WATERS EDGE ENVIRONMENTAL, LLC
1434 CHESTER ROAD • RALEIGH, NC27608 • PHONE 919.219.5820

Part B Permit Application Final
Former Porcelanite Facility
20 Victor Street
Lexington, North Carolina 27292
EPA ID #NCD 986 181 451
February 1, 2019

WATERS EDGE ENVIRONMENTAL, LLC
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February 1, 2019

Ms. Mary Siedlecki
North Carolina Department of Environmental
Quality
Division of Waste Management
217 West Jones Street
1646 Mail Service Center
Raleigh, NC 27699-1646

Reference: **Part B Permit Application Final**
(Former) Porcelanite Facility
20 Victor Street
Lexington, North Carolina 27292
EPA ID Number: NCD 986 181 451

Dear Ms. Siedlecki:

On behalf of Mannington Mills, Inc. (formerly referred to as Mannington Mills of Delaware, Inc. or Maneto, Inc. and referred to in this submittal as "Mannington"), and without admission of liability, enclosed please find our February 1, 2019 Part B Permit Application Final including all the revisions that were completed in response to the two NODs. Here is what we believe is a "final," or renewed, Part B submittal that incorporates changes described in both our written NOD 1 (12/29/17) & NOD 2 (3/9/18) replies. It is unsigned and like the original Part B submission, this set of documents was prepared and financed by or on behalf of Mannington. This is not a Condumex work product as they continue to be unwilling to participate in the process. For ease of your review, we have submitted one hard copy and one electronic copy that incorporates the recommendations made in the NOD #1 and NOD #2. We hope this method is in keeping with your understanding of the deliverables. There are also several of the figures which are larger scale maps that were compressed for the electronic copy submission.

We look forward to discussing the enclosed materials with you to address any questions you may have.

Sincerely,
WATERS EDGE ENVIRONMENTAL, LLC

Phillip Rahn

Phillip L. Rahn, PG
President

cc: Mr. Dave Kitts and Mr. Vic Giudice-Mannington
Ms. Pam Goodwin Esq.- Saul et al.

19-006

Part A- Part A Application

OMB# 2050-0024; Expires 01/31/2017

SEND COMPLETED FORM TO: The Appropriate State or Regional Office.	United States Environmental Protection Agency **RCRA SUBTITLE C SITE IDENTIFICATION FORM**
1. Reason for Submittal MARK ALL BOX(ES) THAT APPLY	**Reason for Submittal:** ☐ To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location) ▣ To provide a Subsequent Notification (to update site identification information for this location) ▣ 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 (If marked, see sub-bullet below) ☐ Site was a TSD facility and/or generator of >1,000 kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)
2. Site EPA ID Number	**EPA ID Number** N C D 9 8 6 1 8 1 4 5 1
3. Site Name	**Name:** Porcelanite, Inc.
4. Site Location Information	**Street Address:** 20 Victor Street **City, Town, or Village:** Lexington **County:** Davidson **State:** North Carolina **Country:** USA **Zip Code:** 27292
5. Site Land Type	☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other
6. NAICS Code(s) for the Site (at least 5-digit codes)	**A.** **C.** **B.** **D.**
7. Site Mailing Address	**Street or P.O. Box:** Condumex Inc. 900 Avenue South **City, Town, or Village:** Grand Prairie **State:** Texas **Country:** USA **Zip Code:** 75050
8. Site Contact Person	**First Name:** David **MI:** E. **Last:** Kitts **Title:** VP - Environment **Street or P.O. Box:** Mannington Mills, Inc. PO Box 30, 75 Mannington Mills Rd. **City, Town or Village:** Salem **State:** New Jersey **Country:** USA **Zip Code:** 08079 **Email:** dave_kitts@mannington.com **Phone:** 856-339-5871 **Ext.:** N/A **Fax:** 856-339-5898
9. Legal Owner and Operator of the Site	**A. Name of Site's Legal Owner:** Condumex, Inc. **Date Became Owner:** 11/16/2009 **Owner Type:** ☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other **Street or P.O. Box:** 900 Avenue South **City, Town, or Village:** Grand Prairie **Phone:** 972-352-2300 **State:** Texas **Country:** USA **Zip Code:** 75050-1133 **B. Name of Site's Operator:** Mannington Mills, Inc. **Date Became Operator:** 1984 **Operator Type:** ☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

10. Type of Regulated Waste Activity (at your site)
Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.

Y ☐ N ☑ **1. Generator of Hazardous Waste**
If "Yes," mark only one of the following – a, b, or c.

☐ a. LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs/mo.) or more of hazardous waste; **or** Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs/mo) of acute hazardous waste; **or** Generates, in any calendar month, **or** accumulates at any time, more than 100 kg/mo (220 lbs/mo) of acute hazardous spill cleanup material.

☐ b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs/mo) of non-acute hazardous waste.

☐ c. CESQG: Less than 100 kg/mo (220 lbs/mo) of non-acute hazardous waste.

If "Yes" above, indicate other generator activities in 2-10.

Y ☐ N ☑ **2. Short-Term Generator** (generate from a short-term or one-time event and not from on-going processes). If "Yes," provide an explanation in the Comments section.

Y ☐ N ☑ **3. United States Importer of Hazardous Waste**

Y ☐ N ☑ **4. Mixed Waste (hazardous and radioactive) Generator**

Y ☐ N ☑ **5. Transporter of Hazardous Waste**
If "Yes," mark all that apply.

☐ a. Transporter

☐ b. Transfer Facility (at your site)

Y ☑ N ☐ **6. Treater, Storer, or Disposer of Hazardous Waste** Note: A hazardous waste Part B permit is required for these activities.

Y ☐ N ☑ **7. Recycler of Hazardous Waste**

Y ☐ N ☑ **8. Exempt Boiler and/or Industrial Furnace**
If "Yes," mark all that apply.

☐ a. Small Quantity On-site Burner Exemption

☐ b. Smelting, Melting, and Refining Furnace Exemption

Y ☐ N ☑ **9. Underground Injection Control**

Y ☐ N ☑ **10. Receives Hazardous Waste from Off-site**

B. Universal Waste Activities; Complete all parts 1-2.

Y ☐ N ☑ **1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If "Yes," mark all that apply.**

a. Batteries ☐

b. Pesticides ☐

c. Mercury containing equipment ☐

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; Complete all parts 1-4.

Y ☐ N ☑ **1. Used Oil Transporter**
If "Yes," mark all that apply.

☐ a. Transporter

☐ b. Transfer Facility (at your site)

Y ☐ N ☑ **2. Used Oil Processor and/or Re-refiner**
If "Yes," mark all that apply.

☐ a. Processor

☐ b. Re-refiner

Y ☐ N ☑ **3. Off-Specification Used Oil Burner**

Y ☐ N ☑ **4. Used Oil Fuel Marketer**
If "Yes," mark all that apply.

☐ 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

D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

❖ You can ONLY Opt into Subpart K if:

- you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
- you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

Y ☐ N ☑ 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories **See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:**

☐ **a. College or University**

☐ **b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university**

☐ **c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university**

Y ☐ N ☑ 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

11. Description of Hazardous Waste

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.

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.

12. Notification of Hazardous Secondary Material (HSM) Activity

Y ☐ N ☑ Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 261.2(a)(2)(ii), 40 CFR 261.4(a)(23), (24), or (25)?

If "Yes," you must fill out the Addendum to the Site Identification Form: Notification for Managing Hazardous Secondary Material.

13. Comments

1) This is an inactive facility that ceased use of lead in 1990. Facility ceased manufacturing operations in 1999 and continued for some period as a distribution warehouse.

2). The Condumex Caretaker is Mr. George Smith (336-752-2945).

3) Regarding 9.B, Mannington began operations in 1984, sold the facility to Porcelanite in 1994 & ceased all operations in 1995. Porcelanite continued manufacturing activities until 1999.

4) We have identified four non-potable water supply wells in Figure A-1 (within 0.25 miles of P/L). In 2012, these wells were sampled for boron and were either BDL or below the boron North Carolina 2L Groundwater Standard of 0.7 mg/L.

5) Per 40 CFR 270.13, we are specifying that no intake or discharge structures and no wells which inject fluids underground exist at the facility. The Facility is also not located on Indian lands. Finally, there are no springs within 0.25 miles of the Facility.

6) We have included current photodocumentation of SWMUs and AOCs in Appendix A-1.

7) We have included all metes and bounds of the parcels found in the Warranty Deed found on the Davidson County GIS website and a 1993 Survey Plat which is included in Appendix A-2.

8) Mannington retains RCRA operator obligations for closed SWMU-2 & closed SWMU-3. Also, SWMU-7; AOC-1;& AOC-2 identified in 2005 after the 1994 sale. The other eight SWMU's and one AOC, also identified in 2005, were continually operated by Porcelanite and are areas Condumex retains as owner obligations.

14. 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 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 possibility of fines and imprisonment for knowing violations. For the RCRA Hazardous Waste Part A Permit Application, all owner(s) and operator(s) must sign (see 40 CFR 270.10(b) and 270.11).

Signature of legal owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm/dd/yyyy)
	Alejandro Sanchez - Pres. Condumex	
	David Kitts - VP Mannington	

ADDENDUM TO THE SITE IDENTIFICATION FORM: NOTIFICATION OF HAZARDOUS SECONDARY MATERIAL ACTIVITY

ONLY fill out this form if:

- You are located in a State that allows you to manage excluded hazardous secondary material (HSM) under 40 CFR 261.2(a)(2)(ii), 261.4(a)(23), (24), or (25) (or state equivalent). See http://www.epa.gov/epawaste/hazard/dsw/statespf.htm for a list of eligible states; **AND**
- You are or will be managing excluded HSM in compliance with 40 CFR 261.2(a)(2)(ii), 261.4(a)(23), (24), or (25) (or state equivalent) or you have stopped managing excluded HSM in compliance with the exclusion(s) and do not expect to manage any amount of excluded HSM under the exclusion(s) for at least one year. Do not include any information regarding your hazardous waste activities in this section.

1. Indicate reason for notification. Include dates where requested.

☐ Facility will begin managing excluded HSM as of _____________ (mm/dd/yyyy).

☐ Facility is still managing excluded HSM/re-notifying as required by March 1 of each even-numbered year.

☐ Facility has stopped managing excluded HSM as of ____________ (mm/dd/yyyy) and is notifying as required.

2. Description of excluded HSM activity. Please list the appropriate codes and quantities in **short tons** to describe your excluded HSM activity ONLY (do not include any information regarding your hazardous wastes). Use additional pages if more space is needed.

a. Facility code (answer using codes listed in the Code List section of the instructions)	**b. Waste code(s) for HSM**	**c. Estimated short tons of excluded HSM to be managed annually**	**d. Actual short tons of excluded HSM that was managed during the most recent odd-numbered year**	**e. Land-based unit code** (answer using codes listed in the Code List section of the instructions)

3. Facility has financial assurance pursuant to 40 CFR 261.4(a)(24)(vi). (Financial assurance is required for reclaimers and intermediate facilities managing excluded HSM under 40 CFR 261.4(a)(24) and (25))

Y ☐ N ☐ Does this facility have financial assurance pursuant to 40 CFR 261.4(a)(24)(vi)?

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EPA ID Number | N | C | D | 9 | 8 | 6 | 1 | 8 | 1 | 4 | 5 | 1 | OMB#: 2050-0024; Expires 01/31/2017

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT INFORMATION FORM

1. Facility Permit Contact	**First Name:** David	**MI:** E.	**Last Name:** Kitts
	Contact Title: VP-Environment-Mannington Mills, Inc.		
	Phone: 856-339-5871	**Ext.:** N/A	**Email:** dave_kitts@mannington.com
2. Facility Permit Contact Mailing Address	**Street or P.O. Box:** Condumex, Inc. - 900 Avenue South		
	City, Town, or Village: Grand Prairie		
	State: Texas		
	Country: USA	**Zip Code:** 75050-1133	
3. Operator Mailing Address and Telephone Number	**Street or P.O. Box:** PO Box 30, 75 Mannington Mills Rd.		
	City, Town, or Village: Salem		
	State: New Jersey	**Phone:** 856-339-5871	
	Country: USA	**Zip Code:** 08079	
4. Facility Existence Date	**Facility Existence Date (mm/dd/yyyy):** mid-50's		

5. Other Environmental Permits

A. Facility Type *(Enter code)*	**B. Permit Number**													**C. Description**
R	N	C	D	9	8	6	1	8	1	4	5			RCRA Part A Permit
N	N	C	0	0	0	6	4	5	9					Former Wastewater Discharge to Rats Springs Branch
P	5	4	0	8	R	5								Former Air Permit
E														POTW

6. Nature of Business: Tile manufacturing operations ceased operations in 1999.

7. Process Codes and Design Capacities – Enter information in the Section on Form Page 3

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in Item 8.

