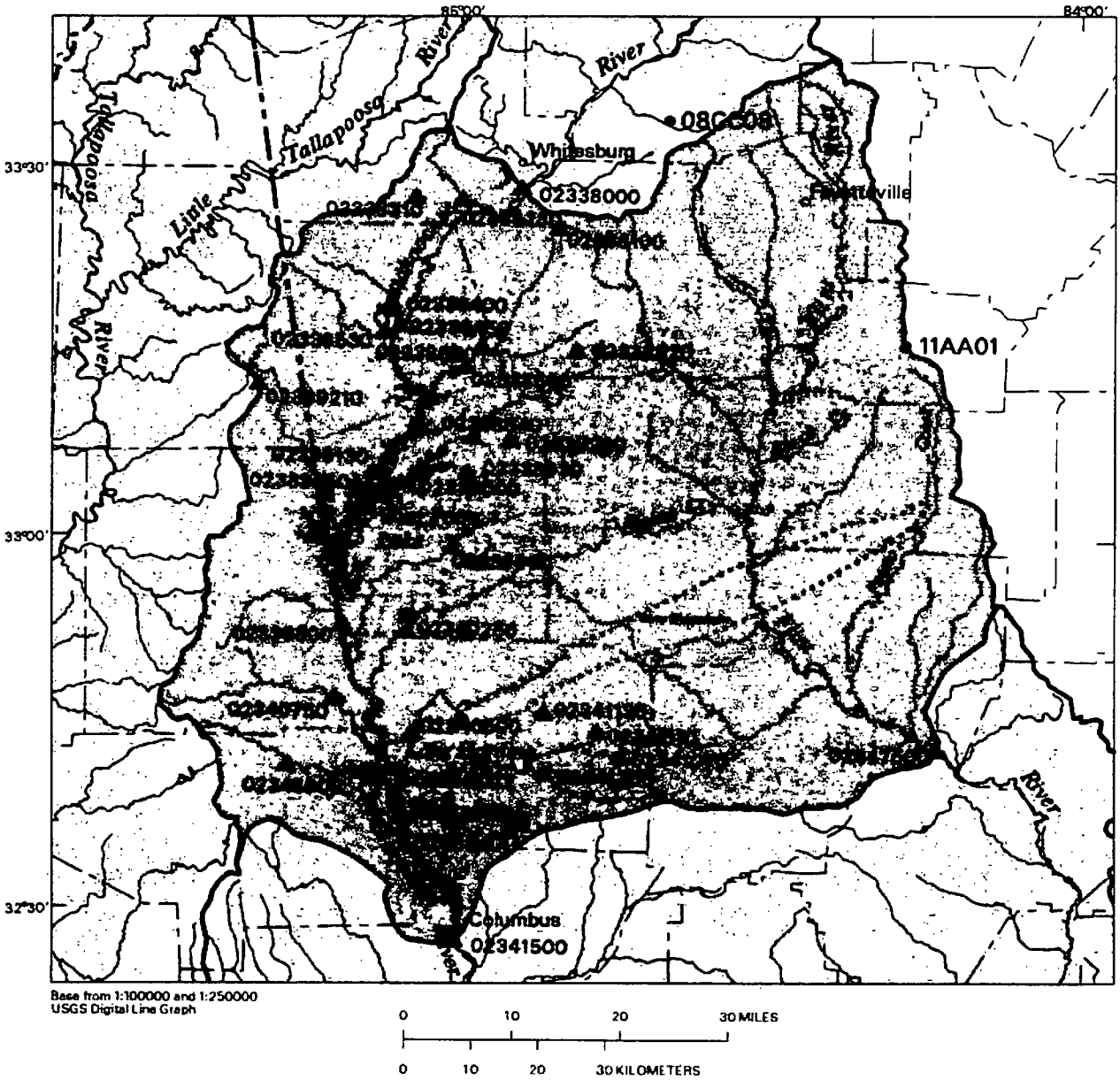


Figure 8. Water-level fluctuations in bedrock well 08CC08, Fulton County, Georgia, during (*A*) 1979–86; and (*B*) the drought of 1981. Negative value indicates water level above land surface.



EXPLANATION

02341500 ▲ Stream-gaging station and number

11AA01 ● Observation well and number

Figure 9. Selected stream-gaging stations and observation wells 08CC08 and 11AA01, Subarea 2.

For this report, the mean-annual stream discharge of a surface-water drainage measured at a gaging station is defined as the arithmetic average of all reported annual discharges for the period of record. Note that, by definition, the stream discharge includes both surface runoff and baseflow. The estimated mean-annual stream discharge of the Chattahoochee River from Subarea 2 to Subarea 3 is about 6,794 ft^3/s; and for the Flint River, mean-annual stream discharge is about 2,344 ft^3/s at the Subarea 2–Subarea 3 boundary.

Three major storage reservoirs are located on the Chattahoochee River in the Piedmont physiographic province. These reservoirs are used for flood control, power generation, recreation, and water supply. The northernmost impoundment is Lake Sidney Lanier (Forsyth, Hall, Gwinnett, and Lumpkin Counties, Ga.), in Subarea 1 of the ACF basin. Usable storage capacity for Lake Sidney Lanier is 1,686,000 acre-feet between elevations of 1,035 and 1,085 ft. The other two reservoirs are in Subarea 2 (table 4): West Point Lake (Troup and Heard Counties, Ga.-Chambers County, Ala.) and Lake Harding (Harris County, Ga.–Lee and Chambers Counties, Ala.) (fig. 9). Storage began in October 1974 at West Point Lake, which has a total capacity of 774,800 acre-ft at an elevation of 641 ft (maximum flood-control pool level) (Stokes and McFarlane, 1994). Lake Harding, where storage began in 1926, is downstream of West Point Lake on the Chattahoochee River, north of Columbus, Ga. Total storage capacity of Lake Harding is 181,000 acre-ft at an elevation of 521 ft (Stokes and McFarlane, 1994). Water-supply withdrawal and wastewater returns are common along the Chattahoochee River in Subarea 2. Although, no major storage reservoirs are on the Flint River in Subarea 2, minor withdrawal and returns occur throughout the river corridor.

Table 4. Major impoundments in the middle Chattahoochee River basin, Georgia and Alabama, Subarea 2

Impoundment structure	Station number	Location	Installation date	Major uses	Total storage capacity[1/] (acre-feet)
West Point	02339400	Troup and Heard Counties, Ga.—Chambers County, Ala.	1975	flood control and power generation	774,800
Bartletts Ferry (Lake Harding)	02339820	Harris County, Ga.—Lee and Chambers Counties, Ala.	1926	power generation	181,000

[1/]Stokes and McFarlane (1994).

GROUND-WATER DISCHARGE TO STREAMS

Streamflow is comprised of two major components—a typical hydrograph integrates these components as:

- overland or surface runoff, represented by peaks, indicating rapid response to precipitation; and
- baseflow, represented by the slope of the streamflow recession, indicating ground-water discharge to the stream.

In relation to the conceptual model, baseflow in streams is comprised of contributions from the local, intermediate, or regional ground-water flow regimes. Estimates of recharge to the ground-water system are minimum estimates because the budgets were developed as ground-water discharge to streams, and do not include ground water discharged as evapotranspiration, to wells, or ground water that flows downgradient into other aquifers beyond the topographic boundary defining Subarea 2. Local flow regimes likely are the most affected by droughts. Discharge measured in unregulated streams and rivers near the end of a drought should be relatively steady and composed largely of baseflow.

Mean-Annual Baseflow

Mean-annual baseflow was determined by estimating mean-annual ground-water discharge to the Chattahoochee and Flint Rivers and selected major tributaries. Streamflow data used to determine mean-annual ground-water discharge at continuous-record gaging stations were selected according to periods of record when flow was unregulated. The hydrograph-separation program SWGW (Mayer and Jones, 1996) was applied to estimate mean-annual baseflow at three continuous-record gaging stations in the middle Chattahoochee River in Georgia and Alabama, and upper Flint River in Georgia (table 5). For each gaging station, two recession indices are listed in table 5; one represents the rate of streamflow recession during the major rise period, generally in winter; and the other during the major recession period, generally in summer. Some variables that are supplied by the user to SWGW for each hydrograph separation are not listed in table 5, but can be obtained from the U.S. Geological Survey, Georgia District Office, Atlanta, Ga. These variables include the time-base (in days) from the peak to the cessation of surface runoff, the time period (the beginning and ending months) for application of the summer recession index, and the adjustment factor for the displacement of the recession curve. See Rutledge (1993) for a discussion of time-base, and Mayer and Jones (1996) for a discussion of the other user-supplied variables.

The mean-annual baseflow, in cubic feet per second, and the related unit-area baseflow, in cubic feet per second per square mile, were computed for each station. Mean unit-area baseflow estimated for three stations representing discharge from igneous and metamorphic rocks along the middle Chattahoochee River in Georgia and Alabama, and upper Flint River in Georgia, Subarea 2, ranged from 0.627 to 1.06 $ft^3/s/mi^2$ (table 5).

Data for gaging stations located downstream of Lake Sidney Lanier (Subarea 1) on the Chattahoochee River in Subarea 2 (fig. 9) were evaluated for the period prior to its impoundment by Buford Dam in 1956. Where possible, data for the same years were used for the hydrograph-separation analyses for each station throughout the study area. In general, in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, the lowest streamflow occurred during the drought of 1941; the highest streamflow occurred in 1949. The average flow year selected for analysis varied for each station with regard to the available period of record for unregulated flow.

Estimated mean-annual baseflow in the upper Chattahoochee River basin ranges from about 50 to 61 percent of mean-annual stream discharge in Subarea 2. The contribution of mean-annual baseflow from Subarea 2 to Subarea 3 was estimated using data from the West Point, Ga., (02339500), gaging station on the Chattahoochee River, and the gaging station near Culloden, Ga., (02347500), on the Flint River (fig. 9; table 5). The discharge to the Chattahoochee River at the Subarea 2–3 boundary at Columbus, Ga., was estimated to be about 4,640 ft^3/s. For the Flint River basin, with headwaters in Subarea 2 in Georgia, the transfer of water from Subarea 2 to Subarea 3 near Culloden, Ga., is estimated to be about 1,160 ft^3/s (750 Mgal/d). The discharge was estimated by applying the unit-area discharge computed at the West Point, Ga., station (02339500), to the entire drainage area at the Columbus, Ga., station (02341500). The baseflows exiting Subarea 2 represent about 68 percent of the mean-annual (regulated, table 3) stream discharge for the Chattahoochee River and 49 percent for the Flint River at Columbus, Ga., and near Culloden, Ga., respectively.

Data representative of unregulated streamflow were used to estimate mean-annual baseflow for all gaging stations in Subarea 2. All gaging stations on the Chattahoochee River in Subarea 2 (table 3) are downstream of Lake Sidney Lanier (Buford Dam), located northeast of Atlanta, Ga., (fig. 1, Subarea 1). Data used for hydrograph-separation analyses from these stations were evaluated for the period prior to the lake's completion in 1956. The station at West Point, Ga., is downstream of West Point Lake (West Point Dam) (fig. 9), which was completed in 1974. Streamflow-discharge data at Columbus, Ga., were not used for the analyses due to regulation upstream from Lake Harding, which began operation in 1926. Although regulation occurs along the Flint River in Subarea 2, no specific record periods were eliminated as there are no major reservoirs within or upstream of the study area, and the influence of regulation on streamflow at the station near Culloden, Ga., is minimal.

Table 5. Mean-annual stream discharge, estimated annual and mean-annual baseflow, and unit-area mean-annual baseflow at selected gaged streams in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, Subarea 2

Station number	Station name	Type of stream	Drainage area (square miles)	Major aquifer type	Recession index		Water year	Flow conditions	Mean-annual stream discharge[1/] (cubic feet per second)	Annual baseflow[2/,3/] (cubic feet per second)	Mean-annual baseflow[3/,4/] (cubic feet per second)	Unit-area mean-annual baseflow[3/,4/] (cubic feet per second per square mile)
					Winter (days)	Summer (days)						
					Chattahoochee River basin							
02338000	Chattahoochee River near Whitesburg, Ga.	regional	2,420	regional	120	100	1941	Low	2,166	1,370		
							1952	Average	4,170	2,460	2,570	1.06
							1949	High	6,221	3,890		6
02339500	Chattahoochee River at West Point, Ga.	do.	3,550	do.	140	100	1941	Low	3,036	1,960		
							1943	Average	5,947	3,660	3,530	0.994
							1929	High	10,100	4,970		
02341500	Chattahoochee River at Columbus, Ga.	do.	4,670	do.	—	—	—	—	—	—	[6/]4,640	.994
					Flint River basin							
02347500	Flint River near Culloden, Ga.	do.	1,850	do.	85	55	1941	Low	1,043	654		
							1943	Average	2,617	1,350	1,160	.627
							1949	High	3,262	1,480		
Mean-annual baseflow exiting middle Chattahoochee River basin, Georgia and Alabama; and upper Flint River basin, Georgia, Subarea 2											[7/]**5,800**	

[1/]From annually published U.S. Geological Survey data reports; for example, Stokes and McFarlane (1994).
[2/]Estimated using the computer program SWGW (Mayer and Jones, 1996).
[3/]Values are reported to three significant digits to maintain the numerical balance of the water budget; implication of accuracy to the degree shown is not intended.
[4/]Estimated by averaging discharges for low, average, and high flow years for the period of unregulated flow.
[5/]Discharge divided by drainage area.
[6/]Mean-annual baseflow estimated by multiplying drainage area by unit-area baseflow for the Chattahoochee River at West Point, Ga. (see text).
[7/]Represents entire Chattahoochee and Flint River basins in Subarea 2.

Because of the absence of continuous-record streamflow data in Alabama, the contribution of mean-annual baseflow in the Chattahoochee River from Alabama in Subarea 2 was computed using the following approximation. The Chattahoochee River forms the State line between Georgia (east) and Alabama (west) beginning at West Point Lake (fig. 9; net drainage area is about 2,250 mi^2). Baseflow from Alabama to the Chattahoochee River in Subarea 2 was estimated by determining the percentage of drainage area in Alabama (26 percent or about 590 mi^2) contributing to the total drainage area between stations near Whitesburg, Ga., and at Columbus, Ga., (2,250 mi^2); and then multiplying this percentage by the net gain in mean-annual baseflow estimated between the Whitesburg and Columbus, Ga., gaging stations. (This extrapolation is considered valid because of similar overall hydrogeologic conditions throughout the study area.) The total net gain in mean-annual baseflow was about 2,070 ft^3/s (1,340 Mgal/d) between the Whitesburg and Columbus gaging stations. The contributing area in Alabama was 26 percent of the total drainage area between the stations. Therefore, the estimated mean-annual baseflow contribution to the Chattahoochee River from Alabama is 26 percent of 2,070 ft^3/s (1,340 Mgal/d), or about 540 ft^3/s (350 Mgal/d). Accordingly, the estimated mean-annual baseflow contribution to the Chattahoochee River from Georgia is about 1,530 ft^3/s (982 Mgal/d) between the stations near Whitesburg, Ga., and at Columbus, Ga.

Drought Flow for 1941, 1954, and 1986

Regional drought periods of 1938-45, 1950-63, and 1984-88 were marked by severe droughts in the years of 1941, 1954, and 1986 in the ACF and ACT River basins. Typically, the lowest mean-annual streamflow for the period of record occurred during one of these years. Streamflow was assumed to be sustained entirely by baseflow near the end of these droughts. Near-synchronous discharge measurements at partial-record gaging stations or daily mean streamflow at continuous-record gaging stations during these periods were assumed to provide a quantitative estimate of near minimum baseflow from Subarea 2 into Subarea 3. Where available, streamflow data for an interval of a few days were compiled; and where not available, streamflow was estimated using various techniques—discussed below.

Estimated and measured streamflow near the end of the 1941, 1954, and 1986 drought years at selected sites on the middle Chattahoochee River in Georgia and Alabama and its tributaries and the upper Flint River in Georgia are shown in tables 6, 7, and 8, respectively, and summarized in table 9. Most of the data presented represent minimum daily mean streamflow from continuous-record gaging stations. Some miscellaneous streamflow measurements were used for the analyses.

Table 6. Stream discharge during the month of October of the drought of 1941, Subarea 2
[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
	Chattahoochee River basin					
02338000	Chattahoochee River near Whitesburg, Ga.	regional	2,420	10-26-41	468	0.193
02339500	Chattahoochee River at West Point, Ga.	do.	3,550	10-25-41	540	.152
02341500	Chattahoochee River at Columbus, Ga.	do.	4,670	—	[4/]710	.152
Drainage area and stream discharge exiting Chattahoochee River basin, Subarea 2			**4,670**	—	[4/]**710**	—
	Flint River basin					
02347500	Flint River at Culloden, Ga.	regional	1,850	10-26-54	98	.053
Drainage area and stream discharge exiting Flint River basin, Subarea 2			**1,850**	—	**98**	—
Drainage area and stream discharge exiting Subarea 2[5/]			**6,520**	—	**808**	—

[1/]From Carter and others (1989), except for Chattahoochee River drainage areas downstream from New River, which are from Carter (1959).
[2/]Daily mean discharge.
[3/]Discharge divided by drainage area.
[4/]Estimated unregulated discharge multiplying drainage area by unit-area discharge for Chattahoochee River at West Point, Ga.
[5/]Represents entire Chattahoochee and Flint River basins.

Table 7. Stream discharge during the months of September and October of the drought of 1954, Subarea 2
[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
	Chattahoochee River basin					
02338000	Chattahoochee River near Whitesburg, Ga.	regional	2,420	09-15-54	[4/]**461**	0.190
—	intermediate area between Chattahoochee River near Whitesburg, Ga., and mouth of Wahoo Creek	—	6	—	[5/]**0.1**	—
02338100	Wahoo Creek near Sargent, Ga.	tributary	20.4	09-24-54	[4/].44	.022
—	Wahoo Creek at mouth	do.	34.6	—	[6/]**.8**	—
—	intermediate area between Wahoo Creek and Acorn Creek	—	16	—	[5/]**1.1**	—
02338220	Acorn Creek near Whitesburg, Ga.	tributary	8.7	09-20-54	[4/].62	.071
—	Acorn Creek at mouth	do.	11.2	—	[6/]**.8**	—
—	intermediate area between Acorn Creek and Whooping Creek	—	6	—	[5/]**.3**	—
02338280	Whooping Creek near Lowell, Ga.	tributary	26.6	09-20-54	[4/]1.53	.058
—	Whooping Creek at mouth	do.	31.4	—	[6/]**1.8**	—
—	intermediate area between Whooping Creek and Yellowdirt Creek	—	2	—	[5/]**.3**	—
02338310	Yellowdirt Creek near Roopville, Ga.	tributary	4.3	09-20-54	[4/].71	.165
—	Yellowdirt Creek at mouth	do.	25.7	—	[6/]**4.2**	—
—	intermediate area between Yellowdirt Creek and Centralhatchee Creek	—	62	—	[5/]**6.0**	—
02338400	Centralhatchee Creek at U.S. Highway 27 near Franklin, Ga.	tributary	56.7	10-11-54	[4/]5.42	.096
—	Centralhatchee Creek at mouth	do.	58.8	—	[6/]**5.6**	—
—	intermediate area between Centralhatchee and New River	—	123	—	[5/]**13**	—
—	New River above Messiers Creek	tributary	10.5	—	[7/]2.6	—
02338620	Messiers Creek near Grantville, Ga.	do.	4.0	09-24-54	[4/]1.01	.252
—	Messiers Creek at mouth	do.	10.5	—	[6/]2.6	—
—	New River below Messiers Creek	do.	21	—	[8/]5.2	—
—	New River above Carey Creek	do.	98.5	—	[9/]12.4	.126
02338650	Caney Creek near Corinth	do.	12.6	10-12-54	[4/]0	0
—	Caney Creek at mouth	do.	22.8	—	[6/]0	0
—	New River below Caney Creek	do.	121	—	[10/]12.4	.102
—	New River at mouth	do.	151	—	[11/]**15**	—
—	intermediate area between New River and Yellowjacket Creek	—	65	—	[5/]**4.3**	—
02339000	Yellowjacket Creek near LaGrange, Ga.	tributary	182	10-19-54	12	.066
—	Yellowjacket Creek at mouth	do.	202	—	[6/]**13**	—
02339130	Whitewater Creek near LaGrange, Ga.	do.	27	10-20-54	[4/].24	[12/].009
02339350	Wedhadkee Creek at Georgia Highway 244 near Abbotsford, Ga.	do.	97.6	10-20-54	[4/].20	[12/].002
—	intermediate area between Yellowjacket Creek and Chattahoochee River at West Point, Ga.	—	338	—	[13/]**21**	—
02339500	**Chattahoochee River at West Point, Ga.**	**regional**	**3,550**	**10-19-54**	[2/,14/]**548**	

Table 7. Stream discharge during the months of September and October of the drought of 1954, Subarea 2—Continued
[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
—	intermediate area between Chattahoochee River at West Point, Ga., and Long Cane Creek	—	0.2	—	[5/]**0.0**	—
02339640	Long Cane Creek at U.S. Highway 27 near LaGrange, Ga.	tributary	22.5	10-20-54	[4/]1.37	.061
—	Long Cane Creek at mouth	do.	83.8	—	[6/]**5.1**	—
—	intermediate area between Long Cane Creek and Flat Shoal Creek	—	8	—	[5/]**.9**	—
02340250	Flat Shoal Creek at State Route 18 near West Point, Ga.	tributary	202	10-20-54	[4/]22.4	.111
—	Flat Shoal Creek at mouth	do.	220	—	[6/]**24**	—
—	intermediate area between Flat Shoal Creek and Mountain Oak Creek	—	78	—	[5/]**8.9**	—
02340500	Mountain Oak Creek near Hamilton	tributary	61.7	10-20-54	7.0	.114
—	Mountain Oak Creek at mouth	do.	69.7	—	[6/]**7.9**	—
—	intermediate area between Mountain Oak and Mulberry Creek	—	270	—	[15/]**45**	—
02341070	Mulberry Creek at State Route 85 near Waverly Hall, Ga.	tributary	123	10-21-54	[4/]0	0
—	Mulberry Creek above Dowdell Creek	do.	43.2	—	[16/].6.6	—
02341110	Dowdell Creek near Waverly Hall, Ga.	do.	27.9	10-21-54	[4/]8.54	.306
—	Dowdell Creek at mouth	do.	32.3	—	[6/]9.9	—
—	Mulberry Creek below Dowdell Creek	do.	75.5	—	[17/]16.5	.219
—	Mulberry Creek above Palmetto Creek	do.	88.5	—	[18/]19.4	—
02341130	Palmetto Creek near Hamilton	do.	9.2	10-21-54	[4/]2.74	.298
—	Palmetto Creek at mouth	do.	20.5	—	[6/]6.1	—
—	Mulberry Creek below Palmetto Creek	do.	109	—	[19/]25.5	.234
—	Mulberry Creek above Ossahatchie Creek	do.	115	—	[20/]26.9	—
02341200	Ossahatchee Creek near Hamilton	do.	42.8	10-21-54	[4/].15	.004
—	Ossahatchee Creek at mouth	do.	46.1	—	[6/].2	—
—	Mulberry Creek below Ossahatchee Creek	do.	161	—	[21/]27.1	.168
—	Mulberry Creek at mouth	do.	228	—	[22/]**38**	—
—	intermediate area between Mulberry Creek and Standing Boy Creek	—	42	—	[5/]**.3**	—
02341330	Standing Boy Creek near Rehobeth	tributary	9.7	10-21-54	[4/].02	.002
—	Standing Boy Creek above Heiferhorn Creek	do.	46.6	—	[23/].1	—
02341340	Heiferhorn Creek near Rehobeth	do.	2.4	10-21-54	[4/].04	.017
—	Heiferhorn Creek at mouth	do.	23.1	—	[6/].4	—
—	Standing Boy Creek below Heiferhorn Creek	do.	69.7	—	[24/].5	.007
—	Standing Boy Creek at mouth	do.	71.3	—	[25/]**.5**	—

Table 7. Stream discharge during the months of September and October of the drought of 1954, Subarea 2—Continued
[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
—	intermediate area between Standing Boy and Chattahoochee River at Columbus, Ga.	—	49	—	[25/].3	—
02341500	**Chattahoochee River at Columbus, Ga.**	**regional**	**4,670**	—	[26/]**679**	—
Drainage area and stream discharge exiting Chattahoochee River basin, Subarea 2			**4,670**		**679**	
	Flint River basin					
02347500	Flint River at Culloden, Ga.	regional	1,850	10-17-54	97	.052
Drainage area and stream discharge exiting Flint River basin, Subarea 2			**1,850**	—	**97**	—
Drainage area and stream discharge exiting Subarea 2[27/]			**6,520**		**776**	

[1/]From Carter and others (1989), except for Chattahoochee River drainage areas downstream from New River, which are from Carter (1959).
[2/]Daily mean discharge.
[3/]Discharge divided by the drainage area.
[4/]Miscellaneous discharge measurement.
[5/]Estimated by multiplying drainage area of the intermediate area by the unit-area discharge that was computed using the discharge at the next downstream miscellaneous measurement site or daily mean-discharge site.
[6/]Estimated by multiplying the drainage area at the tributary's mouth by the unit-area discharge that was computed using the discharge at that tributary's miscellaneous measurement site or daily mean-discharge site.
[7/]Estimated by multiplying drainage area by Messiers Creek unit-area discharge.
[8/]Sum of discharges estimated for New River above Messiers Creek and Messiers Creek at mouth.
[9/]Estimated by multiplying the drainage area by the average unit-area discharge of Messiers Creek and Caney Creek.
[10/]Sum of the estimated discharges for New River above Caney Creek and Caney Creek at mouth.
[11/]Estimated by multiplying drainage area by unit-area discharge for New River below Caney Creek.
[12/]Unit-area discharge not used to estimate tributary or intermediate discharges.
[13/]Estimated by multiplying drainage area by mean-unit area discharge of Yellowjacket Creek and Long Cane Creek.
[14/]Daily mean discharge and sum of estimated upstream discharges at intermediate drainage areas and tributary mouths.
[15/]Estimated by multiplying drainage area by unit-area discharge of Mulberry Creek below Ossahatchee Creek.
[16/]Estimated by multiplying drainage area by mean unit-area discharge of Mulberry Creek at State Route 85 near Waverly Hall and Dowdell Creek.
[17/]Sum of the estimated discharges for Mulberry Creek above Dowdell Creek and Dowdell Creek at mouth.
[18/]Estimated by multiplying drainage area by unit-area discharge for Mulberry Creek below Dowdell Creek.19/Sum of the estimated discharges for Mulberry Creek above Palmetto Creek and Palmetto Creek at mouth.
[20/]Estimated by multiplying drainage area by unit-area discharge for Mulberry Creek below Palmetto Creek.
[21/]Sum of estimated discharges for Mulberry Creek above Ossahatchee Creek and Ossahatchee Creek at mouth.
[22/]Estimated discharge by multiplying drainage area by unit-area discharge for Mulberry Creek below Ossahatchie Creek.
[23/]Estimated by multiplying drainage area by unit-area discharge for Standing Boy Creek near Rehobeth.
[24/]Sum of estimated discharges for Standing Boy Creek above Heiferhorn Creek and Heiferhorn Creek at mouth.
[25/]Estimated by multiplying drainage area by unit-area discharge for Standing Boy Creek below Heiferhorn Creek.
[26/]Estimated unregulated flow obtained by summing the discharge for the Chattahoochee River at West Point (02339500), estimated discharges for tributaries at their mouths and intermediate area discharges downstream (in boldface type), except Dowdell Creek, Palmetto Creek, and Ossahatchie Creek which are tributaries of Mulberry Creek and Heiferhorn Creek which is a tributary of Standing Boy Creek.
[27/]Represents entire Chattahoochee and Flint River basins.

Table 8. Stream discharge during the month of July of the drought of 1986, Subarea 2
[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
	Chattahoochee River basin					
02338000	Chattahoochee River near Whitesburg, Ga.	regional	2,420	—	[4/]**637**	0.263
—	intermediate area between Chattahoochee River near Whitesburg, Ga., and Wahoo Creek	—	6	—	[5/]**1.2**	—
02338100	Wahoo Creek near Sargent, Ga.	tributary	20.4	07-07-86	4.0	.196
—	Wahoo Creek at mouth	do.	34.6	—	[6/]**6.8**	—
—	intermediate area between Wahoo Creek and Centralhatchee Creek	—	155	—	[7/]**34**	.221
02338400	Centralhatchee Creek near Franklin, Ga.	tributary	57	07-07-86	14	.246
02338450	Centralhatchee Creek at mouth	do.	58.8	—	[6/]**14.5**	—
—	intermediate area between Centralhatchee and Hillabahatchee Creek	—	4	—	[5/]**1.1**	—
02338530	Hillabahatchee Creek near Franklin	tributary	77.3	07-07-86	22	.285
—	Hillabahatchee Creek at mouth	do.	80.2	—	[6/]**22.9**	—
—	intermediate area between Hillabahatchee Creek and New River	—	39	—	[5/]**1.6**	—
02338660	New River near Corinth, Ga.	tributary	127	07-07-86	[8/]5.2	.041
—	New River at mouth	do.	151	—	[6/]**6.2**	—
—	intermediate area between New River and Yellowjacket Creek	—	65	—	[5/]**3.3**	—
02338840	Yellowjacket Creek near Hogansville, Ga.	tributary	91	07-07-86	4.6	.050
—	Yellowjacket Creek at West Point Lake	do.	97.2	—	[9/]**4.9**	—
02338930	Beech Creek near LaGrange, Ga.	do.	52.9	07-07-86	3.5	.066
—	Beech Creek at West Point Lake	do.	56.5	—	[9/]**3.7**	—
02339210	Wehadkee Creek near Pittman, Ala.	do.	11.5	07-09-86	3.1	.270
—	Wehadkee Creek at West Point Lake	do.	97.6	—	[9/]**26.4**	—
—	intermediate area between New River, backwater effects of West Point Lake on inflow tributaries and Chattahoochee River at West Point, Ga.	—	289	—	[10/]**37.3**	.129
02339500	**Chattahoochee River at West Point, Ga.**	**regional**	**3,550**	—	[11/]**801**	**.226**
—	intermediate area between Chattahoochee River at West Point, Ga., and Flat Shoal Creek	—	92	—	[5/]**15.3**	—
02340262	Flat Shoal Creek near West Point, Ga.	tributary	211	07-09-86	35	.166
—	Flat Shoal Creek at mouth	do.	220	—	[6/]**36.5**	—
—	intermediate area between Flat Shoal and Mountain Oak Creek	—	78	—	[5/]**6.7**	—
02340500	Mountain Oak Creek near Hamilton, Ga.	tributary	61.7	07-09-86	5.3	.086
—	Mountain Oak Creek at mouth	do.	69.7	—	[6/]**6.0**	—
—	intermediate area between Mountain Oak and Osanippa Creek	—	0	—	[5/]0	—
02340750	Osanippa Creek near Fairfax, Ala.	tributary	99.7	07-08-86	3.7	.037

Table 8. Stream discharge during the month of July of the drought of 1986, Subarea 2—Continued

[—, not applicable]

Station number	Station name	Type of stream	Drainage area[1/] (square miles)	Date	Stream discharge[2/] (cubic feet per second)	Unit-area discharge[3/] (cubic feet per second per square mile)
—	Osanippa Creek at mouth	do.	126	—	[6/]**4.7**	—
02340900	Halawakee Creek near Opelika, Ala.	do.	36.2	07-08-86	1.1	.030
—	Halawakee Creek at mouth	do.	96.8	—	[6/]**2.9**	—
—	intermediate area between Osanippa Creek and Mulberry Creek	—	48	—	[12/]**1.6**	.034
02341220	Mulberry Creek near Mulberry Grove, Ala.	tributary	190	07-08-86	9.2	.048
—	Mulberry Creek at mouth	do.	228	—	[6/]**11**	—
—	intermediate area between Mulberry Creek and Chattahoochee River at Columbus, Ga.	—	42	—	[13/]**2.0**	—
02341500	**Chattahoochee River at Columbus, Ga.**	**regional**	**4,670**	—	[14/]**888**	—
Drainage area and stream discharge exiting Chattahoochee River basin, Subarea 2			**4,670**	—	**888**	—
	Flint River basin					
02347500	Flint River at Culloden, Ga.	regional	1,850	07-15-86	107	.058
Drainage area and stream discharge exiting Flint River basin, Subarea 2			**1,850**	—	**107**	—
Drainage area and stream discharge exiting Subarea 2[15/]			**6,520**		**995**	

[1/]From Carter and others (1989), except for Chattahoochee River drainage areas downstream from New River which were obtained from Carter (1959).

[2/]Miscellaneous discharge measurements.

[3/]Discharge divided by the drainage area.

[4/]Estimated unregulated discharge entering Subarea 2 (exiting Subarea 1).

[5/]Estimated by multiplying drainage area of the intermediate area by the unit-area discharge that was computed using the discharge at the next downstream miscellaneous measurement site or daily mean-discharge site.

[6/]Estimated by multiplying the drainage area at the tributary's mouth by the unit-area discharge that was computed using the discharge at that tributary's miscellaneous measurement site or daily mean-discharge site.

[7/]Estimated by multiplying the drainage area by average unit-area discharge of Wahoo Creek and Centralhatchee Creek.

[8/]Daily mean discharge.

[9/]Estimated at the point the stream enters West Point Lake.

[10/]Estimated by multiplying drainage area by average unit-area discharge of Yellowjacket Creek, Beech Creek, and Wehadkee Creek.

[11/]Sum of estimated unregulated discharge at Chattahoochee River near Whitesburg, Ga., intermediate area discharges, and tributary mouth discharges.

[12/]Estimated by multiplying drainage area by mean unit-area discharge for Osanippa Creek and Halawakee Creek.

[13/]Estimated by multiplying drainage area by unit-area discharge for Mulberry Creek.

[14/]Sum of estimated unregulated discharge at Chattahoochee River at West Point, Ga., intermediate area discharges, and tributary discharges at their mouths (in boldface type).

[15/]Represents entire Chattahoochee and Flint River basins.

Table 9. Estimated mean-annual baseflow and drought flows entering and exiting the middle Chattahoochee River basin in Georgia and Alabama, and exiting the upper Flint River basin in Georgia, Subarea 2

Contributing drainage area	Contributing drainage area (square miles)	Unregulated mean-annual streamflow (cubic feet per second)	Stream discharge (cubic feet per second)			
			Estimated mean-annual baseflow[1/]	Drought of 1941[2/]	Drought of 1954[3/]	Drought of 1986[4/]
Chattahoochee River basin						
Entering Chattahoochee River basin, Subarea 2	**2,420**	**3,740**	**2,570**	**468**	**461**	**637**
02338000 Chattahoochee River near Whitesburg, Ga.	2,420	3,740	2,570	468	461	637
02339500 Chattahoochee River at West Point, Ga.	3,550	5,625	3,530	540	548	801
02341500 Chattahoochee River at Columbus, Ga.	4,670	[5/]6,794	4,640	710	679	888
Georgia exiting Subarea 2		[5/]4,994	3,410	522	499	653
Alabama exiting Subarea 2		[5/]1,800	1,230	188	180	235
Exiting Chattahoochee River basin, Subarea 2	**4,670**	**6,794**	**4,640**	**710**	**679**	**888**
Flint River basin						
02347500 Flint River at Culloden, Ga.	1,850	2,344	1,160	98	97	107
Exiting Flint River basin, Subarea 2	**1,850**	**2,344**	**1,160**	**98**	**97**	**107**
Exiting Chattahoochee and Flint River basins, Subarea 2	**6,520**	**[5/]9,138**	**5,800**	**808**	**776**	**995**

[1/]From table 5.
[2/]From table 6.
[3/]From table 7.
[4/]From table 8.
[5/]Regulated.

In evaluating streamflow data on the Chattahoochee River during these drought years, regulation and withdrawal are evident as abnormally increased streamflow (storage releases) or decreased streamflow (storage increases). The Chattahoochee River has been regulated below the Lake Harding Dam since 1926 (Subarea 2), below Buford Dam (Subarea 1) since 1955, and below West Point Dam (Subarea 2) since 1974. Therefore, unregulated streamflow had to be estimated for sites below these structures to determine streamflow exiting Subarea 2 for the 1941, 1954, and 1986 droughts; and streamflow entering Subarea 2 for the 1986 drought (Chapman and Peck, 1996).

Streamflow in the Flint River is affected by withdrawals from and return to the river or its tributaries from communities such as Griffin, Ga., but no major reservoirs affect the streamflow. The minimal effects caused by the lack of major storage reservoirs along the Flint River are indicated by the similarity of streamflow at Culloden, Ga., near the end of the droughts of 1941, 1954, and 1986. Due to the lack of tributary data between continuous gaging stations near the upper Flint River drainage and the boundary station, data from only the Culloden station is presented in this report.

The estimates for the 1954 and 1986 drought flows in the Chattahoochee River were determined by balancing mass in a stream in a general downstream direction during two relatively short periods of time for the 1954 drought and one relatively short period of time for the 1986 drought. The daily mean-discharge values available from gaging stations in Subarea 2 indicate that flows were comparable during the two periods used in the 1954 drought analysis and similar discharge contributions were assumed throughout Subarea 2. Accordingly, the tributary discharges to the Chattahoochee River during the drought periods were estimated using the unit-area discharge computed at a miscellaneous measurement site or gaging station site extrapolated to the entire tributary drainage. These unit-area discharges were also applied to the intermediate areas between tributaries. The unit-area discharge for a tributary was

generally applied to the intermediate area immediately upstream from the tributary except for the last intermediate area in Subarea 2 for which the unit-area discharge for the last upstream tributary was used (Standing Boy Creek below Heiferhorn Creek, 1954; Mulberry Creek near Mulberry Grove, Ala., 1986). Exceptions to this procedure occurred when a unit-area discharge was unusually low in which case an average unit-area discharge was used (tables 7 and 8).

Estimated discharges exiting Subarea 2 from the Chattahoochee River were computed by summation of the discrete discharges estimated for the tributary streams and intervening drainage areas between tributaries (tables 7 and 8). These estimates are identified in boldtype face in tables 7 and 8 (679 ft^3/s, 1954; 888 ft^3/s, 1986).

Baseflow during the later parts of the droughts of 1941, 1954, and 1986 ranged from 15 to 19 percent of the estimated mean-annual baseflow to the Chattahoochee River at Columbus, Ga., and averaged 8.7 percent at the Flint River at Culloden, Ga. (table 10). Ground-water contribution to streamflow during the drought periods at the Subarea 2-3 boundary (table 10) was estimated using the computed flows at the Columbus, Ga., gage along the Chattahoochee River, and gaged data from the Culloden, Ga., gage along the Flint River. In relation to the conceptual model of ground-water flow and stream-aquifer relations, baseflow during droughts represents greatly reduced contributions from the local and intermediate flow regimes. Downstream baseflow in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, near the end of the 1941, 1954, and 1986 droughts is related to drainage area in figure 10 and summarized in tables 9 and 10.

Table 10. Estimated drought flows and mean-annual baseflow in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia; and ratio of average drought flow to mean-annual baseflow, Subarea 2
[—, not applicable]

Contributing drainage area	Drought flows (cubic feet per second)								Mean-annual baseflow[1/] (cubic feet per second)		Ratio of average drought flow to mean-annual baseflow (percent)	
	[2/]1941		[3/]1954		[4/]1986		Average of 1954 and 1986 droughts					
	Chattahoochee River	Flint River	Chattahoochee River	Flint River	Chattahoochee River	Flint River	Chattahoochee River	Flint River	Chattahoochee River	Flint River	Chattahoochee River	Flint River
Flow entering subarea, by river	468	—	384	—	637	—	496	—	2,570	—	19	—
Flow gain in subarea, by river	242	98	295	97	251	107	263	101	2,070	1,160	13	8.7
Flow exiting drainage basin, by river	710	98	679	97	888	107	759	101	4,640	1,160	16	8.7
Flow exiting Subarea 2	**808**		**776**		**995**		**860**		**5,800**			

[1/]From table 5.
[2/]From table 6.
[3/]From table 7.
[4/]From table 8.