B. PROCESS DESIGN CAPACITY – For each code entered in Item 7.A; enter the capacity of the process.

1. **AMOUNT – Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.**
2. **UNIT OF MEASURE – For each amount entered in Item 7.B(1), enter the code in Item 7.B(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.**

C. PROCESS TOTAL NUMBER OF UNITS – Enter the total number of units for each corresponding process code.

Process Code	Process	Appropriate Unit of Measure for Process Design Capacity
	Disposal	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectares-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
	Storage	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
	Treatment	
T01	Tank Treatment	Gallons Per Day; Liters Per Day
T02	Surface Impoundment	Gallons Per Day; Liters Per Day
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Metric Tons Per Hour; or Million BTU Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Short Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; or Million BTU Per Hour

Process Code	Process	Appropriate Unit of Measure for Process Design Capacity
	Treatment (Continued)	**(for T81 – T94)**
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liters Per Hour; Kilograms Per Hour; or Million BTU Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, or Refining Furnace	
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR 260.10	
T94	Containment Building Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTU Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million BTU Per Hour
	Miscellaneous (Subpart X)	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; or Million BTU Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code
Gallons	**G**	**Short Tons Per Hour**	**D**	**Cubic Yards**	**Y**
Gallons Per Hour	**E**	**Short Tons Per Day**	**N**	**Cubic Meters**	**C**
Gallons Per Day	**U**	**Metric Tons Per Hour**	**W**	**Acres**	**B**
Liters	**L**	**Metric Tons Per Day**	**S**	**Acre-feet**	**A**
Liters Per Hour	**H**	**Pounds Per Hour**	**J**	**Hectares**	**Q**
Liters Per Day	**V**	**Kilograms Per Hour**	**X**	**Hectare-meter**	**F**
		Million BTU Per Hour	**X**	**BTU Per Hour**	**I**

7. Process Codes and Design Capacities (Continued)

EXAMPLE FOR COMPLETING Item 7 (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	B. PROCESS DESIGN CAPACITY (2) Unit of Measure	C. Process Total Number of Units	For Official Use Only					
X	**1**	**S**	**0**	**2**	**533.788**	**G**	**001**						
	1	D	8	0	0	Y	001						
	2	D	8	0	0	Y	001						
	3												
	4												
	5												
	6												
	7												
	8												
	9												
1	**0**												
1	**1**												
1	**2**												
1	**3**												

Note: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the line sequentially, taking into account any lines that will be used for "other" process (i.e., D99, S99, T04, and X99) in Item 8.

8. Other Processes (Follow instructions from Item 7 for D99, S99, T04, and X99 process codes)

Line Number (Enter #s in sequence with Item 7)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	B. PROCESS DESIGN CAPACITY (2) Unit of Measure	C. Process Total Number of Units	For Official Use Only					
X	**2**	**T**	**0**	**4**	**100.00**	**U**	**001**						

9. Description of Hazardous Wastes - Enter Information in the Sections on Form Page 5

A. EPA HAZARDOUS WASTE NUMBER – Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY – For each listed waste entered in Item 9.A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in Item 9.A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE – For each quantity entered in Item 9.B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all listed hazardous wastes.

For non-listed waste: For each characteristic or toxic contaminant entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. **Enter the first two as described above.**
2. **Enter "000" in the extreme right box of Item 9.D(1).**
3. **Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 9.E.**

2. PROCESS DESCRIPTION: If code is not listed for a process that will be used, describe the process in Item 9.D(2) or in Item 9.E(2).

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. **Select one of the EPA Hazardous Waste Numbers and enter it in Item 9.A. On the same line complete Items 9.B, 9.C, and 9.D by estimating the total annual quantity of the waste and describing all the processes to be used to store, treat, and/or dispose of the waste.**
2. **In Item 9.A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In Item 9.D.2 on that line enter "included with above" and make no other entries on that line.**
3. **Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.**

EXAMPLE FOR COMPLETING Item 9 (shown in line numbers X-1, X-2, X-3, and X-4 below) – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter Code)									D. PROCESSES (2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
X	1	K	0	5	4	900	P	T	0	3	D	8	0				
X	2	D	0	0	2	400	P	T	0	3	D	8	0				
X	3	D	0	0	1	100	P	T	0	3	D	8	0				
X	4	D	0	0	2												Included With Above

9. Description of Hazardous Wastes ***(Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)***

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES									
								(1) PROCESS CODES (Enter Code)									(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
1	0																
1	1																
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1	5																
1	6																
1	7																
1	8																
1	9																
2	0																
2	1																
2	2																
2	3																
2	4																
2	5																
2	6																
2	7																
2	8																
2	9																
3	0																
3	1																
3	2																
3	3																
3	4																
3	5																
3	6																

9. Description of Hazardous Wastes *(Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)*

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES									
								(1) PROCESS CODES (Enter Code)									(2) PROCESS DESCRIPTION (If code is not entered in 9.D.1)

10. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

11. Facility Drawing

All existing facilities must include a scale drawing of the facility (see instructions for more detail).

12. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas (see instructions for more detail).

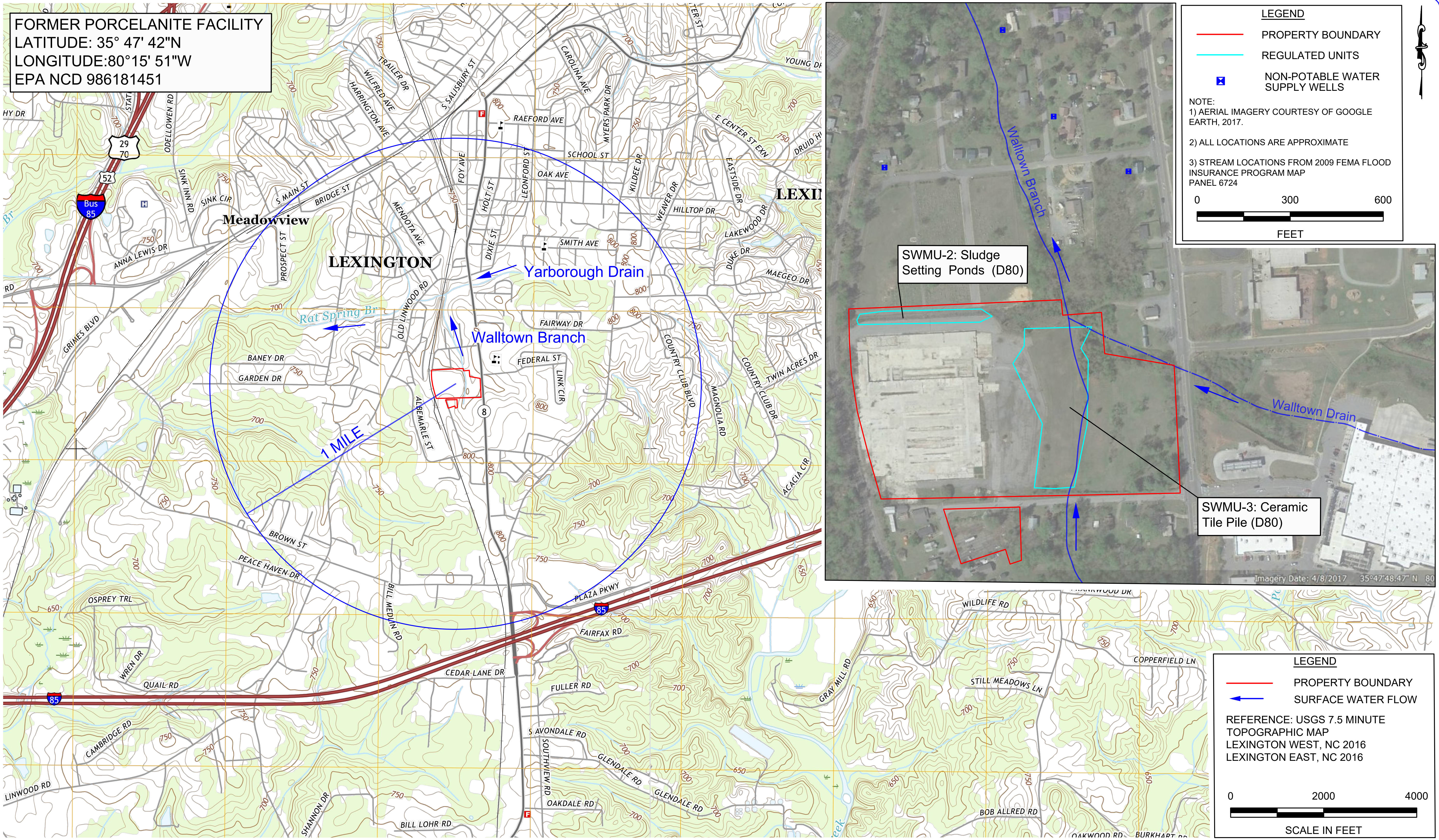
13. Comments

1).Regarding 3. Operator; Mannington began operations in 1984, sold the facility to Porcelanite in 1994, and ceased all operations at the facility in 1995. Porcelanite continued manufacturing operations until 1999. Mannington retains RCRA operator obligations for closed SWMU-2 (settling ponds) and closed SWMU-3 (tile pile). Additionally, Mannington retains obligations for SWMU-7 (Walltown Branch); AOC-1 (tile pile discharge area); and AOC-2 (broken tile roadway) which were identified in the 2005 RFA after the 1994 sale. The other eight SWMU's and one AOC were operated by Porcelanite, identified in the 2005 RFA, and are areas of responsibility for Porcelanite.

2).We have depicted four water supply wells in Figure A-1. These are non-potable supply wells that were sampled for boron in 2012 and were either BDL or below the North Carolina 2L Groundwater Standard at 0.7 mg/L.

3). Regarding photographs, we have provided photographs of all SWMUs in Appendix A-1. The building was demolished in 2014; therefore, there are no other structures including any existing storage, treatment, and disposal areas or sites of future storage, treatment, or disposal areas.