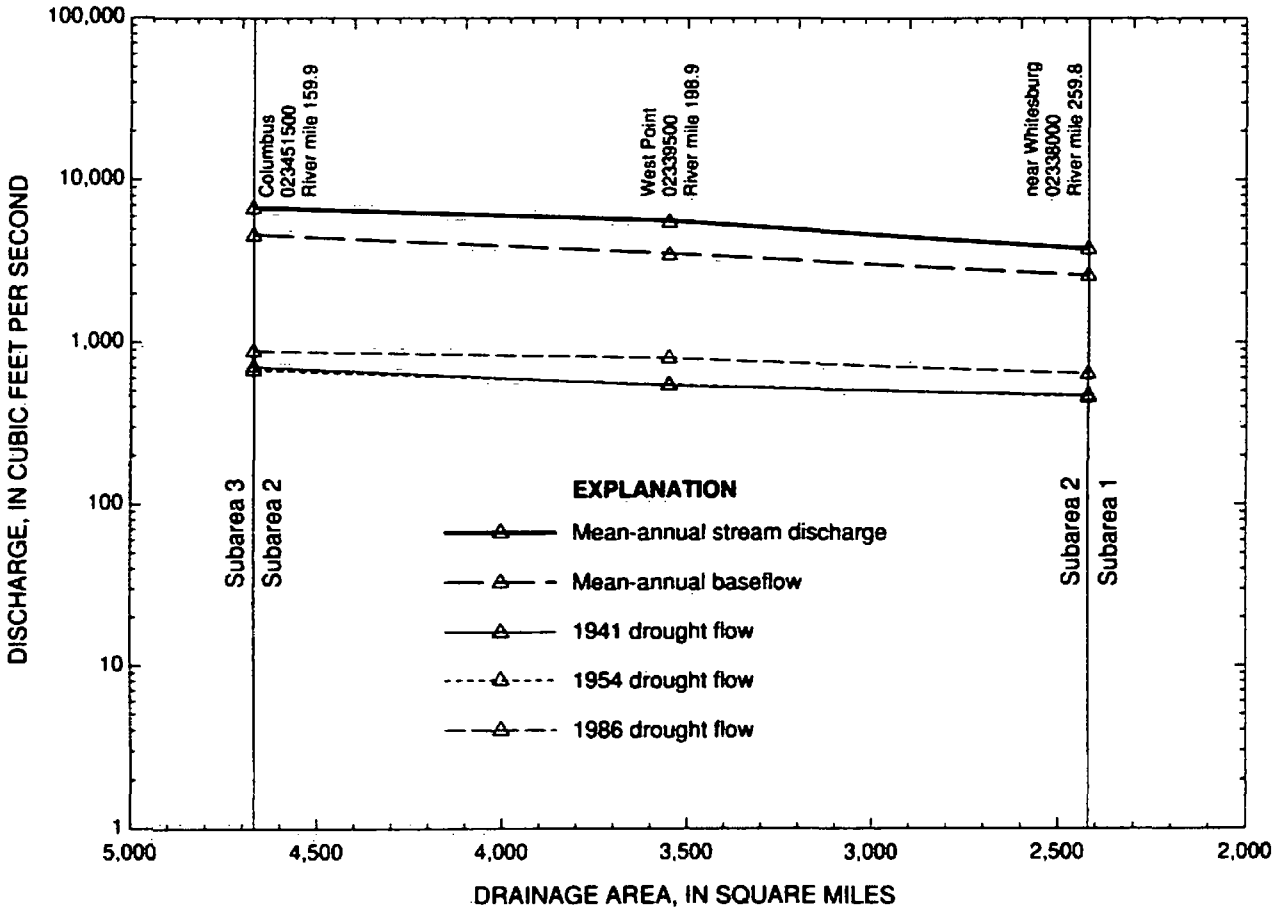


Figure 10. Relations among mean-annual stream discharge, mean-annual baseflow, and drought flow, Chattahoochee River, Subarea 2. [Note: Triangles represent estimated or measured discharges; lines connecting triangles represent interpolated discharge. River mile is measured upstream from the mouth of the Chattahoochee River.]

GROUND-WATER UTILIZATION AND GENERAL DEVELOPMENT POTENTIAL

Ground-water utilization is defined as the ratio of ground-water use in 1990 to mean-annual ground-water recharge. The degree of ground-water utilization is scale dependent. For example, local ground-water pumping may result in substantial storage change and water-level declines near a center of pumping; whereas, such pumping relative to the entire Subarea would be small compared to mean-annual recharge. Because ground-water use in Subarea 2 represents a relatively minor percentage of ground-water recharge, even a large increase in ground-water use in Subarea 2 in one State is likely to have little effect on ground-water and surface-water occurrence in the other.

Ground-water use of about 31 ft^3/s in Georgia and 9.2 ft^3/s in Alabama in 1990 in Subarea 2 represented 1.2 percent of the mean-annual baseflow in Georgia and 1.7 percent of the mean-annual baseflow in Alabama (table 11). Ground-water use represented 10.5 percent of the average drought flow in Georgia and 13.1 percent of the average drought flow in Alabama. Local problems of ground-water overuse were not identified. However, long-term water-level data at wells in Subarea 2 are few in number and poorly distributed areally; and conclusions regarding regional water-level declines or storage change cannot be reasonably drawn.

Table 11. Relation between 1990 ground-water use and ground-water discharge during mean-annual baseflow, average selected drought-flow conditions, and drought flow from Alabama and Georgia, Subarea 2

State	Ground-water use, 1990 (cubic feet per second)	Baseflow contributions to Subarea 2 (cubic feet per second)					Ratio of ground-water use to baseflow (percent)				
		Mean-annual baseflow	1941 drought baseflow	1954 drought baseflow	1986 drought baseflow	Average drought baseflow	Mean-annual baseflow	1941 drought baseflow	1954 drought baseflow	1986 drought baseflow	Average drought baseflow
Georgia	31	2,680	276	314	291	294	1.2	11.2	9.9	10.7	10.5
Alabama	9.2	550	64	78	67	70	1.7	14.4	11.8	13.7	13.1

In general, ground-water resources are underutilized throughout the study area. The rural population relies on ground water as their principal source of water supply; whereas, more densely populated areas rely on surface-water resources. However, wells supplied water to many communities prior to the development of large surface-water reservoirs. In recent years, suburban communities have developed ground-water supplies in response to curtailed surface-water supplies.

Ground-water exploration in the Piedmont Province of Georgia historically has been "difficult" and its success "unpredictable". The crystalline-rock aquifers of this region are characterized by little or no primary porosity and complex development of secondary permeability. The yield of bedrock wells depends on the characteristics of the water-bearing zones penetrated by the open borehole in the bedrock. The aquifers in the Piedmont are extremely anisotropic and heterogeneous due to complex geologic controls in the crystalline bedrock (fig. 6). Depth to water-bearing zones is highly variable. Wells may yield water from several fractures throughout a borehole, or from a single productive fracture. Conversely, a borehole may not intersect an opening; and thus, may yield little or no water.

A general assessment of ground-water development potential in Subarea 2 would reflect, in part, the cumulative effects of current and anticipated future hydrologic stresses imposed on the ground-water resources, and to a lesser extent, the current availability of surface-water supplies. The nature of such an assessment is limited by a lack of knowledge of current hydrologic conditions and the lack of agreed upon standards by which Federal, State, or local water-resource managers evaluate the effects of additional stress and future development. Current stresses and hydrologic conditions might be unknown in some areas; thereby making an evaluation of ground-water development potential highly uncertain. Future stresses also might be linked to water-management practices that have yet to be formulated, or to water-management decisions that have yet to be made. Therefore, an assessment of ground-water development potential provides insight only into one aspect of the broader question of how water-management decisions affect ground-water availability. Specifically, whether existing hydrologic data documents the flow-system behavior adequately to allow the potential effects of future development on the flow system to be adequately

evaluated and understood. Further, an assessment of ground-water development potential does not account for the suitability of existing ground-water resource management approaches or the effects of future approaches on further resource development. Such answers partly are dependent on the synthesis of results from the various Comprehensive Study components and subsequent consideration by the Federal, State, or local water managers responsible for decision-making within the basin.

The identification of areas that could be developed for ground-water supply to replace or supplement surface-water sources could not be determined from available data for Subarea 2. Because geologic controls affecting ground-water availability are highly variable, even on a local scale, regional evaluations are inherently characterized by a high degree of uncertainty. Ground-water resources probably could provide supplemental supplies during peak demand periods throughout most suburban areas of Subarea 2. In more rural areas, ground-water supplies could serve as a primary resource depending upon demands. Generally, wells need only supply about 5 gal/min for domestic users, and may not be drilled to a depth that taps the available ground-water supply at a site. Most municipal or industrial users generally require well yields of at least 50 to 100 gal/min or more, and wells for such supplies likely are drilled to a depth sufficient to intersect as many water-bearing zones as feasible. Municipal and industrial users also tend to drill multiple wells to obtain the required ground-water supply.

Ground-Water Exploration-Program Example

An example of a successful ground-water exploration program in Subarea 2 on a local scale is that implemented for the city of Fayetteville, Fayette County, Ga. (fig. 9). The goal of the program, initiated in 1988, was to develop a "drought-resistant" water source to be integrated with the city's surface-water supply system. The exploration program utilized several methods of investigation to locate favorable drilling sites, including surficial geologic mapping (rock types, structural features, fracture fabric, and joint statistical analysis), reconnaissance surface geophysical surveys, photolineament analysis, collection of background well information, drainage basin analysis, collection of soils information, and contaminant-potential analysis. The overall assessment of the hydrogeologic framework of the Fayetteville area, evaluated as part of this ground-water exploration program, was the delineation of two aquifers: a shallow, regolith zone consisting of alluvium and saprolite; and a deeper fractured bedrock aquifer. Following well siting, three test wells were completed in a quartz-biotite gneiss and an epidote-calcite-diopside gneiss that yielded a total of 550 gal/min (145, 185, and 220 gal/min each), or about 0.8 Mgal/d (1.23 ft^3/s). Depth to water-bearing zones in the bedrock was highly variable at these three sites. Borehole geophysical logging, including a downhole camera and caliper, were used to evaluate water-bearing-zone characteristics. The major water-bearing fractures were horizontal or low-dipping, along the margins of granitic bodies, or where significant lithologic changes occurred (BCI Geonetics, 1990).

To determine the development potential of and to monitor recharge to the well during pumping, shallow regolith and deeper bedrock observation wells were completed at the three well sites. Based on 72-hr aquifer tests, the total maximum safe yield for the three wells was estimated to be about 937,000 gal/d (BCI Geonetics, 1990). During pumping of each bedrock well, drawdown in the shallow regolith wells was insignificant, indicating that most of the recharge was derived from deeper bedrock fracture zones. The stage of a nearby creek also was monitored, and indicated no apparent effects from ground-water withdrawal (BCI Geonetics, 1990). Water levels in observation wells completed in the bedrock responded to the pumping at distances of a few thousand feet (BCI Geonetics, 1990).

SUMMARY

Drought conditions in the 1980's have focused attention on the multiple uses of the surface- and ground-water resources in the Apalachicola-Chattahoochee-Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT) River basins in Alabama, Florida, and Georgia. Federal, State, and local agencies also have proposed projects that are likely to result in additional water use and revisions of reservoir operating practices within the river basins. The existing and proposed water projects have created conflicting demands for water and emphasized the problem of allocation of the resource. This study was initiated to describe ground-water availability in the middle Chattahoochee River basin in Georgia and Alabama, and the upper Flint River basin in Georgia, Subarea 2 of the ACF-ACT River basins, and to estimate the possible effects of increased ground-water use in the basin.

Subarea 2 encompasses about 4,100 mi^2 in west-central Georgia and eastern Alabama. Subarea 2 is bounded to the northeast by the upper Chattahoochee River basin (Subarea 1) in Georgia, to the south by the lower Chattahoochee and Flint River basins (Subarea 3) in Georgia and Alabama, to the east by the Altamaha River basin, and to the west by the Tallapoosa River basin of the ACT River basins (Subarea 5) in Alabama and Georgia.

The Piedmont Province is characterized by a two-component aquifer system composed of a fractured crystalline-rock aquifer characterized by little or no primary porosity or permeability. The overlying weathered regolith (saprolite) behaves as a porous-media aquifer. In some areas, a transition zone lies between the regolith and unweathered crystalline bedrock.

The conceptual model of ground-water flow and stream-aquifer relations subdivides the ground-water flow system into local (shallow), intermediate, and regional (deep) flow regimes. The regional flow regime probably approximates steady-state conditions and water discharges chiefly to the Chattahoochee River. Ground-water discharge to tributaries primarily is from the local and intermediate flow regimes. Ground water that discharges to regional drains is composed of local, intermediate, and regional flow regimes. Mean-annual ground-water discharge to streams (baseflow) is considered to approximate the long-term, average recharge to ground water.

Mean-annual baseflow in Subarea 2 was estimated using an automated hydrograph-separation method. Total mean-annual baseflow to the middle Chattahoochee River basin in Georgia and Alabama and upper Flint River basin in Georgia and their tributaries was estimated to be about 5,800 cubic feet per second (from the headwaters to Subarea 2–Subarea 3 boundary). Mean-annual baseflow represents about 68 percent of the mean-annual stream discharge in the Chattahoochee River basin and 49 percent in the Flint River basin at the Subarea 2–Subarea 3 boundary.

Stream discharges for selected sites on the Chattahoochee and Flint Rivers and tributaries were compiled for the years 1941, 1954, and 1986, during which historically significant droughts occurred throughout most of the ACF-ACT River basins. Stream discharge was assumed to be sustained entirely by baseflow during the latter periods of these droughts. Estimated baseflow near the end of the individual drought years averaged about 16 percent of the estimated mean-annual baseflow in the Chattahoochee River system and 8.7 percent in the Flint River system in Subarea 2.

The limited scope, lack of field-data collection, and the short duration of the ACF-ACT River basin study has resulted in incomplete descriptions of ground- and surface-water-flow systems, which may affect the future management of water resources in the basins. For example, the extent and continuity of local and regional flow systems and their relation to geology is largely unknown. Similarly, quantitative descriptions of stream-aquifer relations, ground-water flow across State lines, water quality, drought flows, and ground-water withdrawal and subsequent effects on the flow systems (the availability and utilization issue) are highly interpretive; therefore, the descriptions should be used accordingly.

Estimates of water use and ground-water discharge to streams are dependent on methodologies employed during data collection, computation, and analyses. Results reported herein are limited by a lack of recent data and the non-contemporaneity of all data. Analyses using limited data may not adequately describe stream-aquifer relations. Most importantly, analyses in this report describe only two hydrologic conditions—(1) mean-annual baseflow and (2) drought-flow conditions during 1941, 1954, and 1986. Analyses derived from extrapolation to other hydrologic conditions, such as much longer drought periods or increased ground-water withdrawal, should be used with caution. Special concern also should be directed to the effects of increased post-1990 withdrawal on ground-water discharge to streams in Subarea 2.

The potential exists for the development of ground-water resources on a regional scale throughout Subarea 2. Ground-water use in 1990 represented about 1.2 percent of the estimated mean-annual baseflow in Georgia, 1.7 percent in Alabama, and 10.5 and 13.1 percent of the average drought flow in Georgia and Alabama, respectively. Because ground-water use in Subarea 2 represents a relatively minor percentage of ground-water recharge, even a large increase in ground-water use in Subarea 2 in one State probably would have little effect on the quantity of ground-water and surface-water occurrence in the other. Long-term ground-water level declines were not observed; however, long-term water-level data at wells in Subarea 2 are few in number and poorly distributed areally, and conclusions regarding regional water-level declines or storage changes cannot be reasonably drawn.

SUGGESTIONS FOR FURTHER STUDY

This report presents a discussion of ground-water resources and interaction of ground- and surface-water systems in the middle Chattahoochee River basin in Georgia and Alabama, and upper Flint River basin in Georgia, Subarea 2, of the ACF-ACT River basins. In Subarea 2, ground-water availability is addressed only from a regional perspective using historical data. Data collection was not a part of this study; therefore, lack of streamflow and ground-water data necessitated that estimation methods be used extensively to describe stream-aquifer relations. Additional data, particularly data describing surface- and ground-water conditions on a local scale, are needed to further refine and quantify interaction of ground- and surface-water systems in the Subarea. Analyses of these data could better describe stream-aquifer relations, as well as ground-water availability and development potential in Subarea 2.

Although the overall objectives of this study were to evaluate the ground-water resources and supply, the data used to accomplish these objectives were stream-discharge data. Stream-discharge data were sufficient to meet study objectives; however, such data either were not totally adequate or were not available at critical sites. Future stream-discharge data collection to support resource management should emphasize (1) continuous-record data at critical hydrologic and political boundaries for a period of years; and (2) concurrent stream-discharge measurements at critical sites during drought periods.

Continuous stream-discharge data collected over a period of years at critical locations provide the basic information essential to basinwide water-resource planning and management. Current data coverage is incomplete. For example, stream-gaging stations located on major tributary streams would have eliminated or reduced the need to extrapolate and interpolate data from stations distant from these boundaries, and consequently, would have improved the accuracy of estimates of ground-water contributions from subarea to subarea.

The collection of drought-flow data obviously is contingent on the occurrence of a drought; thus, collection of drought data is not routine and is not easily planned. A contingency plan to collect drought data should be in place. The plan could consider, but not be limited to, logistics, manpower needs, and the preselection of stream data-collection locations. For more rigorous planning, field reconnaissance of preselected stream sites could be conducted.

Data-base development also is critical to resource management. Data elements, such as well construction and yield; hydraulic characteristics of aquifers; water quality; and ground-water withdrawals—both areally and by aquifer—are particularly important. Seepage runs (detailed streamflow measurements of drainage systems made concurrently during baseflow conditions) can be used to identify individual ground-water flow systems and improve the understanding of stream-aquifer relations, especially in crystalline and mixed-rock terranes. Once identified, a flow system can be studied in detail to define its extent, recharge and discharge areas, movement of water, chemical quality, and the amount of water that can be withdrawn with inconsequential or minimal effects. These detailed studies might include test drilling, borehole geophysical logging, applications of surface geophysics, aquifer testing, a thorough water-withdrawal inventory, and chemical analyses of ground water to delineate the extent of the ground-water-flow system and evaluate its potential as a water supply. Evaluation of several such flow systems would greatly improve the understanding of ground-water resources throughout the subarea. Because aquifer properties vary substantially on a local scale and data are sparse, field studies are needed to obtain quantitative definitions of the hydraulic interactions of aquifers and streams in Subarea 2.

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___1974a, Hydrologic Unit Map, State of Alabama: U.S. Geological Survey Hydrologic Unit Map, scale 1:500,000, 1 sheet.

___1974b, Hydrologic Unit Map, State of Georgia: U.S. Geological Survey Hydrologic Unit Map, scale 1:500,000, 1 sheet.

___1974c, Hydrologic Unit Map, State of Tennessee: U.S. Geological Survey Hydrologic Unit Map, scale 1:500,000, 1 sheet.

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APPENDIX EE

Georgia Department of Natural Resources
205 Butler Street, S.E., East Floyd Tower, Atlanta, Georgia 30334
Joe D. Tanner, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-3094

July 21, 1994

PERMANENT

Mr. Patrick C. Bowie, Jr.
Director of Utilities
City of LaGrange
P. O. Box 430
LaGrange, Georgia 30241

Re: Surface Water Withdrawal Permit
Number 141-1292-01(Modified)

Dear Mr. Bowie:

In accordance with the Georgia Water Quality Control Act, as amended, a modified Permit to Withdraw Surface Water has been issued by the Division and is hereby enclosed.

Specific conditions of compliance are provided on pages 1 and 2 of the Permit. Your attention to particularly directed to paragraph (4) of the Standard Conditions Section of the permit which requires that a yearly report of water withdrawals be submitted. This report is to be submitted on your own stationary.

Exceeding the maximum 24 hour or monthly average withdrawal limitation is a permit violation and must be reported to the Water Resources Management Branch by telephone (404/656-3094) within 48 hours, and confirmed in writing within 10 days.

Failure to comply with any of the provisions of the permit may make the permittee liable for civil penalties as provided by the Act.

Sincerely,

David Vaughn
Coordinator
Surface Water Unit

DV/kwn

Enclosure

cc: Paul Harper
Margaret Boykin
Jim Hansen

GDV-BOWIE/CITY OF LAGRANGE

ENVIRONMENTAL PROTECTION DIVISION
DEPARTMENT OF NATURAL RESOURCES
STATE OF GEORGIA
PERMIT TO WITHDRAW, DIVERT OR IMPOUND SURFACE WATER

PERMANENT

PERMITTEE'S NAME City of LaGrange PERMIT NUMBER 141-1292-01(Modified)

PERMITTEE'S ADDRESS Post Office Box 430, LaGrange, Georgia 30240

In accordance with the provisions of the Water Quality Control Act, (Ga. Law 1964, p. 416 et seq.) as amended, and the Rules and Regulations for Water Quality Control, Chapter 391-3-6, promulgated pursuant thereto, this permit is issued to withdraw surface water from the (source) West Point Lake for the purpose of municipal water supply.

The permittee must comply with the following limitations:

(1) Maximum 24 hour: Withdrawal 17.6 MGD; Impoundment ____ MGD; Diversion _____ MGD

(2) Not to exceed a monthly average of 16.0 MGD

This permit is conditioned upon the permittee complying with the following:

STANDARD CONDITIONS

(1) The provisions of the Water Quality Control Act, as amended, or any of the Rules and Regulations promulgated thereto;

(2) This permit shall not be transferred except with the approval of the Division;

(3) The use of surface water is limited to the quantities and purposes as specified herein;

(4) The permittee shall submit annually to the Division, within 30 days of completion of the calendar year, a report listing for each month of the previous year:

a. The gallons per day withdrawn, based on an average of the daily withdrawals for the month;

b. The maximum 24 hour withdrawal;

(5) And the attached special conditions which are hereby made a part of this permit.

In accordance with the application dated July 14, 1989 and in conformity with the statements and supporting data entered therein or attached thereto, all of which are filed with the Environmental Protection Division of the Department of Natural Resources and are hereby made part of this Permit.

This Permit is effective from the date first above written and is subject to revocation pursuant to Section 10A(11) of the Georgia Water Quality Control Act, as amended, Ga. Laws 1977, pp. 368, 375-376.

Absent prior revocation in accordance with the above language, this Permit shall expire on the 30th day of April, 2001.

DIRECTOR'S SIGNATURE DATE: July 15, 1994

Director
Environmental Protection Division
Department of Natural Resources

SPECIAL CONDITIONS

1. All withdrawals from West Point Lake must be in compliance with the City's contract with the U.S. Army Corps of Engineers.

2. The maximum safe production level of the treatment plant(s) as specified by condition four of the permittee's Permit to Operate a Public Water Supply must not be exceeded.

3. The former Deering Milliken, Inc. Hillside Plant withdrawal from West Point Reservoir is to be used by the City for emergency purposes only. The total amount of water withdrawn from the Hillside Plant site and the City's current site together cannot exceed a 24 hour maximum of 17.6 million gallons per day (mgd) or a monthly average of 16.0 mgd.