Part A Figures



PROJECT NUMBER 2017.0008.WATR
DRAFTER KTS
CHECKED BY PR
PROJECT MANAGER PR
DATE 11/22/2017
FILE Porcelanite Part A.dwg

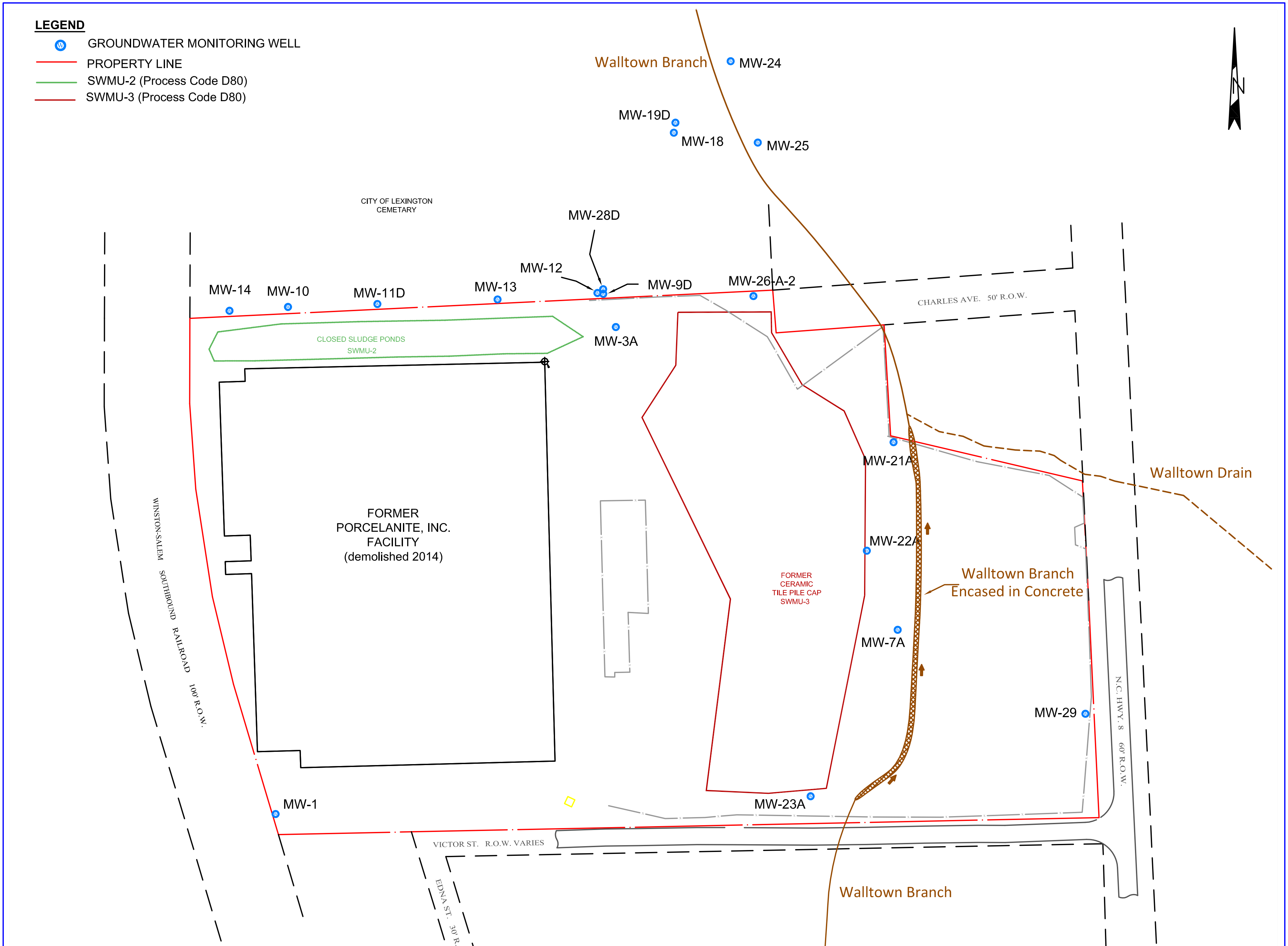
WATERS EDGE ENVIRONMENTAL, LLC

FORMER PORCELANITE FACILITY
LEXINGTON, NORTH CAROLINA

SITE TOPOGRAPHIC MAP

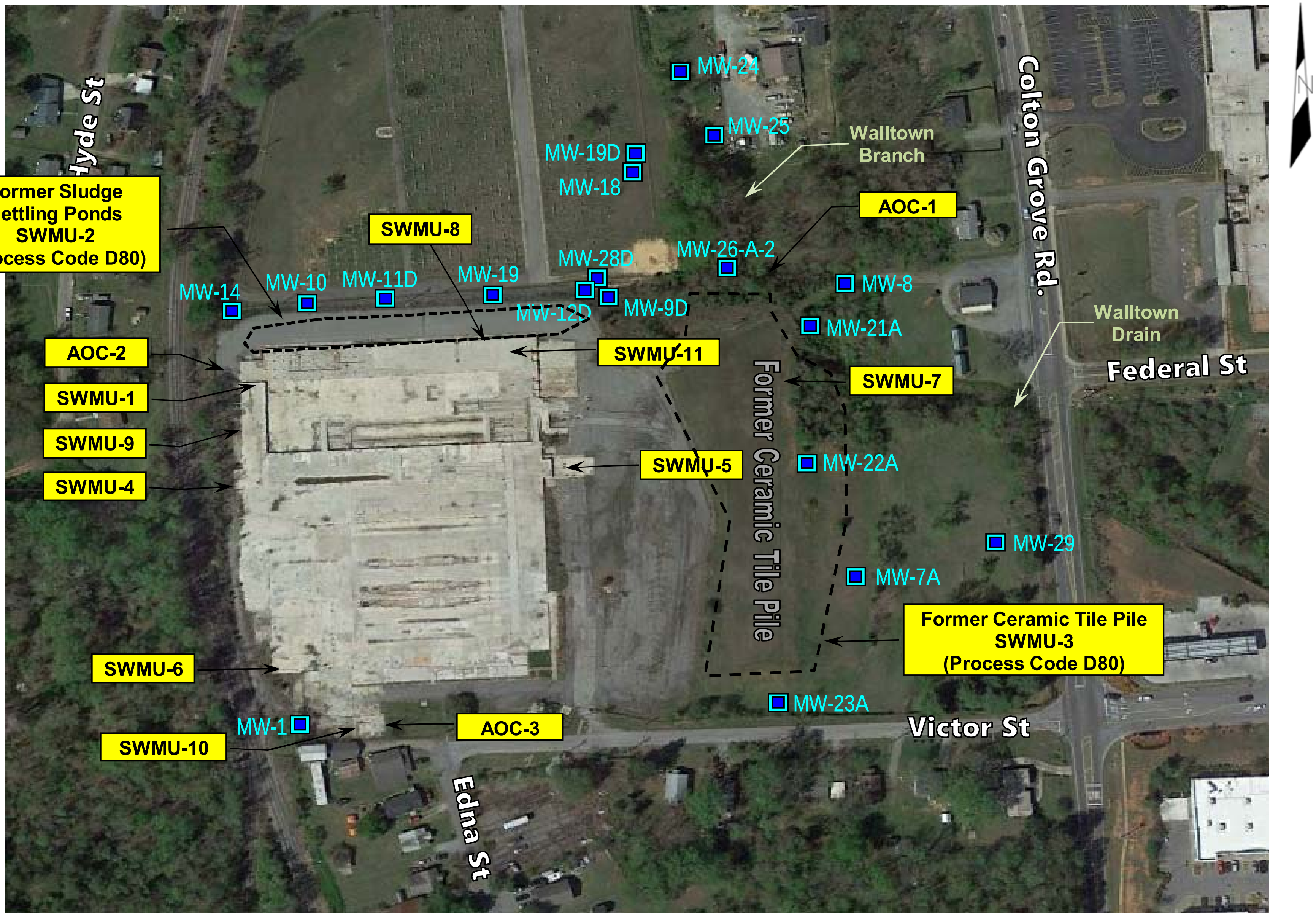
FIGURE: A-1

J:\Project Files\Watersedge\Porcelanite Part A\Current Drawings\Porcelanite Part A.dwg



WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
plr	Part A Fig A-2		12.20.2016	Facility Drawing
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	2.23.2017	A-2	1" = 150'	Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC

Drawing	Image Source	Layers	Revision Date	Title	
Part A Fig A-3	Google Earth		12.22.2017		Facility Aerial Photograph
Job No.	Image Date	Figure	Scale	Project	Former Porcelanite Facility
R1-21	4.8.2017	A-3	1" ~ 200'		Lexington, North Carolina

Part A Appendices

Appendix A-1
SWMU
Photodocumentaion

 **SWMU-1 Area Viewing North**	 **SWMU-2 and SWMU-8 Area Viewing West**
 **SWMU-3 Viewing East**	 **SWMU-4 Area Viewing Northwest**
 **SWMU-5 Area Viewing West with Empty 55-gallon Drums used for Groundwater Monitoring**	 **SWMU-6 Viewing Northwest**

SWMU-7 Viewing Northeast

SWMU-9 Area Viewing North

SWMU-10 and AOC-3 Area Viewing West

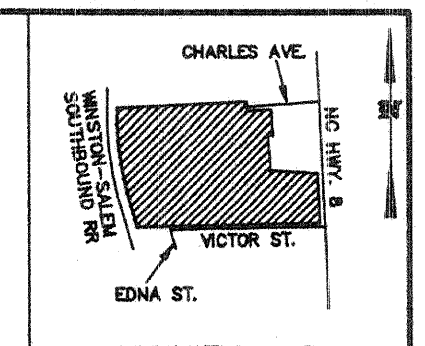
SWMU-11 Area Viewing West

AOC-1 Viewing North

AOC-2 Viewing Northwest

Appendix A-2
1993 Survey Plat and Condumex Warranty Deed

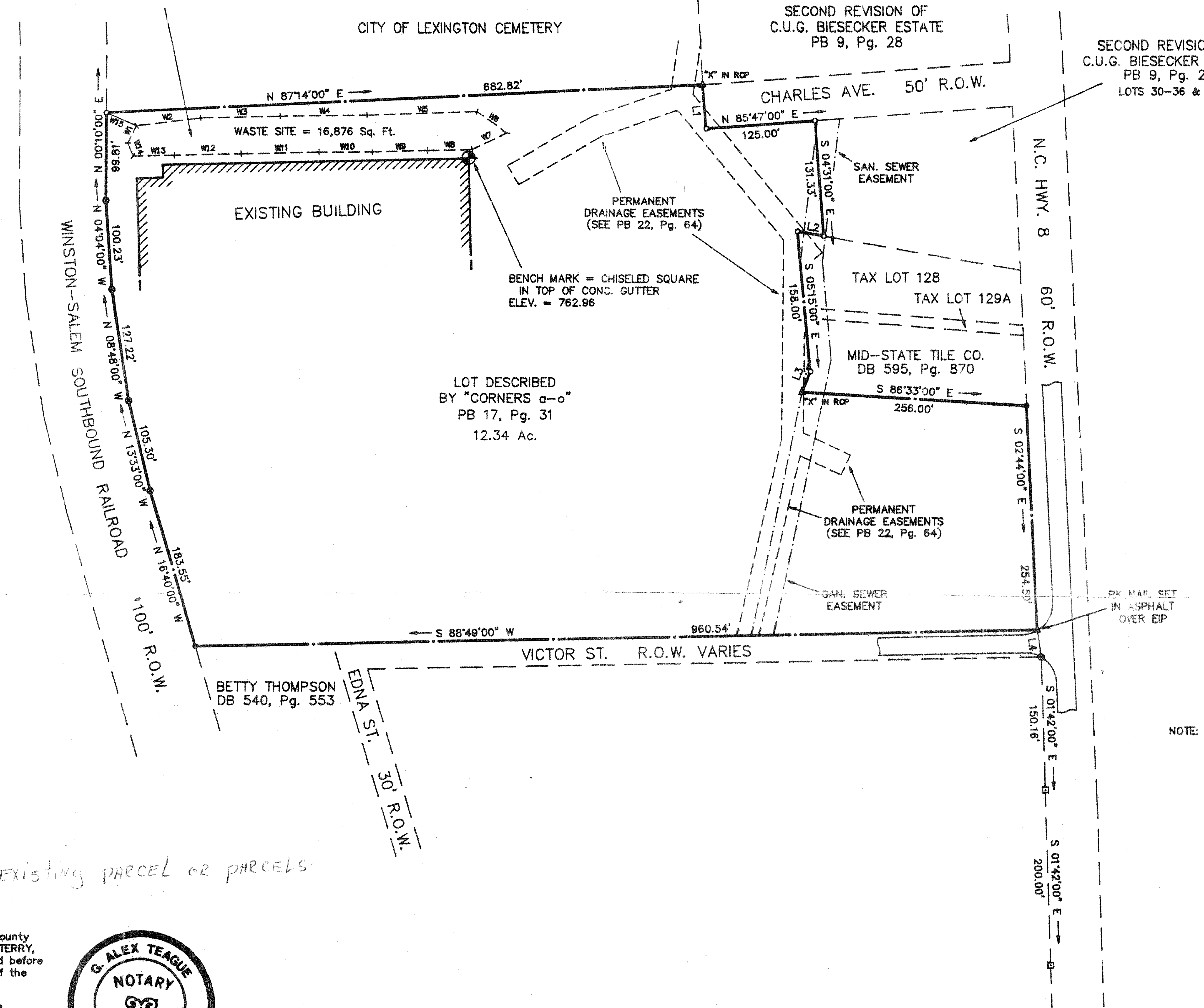
FILED
JUN 29 AM 10:40



VICINITY MAP
1"=1000'±

NOTE:
THIS LAND HAS BEEN USED TO MANAGE HAZARDOUS WASTES, SPECIFICALLY D008.
ITS USE IS RESTRICTED UNDER 40 C.F.R., SUBPART G, REGULATIONS.
THE VOLUME OF STABILIZED HAZARDOUS WASTE IS 11,135 CUBIC YARDS LOCATED IN THE NORTHWEST CORNER AS SHOWN.

N
PB 17, Pg. 31



LEG TABLE

LINE	DIRECTION	DISTANCE
L1	S 04°38'00" E	50.00'
L2	N 80°22'00" W	30.35'
L3	S 22°07'00" W	25.00'
L4	S 08°25'00" E	30.90'

WASTE SITE LEG TABLE

LINE	DIRECTION	DISTANCE
W1	S 27°27'17" W	22.00'
W2	S 82°59'02" W	74.40'
W3	S 88°28'47" W	90.61'
W4	S 89°14'38" W	99.03'
W5	S 87°59'53" W	127.24'
W6	N 54°15'19" W	42.15'
W7	N 65°11'05" E	43.89'
W8	N 88°37'06" E	51.56'
W9	N 88°31'29" E	63.60'
W10	N 89°34'47" E	60.58'
W11	N 88°50'57" E	88.99'
W12	N 88°28'14" E	77.25'
W13	N 88°41'02" E	47.35'
W14	S 22°01'18" E	15.68'
W15	S 66°09'29" E	37.57'

NOTE: NO KNOWN GRID TIE AVAILABLE WITHIN 2000'.

THE SURVEY IS OF AN EXISTING PARCEL OR PARCELS

NORTH CAROLINA RANDOLPH COUNTY

I, G. ALEX TEAGUE, a Notary Public of the County and State aforesaid, certify that LARRY MARK TERRY, a Registered Land Surveyor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

Witness my hand and offical stamp or seal this 26th day of MAY 19 93.

G. Alex Teague
G. ALEX TEAGUE, Notary Public
My commission expires December 21, 1997.

G. ALEX TEAGUE NOTARY PUBLIC GUILFORD, NC

I, LARRY MARK TERRY, RLS, certify that this plat was drawn under my supervision from an Actual Field Survey performed under my supervision; that the boundaries not surveyed are clearly indicated by broken lines plotted from Deed or Plat information as shown on this plat; that the ratio of precision as calculated is 1:10,000+; and that this plat was prepared in accordance with N.C.G.S. 47-30 as amended.

I also certify that this is an Existing Parcel of land.

Witness my hand and seal this 26 day of May, 1993.

Larry M. Terry
LARRY MARK TERRY, RLS / L-3096

NORTH CAROLINA REGISTERED LAND SURVEYOR SEAL L-3096 LARRY MARK TERRY

SURVEY FOR
MANNINGTON CERAMIC TILE COMPANY
N.C. HWY. 8
LEXINGTON
DAVIDSON COUNTY, N.C.
FEBRUARY 9, 1993

100 0 100 200 300
SCALE: 1" = 100'

MARK TERRY & Associates
REGISTERED LAND SURVEYOR
10705 N. Main St., Suite 300, Archdale, NC 27263
Phone: (919) 431-2114 FAX: (919) 431-2136

DRAWN BY: GAT
SURVEYED BY: LMT
JOB NO.: 3049-40-77

FILED
BOOK 17 PAGE 31

Plat Book 17 Page 31

NORTH CAROLINA
DAVIDSON COUNTY

I, J.S. McNEILL, REGISTERED SURVEYOR, DO HEREBY CERTIFY THAT THIS MAP WAS DRAWN FROM AN ACTUAL SURVEY MADE BY ME, FROM DEED DESCRIPTION AS SHOWN HEREON: THAT THE ERROR OF CLOSURE AS CALCULATED BY D.M.D WAS 1-10,000± THAT THIS MAP WAS DRAWN IN ACCORDANCE WITH G.S. 4730 AS AMENDED

J.S. McNeill
REGISTERED SURVEYOR

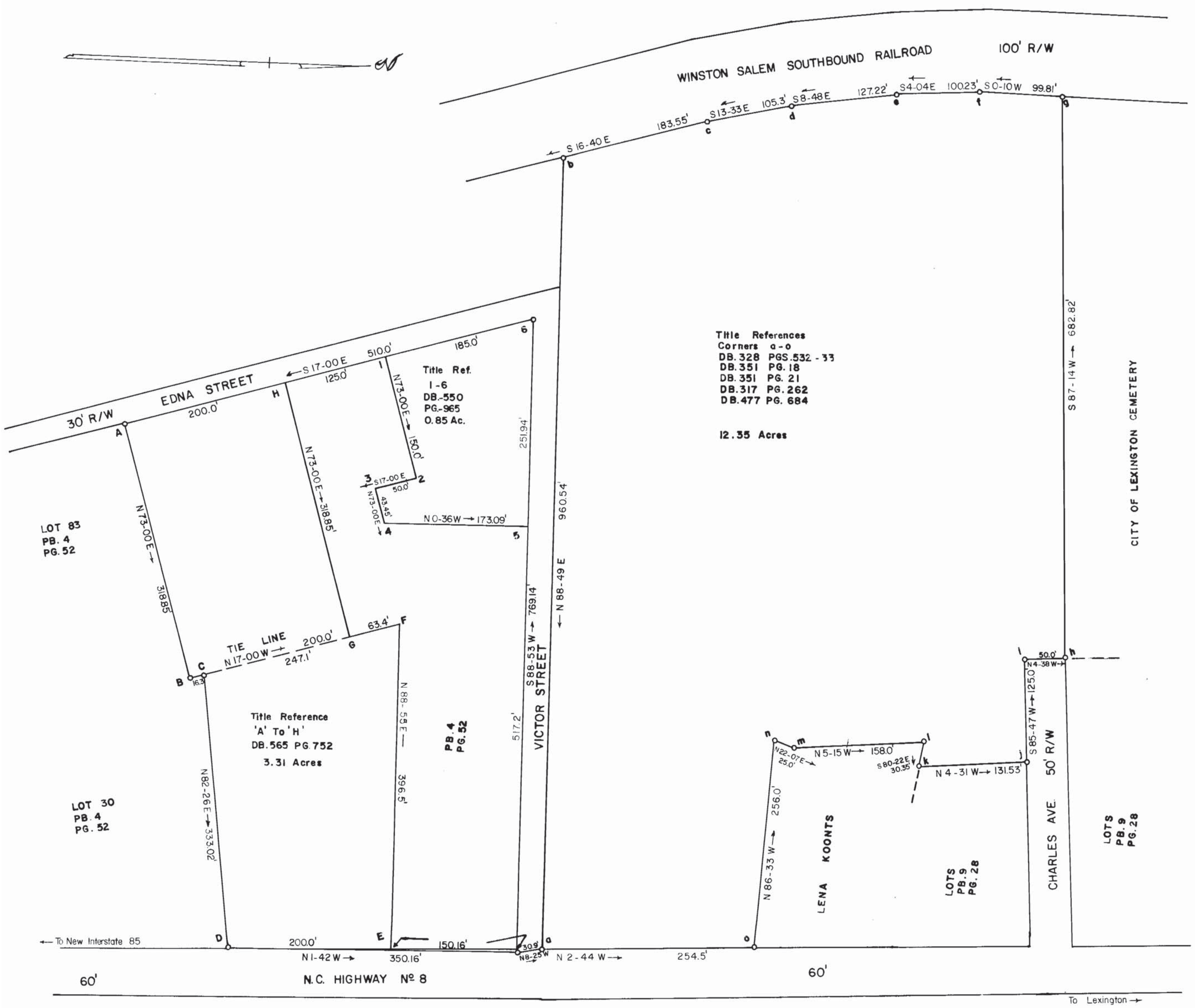
I, THE UNDERSIGNED, NOTARY PUBLIC DO HEREBY CERTIFY THAT J.S. McNEILL, REGISTERED SURVEYOR, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE FOREGOING AFFIDAVIT.

WITNESS MY HAND AND NOTARIAL SEAL THIS 27th DAY OF September 1979.

NOTARY PUBLIC
MY COMMISSION EXPIRES:
July 19, 1983

31

North Carolina—Davidson County
The foregoing (or annexed) certificate of
Sue W. Tew - Notary of
Richmond County, NC
is certified to be correct
This 6 day of Nov. A. D. 1979
Ronald W. Callicutt, Register of Deeds
Diane BeDen, Asst Deputy



PLAT OF PROPERTY
SURVEYED for MID-STATE TILE CO., INC.
Lexington TWSP - Davidson County
Scale 1" = 100'
Surveyed in August, 1979 by J. S. McNeill and Associates
Platted in September, 1979 by B. B. T.

J.S. McNeill
Registered Surveyor
№ L580

FILED DAVIDSON COUNTY, NC DAVID T. RICKARD, REGISTER OF DEEDS 11/24/2009
9:13:33 AM BOOK 1950 PAGE 1118 - 1122 INSTRUMENT #2009000058124
Recording:$24.00 Verification:$2.00 Excise Tax:$0.00 CR Fee:$5.00 Deputy: SKEPLEY

3/5

NORTH CAROLINA GENERAL WARRANTY DEED

Excise Tax: NTC

Prepared by and mail after recording to: Jean C. Brooks, Esq.
Brooks, Pierce, McLendon, Humphrey & Leonard, L.L.P., P O Box 26000, Greensboro, NC 27420
(No title examination was performed in connection with preparation of this Deed.)

THIS GENERAL WARRANTY DEED, made and entered into as of the 16th day of November, 2009 by and between

Grantor	Grantee
PORCELANITE, INC., a North Carolina corporation 2590 114th Street Grand Prairie, TX 75050	**CONDUMEX, INCORPORATED** 2590 114th Street Grand Prairie, TX 75050

The designations Grantor and Grantee as used herein shall include such parties, their heirs, successors and assigns, and shall include singular, plural, masculine, feminine or neuter, as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey to the Grantee in fee simple all of those certain lots or parcels (as listed) of land situated in the City of Lexington, Davidson County, North Carolina and more particularly described on Exhibit A, attached hereto and incorporated herein by reference.

The parcels described herein were acquired by Grantor by the instruments referenced on Exhibit A.

TO HAVE AND TO HOLD unto the Grantee, and unto its heirs, successors and assigns, in fee simple forever, the above described real estate, together with the improvements thereon, and the hereditaments and appurtenances thereunto appertaining.

AND THE GRANTOR HEREBY COVENANTS with the Grantee, and with its heirs, successors and assigns, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever, except for the following exceptions:

Easements, restrictions, and rights of way of record, if any, and ad valorem taxes for the current year.

IN WITNESS WHEREOF, Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officer, the day and year first above written.

PORCELANITE, INC., a North Carolina corporation

By: ____________________
Nov 16, 2009 President
Alejandro Sanchez, President

NORTH CAROLINA
GUILFORD COUNTY

I, B. Francis, a Notary Public of the County and State aforesaid, certify that Alejandro Sanchez personally came before me this day and acknowledged that he is _______ President of PORCELANITE, INC., a North Carolina corporation, and that by authority duly given and as an act of the corporation, has signed the foregoing instrument in its name and on its behalf as its act and deed.

WITNESS my hand and notarial seal, this 16 day of November, 2009.

[Notarial Seal]

B. FRANCIS
Notary Public, State of Texas
My Commission Expires
June 21, 2013

B Francis
Notary Public
Printed Name B. Francis

My Commission Expires: 06/21/2013

Exhibit A

Parcel 1
BEING Lot Nos. 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 of Littleville as shown on a map recorded in Plat Book 4 at page 52 in the Office of the Register of Deeds for Davidson County, North Carolina.

For further reference, see Deed Book 283, page 92, page 90, and page 88; Deed Book 203, page 536; Deed Book 200, page 56; Deed Book 199, page 485; Deed Book 169, page 409; and Deed Book 289, page 131, in the Office of the Register of Deeds for Davidson County, North Carolina.

Parcel 2
BEGINNING at an iron stake, corner to the Littleville subdivision property on the east right-of-way of the Southbound Railroad; thence with (4) calls and distances on the East right-of-way of said railroad North 16 degrees 17' West 139.1 feet; thence North 14 degrees 27' West 100 feet; thence North 11 degrees 28' West 65 feet; North 8 degrees 56' West 60.4 feet to an iron stake, corner to Lexington's colored cemetery property on the East right-of-way of Southbound Railroad; thence with the line of said cemetery property and C. U. G. Biesecker Estates property South 86 degrees 29' East 654.5 feet to an iron stake, new corner to Davis in Biesecker line; thence with new line to Davis South 6 degrees 44' West 310.4 feet to an iron stake on the north side of Victor Street, a new corner to Davis; thence with the north side of Victor Street 375 feet to an iron stake where the north side of Victor Street intersects the West side of Edna Street, corner to Littleville property; thence with the Littleville property line South 89 degrees 16" West 155.8 feet to an iron stake, point of beginning.

See Deed Book 284, Page 593.

Parcel 3
BEGINNING at an old iron stake on the western right-of-way of N. C. Highway No. 8 (30 feet west of center line), said stake being the southeast corner of the original Lena Koonts lot, as recorded in the Office of the Register of Deeds for Davidson County in Book 210, Page 327, said stake also being designated as Corner "O" of the Mid-State Tile Company land as recorded in the Office of the Register of Deeds for Davidson County in Plat Book 17, Page 31; thence runs with Mid-State Tile Company's line and the original southern line of the Lena Koonts lot, North 86 degrees 33' West 256 feet to an old iron stake and being designated as Corner "N" of the Mid-State Tile Company land above referred to; thence runs with the original line, North 22 degrees 07' East 25 feet to Corner "M" on said plat; thence runs with the original line, North 5 degrees 15' West 61 feet to the southwest corner of William R. Koonts and wife, Margaret L. Koonts, lot, as recorded in the Office of the Register of Deeds for Davidson County in Book 290, Page 523; thence runs with the southern line of said lot, South 85 degrees 27' East 248.69 feet to an iron stake on the western right-of-way of N. C. Highway No. 8, said stake being the southeast corner of William R. Koonts' lot above referred to; thence runs with the western right-of-way of N. C. Highway No. 8, South 2 degrees 44' East 79.7 feet to the beginning containing 0.46 of an acre, more or less.

The above-described parcel of land is comprised of a southern portion of Tract Number 7 of the C. U. G. Biesecker Division, as recorded in Plat Book 7, Page 83, of the Davidson County Registry.

See Book 577, Page 76.

Parcel 4
COMMENCING at an existing iron pipe at the intersection of the Western right-of-way: of NC Highway 8 and the Northern right-of-way of Charles Avenue (street unopened); THENCE with the Western right-of-way of NC Highway 8 South 03° 07' 02" East 241.22 feet to a new iron pipe, said iron being the POINT AND PLACE OF BEGINNING; THENCE with the Western right-of-way of NC Highway 8 South 03° 07' 02" East 80.90 feet to a new iron pipe; THENCE with Mid-State Tile Company's line as described in Deed Book 595 at Page 870 North 85° 26' 00" West 247.87 feet to a new iron pipe; THENCE with Mid-State Tile Company's line as described in Deed Book 351 at Page 21 North 05° 17' 38" West crossing an existing iron pipe at 11.60 feet and continuing an additional 96.96 feet for a total distance of 108.56 feet to an existing iron pipe; THENCE with Mid-State Tile Company's line as described in Deed Book 351 at Page 21 and Warren J. Koonts' line as described in Deed Book 410 at Page 43 and Deed Book 583 at Page 692 South 79° 27' 08" East 257.05 feet to a new iron pipe on the Western right-of-way of NC Highway 8, said iron being the POINT AND PLACE OF BEGINNING and containing 0.536 acres more or less as shown on a map of survey by Mitcham & Associates, P.A., Job No. 902665L, dated 03/28/90.