4. All withdrawals from the Hillside Plant site must be metered and reported to the Environmental Protection Division on an annual basis.

PERMIT MODIFICATION

The permittee may seek modification of any of the terms of an unexpired permit upon written request to the Director.

APPENDIX FF

Georgia Department of Natural Resources
205 Butler Street, S.E., East Floyd Tower, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division

Reply To:
Drinking Water Permitting Program
205 Butler Street, S.E.
Suite 1362, East Floyd Tower
Atlanta, Georgia 30334

November 4, 1997

PERMANENT

FILE COPY

Mr. Patrick C. Bowie
City Of LaGrange
POB 430
LaGrange, GA 30240

Re: **LaGrange Water System**
ID# 2850001
Troup County

Dear Mr. Bowie:

In accordance with the Georgia Safe Drinking Water Act of 1977 as passed by the Georgia General Assembly and the Rules for Safe Drinking Water, Chapter 391-3-5, a permit to operate the **LaGrange Water System (CS2850001)**, a public water system located in **Troup County**, Georgia has been **reissued** by the Environmental Protection Division (EPD) and is hereby enclosed. **Please provide a copy of this permit to anyone directly involved in the operation or sample collection for this system.**

Specific conditions for operation of this water system are outlined in the permit. **The Rules specify the number of chemical and microbiological samples that must be analyzed. You are currently required to collect 50 microbiological sample(s) each month on the date assigned by the EPD Laboratory.** Chemical samples will be scheduled by the EPD Drinking Water Program. If you contracted with EPD, sample bottles with instructions for collection will be mailed to you as sampling is required. If you did not contract with the EPD, you must comply with the monitoring schedules required in the Rules and sent to you under separate cover.

You should become familiar with all of the Rules for Safe Drinking Water. Especially note Sections 391-3-5-.15, Record Maintenance and 391-3-5-.32, Public Notification. All bacteriological samples, chemical samples, information and correspondence for this system, that are submitted to the EPD, should be identified by the water system identification number **2850001**.

Sincerely,

Gary Oller
Program Manager I
Licensing Unit
Drinking Water Permitting Program
Phone: (404) 651-5167

Enclosure
cc: Drinking Water Program, EPD

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

*OWNER: **City of LaGrange*** *REISSUE DATE: **November 16, 1997***

*SYSTEM: **LaGrange Water System*** *PERMIT NO.: **CS2850001***

PERMIT CONDITIONS

*4. This permit is for the **operation of a public water system using surface water as the principal source of supply.** The approved production rate(s) for the surface water treatment plant(s) and other approved sources of raw water are:*

West Point Lake/Chattahoochee River (Source #101)
13,356 GPM (16.0 MGD) W/14 FILTERS @ 3.5 GPM/SQFT

THE FLOW IS TO BE CONTROLLED SUCH THAT THE TWO (2) 1949 SEDIMENTATION BASINS RECEIVE NO MORE THAN 8.0 MGD TOTAL AND THE 1969 SEDIMENTATION BASIN RECEIVES NO MORE THAN 6.0 MGD TOTAL.

*Operation of the water plant in escess of the approved production rate in a twenty-four (24) hour period (starting at 0000 to midnight 2400 hours) is a violation of this permit. Violations must be reported to the Drinking Water Program by telephone within forty-eight (48) hours and confirmed in writing within ten (10) days. The total daily production rates must not exceed the limits imposed by your surface water withdrawal permit **#141-1292-01**.*

*5. The permittee must **provide continuous disinfection by chlorinating all water distributed by the system to maintain a detectable residual of free chlorine in the recommended amount of 0.2 milligrams per liter in all parts of the distribution system,** or as specified in Section 391-3-5-.14, as amended, of the Rules for Safe Drinking Water.*

*6. **The Permittee shall analyze or have analyzed all microbiological and chemical samples required by the Rules. Monitoring for each contaminant must be performed as scheduled by the Georgia Environmental Protection Division's (EPD) Drinking Water Program (DWP). The supplier must provide all test results to the DWP within the time frame established in the schedule.** The permittee may use the laboratory services of the EPD's certified laboratory or any laboratory certified by the DWP to perform the specific analysis. If a laboratory other than the EPD's certified laboratory is used, the laboratory results must be submitted to the following address as specified in Section 391-3-5-.30.*

Environmental Protection Division
Drinking Water Permitting Program
Information Management Unit, Suite 1362
205 Butler Street, SE
Atlanta, Georgia 30334
(404) 657-8282/651-5525
Fax# (404)651-9590

The format used to report results must be approved by the DWP and must identify the system by the water system ID number 2850001 and the laboratory performing the analysis. The laboratories certification number must be included on the report. Results requiring immediate notification should be reported to the Drinking Water Program by telephone at (404) 651-5164/656-4807 or Fax (404)651-9590.

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

*OWNER: **City of LaGrange*** *REISSUE DATE: **November 16, 1997***

*SYSTEM: **LaGrange Water System*** *PERMIT NO.: **CS2850001***

PERMIT CONDITIONS

*7. Reports must be maintained by the permittee on the premises of the water system and be available for inspection. **A true and correct copy of the operation records and other reports must be sent to the following address, by the tenth day of the month following the month being reported, unless otherwise stated in Section 391-3-5-.30 or elsewhere in the Rules:***

Environmental Protection Division
Drinking Water Compliance Program
Northwest Compliance Unit, Suite 1362
205 Butler Street, SE
Atlanta, Georgia 30334
(404) 656-5660
Fax# (404)651-9590

*8. **The permittee shall insure that this public water system is operated in compliance with the Georgia Certification of Water and Wastewater Treatment Plant Operators and Laboratory Analysts Act, as amended, and the Rules adopted thereunder.** The certification classification must be consistent with the public water system classification as specified in Section 391-3-5-.39 of the Rules for Safe Drinking Water.*

9. Drinking water distributed by the permittee should not contain any impurity which will cause offense to the sense of sight, taste or smell and should not be excessively corrosive as to cause degradation of the water quality or deterioration of the distribution system, as specified in Section 391-3-5-.19 and .26 of the Rules for Safe Drinking Water.

10. The permittee is required to have a water conservation and cross-connection control plan on file with the Division.

11. The permittee is required to provide continuous fluoridation to all water distributed by the system, as specified in Section 391-3-5-.16 of the Rules for Safe Drinking Water.

12. This permit replaces all Permits to Operate a Public Water System previously issued for the operation of this public water system.

From: Mark N Landers <landers@usgs.gov>
To: "Andy Taft" <Andy.Taft@dnr.state.ga.us>
Date: 12/11/2007 10:59 AM
Subject: Re: Fw: Gaging Station Number 02339640
Attachments: EPD_Datarequest_longcanecr.xls

Andy,

We do not have any daily streamflow records on Long Cane Creek; however, we can estimate the average annual flow and see where it falls in the categories you note.

The following table provides the information you are requesting. The stream reaches are perennial throughout as the 7Q10 does not drop below zero and/or the 1954 drought (less than the 7Q10) did not go below zero. The reports this information is taken from are referenced; however they are not available in digital format and we do not have hard copies available. If you need it, I can copy and fax the pages used.

regards,
-Mark

****

Mark N Landers, Hydrologist, P.E.
USGS, Georgia Water Science Center
770-903-9152 (office)
404-625-6106 (cell)
ga.water.usgs.gov

"Andy Taft" <Andy.Taft@dnr.state.ga.us>
12/10/2007 11:33 AM

To
"Mark N Landers" <landers@usgs.gov>
cc

Subject
Re: Fw: Gaging Station Number 02339640

Mr. Landers:

The specific reach I'm interested in is a fifteen (15) mile Target Distance Limit (TDL) described as follows:

· From a tributary known as Atlanta Branch located immediately
south of LaGrange, GA (i.e., the beginning of the TDL), Blue John Creek flows generally southwest for approximately three point two (3.2) miles before converging with Long Cane Creek.

· From the point of confluence of Blue John Creek and Long Cane
Creek, Long Cane Creek flows generally southwest for approximately eleven point eight (11.8) miles before the surface water TDL terminates at fifteen (15) miles downstream of where it started.

· From the surface water TDL termination point, Long Cane Creek
flows generally south for approximately one (1) mile before converging with the Chattahoochee River below West Point Lake.

The categories of flow rates I'm interested in are as follows (average annual flow rate):

less than 10 cfs
10 to 100 cfs
greater than 100 to 1,000 cfs
1,000 to 10,000

See page 30 of the linked report where it indicates a drainage area of 83.8 miles for Long Cane Creek at the mouth and 5.1 cfs during the drought of 1954.

The report also indicates a drainage area of 22.5 miles for Long Cane Creek at U.S. 27 and 1.37 cfs during the drought of 1954.

Here's the link to the report:http://pubs.usgs.gov/of/1996/ofr96-492/pdf/ofr96-492.pdf

In summary, I need an estimate of average annual flow of the last 3.2 miles of Blue John Creek and that portion of Long Cane Creek that starts at the confluence with Blue John Creek and proceeds 11.8 miles (approx. 1 mile short of the Chattahoochee). Additionally, if possible, could you confirm the perennial flow designation of my before described reach?

Thank you so much.
Andy

>>> Mark N Landers <landers@usgs.gov> 12/7/2007 4:11 PM >>>
Mr Taft,

I was unable to find any data, online or in our files for the site: 02339640 -- Long Cane Creek at U.S. Highway 27. We collect water quality
samples at a site on Long Creek downstream from this location; but do

not
collect continuous discharge from which an average annual flow could be

obtained. If you wish to estimate an average annual flow rate, we have

methods to do so. Call if you wish to discuss this.

-Mark Landers

****
Mark N Landers, Hydrologist, P.E.
USGS, Georgia Water Science Center
770-903-9152 (office)
404-625-6106 (cell)
ga.water.usgs.gov

----- Forwarded by Robert A Johnson/RGIO/USGS/DOI on 12/06/2007 04:57 PM
-----

andy_taft@dnr.state.ga.us
12/06/2007 04:09 PM

To: ask@usgs.gov
cc: archive_ask@usgs.gov
Subject: Gaging Station Number 02339640

Transaction=GSFWG8RJ [06DEC2007 21:09:52UTC]
Customer email: andy_taft@dnr.state.ga.us
Customer: Andrew Taft
Customer phone: (404) 656-2833
Customer address:
2 Martin Luther King, Jr., Dr.
Floyd Tower East, Suite 1154
Atlanta, GA 30334
Subject: Gaging Station Number 02339640
Primary response: ask@usgs.gov

USGS PERSONNEL: This email was generated through the Contact USGS system.
When replying to the customer PLEASE BE SURE TO CC archive_ask@usgs.gov.
(Customers, please do not send email to archive_ask, as it will not be

answered.) If you answer by phone, simply forward this email to archive_ask@usgs.gov. You can see more information about replying to customers at <http://answers.usgs.gov/usgs/responding.htm> (USGS only).
==========

I'm trying to get some historical stream flow data from the above referenced station on Long Cane Creek at U.S. Highway 27 near LaGrange,

GA.
I suspect that the station is no longer in exsistence. Specifically,
I'm
looking for a mean annual flow rate. Are you aware of any publications

that might include this information? Thank you.

Blue John Creek (Troup County, tributary to Long Cane Creek)

Location	(1) Miles above mouth	(1) Drainage Area (sq-mi)	(1) 7Q10	(2) Average Annual Flow
Ga Hwy 219-285	4.58	3.6		5
WPCP (per 1989 report)	3.56	7.1		9
WPCP (per 1989 report)	3.16	8.5		11
Road 138-285	2.96	9.2		12
at incoming tributary	0.24	14.2		19
Mouth (confluence w/ Long Cane Cr)	0	21.5		29

Long Cane Creek (Troup County, trib to Chattahoochee R.)

Location	(1) Miles above mouth	(1) Drainage Area (sq-mi)	(1) 7Q10	(2) Average Annual Flow
Interstate 85	14.35	32.9	3.1	44
Above Blue John Cr	13.86	33.8		45
Below Blue John Cr	13.86	55.3		73
Road 098-285	8.95	66.4		88
Road 413-285	5.55	73.9		98
Road 069-285	3.92	76.8		102
Ga hwy 18-285	2.51	79.3		105
Interstate 85	2.19	79.9		106
Troup - Harris County Line	1.84	80.5		107
Road 029-145	1.42	81.2		108
Mouth (confluence with Chattahoochee)	0	83.8	9.6	111

(1)-- USGS, Water Resources Investigation 89-4056,
Low-flow profiles of the upper Chattahoochee River and tributaries, 1989,
by: R.F. Carter, E.H. Hopkins, and H.A. Perlman, pgs 142-143

(2)--GaDNR Hydrologic Atlas 9, 1983,
Average annual rainfall and runoff in Georgia 1941-70,
R.F. Carter and H.R. Stiles
Average Runoff in SW Troup County is 18 inches

APPENDIX HH

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
404/656-2833

November 8, 2007

RECORD OF PHONE COMMUNICATION

CALL BY: Kent Bennett
Plant Manager
Milliken & Company – Hillside Plant
(706) 880-3389

TO: Andrew S. Taft
Environmental Specialist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
(404) 656-2833

DATE OF CALL: November 8, 2007

SUBJECT: Current Flow Conditions of On-Site Stream and Historic Flow Conditions of Long Cane Creek and Blue John Creek

---

SUMMARY OF PHONE COMMUNICATION

In response to a November 5, 2007 telephonic request by the EPD that was not time-critical, Mr. Bennett called back to confirmed that on or near November 8, 2007, flow conditions of the on-site stream were as follows:

- Only puddles of water exist in the on-site stream.
- An algae-like growth was observed on the surface of some of the puddles located within the on-site stream.
- There is no visible flow in the on-site steam.
- In areas of the on-site stream between puddles, the streambed remains damp.
- The area did receive approximately one (1) inch of rain in late October 2007.

In a separate matter, Mr. Bennett stated that although he has only observed Long Cane Creek from bridges, he has never observed the creek without some water flowing thru it. Mr. Bennett was unfamiliar with historic flow conditions of Blue John Creek.

APPENDIX II

Environmental Protection Division
Georgia Department of Natural Resources

Watershed Protection Branch

The **Watershed Protection Branch** manages water resources in Georgia through permits to local governments and industry to discharge treated wastewater and to local governments, industry, farmers and subdivisions for surface water and groundwater withdrawals. The Branch ensures that Georgia's public water systems are operating properly to supply safe drinking water to citizens, works to control nonpoint sources of pollution, including erosion and sedimentation, and manages storm water discharges. This Branch also conducts water quality monitoring and modeling of Georgia's waterways.

Watershed Protection Branch links of interest:

- Rules and Laws
  - Existing Rules
  - Proposed Rules
- Technical Guidance
- Forms
  - Drinking Water
  - Erosion and Sedimentation
  - Engineering and Technical Support (Wastewater)
  - Non-Point Source
  - Storm Water
  - Wastewater (NPDES & LAS)
  - Underground Injection Control
  - Water Well Driller Standards
  - Water Withdrawal Permitting
- Permitted Facilities
  - Drinking Water Facilities
  - Erosion and Sedimentation
  - Groundwater Withdrawals
  - Storm Water
  - Surface Water Withdrawals
  - Wastewater
  - Water Well Drillers
- Authorization To Discharge Under The National Pollutant Discharge Elimination System Storm Water Discharges Associated With Industrial Activity
- Coastal Water Studies
- Coosa River Modeling Project
- Fish Consumption Guidelines
- Flint River Basin Plan
- Georgia 305(b)/303(d) List Documents
- Georgia Flood Mapping Program
- Lake Lanier Chlorophyll a TMDL Study
- Operator Certification Reimbursement Program
- Outdoor Water Use Rules
- River Basin Management Plans
- Stage 2 DBPR & IDSE Information *(NEW)*
- State Drought Management Plan
- Total Maximum Daily Loadings (TMDLs)
- Water Conservation Program

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Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Jr Drive, Suite 1152 East Tower
Atlanta, GA 30334
Telephone: 404.657.5947 or 888.373.5947 (toll-free throughout Georgia)
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Environmental Protection Division
Georgia Department of Natural Resources

Georgia 305(b)/303(d) List Documents

Georgia 2006 305(b)/303(d) List Documents (Final)

The Georgia 2006 305(b)/303(d) draft list of waters was prepared as a part of the Georgia 2004-2005 assessment of water quality prepared in accordance with Sections 305(b) and 303(d) of the Federal Clean Water Act and guidance from the U.S. Environmental Protection Agency. Assessed waterbodies are classified according to a comparison of water quality monitoring results to water quality standards and other pertinent information.

Georgia 2006 305(b)/303(d) List Documents

- Data Source Code/Key for Abbreviations
- 2006 Rivers/Streams Not Fully Supporting Designated Uses
- 2006 Lakes/Reservoirs Not Fully Supporting Designated Uses
- 2006 Estuarine Waters Not Fully Supporting Designated Uses
- USEPA added waters to the Georgia EPD's 305(b)/303(d) List
- Georgia's 2006 305(b)/303(d) Listing Methodology
- USEPA Approval Letter - Mary 15, 2007

Beaches

- Georgia's Draft Assessment Methodology for Beaches and Enterococci
- Table of Beaches of Concern

Georgia 2004 305(b) Report (Final)

A comprehensive evaluation of Georgia's surface water quality is presented in this report to the US Environmental Protection Agency. Georgia's 2004 303 (d) list is included in Appendix A of the 305(b) report.

Water Quality in Georgia, 2002-2003 (Adobe .pdf - 18 MB Size)

Georgia 2002 305(b) Report (Final)

A comprehensive evaluation of Georgia's surface water quality is presented in this report to the US Environmental Protection Agency. Georgia's 2002 303 (d) list is included in Appendix A of the 305(b) report.

Water Quality in Georgia, 2000-2001 (Adobe .pdf - 18 MB Size)

Georgia 2002 305(b)/303(d) List Map Products Based on April, 2002 List. The spatial data and corresponding map represent the State of Georgia's 2000-2001 assessment of water quality and resulting 2002 305(b)/303(d) list of waters.