This description contains property described in Deed Book 290 at Page 523 and Deed Book 595 at Page 931. This property is also a portion of lot 7, Plat Book 7 at Page 83.

Parcel 5
BEGINNING at an iron stake on the west side of State Highway #8 and running thence with the west side of Highway S. 2 deg. 15' E. 255 ft. to an iron stake on the west side Highway and north side of Street; thence with the north side of Street S. 88 deg. 30' W. 975 ft. to an iron stake on the North side of Street and on the right-of-way of the Winston-Salem S. B.Ry. Co.; thence with the right-of-way N. 17 deg. 05' W 165 ft. to a stake on the right-of-way; thence with the right-of-way again 200 ft. to an iron stake on the Biesecker line; thence with the said line about S. 86 deg. E. 800 ft. to an iron stake on branch the Koonts' corner; thence with the branch about S. 25 ft. to a stake in the branch; thence about S. 86 deg. E. 275 ft. to the beginning, containing 6.52 acres more or less. See also Deed Book 134, page 617, in Office of the Register of Deeds for Davidson County, NC.

Parcel 6
BEING one-half undivided interest in Lot Nos. 66, 67, 68, 69 and 70 of the C. U. G. Biesecker Estate as recorded in Plat Book 9, page 28, in the Office of the Register of Deeds of Davidson County.

Parcel 7
BEGINNING at the North West corner of Lot No. 64 as shown by map on record in the Register of Deeds Office of Davidson County in Plat Book 8, page 57; thence S. 85° 05' W 690 feet, more

or less, to the Winston-Salem Southbound Railroad right-of-way; thence South with said right-of-way as it curves 225 feet, more or less, to corner of Mid-State Tile company and the Winston-Salem Southbound Railroad right-of-way; thence S. 86° 55' E. 646.6 feet, more or less, to the South West corner of Lot No. 70 as shown by Plat Book 8, page 57; thence N. 4° 55' W. 319.2 feet, more or less to the beginning, containing 4.34 acres, more or less.

Subject to R.E.A. right-of-way over the Southeast corner of the tract above described.

Part B
Facility Description

Part B – Facility Description

Table of Contents

Acronym List

ACL	Alternative Concentration Limits
AOC	Area of Concern
AQI	Air Quality Index
BGS	below ground surface
BDL	below detection limits
BQL	below quantitation limits
°C	Celsius
COCs	Constituents of Concern
DAQ	Division of Air Quality
DWM	Division of Waste Management
EP	Extraction Procedure
Ft/ft	Foot per foot
HWMU	Hazardous Waste Management Unit
HWS	Hazardous Waste Section
Mannington	Mannington Ceramic Tile
mg/kg	milligrams per kilogram or parts per million
NC	North Carolina
NCDCPCA, NHP Community	North Carolina Division of Conservation, Planning, and Affairs, Natural Heritage Program
NCDEHNR	North Carolina Department of Environment, Health and Natural Resources
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality (formerly NCDENR, and renamed effective September 18, 2015)

NCDEQ, DWM, HWS	North Carolina Department of Environmental Quality Division of Waste Management, Hazardous Waste Section
NCDFR	North Carolina Division of Forest Resources
NCGS	North Carolina Groundwater Standards
NCDWR	North Carolina Division of Water Resources
NCDNCR	North Carolina Department of Natural and Cultural Resources
NPS	National Park Service
Porcelanite	Porcelanite, Inc.
PVC	Polyvinyl Chloride
RCP	reinforced concrete pipe
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
SAP	Sampling and Analysis Plan
SIC	Standard Industrial Classification
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Units
TCLP	Toxicity Characteristic Leaching Procedure
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
VOC	Volatile Organic Compound
VSI	Visual Site Inspection
Waters Edge	Waters Edge Environmental, LLC

Part B – Facility Description

B-1 General Description

B-1-1 Site Location and Boundary Features

From the mid-1950's until the end of 1983, Mid-State Tile operated a ceramic tile manufacturing facility in Lexington, Davidson County, North Carolina (the "Facility") (see Figures B-1 and B-2). Prior to use by Mid-State Tile, the property was undeveloped, forested land. In 1984 Mannington Ceramic Tile, Inc. acquired Mid-State Tile and began operations at the Facility. In 1994, Porcelanite, Inc. purchased the Facility by acquiring all the stock of Mannington Ceramic Tile, Inc. from Mannington Mills of Delaware, Inc. (now known as Maneto, Inc. ["Mannington"]) and changing the corporate name from Mannington Ceramic Tile, Inc. to P&M Tile, Inc. Porcelanite commenced operation of the Facility shortly thereafter. In 1999, manufacturing operations ceased. Porcelanite, Inc. executed a General Warranty Deed of the property transferring ownership to Condumex, Incorporated on November 16, 2009. The deed was recorded with the Davidson County Register of Deeds on November 11, 2009 which is included in Appendix A-2. In 2014, all buildings on the site were demolished. The site is referenced as the Former Porcelanite Facility.

The Facility is located at 20 Victor Street, in Lexington, Davidson County, North Carolina, approximately 1 mile north of Interstate 85. The Tax Assessor's Parcel Number (APN) is 1134200000022. The geographical location of the Facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W, with elevations ranging from approximately 770 feet above MSL to approximately 730 feet above MSL at Walltown Branch. The Facility is located in a relatively rural area; however, the Facility is zoned for light industrial use. The Facility is bounded on the north by the Charles Avenue right-of-way, the Lexington City Cemetery, and undeveloped wooded property, and on the east by Cotton Grove Road (North Carolina Highway 8). The Facility is bounded on the south by Victor Street (State Road 1261) and on the west by the Winston-Salem southbound railway and undeveloped wooded property.

As shown on Figure B-2, the entire Facility occupies an area of approximately 13.3 acres. Formerly there was a 126,000-square foot building that was used for manufacturing and office space, a small maintenance garage, and a small security shack located at the site. These buildings have all been demolished and were removed in 2014. There are currently no building structures on the Facility property, and there are no immediate plans to redevelop the property, although potential Brownfields development has been explored.

The location of the Facility is shown on Figure B-1 and a 1,000-foot radius facility location map is shown on Figure B-2.

B-1-2 RCRA Related History of the Facility

We would begin this Section by noting there are numerous references to the previous names of the current NCDEQ including NCDENR and NCDEHNR; however, for consistency, we will use

NCDEQ throughout this document. During ceramic tile manufacturing operations at the Facility by Mid-State Tile and Mannington, two areas were created to handle waste generated from the ceramic tile manufacturing process. These later became SWMUs described as the Sludge Settling Ponds (SWMU-2) and the Ceramic Tile Pile (SWMU-3) (see Figure B-3). The Sludge Settling Ponds were used to settle solids contained in wastewater from the tile manufacturing process prior to discharge to the Rat Spring Branch of the Yadkin-Pee Dee River Basin under an NPDES permit. The Ceramic Tile Pile was used for disposal of off-specification ceramic tile materials.

The following is a list of significant regulatory events at the Facility:

- Between 1972 and 1989, wastewater was treated by passing it through two Sludge Settling Ponds which allowed solids to settle prior to discharge of the water to the Rat Springs Branch of the Yadkin-Pee Dee River Basin pursuant to NPDES permit #NC0006459.

- Based on a site assessment prepared by Mannington (dated April 12, 1990) and the likelihood that soil and groundwater at the Facility had been adversely impacted, NCDEQ issued a Compliance Order with Administrative Penalty (Order) (Docket #90-164) to Mannington Ceramic Tile, Inc.

- On July 5, 1990, Mannington submitted a consolidated Hazardous Waste Permit Application, Part A, to the EPA. This permit application listed two HWMUs - an 8,240-cubic yard surface impoundment and a 69,300-cubic yard waste pile. Both units were listed as managing D008 wastes, which are wastes that exhibit the toxicity characteristic for lead. These two regulated units were identified as the Sludge Settling Ponds (SWMU-2) and the Ceramic Tile Pile (SWMU-3), respectively.

- On May 29, 1992, Mannington submitted a Hazardous Waste Permit Application, Part A, to the EPA. This permit application provided the same information as the previous permit application; however, it also indicated that the Facility had two other environmental permits. The first permit listed was a POTW discharge permit with the City of Lexington. The second permit was an Air Permit #5408R5, which was issued by NCDEQ DAQ. The permit application also listed a request for change in the air permit requirements.

- The 1990 Order was superseded by a Consent Agreement and Settlement Order (OAH File No. 90 HER 0689) on September 24, 1992. The 1992 Order required that Mannington:
  a. Develop a plan to close the regulated units, identified as the two sludge settling ponds and the waste ceramic tile pile.
  b. Investigate and assess subsurface contamination originating from the regulated units.
  c. Implement a groundwater monitoring program.

- In May 1992, a Closure Plan for the Sludge Settling Ponds (SWMU-2) was submitted to NCDEQ, and was provisionally approved on August 13, 1992. To reflect the many subsequent modifications made to the closure plans for the Sludge Settling Ponds, the Closure Report contained several additional documents, including (a) the June 20, 1993, Closure Report for the Porcelanite Settling Ponds, (b) the proposed modification to the Closure Plan dated November 2, 2002, (c) the internal NCDEQ memo drafted by Ms. Sandra Moore to Ms. Rosemarie Roberts dated March 17, 2003, discussing the rationale for the amended closure performance standards, (d) the July 14, 2004, Revised Closure Plan, and (e) the August 9, 2005 report documenting additional soil excavation adjacent to the Sludge Settling Ponds which was placed on the Ceramic Tile Pile, prior to its closure. All the documents together satisfied closure and closure certification requirements for the Sludge Settling Ponds (SWMU-2). The Certification for Closure was submitted on November 9, 2005 and the Section accepted closure in place for the two Sludge Settling Ponds on February 1, 2006.

- In July 1992, initial construction work was performed to stabilize the tile pile/parking area. Phase II work was also completed to pipe the Walltown Branch (SWMU-7) along the eastern boundary of the Ceramic Tile Pile (SWMU-3).

- Between 1992 and 1998, numerous investigations of the Ceramic Tile Pile (SWMU-3) were conducted. These included assessments of soil and groundwater, investigation and characterization of the wastes stored in the Ceramic Tile Pile, and performing a treatability study to evaluate possible remediation techniques for the Ceramic Tile Pile (Aquaterra, 1997a, 1997b). Additional soil assessment outside and under the Ceramic Tile Pile was also conducted. Mannington submitted a Closure Plan for the Ceramic Tile Pile on February 11, 1997. The Closure Plan involved placing a RCRA-compliant technology cap over the Ceramic Tile Pile. The closure certification with waste in place was certified and submitted on April 26, 2004 and accepted by the NCDEQ on March 14, 2005.

- An RFA report was completed on April 29, 2004 by Booz Allen and was detailed in a February 16, 2005 NCDEQ *RCRA Facility Assessment*. The RFA identified eleven (11) SWMUs and three (3) AOCs. SWMU-2 was identified as the two Sludge Settling Ponds and SWMU-3 was identified as the Ceramic Tile Pile (regulated units). These two SWMUs as well as the remaining SWMUs and AOCs are discussed individually in greater detail in Part L of this report.

- The Facility is currently in post-closure monitoring with the intent of the sampling program to conform with 40 CFR 265 Subparts F and G. Waters Edge, environmental consultant for the Facility, is currently continuing the semi-annual post-closure monitoring of groundwater monitoring wells MW-1, MW-9, MW-12, MW-22A, MW-26A-2, and MW-28 for analysis of boron, cadmium, chromium, cobalt, lead, manganese, and zinc in accordance with the most recently approved October 2007 Revised SAP.

B-1-2-1 Part B Permit

On September 7, 2016, Ms. Julie S. Woosley, Section Chief, with the NCDEQ, DWM, HWS, issued a *Call for RCRA Part B Permit Application* letter jointly to Mannington Mills, Inc. and Condumex, Inc. for the Former Porcelanite Facility. This RCRA Part B Post-Closure Permit Application is in response to that Call.

B-1-2-2 Solid Waste Management Units

An RFA report was completed on April 29, 2004 by an EPA contractor (Booz Allen, 2004) and submitted on February 16, 2005 (see Appendix B-1). The RFA identified eleven (11) SWMUs and three (3) AOCs as depicted on Figure B-4. The RFA identified the original Hazardous Waste Regulated Units as SWMU-2 (two Sludge Settling Ponds) and SWMU-3 (Ceramic Tile Pile). Based on the 2005 RFA, Table B-1 lists the SWMUs and AOCs identified along with the recommended course of action in 2005 and after reevaluation in 2016. Portions of the following SWMU and AOC descriptions and past investigation summaries are directly referenced from the February 2005 RFA.