Download Georgia 305(b)/303(d) GIS Database and Map [Revised July 2002] Based on April 2002 list
Preview Georgia 305(b)/303(d) Map [Revised July 2002] Based on April 2002 list

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Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive, Suite 1152 East Tower
Atlanta, GA 30334
Telephone: 404.657.5947 or 888.373.5947 (toll-free throughout Georgia)
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Data Source Code/ Key for Abbreviations

State Agencies

1	=	DNR-EPD, Watershed Planning & Monitoring Program
2	=	DNR-EPD, Permitting Comp. & Enf. Program (Municipal)
3	=	DNR-EPD, Permitting Comp. & Enf. Program (Industrial)
55	=	DNR-EPD, Brunswick Coastal District
56	=	DNR-EPD, Hazardous Waste Mgmt. Branch
4	=	DNR, Wildlife Resources Division
5	=	DNR, Coastal Resources Division
6	=	State University of West Georgia
7	=	Gainesville College
8	=	Georgia Institute of Technology
31	=	South Carolina DHEC
33	=	Alabama DEM
35	=	Kennesaw State University
36	=	University of Georgia

Federal Agencies

9	=	U.S. Environmental Protection Agency
10	=	U.S. Geological Survey
11	=	U.S. Army Corps of Engineers
12	=	U.S. Forest Service
13	=	Tennessee Valley Authority

Local Agencies

14	=	Cobb County
15	=	Dekalb County
16	=	Douglas County Water & Sewer Authority
17	=	Fulton County
18	=	Gwinnett County
19	=	City of Clayton
20	=	City of Gainesville
21	=	City of LaGrange
22	=	Georgia Mountains R.D.C.
23	=	City of Conyers
34	=	City of College Park
37	=	Columbus Water Works
38	=	Columbus Unified Government
40	=	Town of Trion
41	=	Cherokee County
42	=	Clayton County Water Authority
43	=	City of Atlanta
44	=	City of Cartersville
50	=	Chatham County
51	=	City of Savannah
53	=	City of Augusta

Contracted Clean Lakes Studies

24	=	Lake Allatoona (Kennesaw State University)
25	=	Lake Blackshear (Lake Blackshear Watershed Association)
26	=	Lake Lanier (University of Georgia)
27	=	West Point (LaGrange College/ Auburn University)

Other

28	=	Georgia Power Company
29	=	Oglethorpe Power Company
30	=	South Carolina Electric & Gas Company
32	=	Jones Ecological Research Center
39	=	St. Johns River Water Mgmt. District
45	=	Georgia Ports Authority
46	=	Chattahoochee/Flint RDC
47	=	Upper Etowah Adopt-A-Stream
48	=	Middle Flint RDC
49	=	Central Savannah RDC
52	=	Heart of Georgia RDC
54	=	Southwire Company
57	=	Ellijay High School

Criterion Violated Codes

As	=	Arsenic
Bio	=	Biota Impacted
Cd	=	Cadmium
CN	=	Cyanide
Cr	=	Chromium
Cu	=	Copper
DO	=	Dissolved Oxygen
CFB	=	Commercial Fishing Ban
FC	=	Fecal Coliform Bacteria
FCG	=	Fish Consumption Guidance
Hg	=	Mercury
Ni	=	Nickel
Pb	=	Lead
SB	=	Shellfishing Ban
Se	=	Selenium
Temp	=	Temperature
Tox	=	Toxicity Indicated
TWR	=	Trophic-Weighted Residue Value of mercury in fish tissue exceeding the EPD human health standard of 0.3 mg/kg.
Zn	=	Zinc

Potential Cause Codes

CSO	=	Combined Sewer Overflow
I1	=	Industrial Facility
I2	=	Residual from Industrial Source
MA	=	Marina
M	=	Municipal Facility
NP	=	Nonpoint Sources/Unknown Sources
UR	=	Urban Runoff/Urban Effects
SB	=	Shellfish Ban

2006 305(b)/303(d) Rivers/Streams Not Fully Supporting Designated Uses

Chattahoochee Basin Streams

Reach Name / Data Source	Reach Location / County	Evaluation / Use	Criterion Violated	Potential Causes	Actions to Alleviate	303(d)	Priority	Extent
Big Creek 26	Hall County Hall	Partially Supporting Fishing	FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Phase II General NPDES Stormwater Permit issued 12/09/02.	3	3	2 miles
Big Creek 1	Hwy 400 to Chattahoochee River Fulton	Not Supporting Fishing/ Drinking Water	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was reissued in 2004.	3	3	5 miles
Big Creek 1	Headwaters to Cheatham Creek Forsyth	Partially Supporting Fishing	FC, Cu	UR, I2	EPD will address nonpoint source (urban runoff) through a watershed protection strategy. Tyson Foods WPCP has a fecal coliform bacteria limit of 200/100 ml in their permit. They are also presently monitoring for copper to determine whether a limit is needed in the permit. Areawide Stormwater Permit was issued in 2005.	3,3	2	3 miles
Bishop Creek 2	Cobb County Cobb	Not Supporting Fishing	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was reissued in 2004.	3	3	2 miles
Black Creek 4	Headwaters to Hannahatchee Creek Stewart	Partially Supporting Fishing	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy.	3	3	6 miles
Blue John Creek 1,21	LaGrange Troup	Partially Supporting Fishing	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy.	3	3	8 miles
Browns Creek 4	Headwaters to Cedar Creek Coweta	Partially Supporting Fishing	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy. Phase II General NPDES Stormwater Permit issued 12/09/02.	X	3	5 miles

2006 305(b)/303(d) Rivers/Streams Not Fully Supporting Designated Uses

Chattahoochee Basin Streams

Reach Name / Data Source	Reach Location / County	Evaluation / Use	Criterion Violated	Potential Causes	Actions to Alleviate	303(d)	Priority	Extent
Little Pine Knot Creek	Headwaters to Pine Knot Creek	Partially Supporting	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy.	3	3	4 miles
4	Chattahoochee	Fishing						
Long Branch	Coweta County	Partially Supporting	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy. Phase II General NPDES Stormwater Permit issued 12/09/02.	3	3	4 miles
4	Coweta	Fishing						
Long Cane Creek	Panther, Blue John & Long Cane Creeks(d/s LaGrange) to Chattahoochee River	Not Supporting	Bio, FC	UR	EPD will address nonpoint sources (urban runoff) through a watershed protection strategy for the basin.	3,3	3	14 miles
4,10	Troup	Fishing						
Long Island Creek	Headwaters to Chattahoochee River	Not Supporting	FC, Bio	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was reissued in 2004.	3,X	3	5 miles
10,4	Fulton	Fishing						
Longwood Park Creek	Gainesville	Not Supporting	FC	UR	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Phase II General NPDES Stormwater Permit issued 12/9/02.	3	3	1 miles
20	Hall	Fishing						
Lullwater Creek	DeKalb County	Not Supporting	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was reissued in 2004.	3	3	2 miles
15	Dekalb	Fishing						
Maple Branch	Headwaters to Mountain Creek	Partially Supporting	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy. Phase II General NPDES Stormwater Permit issued 12/09/02.	X	3	4 miles
4	Coweta	Fishing						

APPENDIX JJ

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
404/656-2833

August 21, 2007

RECORD OF PHONE COMMUNICATION

CALL BY: Andrew S. Taft
Environmental Specialist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
(404) 656-2833

TO: Anne Westmoreland
Superintendent
City of LaGrange
Office of Water Pollution Control
(706) 880-2150

DATE: August 21, 2007

SUBJECT: Wastewater Treatment Plant Operations and Fishing in Long Cane Creek

---

SUMMARY OF PHONE COMMUNICATION

Ms. Westmoreland provided the following information during the phone communication:

- For the past twenty-seven (27) years, Ms. Westmoreland has been involved in water quality control as an employee of the City of LaGrange.

- The City of LaGrange currently treats wastewater at a single wastewater treatment plant located at 1514 Old Hutchinson Mill Road, LaGrange, Georgia 30240. The plant is located near where Blue John Creek enters Long Cane Creek. In operation since 1986, the plant is currently permitted to discharge up to twelve and one half (12½) million gallons of treated wastewater per day to the Chattahoochee River.

- From 1986 thru 1994, the Old Hutchinson Mill Road Plant discharged treated wastewater to nearby Long Cane Creek. During that time period, effluent from the plant accounted for approximately ninety percent (90%) of the total stream flow of Long Cane Creek in that area. In 1994, the plant ceased discharging to Long Cane Creek and began pumping treated wastewater to the Chattahoochee River via approximately eleven (11) miles of ancillary equipment. Currently in operation, the Chattahoochee Discharge Point is located near where

Long Cane Creek enters the Chattahoochee River, south and downstream of West Point Lake.

- Prior to 1986, the City of LaGrange treated wastewater at four (4) separate plants, one (1) of which was located on Blue John Creek, just downstream from where surface water run-off generated at the Milliken & Company Hillside Mill enters Blue John Creek. Wastewater was treated at the Blue John Creek Plant from probably sometime in the 1960s until 1986, when the Old Hutchinson Mill Road Plant began operations. Although wastewater is no longer treated at the Blue John Creek Plant, wastewater is sometimes stored at that location during periods of heavy rainfall, until such time as the Old Hutchinson Mill Road Plant can accept the wastewater for subsequent treatment.

- In accordance with Section 303(d) of the Federal Clean Water Act, both Blue John Creek and Long Cane Creek are considered impaired streams. To Ms. Westmoreland's knowledge, Long Cane Creek did not support large numbers of fish. Ms. Westmoreland has never observed anyone fishing on Long Cane Creek.

APPENDIX KK

From: Brett Albanese
To: Krakow, Greg; Morris, Katrina; Taft, Andy
Date: 11/1/2007 11:55 AM
Subject: Re: Fwd: Highscale Shiner (Notropis hysilepis)

Andy,

Thanks for checking with us. Yes, we actually have records of the highscale shiner at 4 sites within the reach you describe. Please let me know if you need any more information.

We updated our state list last year. The updated list is posted on our website (see link). Highscale shiner is now listed as a rare species. There are no regulatory implications of this change in status.

http://www.georgiawildlife.com/content/displaycontent.asp?txtDocument=514

Brett

Brett Albanese, Ph.D.
Georgia Department of Natural Resources
Nongame Conservation Section
Wildlife Resources Conservation Center
2065 U.S. Highway 278 SE
Social Circle, GA 30025-4743
Email: brett_albanese@dnr.state.ga.us
Phone: 706-557-3032
Fax: 706-557-3033

GIS shapefiles and a list of Georgia's High Priority Waters are now posted at www.georgiawildlife.com
Follow links to "Nongame Animals & Plants", "Georgia Rare Species and Natural Community Information", and "High Priority Waters"

Check out rare species information by watershed at www.georgiawildlife.com
Follow links to "Nongame Animals & Plants", "Georgia Rare Species and Natural Community Information", and "HUC8 Watershed Rare Element"

>>> Greg Krakow 10/31/2007 11:04 AM >>>
Could either of you help Mr. Taft? Please CC me on any correspondence.

Greg

>>> Andy Taft 10/30/2007 5:10 PM >>>
Mr. Krakow:

I'm an employee of the EPD's Hazardous Waste Management Branch. As part of a site assessment that I'm conducting, can you confirm the occurrence of the Highscale Shiner in Long Cane Creek in Troup County, Georgia? I'm specifically interested in the section of Long Cane Creek that starts at its confluence with Blue John Creek (just south of the City of LaGrange) and ends approximately one (1) mile upstream of Long Cane Creek's confluence with the Chattahoochee River (just below the City of West Point).

Protected Animals of Georgia documents that the Highscale Shiner is a state threatened species with a known occurrence in Troup County. Further, *Fishes of Alabama* documents that the Highscale Shiner is distributed near and above the fall line in the Chattahoochee River system, is known to inhabit small streams [three (3) to six (6) meters wide] and is often found near the mouth of such streams as they enter large rivers and where the substrate is sandy. The specified section of Long Cane Creek meets all of these habitat conditions.

Anything you could provide me would be appreciated. I don't need an exact location, only whether or not the species exists in the specified section of Long Cane Creek.

Thanks,
Andy Taft
Environmental Specialist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
(404) 656-2833

Environmental Protection Division
Georgia Department of Natural Resources

Watershed Protection Branch

The **Watershed Protection Branch** manages water resources in Georgia through permits to local governments and industry to discharge treated wastewater and to local governments, industry, farmers and subdivisions for surface water and groundwater withdrawals. The Branch ensures that Georgia's public water systems are operating properly to supply safe drinking water to citizens, works to control nonpoint sources of pollution, including erosion and sedimentation, and manages storm water discharges. This Branch also conducts water quality monitoring and modeling of Georgia's waterways.

Watershed Protection Branch links of interest:

- Rules and Laws
  - Existing Rules
  - Proposed Rules
- Technical Guidance
- Forms
  - Drinking Water
  - Erosion and Sedimentation
  - Engineering and Technical Support (Wastewater)
  - Non-Point Source
  - Storm Water
  - Wastewater (NPDES & LAS)
  - Underground Injection Control
  - Water Well Driller Standards
  - Water Withdrawal Permitting
- Permitted Facilities
  - Drinking Water Facilities
  - Erosion and Sedimentation
  - Groundwater Withdrawals
  - Storm Water
  - Surface Water Withdrawals
  - Wastewater
  - Water Well Drillers
- Authorization To Discharge Under The National Pollutant Discharge Elimination System Storm Water Discharges Associated With Industrial Activity
- Coastal Water Studies
- Coosa River Modeling Project
- Fish Consumption Guidelines
- Flint River Basin Plan
- Georgia 305(b)/303(d) List Documents
- Georgia Flood Mapping Program
- Lake Lanier Chlorophyll a TMDL Study
- Operator Certification Reimbursement Program
- Outdoor Water Use Rules
- River Basin Management Plans
- Stage 2 DBPR & IDSE Information *(NEW)*
- State Drought Management Plan
- Total Maximum Daily Loadings (TMDLs)
- Water Conservation Program

To view and print the PDF documents on this site, the FREE Adobe Acrobat Reader is required. Click on the Adobe logo below to download it.

Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Jr Drive, Suite 1152 East Tower
Atlanta, GA 30334
Telephone: 404.657.5947 or 888.373.5947 (toll-free throughout Georgia)
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Environmental Protection Division
Georgia Department of Natural Resources

Georgia 305(b)/303(d) List Documents

Georgia 2006 305(b)/303(d) List Documents (Final)

The Georgia 2006 305(b)/303(d) draft list of waters was prepared as a part of the Georgia 2004-2005 assessment of water quality prepared in accordance with Sections 305(b) and 303(d) of the Federal Clean Water Act and guidance from the U.S. Environmental Protection Agency. Assessed waterbodies are classified according to a comparison of water quality monitoring results to water quality standards and other pertinent information.

Georgia 2006 305(b)/303(d) List Documents

- Data Source Code/Key for Abbreviations
- 2006 Rivers/Streams Not Fully Supporting Designated Uses
- 2006 Lakes/Reservoirs Not Fully Supporting Designated Uses
- 2006 Estuarine Waters Not Fully Supporting Designated Uses
- USEPA added waters to the Georgia EPD's 305(b)/303(d) List
- Georgia's 2006 305(b)/303(d) Listing Methodology
- USEPA Approval Letter - Mary 15, 2007

Beaches

- Georgia's Draft Assessment Methodology for Beaches and Enterococci
- Table of Beaches of Concern

Georgia 2004 305(b) Report (Final)

A comprehensive evaluation of Georgia's surface water quality is presented in this report to the US Environmental Protection Agency. Georgia's 2004 303 (d) list is included in Appendix A of the 305(b) report.

Water Quality in Georgia, 2002-2003 (Adobe .pdf - 18 MB Size)

Georgia 2002 305(b) Report (Final)

A comprehensive evaluation of Georgia's surface water quality is presented in this report to the US Environmental Protection Agency. Georgia's 2002 303 (d) list is included in Appendix A of the 305(b) report.

Water Quality in Georgia, 2000-2001 (Adobe .pdf - 18 MB Size)

Georgia 2002 305(b)/303(d) List Map Products Based on April, 2002 List. The spatial data and corresponding map represent the State of Georgia's 2000-2001 assessment of water quality and resulting 2002 305(b)/303(d) list of waters.

Download Georgia 305(b)/303(d) GIS Database and Map [Revised July 2002] Based on April 2002 list
Preview Georgia 305(b)/303(d) Map [Revised July 2002] Based on April 2002 list

To view and print the PDF documents on this site, the FREE Adobe Acrobat Reader is required. Click on the Adobe logo below to download it.

Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive, Suite 1152 East Tower
Atlanta, GA 30334
Telephone: 404.657.5947 or 888.373.5947 (toll-free throughout Georgia)
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Data Source Code/ Key for Abbreviations

State Agencies

1	=	DNR-EPD, Watershed Planning & Monitoring Program
2	=	DNR-EPD, Permitting Comp. & Enf. Program (Municipal)
3	=	DNR-EPD, Permitting Comp. & Enf. Program (Industrial)
55	=	DNR-EPD, Brunswick Coastal District
56	=	DNR-EPD, Hazardous Waste Mgmt. Branch
4	=	DNR, Wildlife Resources Division
5	=	DNR, Coastal Resources Division
6	=	State University of West Georgia
7	=	Gainesville College
8	=	Georgia Institute of Technology
31	=	South Carolina DHEC
33	=	Alabama DEM
35	=	Kennesaw State University
36	=	University of Georgia

Federal Agencies

9	=	U.S. Environmental Protection Agency
10	=	U.S. Geological Survey
11	=	U.S. Army Corps of Engineers
12	=	U.S. Forest Service
13	=	Tennessee Valley Authority

Local Agencies

14	=	Cobb County
15	=	Dekalb County
16	=	Douglas County Water & Sewer Authority
17	=	Fulton County
18	=	Gwinnett County
19	=	City of Clayton
20	=	City of Gainesville
21	=	City of LaGrange
22	=	Georgia Mountains R.D.C.
23	=	City of Conyers
34	=	City of College Park
37	=	Columbus Water Works
38	=	Columbus Unified Government
40	=	Town of Trion
41	=	Cherokee County
42	=	Clayton County Water Authority
43	=	City of Atlanta
44	=	City of Cartersville
50	=	Chatham County
51	=	City of Savannah
53	=	City of Augusta

Contracted Clean Lakes Studies

24	=	Lake Allatoona (Kennesaw State University)
25	=	Lake Blackshear (Lake Blackshear Watershed Association)
26	=	Lake Lanier (University of Georgia)
27	=	West Point (LaGrange College/ Auburn University)

Other

28	=	Georgia Power Company
29	=	Oglethorpe Power Company
30	=	South Carolina Electric & Gas Company
32	=	Jones Ecological Research Center
39	=	St. Johns River Water Mgmt. District
45	=	Georgia Ports Authority
46	=	Chattahoochee/Flint RDC
47	=	Upper Etowah Adopt-A-Stream
48	=	Middle Flint RDC
49	=	Central Savannah RDC
52	=	Heart of Georgia RDC
54	=	Southwire Company
57	=	Ellijay High School

Criterion Violated Codes

As	=	Arsenic
Bio	=	Biota Impacted
Cd	=	Cadmium
CN	=	Cyanide
Cr	=	Chromium
Cu	=	Copper
DO	=	Dissolved Oxygen
CFB	=	Commercial Fishing Ban
FC	=	Fecal Coliform Bacteria
FCG	=	Fish Consumption Guidance
Hg	=	Mercury
Ni	=	Nickel
Pb	=	Lead
SB	=	Shellfishing Ban
Se	=	Selenium
Temp	=	Temperature
Tox	=	Toxicity Indicated
TWR	=	Trophic-Weighted Residue Value of mercury in fish tissue exceeding the EPD human health standard of 0.3 mg/kg.
Zn	=	Zinc

Potential Cause Codes

CSO	=	Combined Sewer Overflow
I1	=	Industrial Facility
I2	=	Residual from Industrial Source
MA	=	Marina
M	=	Municipal Facility
NP	=	Nonpoint Sources/Unknown Sources
UR	=	Urban Runoff/Urban Effects
SB	=	Shellfish Ban

2006 305(b)/303(d) Rivers/Streams Not Fully Supporting Designated Uses

Chattahoochee Basin Streams

Reach Name / Data Source	Reach Location / County	Evaluation / Use	Criterion Violated	Potential Causes	Actions to Alleviate	303(d)	Priority	Extent
Big Creek 26	Hall County Hall	Partially Supporting Fishing	FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Phase II General NPDES Stormwater Permit issued 12/09/02.	3	3	2 miles
Big Creek 1	Hwy 400 to Chattahoochee River Fulton	Not Supporting Fishing/ Drinking Water	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was reissued in 2004.	3	3	5 miles
Big Creek 1	Headwaters to Cheatham Creek Forsyth	Partially Supporting Fishing	FC, Cu	UR, I2	EPD will address nonpoint source (urban runoff) through a watershed protection strategy. Tyson Foods WPCP has a fecal coliform bacteria limit of 200/100 ml in their permit. They are also presently monitoring for copper to determine whether a limit is needed in the permit. Areawide Stormwater Permit was issued in 2005.	3,3	2	3 miles
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2006 305(b)/303(d) Rivers/Streams Not Fully Supporting Designated Uses

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4	Chattahoochee	Fishing						
Long Branch	Coweta County	Partially Supporting	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy. Phase II General NPDES Stormwater Permit issued 12/09/02.	3	3	4 miles
4	Coweta	Fishing						
Long Cane Creek	Panther, Blue John & Long Cane Creeks(d/s LaGrange) to Chattahoochee River	Not Supporting	Bio, FC	UR	EPD will address nonpoint sources (urban runoff) through a watershed protection strategy for the basin.	3,3	3	14 miles
4,10	Troup	Fishing						
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10,4	Fulton	Fishing						
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15	Dekalb	Fishing						
Maple Branch	Headwaters to Mountain Creek	Partially Supporting	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy. Phase II General NPDES Stormwater Permit issued 12/09/02.	X	3	4 miles
4	Coweta	Fishing						

APPENDIX JJ

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Environmental Protection Division
Carol A. Couch, Ph.D., Director
404/656-2833

August 21, 2007

RECORD OF PHONE COMMUNICATION

CALL BY: Andrew S. Taft
Environmental Specialist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
(404) 656-2833

TO: Anne Westmoreland
Superintendent
City of LaGrange
Office of Water Pollution Control
(706) 880-2150

DATE: August 21, 2007

SUBJECT: Wastewater Treatment Plant Operations and Fishing in Long Cane Creek

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APPENDIX LL

From: Brett Albanese
To: Andy Taft
Date: 11/12/2007 12:45 PM
Subject: Re: Fwd: Highscale Shiner (Notropis hysilepis)

Hello Andy,

Although we can only be certain for the exact locations sampled, I would expect the highscale shiner to be distributed throughout the reach you describe. The lowest record I have is about 3 river kilometers from the Chattahoochee confluence. The upper one is less than 1 km from the confluence with Blue John Creek. We have additional dots located upstream of Blue John Creek within Long Cane. We don't have any records of highscale shiner from Blue John Creek. However, the only samples I have are for sites in the upper reaches of Blue John Creek (about 4 RKM from conf. with Long Cane). I would not be surprised if highscale shiner occurs in the lower reaches of Blue John Creek.

Thanks,

Brett

Brett Albanese, Ph.D.
Georgia Department of Natural Resources
Nongame Conservation Section
Wildlife Resources Conservation Center
2065 U.S. Highway 278 SE
Social Circle, GA 30025-4743
Email: brett_albanese@dnr.state.ga.us
Phone: 706-557-3032
Fax: 706-557-3033

GIS shapefiles and a list of Georgia's High Priority Waters are now posted at www.georgiawildlife.com
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Follow links to "Nongame Animals & Plants", "Georgia Rare Species and Natural Community Information", and "HUC8 Watershed Rare Element"
>>> Andy Taft 11/07/07 12:00 PM >>>
Brett:

Sorry to bother you again, but I have two (2) more questions:

1. Do the before described 4 sites comprise 4 separate habitats, or is the Highscale Shiner equally distributed within the specified reach?

2. Are there any records of the Highscale Shiner in Blue John Creek? Specifically, from the point of confluence of Blue John Creek and Long Cane Creek to 3.2 miles upstream on Blue John Creek (i.e., the last 3.2 miles of Blue John Creek).