Table B-1
SWMU/AOC Identification and Past Status

Unit	Name	2005
SWMU-1	Wastewater Pretreatment System	CS
SWMU-2	Sludge Settling Ponds (Regulated)	NFA
SWMU-3	Ceramic Tile Pile (Regulated)	NFA
SWMU-4	20 cubic yard Sludge Roll-Off Container	NFA
SWMU-5	20 cubic yard Floor Sweeping Roll–Off Container	NFA
SWMU-6	Baghouse	CS
SWMU-7	Walltown Branch	RFI
SWMU-8	Off-Spec Tile Accumulation Roll-Off	NFA
SWMU-9	Filter Cake Waste Pile Area	NFA
SWMU-10	Maintenance Building Waste Management	NFA
SWMU-11	Spray Line Area Sumps	CS
AOC-1	Area of Discharge from Tile Pile	RFI
AOC-2	Broken Ceramic Tile Roadway	CS

AOC-3	Former UST and AST Area	NFA

Notes:
CS = Confirmatory Sampling
NFA = No Further Action
RFI = Recommended Further Investigation

B-1-3 Current Site Operation

All manufacturing operations at the Facility ceased in 1999 and the facility continued for some period as a tile distribution warehouse. The buildings were demolished and removed in 2014. There are currently no building structures at the Facility.

B-1-4 Description of Regulated Units

B-1-4-1 Two Closed Sludge Settling Ponds (SWMU-2)

SWMU-2 consisted of two surface impoundments estimated at 130’ (L) x 30’ (W) each (based on preliminary assessment figures) located in the northwestern corner of the Facility, between the northern property boundary and the northern wall of the former Main Building (see Figure B-3). Previous calculations indicated a total volume for both ponds to be approximately 8,240 cubic yards, consisting of approximately 3,625 cubic yards in the Western Pond and approximately 4,615 cubic yards in the Eastern Pond. Prior to January 1, 1989 and dating back to approximately 1972, wastewater treatment conducted at the Facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU-2), allowing solids to settle prior to discharge. After wastewater passed through the second (eastern) settling pond, Mid-State Tile and subsequently Mannington discharged wastewater directly into Rat Spring Branch of the Yadkin-Pee Dee River Basin pursuant to NPDES permit #NC0006459 (ENSCI, 1993, 1994).

Prior to 1990, the clay and silica used at the Facility likely contained hazardous constituents such as lead. In addition, according to Facility representatives, the pH of the incoming wastewater was usually in the range of 4 to 6. A site assessment of the Facility, prepared by Mannington, and dated April 12, 1990, consisted of a field investigation in which samples were collected from the Sludge Settling Ponds. TCLP analyses detected leachable lead levels in the sludge ranging from 230 mg/L to 1,230 mg/L, which is above the 5.0 mg/L threshold for a characteristic hazardous waste. All VOCs and SVOCs were BDL with the exception of methylene chloride, acetone, and carbon disulfide, which are considered laboratory artifacts. As a result, the solid waste (i.e., sludge) disposed in the Sludge Settling Ponds was a characteristic hazardous waste (D008) (NCDEQ, 1990b; ENSCI, 1993, 1994).

In July 1993, Mannington completed closure of the Sludge Settling Ponds (SWMU-2) per the NCDEQ approved Closure Plan. Mannington submitted a certified closure report to NCDEQ on November 9, 2005, which NCDEQ subsequently accepted on February 1, 2006. As a result of closure activities, sludge was removed from both sludge ponds and stabilized with Portland

Cement, such that the waste passed TCLP for lead. The stabilized material was placed back into the ponds and the area was capped with a RCRA compliant cap. According to Facility representatives, the cap included a 30-millimeter synthetic liner and an asphalt cap that serves as the top layer. Additionally, all piping associated with the sludge ponds was removed. Some of the surrounding soils north and west of the Sludge Settling Ponds were excavated and placed on the Ceramic Tile Pile (SWMU-3) prior to its closure in 1997. According to a September 1992 Consent Agreement, sludge from SWMU-2 was also deposited in SWMU-3. At the time of the September 2003 VSI, the asphalt cover appeared to be in good condition with no significant cracks, staining, or erosion identified (Booz Allen RFI, 2005).

B-1-4-2 Closed Waste Ceramic Tile Pile (SWMU-3)

The Closed Waste Ceramic Tile Pile (SWMU-3) is located east of the former Main Process Building and immediately west of Walltown Branch (SWMU-7). The Facility used SWMU-3 to store off-specification unfired and fired glazed ceramic tile beginning in the 1950s or 1960s until 1990. The unit extends approximately 12 feet north of the southern property fence line to the Area of Discharge from Tile Pile (AOC-1) to Rat Springs Branch as shown on Figure B-3. The total volume of the unit is estimated to be approximately 260,000 tons (*Transmittal of Revised Closure and Post-Closure Care Plans*, July 30, 1997). Additionally, in the early 1990s, soil north of SWMU-2 exhibiting elevated lead and zinc concentrations was excavated and placed on top of the Ceramic Tile Pile prior to closure of the unit, as was material from the Broken Tile Roadway (AOC-2). In 1990, Mannington ceased depositing waste tile material in SWMU-3 (NCDEQ, 1990d, 1990e, and 1990f).

Based on the site assessments conducted between 1989 and 1997 at the Facility, sample analyses results detected leachable lead levels in the Waste Ceramic Tile Pile considered to be a characteristic hazardous waste. As a result, the solid waste (i.e., ceramic tile) disposed on the Waste Ceramic Tile Pile was considered a characteristic hazardous waste (D008) in that samples from several different areas contained TCLP lead levels in excess of the regulatory limit (NCDEQ, 1990b).

In addition, impacted sludge/soil from SWMU-2 was also deposited in the Waste Ceramic Tile Pile prior to closure as follows:

- An unknown quantity of partially stabilized sludge and additional impacted soil located north and west of the Sludge Settling Ponds (SWMU-2) were excavated and deposited on the Ceramic Tile Pile (SWMU-3) prior to closure. According to the Closure Report for the Sludge Settling Ponds (SWMU-2), the partially stabilized sludge exceeded the NCGS via TCLP for mercury and zinc (closure standards NCDEQ temporarily used during that period of time) and the TCLP regulatory limit for lead when it was deposited on the Ceramic Tile Pile (SWMU-3) (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz

Allen 2003). This excavated area also included one soil sample location from the area northeast of SWMU-2 which slightly exceeded the lead TCLP threshold.

- Lead impacted soil from along former Charles Avenue north of the Ceramic Tile Pile near the northern property boundary was excavated and placed on the Ceramic Tile Pile.

After multiple phases of soil assessment, the Facility initiated closure with wastes in place of the Ceramic Tile Pile (SWMU-3) due to soils exhibiting leachable levels of lead that were considered a characteristic hazardous waste (D008). Consistent with the approved 1997 Closure Plan, wastes were left in place and the unit was closed with a RCRA-compliant cap. The unit is capped with a "flat top surface cap" and a "slope surface cap" using a RCRA-compliant cap including a vegetative cover, geotextile liner, HDPE liner, and another managed vegetative cap. The top portion of the unit is level with the facility parking lot and has gravel covering the majority of the top of the unit. The sloped sides of the unit are covered with native vegetation. The 1997 approved *Ceramic Tile Pile Closure Plan* also depicted an area which exceeded three (3) times background levels for the metals barium, boron, lead, manganese, and zinc. These other areas that exhibited elevated total inorganic values in excess of three (3) times background levels were covered with the silty clay cover material used to stabilize the RCRA cap as shown on Figure B-3. The silty clay cover was two (2) or more feet thick over these elevated total inorganic areas, thus preventing dermal contact and minimizing leaching of the metals from the soils to the groundwater. (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003). This closure plan was approved by NCDEQ on March 14, 2005.

B-2 Topographic Map

B-2a General Requirements

The following figures include map information as required by the Part B Application:

Figure B-1 is U. S. Geological Survey topographic quadrangle map (Lexington West) identifying the general Facility location. Figure B-2 is a more detailed topographic map of the Facility, and includes features 1,000-feet from the perimeter of the Facility, the Facility property boundary, surrounding tax parcel boundaries, surface water features, contour intervals, map scale, map date, 100-year floodplain, the two regulated units (SWMU-2 and SWMU-3). Figure B-3 depicts the location of access controls, internal roads and the location of storm and sanitary sewers. No buildings or structures remain on the property; therefore, there are no loading or unloading areas, fire control facilities, nor injection or withdrawal wells (both onsite and offsite). The concrete building foundation slab is the only remaining improvement. Figure B-2 also includes a wind rose from data collected from the nearest airport (Davidson County Airport [KEXX]).

The location of all remaining SWMUs and AOCs identified in Table B-1 is shown on Figure B-4. Photodocumentation is provided in Appendix A-2.

The current groundwater flow direction and plume maps for the Facility are discussed in Part E-Groundwater Monitoring of this report. The most recently approved October 2007 SAP includes semi-annual (March and September) monitoring and sampling of six (6) monitoring wells for analysis of boron, cadmium, chromium, cobalt, lead, manganese, and zinc. Monitoring wells MW-1, MW-12, and MW-22A are installed in the saprolite/shallow aquifer, and wells MW-9D, MW-26A-2, and MW-28D monitor groundwater quality in the bedrock/deeper saprolite aquifer. The information is presented to the NCDEQ, DWM, HWS semi-annually in a *Semi-annual Groundwater Assessment Report*.

B2-b Additional Topographic Requirements for Land Storage, Treatment and Disposal Facilities

The Facility is not an active treatment and disposal facility; however, additional topographic map requirements as listed in Part E-Groundwater Monitoring include the following:

- Groundwater flow direction and rate (isometric graph)
- Point of compliance
- Groundwater monitoring wells
- The extent of any plume (horizontal and vertical)
- Hazardous waste management area
- Property boundary

This information is included in Part E-Groundwater Monitoring.

B-3 Traffic Information

As this is a closed facility, transportation of hazardous waste is not presently occurring, and there are no immediate future plans for the transportation of hazardous waste at the Facility; therefore, there is no information regarding the movement of hazardous waste at the Facility.

B-4 Location Information

B-4a Seismic Considerations

Information regarding seismic considerations is required for new facilities only. As this is not a new facility, no seismic information is provided.

B-4b Floodplain Standard

According to the FEMA, National Flood Insurance Program, Flood Insurance Rate Map (FIRM) Panel 6724, Map Number 3710672400J, effective date March 16, 2009, a portion of the Facility property that encompasses Walltown Branch (SWMU-7) and a portion of the Ceramic Tile Pile (SWMU-3) is located within the 100-year floodplain (identified as the 1% annual chance floodplain boundary). Base floodplain elevations range from 747 feet above MSL south of Victor Street to 734 feet above MSL immediately north of the confluence of Walltown Branch with Walltown Drain. The limits of the 100-year floodplain boundaries are shown on Figure B-2 and documented in Appendix B-2.

B-4b (1) Demonstration of Compliance

In order to prevent surface water runoff and groundwater migration from the Ceramic Tile Pile (SWMU-3) from impacting Walltown Branch (SWMU-7), located at the eastern toe of the Ceramic Tile pile, Walltown Branch was enclosed in pipe in 1992/1993 by the City of Lexington under a Nationwide 26 permit from the USACE. This permit was issued based on the determination by the USACE that no significant wetlands were present at the site (Booz Allen, 2004). The enclosure included construction of a 36-inch RCP surrounded by #57 stone, a geotextile layer cap, and a compacted silty clay to clayey silt cover. This area is inspected quarterly by Condumex/Mannington personnel as part of the Post-Closure Care Plan. It is also inspected annually by a NCDEQ RCRA Compliance inspector. At the time the piping was installed at Walltown Branch, a permanent 25-foot easement was conveyed to the City of Lexington.

B-4b(1)(a) Floodproofing and Flood Protection

As indicated in Section B-4b (1), Walltown Branch was enclosed in 36-inch RCP in 1992/1993 by the City of Lexington under a Nationwide 26 permit from the USACE. No additional information is provided regarding floodproofing or flood protection.

B-4b(1)(b) Flood Plan

As this is a closed facility, the closed surface impoundments (Sludge Ponds) and closed landfill (Ceramic Tile Pile) will remain in-place. These units are monitored and maintained to protect the integrity of the final cover. There are no plans to remove hazardous waste.

B-4b (2) Plan for Future Compliance with Floodplain Standard

The portion of the Facility within the 100-year flood zone is under local enforcement by the Davidson County Planning and Zoning Department who is responsible for the management of the permit. Any compliance issues would be handled by Davidson County. A copy of the FEMA FIRM Flood Map is documented in Appendix B-2.

B-4b (3) Waiver for Land Storage and Disposal Facilities

This is not applicable as a waiver is not being sought.

B-4c Additional North Carolina Location Standards

The two regulated SWMUs located at the Facility were closed in accordance with NCDEQ approved Closure Plans. The Certification for Closure for SWMU-2 was submitted on November 9, 2005 and the Section accepted closure in place for the two Sludge Settling Ponds on February 1, 2006. The closure certification with waste in place for SWMU-3 was certified and submitted on April 26, 2004 and accepted by the NCDEQ on March 14, 2005. As both of these units have been closed in place, the Facility is not required to meet these requirements.

This section addresses specific North Carolina standards for hazardous waste management facilities as outlined in 15A NCAC 13A.0109(r)(2), .0113(c)(3), and .0113(c)(5).

Regulation	Description	Meets Standard
13A.0109(r)(2) (A)	0.25-mile from institution	No, South Lexington School is located less than 0.25 mile to the northeast beyond NC Highway 8.
(B)	50-foot separation from property line	No, both HWMUs are located just inside the northern property line.
(C)(i)	Hazardous waste 200 feet from the property line	No, both HWMUs are located just inside the northern property line.
(C)(ii)	10 feet above historic high groundwater table	No, bottoms of both SWMU-2 and SWMU-3 are located within 10 feet of the historic high groundwater level.
(C)(iii)	Drinking water wells greater than 1,000 feet	Uncertain, there are wells currently located within 1,000 feet of the Facility, but by City Ordinance these are not to be used for drinking water, and municipal drinking water is supplied for use.
(D)	Liquid Waste	Facility waste is not applicable.
13A.0109(r)(4)(A)(i)	Recharge Area of an aquifer which is a sole-source drinking water aquifer	Not Applicable, aquifer is not a sole-source drinking water aquifer.
13A.0109(r)(4)(A)(ii)	Within 200 feet of a surface water stream	The HWMUs are within 200 feet of a surface water stream (e.g. Walltown

Regulation	Description	Meets Standard
		Branch); however, they are closed and cannot be moved.
13A.0109(r)(4)(A)(iii)	Discharge to WS-1, WS-11 or SA waters or Class III Reservoir	Walltown Branch is the discharge feature from the Facility and is considered a Class C surface water stream and not WS-1, WS-11, or SA waters or Class III Reservoir.
13A.0109(r)(A)(4)(iv)	Discharge to watershed for a WS-1, WS-11 or SA waters or Class III Reservoir	Walltown Branch is the discharge feature from the Facility and is considered a Class C surface water stream and does not discharge to a watershed for a WS-1, WS-11, or SA waters or Class III Reservoir.
13A.0109(r)(A)(4)(v)	200 feet of a 100-year flood hazard	The HWMUs are located within 200 feet of a 100-year flood hazard; however, they are closed and cannot be moved.
13A.0109(r)(A)(4)(vi)	Within 200 feet of a seismically active area	The HWMUs are not located within 200 feet of a seismically active area.
13A.0109(r)(A)(4)(vii)	Within 200 feet of a mine, cave, or cavernous bedrock	The HWMUs are not located within 200 feet of a mine, cave, or cavernous bedrock.

In order to obtain additional information regarding the location of the Facility as outlined in 15A NCAC 13A .0113(c)(3), and .0113(c)(5), the following state and/or local agency representatives were contacted and asked to provide information regarding wetlands, endangered species habitats, parks, forests, wilderness areas, historical sites, mines and air quality:

- The NCDCPCA, NHP was contacted by electronic mail on January 23, 2017 for information regarding endangered species habitats, parks, forests, wilderness areas, and historical sites. As of March 1, 2017, the NCDCPCA, NHP has not responded to this request in sufficient time to be included in this report.

- Ms. Anita Barnett with the NPS, Public Affairs Office, was contacted by electronic mail on January 23, 2017 and by telephone on January 30, 2017 for information regarding National Seashore, Lakeshore, and River Recreational Areas, National Parks and Monuments, and Federal Designated Wild & Scenic Rivers. As of March 1, 2017, an NPS representative has not responded to this request in sufficient time to be included in this report.

- Ms. Heather Luczak with the US Forest Service, was contacted by telephone and electronic mail on January 23, 2017 and January 24, 2017, respectively for information regarding

Designated and Proposed Federal Wilderness and Natural Areas, National Preserves and Forests, Federal Land Designated for the Protection of Natural Ecosystems. Ms. Luczak responded by electronic mail stating none of these sensitive environments were located within a 1.0-mile radius of the Facility.

- Ms. Melanie Williams with the NCDWR, was contacted by electronic mail on January 24, 2017 for information regarding State-designated areas for protection or maintenance of aquatic life (Clean Water Act 305b Report). As of March 1, 2017, an NCDWR representative has not responded to this request in sufficient time to be included in this report.

- Mr. Tom James with the NCDFR, was contacted by telephone on January 23, 2017 for information regarding State Preserves and Forests. As of March 1, 2017, an NCDFR representative has not responded to this request in sufficient time to be included in this report.

- Ms. Leigh Mann with the USFWS was contacted by electronic mail on January 23, 2017 for information regarding endangered species. Mr. Allen Ratzlaff, a Fish and Wildlife Biologist with the USFWS, responded electronically stating "no federally listed species or their habitats occur in the project area. Therefore, we believe the requirements under Section 7 of the Endangered Species Act of 1973 are fulfilled."

- The NCDNCR was contacted by electronic mail on January 24, 2017 for information regarding National and State Historical Sites. Ms. Ramona M. Bartos responded electronically stating "We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed."

- Mr. David Cox with the NC Wildlife Resources Commission was contacted by electronic mail on January 24, 2017 for information regarding dq|#National or State Wildlife Refuges, State lands designated for wildlife or game management, Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes in which fish spend extended periods of time, or spawning areas critical for the maintenance of fish/shellfish species within river or lake waters. Ms. Olivia Munzer, Western Piedmont Habitat Conservation Coordinator, responded electronically stating "There are no national refuges or state-owned, wildlife-designated or management lands within 1.0 mile of the site. However, lands managed by Davidson County as Open-Space are located with 1.0 mile of the site. There are no migratory or feeding grounds for anadromous fish or spawning areas critical for the maintenance of fish/shellfish species, or large lakes or reservoirs with areas that fish spend extended periods of time occur[sic] within 1.0 mile of the site. There is a historical record of the Carolina birdfoot-trefoil (*Acmispon* *helleri*), a state species of special concern-vulnerable, within 1.0 mile of the site. A current record of the northern-long eared bat (*Myotis septentrionalis*), a state significantly rare and federally threatened species, occurs in Davidson County with no specific location identified. Therefore, the northern-long eared bat may be present or within 1.0 mile of the site. As such, consultation with the USFWS may be required."

- Ms. Bridget Munger with the NC Department of Energy, Mineral and Land Resources was contacted by electronic mail on January 25, 2017 for information regarding any active or inactive mines within a 1.0-mile radius of the Facility. Ms. Munger returned a letter by electronic mail including a list of active and inactive mines in Davidson County. None of the mines listed appear to be located within a 1.0-mile radius of the Facility.

- Ms. Jean Gibby with the USACE was contacted by telephone on January 30, 2017 for information regarding the 1992 Permit for piping in Walltown Branch and any wetlands within a 1.0-mile radius of the Facility. Ms. Gibby returned a letter by electronic mail stating "I have looked at the map and there is no record in our system about the town ever having acquired a permit for the fill at the referenced facility. As I had mentioned to you, we had permits back in 1992 that would have allowed such activities. There is a site off of Cotton Grove Road that had a permit and that stream flows from that property through the referenced property. In our conversation, I missed the fact that you desire to know about jurisdictional features within a 1-mile radius of the project. I am unable to do anything more than what you likely could do which is to review USGS topo maps and NRCS soil maps along with NWI maps."

- Air quality information for the Lexington area was obtained from www.usa.com. The website indicates the AQI for the calendar year 2009, the most recent data available, was 39. This AQI is used by the US EPA in issuing standardized public health warnings. AQI values between 0 and 50 are considered good.

Documentation of all correspondence is provided in Appendix B-3.

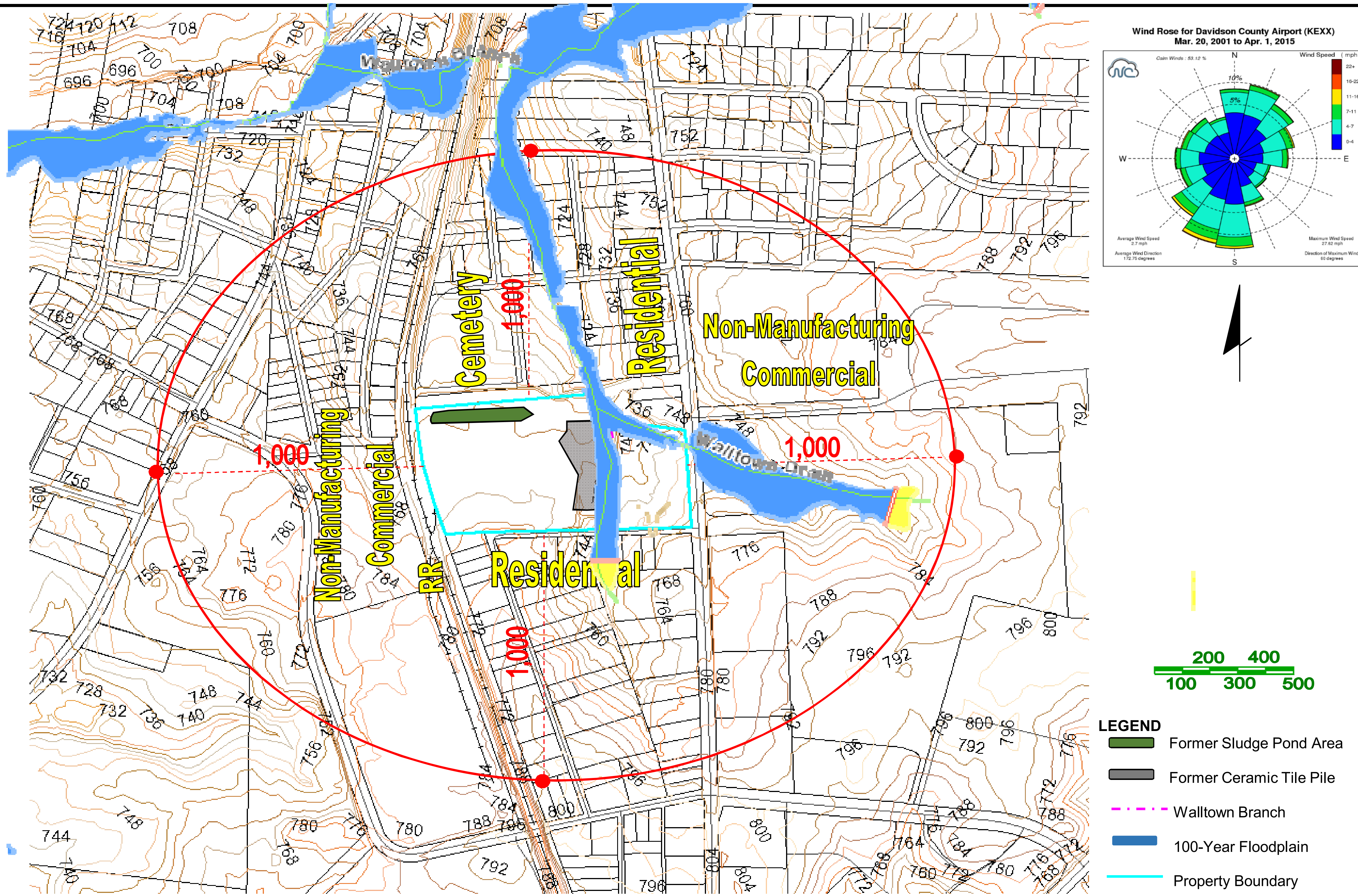
B-5 Additional North Carolina Requirements

B-5b Public Participation for New Facilities

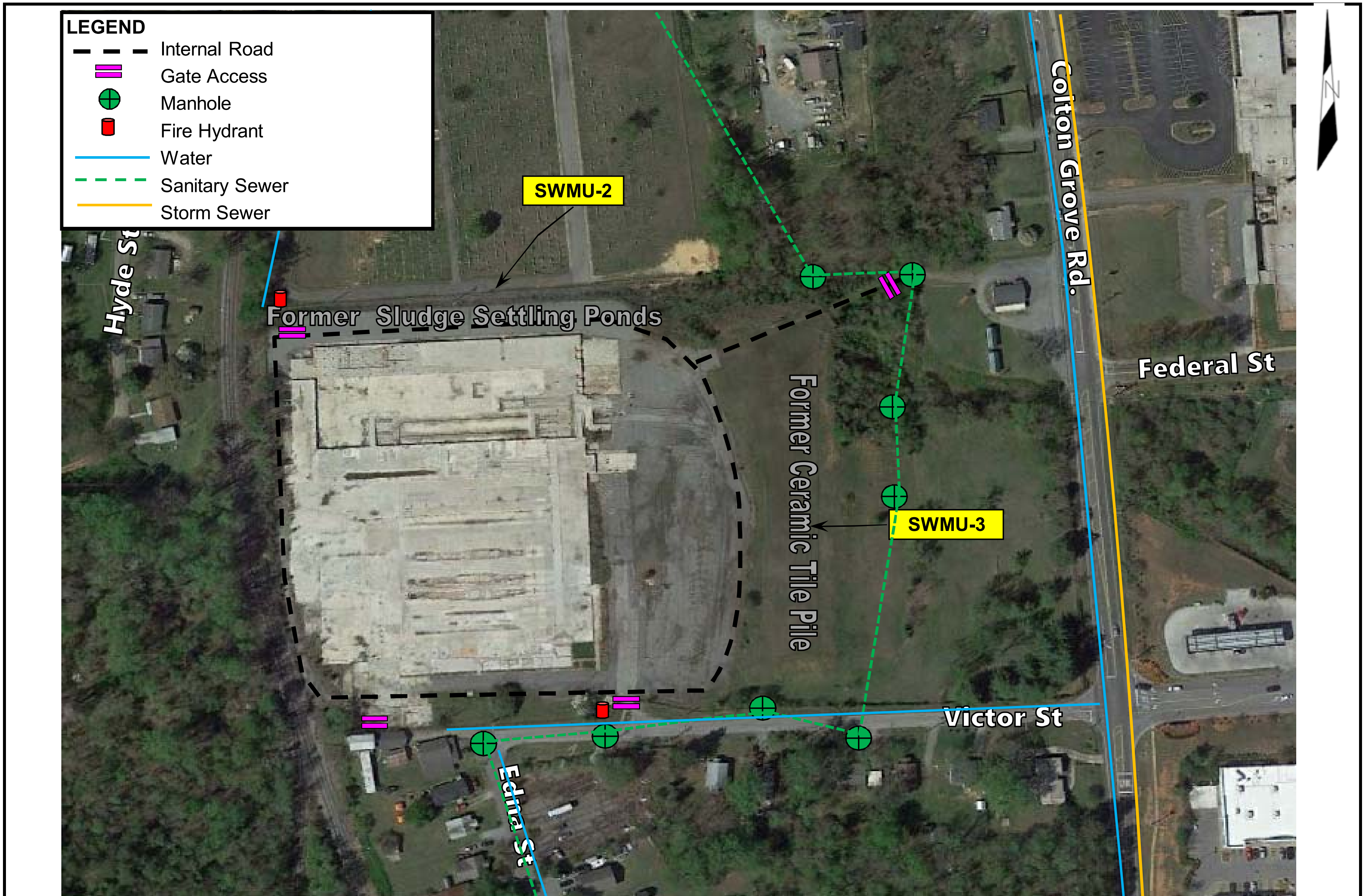
This section is not applicable as this is not a new facility.