Thanks,
Andy

>>> Brett Albanese 11/1/2007 11:55 AM >>>
Andy,

Thanks for checking with us. Yes, we actually have records of the highscale shiner at 4 sites within the reach you describe. Please let me know if you need any more information.

We updated our state list last year. The updated list is posted on our website (see link). Highscale shiner is now listed as a rare species. There are no regulatory implications of this change in status.

http://www.georgiawildlife.com/content/displaycontent.asp?txtDocument=514

Brett

Brett Albanese, Ph.D.
Georgia Department of Natural Resources
Nongame Conservation Section
Wildlife Resources Conservation Center
2065 U.S. Highway 278 SE
Social Circle, GA 30025-4743
Email: brett_albanese@dnr.state.ga.us
Phone: 706-557-3032
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Thanks,
Andy Taft
Environmental Specialist
Georgia Environmental Protection Division

Hazardous Waste Management Branch
(404) 656-2833

APPENDIX MM

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, SE, Suite 1154, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/656-2833

July 27, 2007

RECORD OF PHONE COMMUNICATION

CALL BY: Andrew S. Taft
Environmental Specialist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
(404) 656-2833

TO: Kent Bennett
Plant Manager
Milliken & Company – Hillside Plant
(706) 880-3389

DATE: July 27, 2007

SUBJECT: Number of On-Site Workers

SUMMARY OF PHONE COMMUNICATION

Mr. Bennett estimated that approximately 230 employees work at the Hillside Mill.

APPENDIX A

OMB Approval Number: 2050-0095
Approved for Use Through: 1/92

PA Scoresheets

Site Name: Milliken & Company Hillside Mill

CERCLIS ID No.: GAD 981 275 993

Street Address: 1300 Brownwood Ave.

City/State/Zip: LaGrange, GA

Investigator: Andrew Taft

Agency/Organization: GA EPD

Street Address: 2 MLK Jr. Dr., Suite 1154

City/State/Zip: Atlanta, GA 30334

Date: December 2007

GENERAL INFORMATION

Site Description and Operational History:

See attached Page 2- Supplement A

Probable Substances of Concern:
(Previous investigations, analytical data)

Contaminants of concern historically associated with the textile industry include spent solvents, spent surfactants, polychlorinated biphenyls (PCBs) from transformers and other machinery, asbestos from spinning machines or historic structures, bleaching products, phosphates from detergents, insecticides, phenols (manmade substances used to make synthetics such as nylon), underground storage tank contents, waste oil, other petroleum products and heavy metals (Ref. 36).

Hazardous substances associated with the site include, but are not limited to, Acrylamide, Cyclohexanone, Ethylene Thiourea, Lead, Mercury, Methanol, Methyl Ethyl Ketone, Phenol, Toluene and Xylene (Ref. 41).

Site Description and Operational History

The site is located at 1300 Brownwood Avenue, within the city limits of LaGrange, Troup County, Georgia, approximately one and one half (1½) miles southwest of the city square (Refs. 2, 5 & 6). Surrounded by private residences of the Hillside Community, the site is bounded to the north by Brownwood Avenue, bounded to the east by Lincoln Street, bounded to the south by Fourth Avenue and bounded to the west by the backyards of private residences located on Grant, Palm and Stonewall Streets (Refs. 5 & 13). For the purposes of this PA, the site is considered to be approximately thirty-four (34) acres in size (Refs. 13 & 14).

The site occupies part of a hillside that slopes south towards Fourth Avenue (i.e., the southern boundary of the site), (Refs. 5 & 6). Originating just north of the site, Lee Branch (a tributary to Blue John Creek) flows southeast a short distance before entering the site via culvert underlying Brownwood Avenue (Refs. 5, 6 & 11). Lee Branch is then conveyed south, via underground ancillary equipment, to a second culvert located near the northwest corner of the on-site surface water impoundment. From that point, Lee Branch re-surfaces and flows southeast (between the impoundment and the site's western boundary) before exiting at the site's southwest corner.

The surface water impoundment occupies much of the southwest quadrant of the site (Refs. 5 & 6). According to a 1921 Sanborn Fire Insurance Map, the impoundment has a capacity of six million (6,000,000) gallons (Ref. 15). During the July 2007 site reconnaissance, site representatives confirmed that on average, overflow of the impoundment occurs every 2 to three 3 years, the last of which occurred approximately 1½ years ago (Ref. 5).

All site-generated run-off enters Lee Branch (Refs. 5 & 6). Most site run-off, including overflows from the surface water impoundment, exits the site at the site's southwest corner via Lee Branch. However, some site run-off is conveyed from the site's southeast corner (via underground storm water line) to an outfall that discharges to Lee Branch approximately 100 feet downstream of the site's southwest corner (Refs. 5 & 17).

An average of 156,000 gallons of wastewater is discharged daily to the city sewer system (Ref. 17). Prior to sewer discharge, wastewater generated from on-site operations is pH adjusted (if necessary) within a sixteen thousand eight hundred and seven (16,807) gallon concrete neutralization basin (Refs. 5 & 18). Used in the neutralization process, two 250 gallon reagent tanks [one (1) containing caustic soda, one (1) containing acetic acid] are located immediately adjacent to the neutralization basin. Continuous pH monitoring occurs within the neutralization basin (Ref. 5).

Two 12,000 gallon metal aboveground storage tanks are located in the general vicinity of the above described neutralization basin (Refs. 5 & 18). The tanks are used to contain wastewater generated from on-site processes prior to pH adjustment within the neutralization basin (Ref. 5). Wastewater within the tanks can contain Zinc, Formaldehyde, Ammonia and Latex Waste, and under certain circumstances it is necessary to containerize the wastewater in drums for off-site disposal rather than discharge to the city sewer system.

Four 10,000 gallon metal aboveground storage tanks comprising a tank farm are located near the site's northeast corner (Refs. 5 & 18). At the time of the July 2007 site reconnaissance, a site representative indicated that Toluene was stored in one (1) tank with the remaining three (3) tanks being empty (Ref. 5).

At the time of the July 2007 site reconnaissance, two (2) covered roll-off boxes were observed on the east side of the site near Lincoln Street (Ref. 5). According to a site representative, the plant roof was being re-decked and the roll-off boxes contained wood debris that was possibly painted with lead-based paint.

As a conservative measure, the roll-off boxes were lined, covered and labeled as "Hazardous Waste" until analytical results became available that indicated otherwise. For the purposes of this PA, the combined volume of the two (2) roll-off boxes is estimated to be approximately eighty (80) square yards. At that same time/location, the smell of organic vapor was evident in the area, similar to the odor previously described in the room where a toluene/silicone mixture was coated onto fabric (Ref. 5).

At the time of the July 2007 site reconnaissance, a walk around the site perimeter did not reveal any areas of stained soil or stressed vegetation (Ref. 5).

Although not observed during the 2007 site reconnaissance, information obtained from a site representative confirmed the on-site presence of one (1) two hundred thousand (200,000) gallon above ground storage tank (currently not in use) and one (1) one hundred thousand (100,000) gallon above ground storage tank containing Number Six (6) Fuel Oil (Ref. 18).

Built in 1915 by textile magnate Fuller E. Callaway (1870 – 1928), the site was the seventh (7th) textile mill built in LaGrange, Georgia (Ref. 25). Textile manufacturing has occurred on-site for a time period exceeding ninety (90) years, the majority of which pre-dated the promulgation of any environmental regulation (Refs. 25 & 26).

A photographic image taken in 1933 depicts a topographic depression in the area where the on-site surface water impoundment is located (Ref. 27). The image is included as Appendix N. At that time, the impoundment may have been temporarily drained. Unauthenticated information obtained from a former site employee suggests that the impoundment has been drained in the past, and that during one such drainage event (unknown date), rusted drums and other debris were discovered at the bottom of the impoundment (Ref. 28).

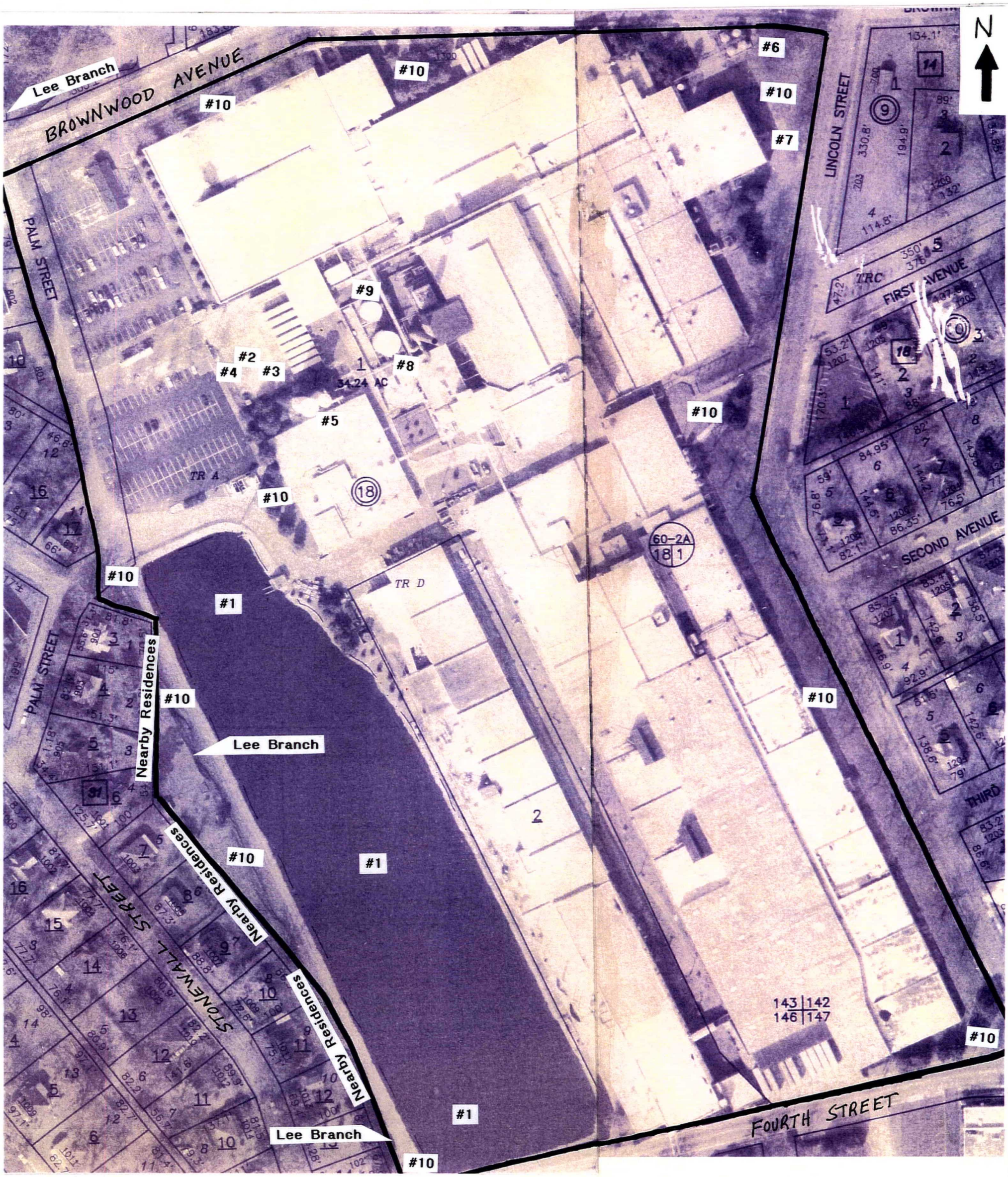
In and around 1956/1957, a current and past nearby resident recalled that the normally clear running Lee Branch that exits the site under Fourth Avenue frequently became murky and exhibited a strong chemical smell (Ref. 29).

On April 18, 2002, the site reported to the GA EPD an un-permitted discharge of an estimated sixty (60) gallons of wastewater containing a non-hazardous textile-finishing chemical described as an "acrylic emulsion containing carbon black" (Ref. 30). Due to a breach in a clay pipe underlying the Valway Plant, wastewater normally conveyed to the municipal sewer system was diverted to a nearby underground storm water line that led to an outfall on Lee Branch approximately one hundred (100) feet downstream from Fourth Avenue (Ref. 17). The result was a discoloration of Lee Branch, for approximately one (1) mile downstream of the site, to a point at or near Blue John Creek (Ref. 30):

GENERAL INFORMATION (continued)

Site Sketch:
(Show all pertinent features, indicate sources and closest targets, indicate north)

See attached Figure 2: Site Sketch



On-Site Potential Source Areas Shown Above

#1. One (1) six million (6,000,000) gallon surface water impoundment;
#2. One (1) sixteen thousand eight hundred and seven (16,807) gallon concrete neutralization basin;
#3. One (1) two hundred and fifty (250) gallon aboveground storage tank containing acetic acid;
#4. One (1) two hundred and fifty (250) gallon aboveground storage tank containing caustic soda;
#5. Two (2) twelve thousand (12,000) gallon aboveground storage tanks containing Zinc wastewater;
#6. Four (4) ten thousand (10,000) gallon aboveground storage tanks [one (1) currently containing Toluene];
#7. Two (2) forty (40) cubic yard roll-off boxes containing wood debris possibly contaminated with lead;
#8. One (1) two hundred thousand (200,000) gallon aboveground storage tank currently not in use;
#9. One (1) one hundred thousand (100,000) gallon aboveground storage tank currently containing Number Six (6) Fuel Oil; and
#10. Approximately five (5) acres of the site not covered by buildings, paving or the on-site surface impoundment.

FIGURE 2: Site Sketch (Refs. 5, 11, 13, 15 & 18)

SOURCE EVALUATION

See attached Page 4 – Supplement A

SOURCE NO.	SOURCE NAME	SOURCE TYPE	TIER	AREA, VOLUME or # DRUMS	WQ DIVISOR	WQ VALUE
1	One (1) 6,000,000 Gallon Surface Water Impoundment.	Surface Impoundment	Volume	29,707 Cubic Yards	2.5 Cubic Yards	11,882.8
2	One (1) 16,807 Gallon Concrete Neutralization Basin.	Tank	Volume	16,807 Gallons	500 Gallons	33.61
3	One (1) 250 Gallon Above Ground Storage Tank (Acetic Acid Reagent Tank).	Tank	Volume	250 Gallons	500 Gallons	0.5
4	One (1) 250 Gallon Above Ground Storage Tank (Caustic Soda Reagent Tank).	Tank	Volume	250 Gallons	500 Gallons	0.5
5	Four (4) 10,000 Gallon Above Ground Storage Tanks (Toluene Storage).	Tank	Volume	40,000 Gallons	500 Gallons	80
6	Two (2) 12,000 Gallon Above Ground Storage Tanks (Zinc Wastewater Storage).	Tank	Volume	24,000 Gallons	500 Gallons	48
7	One (1) 200,000 Above Ground Storage Tank (Currently Not Used).	Tank	Volume	200,000 Gallons	500 Gallons	400
8	One (1) 100,000 Above Ground Storage Tank (Currently Containing # 6 Fuel Oil).	Tank	Volume	100,000 Gallons	500 Gallons	200
9	Two (2) 40 Cubic Yard Roll Off Boxes Containing Lead Contaminated Wood	Non-Drum Container	Volume	13,885 Gallons (Dry)	500 Gallons	27.77
10	Thirty-five (35) 55-Gallon Drums of Liquid Hazardous Waste.	Drums	Volume	35 Drums	10 Drums	3.5
11	Seventy-five (75) 55-Gallon Drums of Liquid Non-Hazardous Waste.	Drums	Volume	75 Drums	10 Drums	7.5
12	Five (5) Acres of Contaminated Soil (Approximate Site Area Not Covered by Buildings, Paving or Surface Water Impoundment).	Contaminated Soil	Area	5 Acres	0.78 Acres	6.41

WC = 100 **Σ of WQ Values = 12,690.59**

POTENTIAL SOURCE DESCRIPTIONS AND WASTE CHARACTERISTIC (WC) CALCULATION FOR MULTIPLE SOURCES (Refs. 3, 5, 15 & 18)

PA TABLE 1: WASTE CHARACTERISTICS (WC) SCORES

PA Table 1a: WC Scores for Single Source Sites and Formulas for Multiple Source Sites

TIER	SOURCE TYPE	SINGLE SOURCE SITES (assigned WC scores)			MULTIPLE SOURCE SITES
		WC = 18	*WC = 32*	*WC = 100*	Formula for Assigning Source WQ Values
CONSTITUENT	N/A	≤100 lb	>100 to 10,000 lb	>10,000 lb	*lb ÷ 1*
WASTESTREAM	N/A	≤500,000 lb	>500,000 to 50 million lb	>50 million lb	*lb ÷ 5,000*
VOLUME	Landfill	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3	>675 million ft^3 >25 million yd^3	*ft^3 ÷ 67,500* *yd^3 ÷ 2,500*
	Surface impoundment	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
	Drums	≤1,000 drums	>1,000 to 100,000 drums	>100,000 drums	*drums ÷ 10*
	Tanks and non-drum containers	≤50,000 gallons	>50,000 to 5 million gallons	>5 million gallons	*gallons ÷ 500*
	Contaminated soil	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3	>675 million ft^3 >25 million yd^3	*ft^3 ÷ 67,500* *yd^3 ÷ 2,500*
	Pile	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
	Other	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
AREA	Landfill	≤340,000 ft^2 ≤7.8 acres	>340,000 to 34 million ft^2 >7.8 to 780 acres	>34 million ft^2 >780 acres	*ft^2 ÷ 3,400* *acres ÷ 0.078*
	Surface impoundment	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres	>130,000 ft^2 >2.9 acres	*ft^2 ÷ 13* *acres ÷ 0.00029*
	Contaminated soil	≤3.4 million ft^2 ≤78 acres	>3.4 million to 340 million ft^2 >78 to 7,800 acres	>340 million ft^2 >7,800 acres	*ft^2 ÷ 34,000* *acres ÷ 0.78*
	Pile*	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres	>130,000 ft^2 >2.9 acres	*ft^2 ÷ 13* *acres ÷ 0.00029*
	Land treatment	≤27,000 ft^2 ≤0.62 acres	>27,000 to 2.7 million ft^2 >0.62 to 62 acres	>2.7 million ft^2 >62 acres	*ft^2 ÷ 270* *acres ÷ 0.0062*

1 ton = 2,000 lb = 1 yd^3 = 4 drums = 200 gallons

* Use area of land surface under pile, not surface area of pile.

PA Table 1b: WC Scores for Multiple Source Sites

WQ Total	*WC Score*
>0 to 100	18
>100 to 10,000	32
>10,000	100

12,691 > 10,000

GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use Within 4-miles of the Site:
(Describe stratigraphy, information on aquifers, municipal and/or private wells)

The site is located in the southern section of the Piedmont Physiographic Province, within an area designated as the Greenville Slope District (Ref. 45). Water-bearing units of the Piedmont Physiographic Province include the surficial regolith unit and the deeper bedrock unit (Ref. 47). The bedrock unit is unconfined and recharged from groundwater stored in the overlying regolith unit (Ref. 51). For the purposes of this PA, all water-bearing units underlying the site and the study area are considered a single interconnected aquifer.

Domestic water supply is the largest use category of groundwater in the Middle Chattahoochee River basin in Georgia (Ref. 47). Wells completed in the shallower regolith are more susceptible to contamination and to water table decline during times of drought. There are no known municipal wells located within the groundwater TDL (Refs. 5 & 52). Further, no wells associated with other permitted drinking water systems are known to occur within the groundwater TDL (e.g., trailer park system, state park, etc.). Based upon information obtained from the 1990 Census of Population and Housing, one thousand five hundred and four (1,504) individuals obtain drinking water from domestic wells located within the groundwater TDL (Ref. 55).

Calculations for Drinking Water Populations Served by Ground Water:

See attached Table 1: Number of Domestic Wells & Population on Domestic Wells per Concentric Distance Category

Milliken & Company
Hillside Mill
LaGrange, Troup County

LAT 33° 01' 22"N / LONG 85° 03' 00"W

	Population		Households		Households Domestic Well		Households Public Water		Population Domestic Well		Population Public Water	
RAD	Ring	Total	Ring	Total	Ring	Total	Ring	Total	Ring	Total	Ring	Total
0.25	476	476	173	173	0	0	172	172	1	1	475	475
0.50	1027	1503	391	564	4	4	387	559	9	10	1018	1493
1.00	3152	4655	1205	1769	24	28	1181	1741	58	68	3093	4586
2.00	8676	13331	3221	4989	99	127	3122	4863	266	334	8410	12997
3.00	8675	22006	3332	8321	176	302	3156	8019	485	819	8191	21187
4.00	5774	27780	2114	10435	240	542	1874	9893	685	1504	5089	26276

Source: Census of Population and Housing, 1990: Summary Tape File 3 on CD-ROM Georgia [machine-readable data files] / prepared by the Bureau of the Census. –Washington: The Bureau [producer and distributor], 1992.

TABLE 1: Number of Domestic Wells & Population on Domestic Wells per Concentric Distance Category (Ref. 55)

GROUND WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
☑	☐	☐	Are sources poorly contained?
☑	☐	☐	Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)?
☑	☐	☐	Is waste quantity particularly large?
☑	☐	☐	Is precipitation heavy?
☐	☐	☑	Is the infiltration rate high?
☐	☑		Is the site located in an area of karst terrain?
☐	☐	☑	Is the subsurface highly permeable or conductive?
☐	☐	☑	Is drinking water drawn from a shallow aquifer?
☑	☐	☐	Are suspected contaminants highly mobile in ground water?
☑	☐	☐	Does analytical or circumstantial evidence suggest ground water contamination?
☐	☐		Other criteria?_____
☑	☐		**SUSPECTED RELEASE?**

PRIMARY TARGETS

Yes	No	Unk	
☐	☑	☐	Is any drinking water well nearby?
☐	☐	☑	Has any nearby drinking water well been closed?
☐	☐	☑	Has any nearby drinking water user reported foul-tasting or foul-smelling water?
☐	☑	☐	Does any nearby well have a large drawdown or high production rate?
☐	☑	☐	Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance?
☐	☑	☐	Does analytical or circumstantial evidence suggest contamination at a drinking water well?
☐	☑	☐	Does any drinking water well warrant sampling?
☐	☐		Other criteria?_____
☐	☑		**PRIMARY TARGET(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

See attached Page 7 – Supplement A

Summarize the rationale for Primary Targets (attach an additional page if necessary):

Primary Targets are not Suspected

RATIONAL FOR GROUNDWATER SUSPECTED RELEASE

- The on-site surface water impoundment, in existence since at least 1921, is considered a poorly contained potential source (Refs. 3, 5 & 15).

- The on-site surface water impoundment is a potential source type likely to contribute to groundwater contamination due to the fact that it is located on the ground and that it contains liquid (Refs. 3 & 5).

- In combination, on-site potential source areas represent a relatively large waste quantity (Refs. 3, 5, 15 & 18).

- The average annual rainfall of approximately fifty-two (52) inches for the Troup County area is considered heavy (Refs. 3 & 7).

- The site generates liquid hazardous waste containing hazardous substances that are highly mobile in groundwater (e.g., Methyl Ethyl Ketone and Toluene), (Refs. 3, 5 & 57).

- Textile manufacturing has occurred on-site for a time period exceeding ninety (90) years, the majority of which pre-dated the promulgation of any environmental regulation (Refs. 25 & 26). During that extended time period, it is reasonable to expect that inadvertent spills of a hazardous substance have occurred on-site.

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics		
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes ___	No ___
Is the site located in karst terrain?	Yes ___	No ___
Depth to aquifer:		___ ft
Distance to the nearest drinking water well:		___ ft

LIKELIHOOD OF RELEASE	A *Suspected Release*	B *No Suspected Release*	*References*
1. SUSPECTED RELEASE: If you suspect a release to ground water (see page 7), assign a score of 550. Use only column A for this pathway.	[550] 550		3,5,7,15,18,25,26,5
2. NO SUSPECTED RELEASE: If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.		[500 or 340]	N/A
LR =	550		

TARGETS			
3. PRIMARY TARGET POPULATION: Determine the number of people served by drinking water wells that you suspect have been exposed to a hazardous substance from the site (see Ground Water Pathway Criteria List, page 7). ___ people x 10 =	N/A		N/A
4. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water wells that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 2. Are any wells part of a blended system? Yes ___ No ✓ If yes, attach a page to show apportionment calculations.	17		3,5,52,55
5. NEAREST WELL: If you have identified a primary target population for ground water, assign a score of 50; otherwise, assign the Nearest Well score from PA Table 2. If no drinking water wells exist within 4 miles, assign a score of zero.	[50,20,18,9,5,3,2, or 0] 18	[20,18,9,5,3,2, or 0]	3,5,52,55
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA, or if you have identified any primary target well within a WHPA, assign a score of 20; assign 5 if neither condition holds but a WHPA is present within 4 miles; otherwise assign zero.	[20, 5, or 0] 0	[20, 5, or 0]	3,5,52
7. RESOURCES	[5 or 0] 5	[5 or 0]	3
T =	40		

WASTE CHARACTERISTICS		
8. A. If you have identified any primary target for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	[100 or 32] N/A	
B. If you have NOT identified any primary target for ground water, assign the waste characteristics score calculated on page 4.	[100,32, or 18] 100	[100,32, or 18]
WC =	100	

GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82{,}500}$ [subject to a maximum of 100] 27

$$\frac{(550)(40)(100)}{82{,}500} = 26.\overline{6}$$

PA TABLE 2: VALUES FOR SECONDARY GROUND WATER TARGET POPULATIONS

PA Table 2a: Non-Karst Aquifers

Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to ¼ mile	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	0
> ¼ to ½ mile	10	18	1	1	3	10	32	101	323	1,012	3,233	10,121	1
> ½ to 1 mile	58	9	1	1	2	5	17	52	167	522	1,668	5,224	2
>1 to 2 miles	266	5	1	1	1	3	9	29	94	294	939	2,938	3
>2 to 3 miles	485	3	1	1	1	2	7	21	68	212	678	2,122	7
>3 to 4 miles	685	2	1	1	1	1	4	13	42	131	417	1,306	4
	Nearest Well =	18										Score =	17

PA Table 2b: Karst Aquifers

Distance from Site	Population	Nearest Well (use 20 for karst)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to ¼ mile	____	20	1	2	5	16	52	163	521	1,633	5,214	16,325	____
> ¼ to ½ mile	____	20	1	1	3	10	32	101	323	1,012	3,233	10,121	____
>½ to 1 mile	____	20	1	1	3	8	26	82	261	816	2,607	8,162	____
>1 to 2 miles	____	20	1	1	3	8	26	82	261	816	2,607	8,162	____
>2 to 3 miles	____	20	1	1	3	8	26	82	261	816	2,607	8,162	____
>3 to 4 miles	____	20	1	1	3	8	26	82	261	816	2,607	8,162	____
	Nearest Well =											Score =	

SURFACE WATER PATHWAY
MIGRATION ROUTE SKETCH

Suface Water Migration Route Sketch:
(include runoff route, probable point of entry, 15-mile target distance limit, intakes, fisheries, and sensitive environments).

See attached:

Figure 4: Overland Run-Off Route & Point of Probable Entry

Figure 5: Point of Probable Entry & Surface Water Target Distance Limit

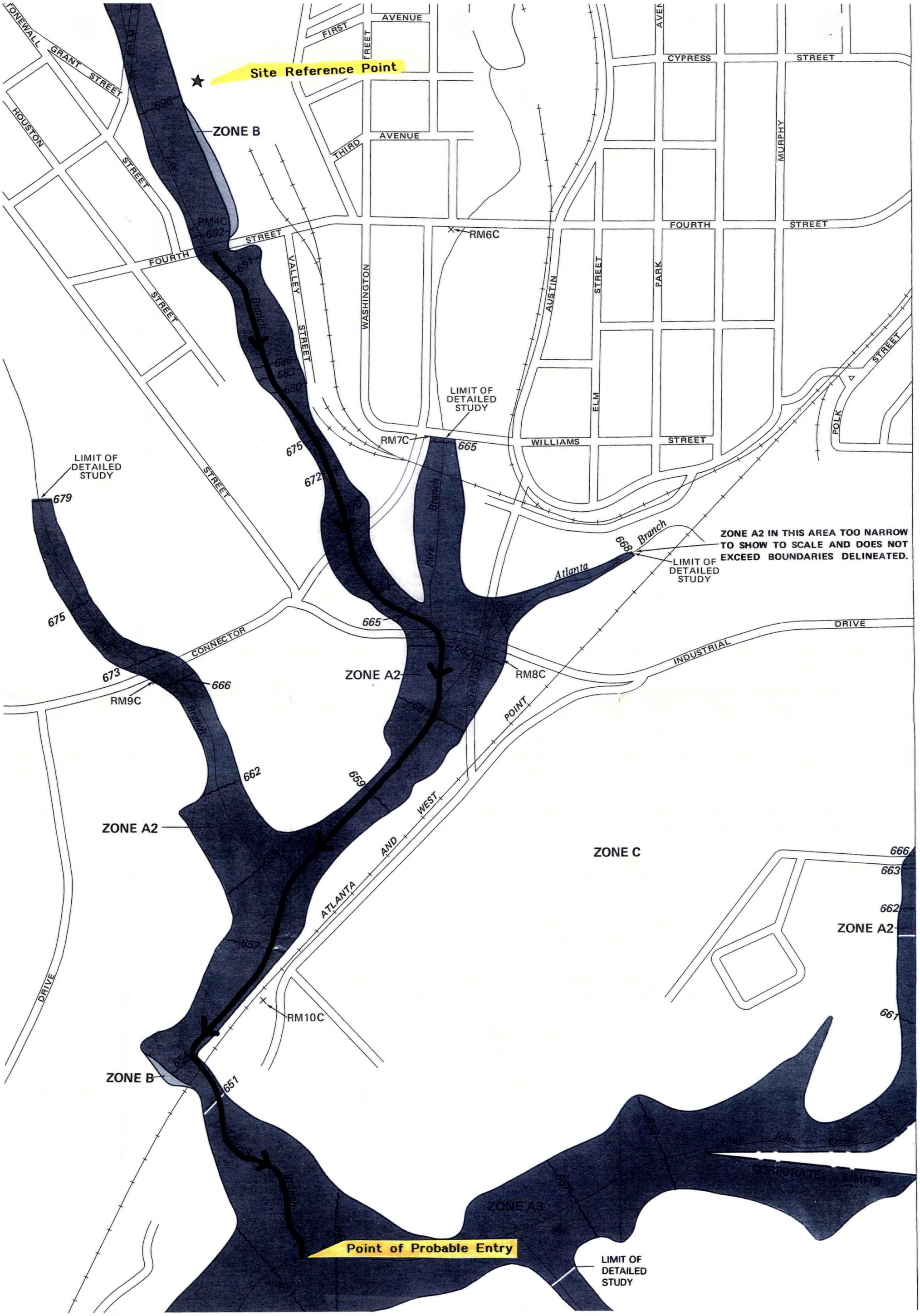


FIGURE 4: Overland Run-Off Route & Point of Probable Entry (Refs. 3, 5, 6, 11, 58 & 59)

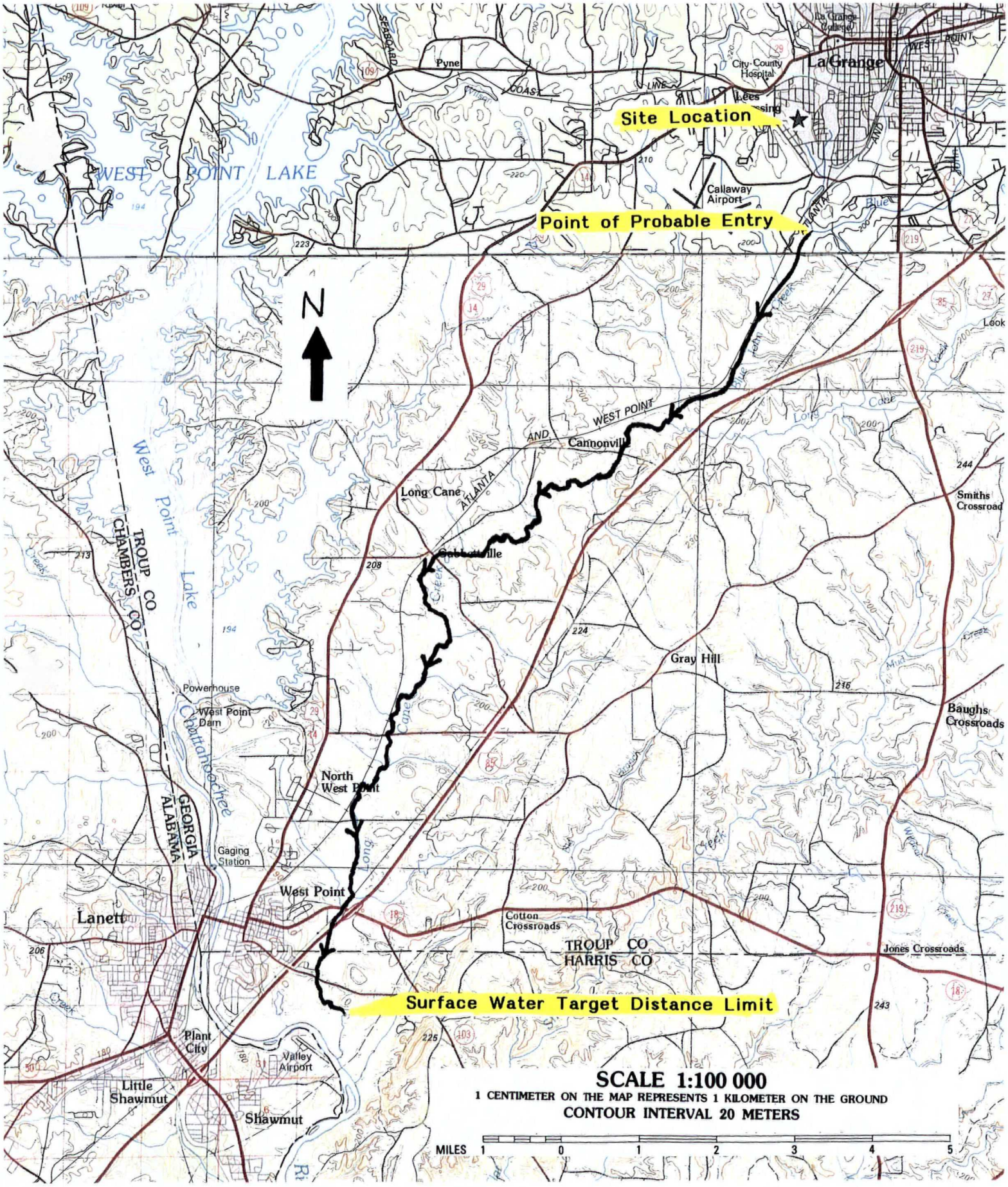


FIGURE 5: Point of Probable Entry & Surface Water Target Distance Limit (Refs. 3, 5, 6, 11, 58 & 59)

SURFACE WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
☑	☐	☐	Is surface water nearby?
☑	☐	☐	Is waste quantity particularly large?
☐	☑	☐	Is the drainage area large?
☑	☐	☐	Is rainfall heavy?
☐	☐	☑	Is the infiltration rate low?
☑	☐	☐	Are sources poorly contained or prone to runoff or flooding?
☑	☐	☐	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
☐	☐	☑	Is vegetation stressed along the probable run-off route?
☑	☐	☐	Are sediments or water unnaturally discolored?
☐	☐	☑	Is wildlife unnaturally absent?
☑	☐	☐	Has deposition of waste into surface water been observed?
☑	☐	☐	Is ground water discharge to surface water likely?
☑	☐	☐	Does analytical or circumstantial evidence suggest surface water contamination?
☐	☐		Other criteria?_____
☑	☐		**SUSPECTED RELEASE?**

PRIMARY TARGETS

Yes	No	Unk	
☑	☐	☐	Is any target nearby? If yes:
			☐ Drinking water intake ☑ Fishery ☑ Sensitive environment
☐	☑	☐	Has any intake, fishery, or recreational area been closed?
☑	☐	☐	Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target?
☑	☐	☐	Does any target warrant sampling? If yes:
			☐ Drinking water intake ☑ Fishery ☑ Sensitive environment
☐	☐		Other criteria?_____
☐	☑		**PRIMARY INTAKE(S) IDENTIFIED?**
☑	☐		**PRIMARY FISHERY(IES) IDENTIFIED?**
☑	☐		**PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

See attached Page 11- Supplement A

Summarize the rationale for Primary Targets (attach an additional page if necessary):

See attached Page 11- Supplement B

RATIONAL FOR SURFACE WATER SUSPECTED RELEASE

- Although the OROR is approximately one (1) mile in length, continuous intermittent conditions within the OROR render the site relatively near to the perennial Blue John Creek (i.e., the surface water TDL), (Refs. 5, 6, 11, 58 & 59).

- In combination, on-site potential source areas represent a relatively large waste quantity (Refs. 3, 5, 15 & 18).

- The average annual rainfall of approximately fifty-two (52) inches for the Troup County area is considered heavy (Refs. 3 & 7).

- On average, overflow of the on-site surface water impoundment (i.e., potential source) occurs every two (2) to three (3) years (Ref. 5). The most recent overflow occurred approximately one and one half (1½) years ago.

- The OROR is very well defined by intermittent sections of Lee Branch, Park Branch and Atlanta Branch (Refs. 5, 6, 11 & 59). Moreover, Lee Branch bisects the site (Refs. 5, 6 & 11).

- In and around 1956/1957, a current and past nearby resident recalled that the normally clear running Lee Branch that exits the site under Fourth Avenue frequently became murky and exhibited a strong chemical smell (Ref. 29).

- On April 18, 2002, the site reported an un-permitted discharge of an estimated sixty (60) gallons of wastewater to Lee Branch (Ref. 30). The result was a discoloration of Lee Branch, for approximately one (1) mile downstream of the site, to a point at or near the surface water TDL.

- Being located on a hillside, it is suspected that groundwater underlying the site discharges to the OROR (Refs. 5 & 6). Note that in Section 3.3 of this PA (Groundwater Conclusions), a release of a hazardous substance from the site to groundwater is suspected.

- Textile manufacturing has occurred on-site for a time period exceeding ninety (90) years, the majority of which pre-dated the promulgation of any environmental regulation (Refs. 25 & 26). During that extended time period, it is reasonable to expect that inadvertent spills of a hazardous substance have occurred on-site.

RATIONAL FOR SURFACE WATER PRIMARY TARGETS

- Surface water targets located within the Blue John Creek section of the surface water TDL are considered relatively near to the site (Refs. 3, 63 & 68). These surface water targets include qualifying wetland frontage, Highscale Shiner habitat and a fishery.

- The site reported an un-permitted discharge of wastewater to Lee Branch that resulted in a discoloration of the stream to a point at or near surface water targets located within the Blue John Creek section of the surface water TDL (Ref. 30).

- Due to urban run-off and/or urban effects, Blue John Creek and Long Cane Creek are considered impaired streams that do not fully support the use of fishing designated by the State of Georgia (Ref. 60). The "does not support fishing" designation does not imply that fish are not present or that fish are not taken for human consumption.

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Surface Water Pathway Criteria List, page 11)?	Yes ___ No ___
Distance to surface water:	_____ft
Flood frequency:	_____yrs
What is the downstream distance to the nearest drinking water intake? _____miles	
Nearest fishery? _____miles Nearest sensitive environment? _____miles	

LIKELIHOOD OF RELEASE

	A *Suspected Release*	B *No Suspected Release*	*References*
1. SUSPECTED RELEASE: If you suspect a release to surface water (see page 11), assign a score of 550. Use only column A for this pathway.	(550) 550		3,5,6,7,11,15,17,18,25,26,59
2. NO SUSPECTED RELEASE: If you do not suspect a release to surface water, use the table below to assign a score based on distance to surface water and flood frequency. Use only column B for this pathway.		(500,400,300 or 100)	
LR =	(550) 550	(500,400,300 or 100)	N/A

Distance to surface water ≤ 2,500 feet	*500*
Distance to surface water > 2,500 feet, and	
Site in annual or 10-year floodplain	*500*
Site in 100-year floodplain	*400*
Site in 500-year floodplain	*300*
Site outside 500-year floodplain	*100*

DRINKING WATER THREAT TARGETS

	A	B	*References*
3. Record the water body type, flow (if applicable), and number of people served by each drinking water intake within the target distance limit. If there is no drinking water intake within the target distance limit, factors 4, 5, and 6 each receive zero scores.			3,53,54
4. PRIMARY TARGET POPULATION: If you suspect any drinking water intake listed above has been exposed to a hazardous substance from the site (see Surface Water Pathway Criteria List, page 11), list the intake name(s) and calculate the factor score based on the total population served. _____, _____, _____ people x 10 =	N/A		N/A
5. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water intakes that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 3. Are any intakes part of a blended system? Yes ___ No ___ If yes, attach a page to show apportionment calculations.	0		3,53,54
6. NEAREST INTAKE: If you have identified a primary target population for the drinking water threat (factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking water intake exists within the target distance limit, assign a score of zero.	(50,20,10,2,1, or 0) 0	(20,10,2,1, or 0)	3,53,54
7. RESOURCES	(5 or 0) 5	(5 or 0)	3
T =	5		

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow (see PA Table 4)	*Population*	*Nearest Intake (choose highest)*	*Population Served by Intakes Within Distance Category*											*Population Value*
			1 to 10	*31 to 100*	*101 to 300*	*301 to 1,000*	*1,001 to 3,000*	*3,001 to 10,000*	*10,001 to 30,000*	*30,001 to 100,000*	*100,001 to 300,000*	*300,001 to 1,000,000*	*Greater than 1,000,000*	
<10 cfs	_____	20	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	_____
10 to 100 cfs	_____	2	1	1	2	5	16	52	163	521	1,633	5,214	16,325	_____
>100 to 1,000 cfs	_____	1	0	0	1	1	2	5	16	52	163	521	1,633	_____
>1,000 to 10,000 cfs	_____	0	0	0	0	0	1	1	2	5	16	52	163	_____
>10,000 cfs or Great Lakes	_____	0	0	0	0	0	0	0	1	1	2	5	16	_____
3-mile Mixing Zone	_____	10	1	3	8	26	82	261	816	2,607	8,162	26,068	81,663	_____
	Nearest Intake =												**Score =**	

PA TABLE 4: SURFACE WATER TYPE / FLOW CHARACTERISTICS WITH DILUTION WEIGHTS FOR SECONDARY SURFACE WATER SENSITIVE ENVIRONMENTS

TYPE OF Surface Water Body			*Dilution Weight*
Water Body Type	*OR*	*FLOW*	
minimal stream		<10 cfs	1
small to moderate stream		10 to 100 cfs	0.1
moderate to large stream		>100 to 1,000 cfs	N/A
large stream to river		1,000 to 10,000 cfs	N/A
large river		>10,000 cfs	N/A
3-mile mixing zone of quiet flowing streams or rivers		10 cfs or greater	N/A
coastal tidal water (harbors, sounds, bays, etc.), ocean, or Great Lakes		N/A	N/A

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SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT SCORESHEET

LIKELIHOOD OF RELEASE		A Suspected Release	B No Suspected Release	References
		[550]	[500,400,300 or 100]	
Enter Surface Water Likelihood of Release score from page 12.	LR =	550		

HUMAN FOOD CHAIN THREAT TARGETS

8. Record the water body type and flow (if applicable) for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Fishery Name	Water Body Type	Flow
Blue John Creek	min to small	9-29 cfs
Long Cane Creek	small to mod.	73-108 cfs
		cfs
		cfs
		cfs

9. PRIMARY FISHERIES: If you suspect any fishery listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the primary fisheries:
Blue John Creek Fishery, _____, _____, _____.

[300] 300 — References: 3,5,6,11,47,58,

10. SECONDARY FISHERIES

A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.

[210] N/A — References: 3,5,6,11,47,58,

B. If you do not suspect a release, assign a Secondary Fisheries score from the table below using the lowest flow at any fishery within the target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

[210,30, or 12] — References: N/A

	A	B
	[300,210, or 0]	[210,30,12 or 0]
T =	300	

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT SCORESHEET

LIKELIHOOD OF RELEASE		A Suspected Release	B No Suspected Release	References
		(550)	(500,400,300 or 100)	
Enter Surface Water Likelihood of Release score from page 12.	LR =	550		

ENVIRONMENTAL THREAT TARGETS

11. Record the water body type and flow (if applicable) for each surface water sensitive environment within the target distance limit (see PA Tables 4 and 5). If there is no sensitive environment within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Environment Name	Water Body Type	Flow
Blue John Creek	min. to small	9-29 cfs
Long Cane Creek	small to mod.	73-108 cfs
		cfs
		cfs
		cfs

12. PRIMARY SENSITIVE ENVIRONMENTS: If you suspect any sensitive environment listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate factor 13. List the primary sensitive environments:

Blue John Creek Wetlands, _____,
Blue John Creek Highscale, Shiner Habitat.

(300) 300

3,5,6,11,47,58,

13. SECONDARY SENSITIVE ENVIRONMENTS: If sensitive environments are present, but none is a primary sensitive environment, evaluate Secondary Sensitive Environments based on flow.

3,5,6,11,47,58,63,68

A. For secondary sensitive environments on surface water bodies with flows of 100 cfs or less, assign scores as follows, and do not evaluate part B of this factor:

Flow	Dilution Weight (PA Table 4)	Environment Type and Value (PA Tables 5 and 6)	Total
cfs	x	=	
cfs	x	=	
cfs	x	=	
cfs	x	=	
cfs	x	=	

Sum = N/A — N/A

B. If all secondary sensitive environments are located on surface water bodies with flows >100 cfs, assign a score of 10.

(10) N/A — (10) N/A

T = 300

PA TABLE 5: SURFACE WATER AND AIR PATHWAY SENSITIVE ENVIRONMENTS VALUES

Sensitive Environment	*Assigned Value*
Critical habitat for Federally designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas Identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federally designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species in a river system Terrestrial areas utilized for breeding by large or dense aggregations of vertebrate animals (air pathway) or semi-aquatic foragers (surface water pathway) National river reach designated as Recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for protection/maintenance of aquatic life under the Clean Water Act	5
Wetlands	See PA Table 6 (Surface Water Pathway) or PA Table 9 (Air Pathway)

PA TABLE 6: SURFACE WATER PATHWAY WETLANDS FRONTAGE VALUES

Total Length of Wetlands	*Assigned Value*
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 18 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	A *Suspected Release*	B *No Suspected Release*
14. A. If you have identified any primary target for surface water (pages 12, 14, or 15), assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	[100 or 32] 100	
B. If you have NOT identified any primary target for surface water, assign the waste characteristics score calculated on page 4.	[100,32, or 18] N/A	[100,32, or 18]
WC =	100	

SURFACE WATER PATHWAY THREAT SCORES

Threat	*Likelihood of Release (LR) Score (from page 12)*	*Targets (T) Score (pages 12, 14, 15)*	*Pathway Waste Characteristics (WC) Score (determined above)*	*Threat Score LR x T x WC / 82,500*
Drinking Water	550	5	100	[subject to a maximum of 100] 3
Human Food Chain	550	300	100	[subject to a maximum of 100] 100
Environmental	550	300	100	[subject to a maximum of 60] 60

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

[subject to a maximum of 100]
100

$$DW = \frac{(550)(5)(100)}{82,500} = 3.\overline{3}$$

$$HFC = \frac{(550)(300)(100)}{82,500} = 200$$

$$E = \frac{(550)(300)(100)}{82,500} = 200$$

SOIL EXPOSURE PATHWAY CRITERIA LIST				
SUSPECTED CONTAMINATION	***RESIDENT POPULATION***			
	Yes	No	Unk	
Surficial contamination can generally be assumed.	☑	☐	☐	Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination?
	☐	☐	☑	Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator?
	☑	☐	☐	Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities?
	☐	☐	☑	Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems?
	☑	☐	☐	Does any neighboring property warrant sampling?
	☐	☐		Other criteria?_____
	☑	☐		**RESIDENT POPULATION IDENTIFIED?**

Summarize the rationale for Resident Population (attach an additional page if necessary):

As part of this PA, the presence of a hazardous substance within the top two (2) feet of any on-site penetrable cover (e.g., landscaped areas, bare soil, sediments, etc.) was not positively confirmed. Regardless, Section 3.5.1 of the PA Guidance (page 111) allows for the conservative assumption that hazardous substances are present on a site in areas not covered by an essentially impenetrable cover; or more than two (2) feet of cover material (Ref. 3).

For the purposes of this PA, approximately twenty-six (26) individuals reside within two hundred (200) feet of suspected contamination that is considered at least partially attributable to the site (Refs. 3, 5, 13 & 56). Further, these twenty-six (26) individuals live within two hundred (200) feet of the on-site surface impoundment and stream sediments associated with the on-site section of Lee Branch (both considered potential sources of hazardous substances).

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics		
Do any people live on or within 200 ft of areas of suspected contamination?	Yes ✓	No ___
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination?	Yes ___	No ✓
Is the facility active? Yes ✓ No ___ If yes, estimate the number of workers: 230		

LIKELIHOOD OF EXPOSURE	*Suspected Contamination*	*References*
1. SUSPECTED CONTAMINATION: Surficial contamination can generally be assumed, and a score of 550 assigned. Assign zero only if the absence of surficial contamination can be confidently demonstrated. LE =	(550 or 0) 550	3
RESIDENT POPULATION THREAT TARGETS		
2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or daycare on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18). 26 people x 10 =	260	3,5,13,15,18,56
3. RESIDENT INDIVIDUAL: If you have identified a resident population (factor 2), assign a score of 50; otherwise, assign a score of 0.	(50 or 0) 50	3,5,13,15,18,56
4. WORKERS: Use the following table to assign a score based on the total number of workers at the facility and nearby facilities with suspected contamination:	(15, 10, 5, or 0) 10	3,5,69
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Use PA Table 7 to assign a value for each terrestrial sensitive environment on an area of suspected contamination: Sum =	0	3,5,64,65
6. RESOURCES	(5 or 0) 5	3
T =	325	
WASTE CHARACTERISTICS		
7. Assign the waste characteristics score calculated on page 4. WC =	(100, 32, or 18) 100	

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
>1,000	15

Terrestrial Sensitive Environment Type	Value

RESIDENT POPULATION THREAT SCORE: $\frac{LE \times T \times WC}{82,500}$ (subject to a maximum of 100) 100

NEARBY POPULATION THREAT SCORE: (4, 2, or 1) 1 — 3,5,56

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat (subject to a maximum of 100) 100

$$\frac{(550)(325)(100)}{82,500} = 216.\overline{6}$$

PA TABLE 7: SOIL EXPOSURE PATHWAY
TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

Terrestrial Sensitive Environment	Assigned Value
Terrestrial critical habitat for Federally designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

AIR PATHWAY CRITERIA LIST

Yes	No	Unk	SUSPECTED RELEASE	PRIMARY TARGETS
☑	☐	☐	Are odors currently reported?	If you suspect a release to air, evaluate all populations and sensitive environments within 1/4 mile (including those onsite) as primary targets.
☐	☑	☐	Has release of a hazardous substance to the air been directly observed?	
☐	☑	☐	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?	
☐	☑	☐	Does analytical or circumstantial evidence suggest a release to the air?	
☐	☐		Other criteria?_____	
☐	☑		**SUSPECTED RELEASE?**	

Summarize the rationale for Suspected Release (attach an additional page if necessary):

Despite a relatively large waste quantity, the smell of an organic vapor on the east side of the site near Lincoln Street at the time of the July 2007 site reconnaissance, the release from the site of fourteen thousand one hundred and ninety-five (14,195) pounds of Toluene emissions in calendar year 2005 and the site being located in an urban residential setting, a release of a hazardous substance from the site to air is not suspected due to the fact that any release is likely to be transient in nature, and that it is considered unlikely that such a transient release could be detected during a scheduled sampling event (Refs. 3, 5, 6, 15, 18 & 44).

AIR PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Air Pathway Criteria List, page 21)?	Yes ___ No ___
Distance to the nearest individual:	_____ ft

LIKELIHOOD OF RELEASE	A *Suspected Release*	B *No Suspected Release*	*References*
1. SUSPECTED RELEASE: If you suspect a release to air (see page 21), assign a score of 550. Use only column A for this pathway.	[550]		N/A
2. NO SUSPECTED RELEASE: If you do not suspect a release to air, assign a score of 500. Use only column B for this pathway.		[500] 500	3,5,6,44
LR =		500	

TARGETS			
3. PRIMARY TARGET POPULATION: Determine the number of people subject to exposure from a suspected release of hazardous substances to the air. _____ people x 10 =			N/A
4. SECONDARY TARGET POPULATION: Determine the number of people not suspected to be exposed to a release to air, and assign the total population score using PA Table 8.		46	3,5,56
5. NEAREST INDIVIDUAL: If you have identified any Primary Target Population for the air pathway, assign a score of 50; otherwise, assign the Nearest Individual score from PA Table 8.	[50,20,7,2,1, or 0]	[20,7,2,1, or 0] 20	3,5,56
6. PRIMARY SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (PA Table 5) and wetland acreage values (PA Table 9) for environments subject to exposure from a suspected release to the air.			
Sum =			N/A
7. SECONDARY SENSITIVE ENVIRONMENTS: Use PA Table 10 to determine the score for secondary sensitive environments.		0.135	3,5,63
8. RESOURCES	[5 or 0]	[5 or 0] 5	3
T =		71.135	

WASTE CHARACTERISTICS			
9. A. If you have identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	[100 or 32]		
B. If you have NOT identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4.	[100,32, or 18]	[100,32, or 18] 100	
WC =		100	

AIR PATHWAY SCORE: $\frac{LR \times T \times WC}{82{,}500}$ [subject to a maximum of 100] 43

$$\frac{(500)(71)(100)}{82{,}500} = 43.\overline{03}$$

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category												Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	
Onsite	230	20	1	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	16
>0 to ¼ mile	454	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	13
>¼ to ½ mile	1214	2	0	0	1	1	3	9	28	88	282	882	2,815	8,815	9
>½ to 1 mile	2921	1	0	0	0	1	1	3	8	26	83	261	834	2,612	3
>1 to 2 miles	8171	0	0	0	0	0	1	1	3	8	27	83	266	833	3
>2 to 3 miles	9413	0	0	0	0	0	1	1	1	4	12	38	120	376	1
>3 to 4 miles	6973	0	0	0	0	0	0	1	1	2	7	23	73	229	1
Nearest Individual =		20												Score =	46

PA TABLE 8: AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
Less than 1 acre	0
1 to 50 acres	25
Greater than 50 to 100 acres	75
Greater than 100 to 150	125
Greater than 150 to 200 acres	175
Greater than 200 to 300 acres	250
Greater than 300 to 400 acres	350
Greater than 400 to 500 acres	450
Greater than 500 acres	500

PA TABLE 10: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY SECONDARY SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from PA Table 5 or 9)	Product
Onsite	0.10	x none	
		x	
0-1/4 mi	0.025	x none	
		x	
		x	
1/4-1/2 mi	0.0054	x Ten (10) acre Wetland (25)	0.135
		x	
		x	
		x	
		Total Environments Score =	0.135

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SITE SCORE CALCULATION

	S	S^2
GROUND WATER PATHWAY SCORE (S_{gw}):	29	841
SURFACE WATER PATHWAY SCORE (S_{sw}):	100	10,000
SOIL EXPOSURE PATHWAY SCORE (S_s):	100	10,000
AIR PATHWAY SCORE (S_a):	43	1,849
SITE SCORE: $\sqrt{\frac{S_{gw}^2+S_{sw}^2+S_s^2+S_a^2}{4}}$		75.32

SUMMARY

	YES	NO
1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water?	☐	☑
A. If yes, identify the well(s).		
B. If yes, how many people are served by the threatened well(s)?		
2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?		
A. Drinking water intake	☐	☑
B. Fishery	☑	☐
C. Sensitive environment (wetland, critical habitat, others)	☑	☐
D. If yes, identify the target(s). Blue John Creek Fishery; Blue John Creek Wetlands; Blue John Creek Highscale Shiner Habitat		
3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility?	☑	☐
If yes, identify the property(ies) and estimate the associated population(s). Ten (10) private residences, twenty-six (26) individuals		
4. Are there public health concerns at this site that are not addressed by PA scoring considerations? If yes, explain:	☐	☑

REFERENCES

1. The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (a.k.a. "Superfund"), (P.L.96-510), as amended by the Superfund Amendments and Reauthorization Act of 1986 (P.L. 99-499).

2. Beckett, Rossell A., Private Citizen, Preliminary Assessment Petition for Hillside Mill Located Near Intersection of Palm Street and Brownwood Avenue, LaGrange, Georgia 30240 **(Appendix A)**.

3. *Guidance for Performing Preliminary Assessments Under CERCLA*, United States Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC 20460, EPA/540/G-91/013, September 1991.

4. Federal Register, Friday, December 14, 1990, Part II, Environmental Protection Agency, 40 CFR Part 300, Hazardous Ranking System; Final Rule.

5. Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program, August 10, 2007 Trip Report Documenting July 2007 On-Site Reconnaissance **(Appendix B)**.

6. United States Department of the Interior, Geological Survey, 7.5 Minute Series Topographic Maps (1:24,000 Scale): 1964 Canyonville Quadrangle (Georgia), (Photo-revised 1973), 1964 LaGrange Quadrangle (Georgia), (Photo-revised 1982), 1964 Hilyer, Quadrangle (Georgia), 1964 Mountainville, Quadrangle (Georgia), (Photo-revised 1982), **(Figure 3)**.

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14. Troup County Tax Assessor's Office, Property Record Card for Parcel Number 060-2A-018-001, Printed July 19, 2007 (**Appendix D**).

15. Sanborn Fire Insurance Maps for Georgia Towns and Cities (1884-1922), 2005 Digital Library of Georgia (**Appendix E**).

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17. Moe, Mark T., Senior Environmental Chemist, Milliken and Company, Valway/Hillside Coating, August 15, 2007 Correspondence to Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Response to Request for Follow-Up Information and Associated Correspondence Related to the April 18, 2002 Release of an Acrylic Emulsion Containing Carbon Black (**Appendix F**).

18. Bennett, Kent, Plant Manager, Milliken & Company – Hillside Plant, July 27, 2007 Memorandum to Andrew Taft, Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Volume Capacity of Certain Tanks Located at the Hillside/Valway Plants (**Appendix B, Attachment C**).

19. Couch, Carol A., Director, Georgia Department of Natural Resources, Environmental Protection Division, Permit Number 2281-285-0040-V-02-0, Part 70 Operating Permit, Issued to Milliken and Company – Hillside Plant, Effective Date: June 1, 2007 (**Appendix G**).

20. Reheis, Harold F., Director, Georgia Department of Natural Resources, Environmental Protection Division, Permit Number 2262-285-0045-V-01-0, Part 70 Operating Permit, Issued to Milliken and Company – Valway Plant, Effected Date: March 26, 2001 (**Appendix H**).

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22. City of LaGrange, GA, Industrial User, Waste Water Discharge Permit No. 101 Issued to Milliken & Company – Hillside/Valway Plant, Effective April 8, 2006 thru April 7, 2009 **(Appendix B, Attachment B)**.

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24. Zurow, Drew, Unit Coordinator, Georgia Department of Natural Resources, Environmental Protection Division, Watershed Protection Branch, Non-Point Source Program, November 14, 2007 E-Mail to Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Multi-Coverage of General Industrial Storm Permit **(Appendix K)**.

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26. Digital Library of Georgia, Troup County Digital Archives Project Photograph Database: 1) Benjamin Franklin Inn, LaGrange, Georgia, 1910, 2) Front View, Hillside Cotton Mills, LaGrange, Georgia, 1910, 3) Hillside and Valway Plants 1930 – 1950, 4) Hillside Cotton Mills and Village, LaGrange, Georgia, 1910 and 5) Rear View of Hillside Cotton Mills, LaGrange, Georgia, 1910 **(Appendix M)**.

27. Digital Library of Georgia, Vanishing Georgia: Citation, Image: trp176, Photograph of Hillside Cotton Mills Plant, LaGrange, Troup County, Georgia, 1933 **(Appendix N)**.

28. Talley, Joe, Former Employee of Milliken & Company - Hillside Mill, November 1, 2007 Telephone Communication with Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Cementing of On-Site Floor Drains and Manholes, Temporary Drainage of Impoundment, Debris Located Within the Impoundment and Bad Taste of Fish Caught from Impoundment **(Appendix O)**.

29. Cavender, Alice, Current and Past Resident of LaGrange, Georgia, November 1, 2007 Telephone Communication with Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Historic Releases to Creek from the Hillside Mill **(Appendix P)**.

30. Moe, Mark T., Senior Environmental Chemist, Milliken and Company, Valway/Hillside Coating, July 28, 2007 Correspondence to Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Information and Associated Correspondence Related to the April 18, 2002 Release of an Acrylic Emulsion Containing Carbon Black (**Appendix Q**).

31. Comprehensive Compliance Monitoring and Enforcement Report for Milliken Hillside Coating (GAD 981 275 993), 1300 Brownwood Avenue, LaGrange, Georgia 30240, Report Run on November 15, 2007 (**Appendix R**).

32. Weglewski, Linda, Environmental Specialist, Georgia Department of Natural Resource, Environmental Protection Division, Hazardous Waste Management Branch, Generator Compliance Program, Generator Inspection Report Documenting Results of March 15, 2006 Compliance Evaluation Inspection (**Appendix S**).

33. Dempsey, Jack N., Unit Coordinator, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Generator Compliance Program, May 25, 2007 Notice of Violation to Moe, Mark, Senior Environmental Chemist, Milliken Hillside Coating RE: Violations Determined Pursuant to the March 13, 2006 Compliance Evaluation Inspection (**Appendix T**).

34. Moe, Mark T., Senior Environmental Chemist, Valway/Hillside Coating, Milliken & Company, June 21, 2006 Correspondence to Weglewski, Linda, Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Generator Compliance Program RE: Response to May 25, 2007 Notice of Violation (**Appendix U**).

35. Weglewski, Linda, Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Generator Compliance Program, July 12, 2006 Correspondence to Moe, Mark, Senior Environmental Chemist, Milliken Hillside Coating RE: Compliance Status (**Appendix V**).

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43. Resource Conservation and Recovery Act (RCRA) Info, Site Identification form for Clean Harbors Environmental Services (ARD069748192), 309 American Circle, El Dorado, Arkansas 71730.

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59. Bennett, Kent, Plant Manager, Milliken & Company – Hillside Plant, November 8, 2007 Telephone Communication, with Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Current Flow Conditions of On-Site Stream and Historic Flow Conditions of Long Cane Creek and Blue John Creek (**Appendix HH**).

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69. Bennett, Kent, Plant Manager, Milliken & Company – Hillside Plant, July 27, 2007 Telephone Communication, with Taft, Andrew S., Environmental Specialist, Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch, Facilities Compliance Program RE: Number of On-Site Workers **(Appendix MM)**.