Part B Figures

WATERS EDGE ENVIRONMENTAL, LLC	*Job No.* R1-21	*Topo Quad* Lexington West	*Date* 2.21.2017	*Title* Project Location Map
	File Name Part B Fig B-1	*Figure* B-1	*Scale* 1"-1,650' approx.	*Project* Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Job No. R1-21	Base Figure Davidson County GIS	Date 2/22/2017	Title 1,000-Foot Radius Facility Location Map
	File Name R15-004	Figure B-2	Scale as shown	Project Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC

Drawing	Image Source	Revision Date	Date	Title	
15-006 Fig B-3	Google Earth	12/6/2017	2/24/2017	SWMU-2 and SWMU-3 Location Map	
Job No.	Image Date	Figure	Scale	Project	Former Porcelanite Facility
R1-21	4/8/2017	B-3	1" ~ 200'		Lexington, North Carolina

Hyde St
Colton Grove Rd.
Federal St
Victor St
Edna St
Former Ceramic Tile Pile
N
MW-24
MW-25
MW-19D
MW-18
AOC-1
SWMU-8
MW-26-A-2
MW-28D
MW-8
MW-14
MW-10
MW-11D
MW-19
MW-12D
MW-9D
MW-21A
SWMU-2
AOC-2
SWMU-11
SWMU-7
SWMU-1
SWMU-9
SWMU-5
MW-22A
SWMU-4
SWMU-3
MW-29
MW-7A
SWMU-6
MW-23A
MW-1
AOC-3
SWMU-10

Part B Appendices

Appendix B-1
Booz Allen 2005 RFA

NCDENR
North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director | **Division of Waste Management** | Michael F. Easley, Governor
William G. Ross Jr., Secretary

February 16, 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Tony Shaw
Environmental/ Safety Manager
Porcelanite, Inc.
1327 Lincoln Drive
High Point, NC 27260-9945

Re: RCRA Facility Assessment Report
Porcelanite, Inc.
Lexington, North Carolina
EPA ID# NCD 986 181 451

Dear Mr. Shaw:

Enclosed is the RCRA Facility Assessment (RFA) Report for Porcelanite, Inc. This RFA was prepared by EPA Region 4.

If you have any questions, please contact Karim Pathan at (919) 733-4996 extension 228.

Sincerely,

K Pathan

Karim Pathan
Project Manager
Facility Management Branch
Hazardous Waste Section

Enclosures

cc: Jon Johnston, US EPA, Region 4
Ernie Lawrence

rc: Harold McCarty
Robert L. Glaser
Karim Pathan

C:\mel\akp\porcelanite.4doc.

RCRA FACILITY ASSESSMENT REPORT

Porcelanite, Inc.
NCD 986 181 451

20 Victor Street
Lexington, North Carolina

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Work Assignment No.:	R04804-1
Contract No.:	68-W-02-17
Prepared By:	Booz Allen Hamilton
Booz Allen WAM:	Jeremy Hogard
Telephone No.:	404-658-8054
EPA WAM:	Robert Morris
Telephone No.:	404-562-8470

January 19, 2005

TABLE OF CONTENTS

FIGURES

TABLES

ATTACHMENTS

1.0 EXECUTIVE SUMMARY

The first step in the Resource Conservation and Recovery Act (RCRA) corrective action process is the RCRA Facility Assessment (RFA). The RFA is conducted to assess if a release of hazardous waste or hazardous constituents has occurred from solid waste management units (SWMUs) and to identify potential area of concern (AOCs) at the facility. The main components of an RFA are to identify and gather information on releases at the RCRA facility; to evaluate SWMUs for releases to all media (groundwater, surface water, air, and soil); and to make preliminary determinations regarding releases of concern and the need for further action and interim measures at the facility.

An RFA is currently being conducted for the Porcelanite, Inc., (Porcelanite) facility located in Lexington, North Carolina. A file search of U.S. Environmental Protection Agency (EPA) Region 4 and North Carolina Department of Environment and Natural Resources (NCDENR) file material for the site was conducted in November 2003. Following completion of the file search, a preliminary review (PR) of the file material was conducted to develop an understanding of the site prior to conducting the visual site inspection (VSI). A VSI of the Porcelanite facility was conducted on September 30, 2003, to address information gaps identified during the PR and to identify and document information associated with all SWMUs identified in the PR. Each SWMU identified during the PR was inspected and a meeting with facility representatives was conducted to obtain additional information. This report outlines the findings of the PR and the VSI.

The Porcelanite facility is an inactive ceramic tile manufacturing facility located at 20 Victor Street, Lexington, North Carolina, in Davidson County. The geographical location of the facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The location of the facility is shown on Figure 1. The Porcelanite facility is bounded on the north by the Charles Avenue right of way and the Lexington City Cemetery; on the east by Cotton Grove Road (North Carolina Highway 8); on the south by Victor Street (State Road 1261); and on the west the Winston-Salem southbound railway and undeveloped wooden property. Several residential homes are located immediately to the south of the facility property, across Victor Street. The entire Porcelanite property comprises approximately 7.5 acres and includes a 126,000 square foot process building that was used for manufacturing and office space, a small maintenance garage, and a small guard shack. The facility property is surrounded by a seven-foot chain-link fence topped with barbed wire and access is controlled by a key-coded security gate (Aquaterra, 1997b; Booz Allen, 2003).

Mid-State Tile began operations at the Porcelanite property in approximately 1960. Prior to use by Mid-State Tile, the property was undeveloped, forested land. According to facility representatives, Mannington Ceramic Tile (Mannington) began operating at the site in 1985. Mannington ceased operations at the Porcelanite site and sold the property to P&M Tile, Inc., in 1994. P&M Tile, Inc., was later renamed Porcelanite, Inc. Porcelanite is currently the owner of the facility and property; however, Mannington retained responsibility for closure of the Ceramic Tile Pile (SWMU 3) and the Sludge Settling Ponds (SWMU 2). The tile manufacturing operations at the Porcelanite facility were shut down in 1999. Shortly after the operations were terminated by Porcelanite, the tile manufacturing equipment was dismantled, sold, and removed from the property (Aquaterra, 1997b; Booz Allen, 2003).

According to facility representatives, the tile manufacturing process conducted at the Porcelanite property began when raw materials, such as clay, silica, feldspar, zinc oxide, limestone, zirconium silicate, and glass frit, were trucked to the site and stored in silos. These materials were then blended in various proportions and sent via belt conveyors to the Ball Mills, where they were mixed with water. After mixing, the materials were transferred to the spray dryer for drying. Using belt conveyors, the materials were then sent to the tile presses where they were formed into various sizes of tile. Three automatic presses for floor tile and as many as twenty small presses for producing trim tile were operated at the facility. After pressing, the green tiles were heated to remove moisture to less than one percent and then sent to the spray lines to receive color. From the spray lines, the tiles were sent through one of three kilns where they were fired at approximately 2000 degrees Fahrenheit. Tiles removed from the kilns were allowed to cool before being boxed for shipment. The finished products were sold to retail tile outlets. The Standard Industry Classification (SIC) code listed on the facility's permit application was 3253 and the facility was operated for the production of glazed ceramic floor and wall tile (Aquaterra, 1997b; Booz Allen, 2003, Mannington, 2004).

Based on the PR and information gathered during the VSI, a total of 11 SWMUs and three areas of concern (AOCs) were identified at the Porcelanite facility. The names of these SWMUs and AOCs are listed in Attachment 1 and their locations are identified on Figure 2. In addition, an overview description of the SWMUs and AOCs is provided in Tables 1 and 2 and a more detailed discussion is provided in Section 6.0.

Table 1
Solid Waste Management Units

SWMU #	SWMU Name	Type of Unit	Period of Operation	Waste Managed	Recommendation
1a, 1b, 1c, 1d	Wastewater Pretreatment System	a. Precipitating Tanks b. Filter Press c. Holding Tanks d. Sump	1989 to present	Wastewater containing RCRA metals such as lead	Confirmatory Sampling
2a, 2b	Sludge Settling Ponds	a. Pond 1 b. Pond 2	1972 to 1989	Wastewater containing RCRA metals such as lead	NFA
3	Ceramic Tile Pile	Waste Pile	1950s or 1960s to present	Tile fragments containing metals such as lead and chromium; sludge from Sludge Settling Ponds (SWMU 2) containing RCRA metals such as lead	NFA
4	20 Cubic Yard Sludge Roll-Off Container	Roll-Off Container	Unknown to present	Sludge from Sludge Settling Ponds (SWMU 2) containing RCRA metals such as lead	No Further Action
5	20 Cubic Yard Floor Sweepings Roll-Off Container	Roll-Off Container	Unknown to 1999	Floor sweepings including tile fragments containing RCRA metals such as	No Further Action

SWMU #	SWMU Name	Type of Unit	Period of Operation	Waste Managed	Recommendation
6	Baghouse	Baghouse	1960s to 1999	Dust generated during tile pressing operations containing RCRA metals such as lead	Confirmatory Sampling
7	Walltown Drain	Drainage Ditch	1960s to present	Surface water runoff from the Ceramic Tile Pile (SWMU 3) potentially containing RCRA metals such as lead	RFI
8	Off-Specification Tile Accumulation Roll-off Container	Roll-Off Container	Unknown to 1999	Broken and off-specification tile	No Further Action
9	Filter Cake Waste Pile Area	Waste Pile	1988 or 1989 to present	Filter cake of solids contained in wastewater treated by Wastewater Pretreatment System (SWMU 1)	No Further Action
10a, 10b	Maintenance Building Waste Management Areas	a. Drum Storage Area b. Parts Washer	1960s to 1999	Used oil and degreasing solvents	No Further Action
11	Spray Line Area Sumps	Sumps	1960s or 1970s to present	Wastewater containing RCRA metals such as lead	Confirmatory Sampling

Table 2 Areas of Concern					
AOC #	AOC Name	Type of Unit	Period of Operation	Waste Managed	Release Potential
1	Area of Discharge from Settling Ponds into Rat Springs Branch	NPDES Discharge	1972 to present (No wastewater discharge received after 1990)	Wastewater and runoff containing RCRA metals such as lead	RFI
2	Broken Ceramic Tile Roadway	Road	Unknown to present	Tile fragments containing RCRA metals such as lead	Confirmatory Sampling
3	Former UST and AST Area	USTs and ASTs	Unknown (Suspected 1960s) to 1989	No wastes managed but stored gasoline, fuel oil #2, and diesel	No Further Action

2.0 INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide authority in the RCRA program to assist the U.S. Environmental Protection Agency (EPA) in implementing corrective action at RCRA facilities. RCRA facilities include all facilities that currently treat, store, or dispose of hazardous waste (or have done so in the past) as regulated under RCRA. The first step in the RCRA corrective action process is the RCRA Facility Assessment (RFA). The RFA is conducted to assess if a release of hazardous waste or hazardous constituents has occurred from solid waste management units (SWMUs) and to identify potential area of concern (AOCs) at the facility. A SWMU is defined as any discernable waste management unit at a RCRA facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for management of solid and/or hazardous waste. An AOC is an area where evidence of spills or other releases of waste have occurred resulting from waste management activities that may not fit the definition of a SWMU release. The main components of an RFA are to identify and gather information on releases at the RCRA facility; to evaluate SWMUs for releases to all media (groundwater, surface water, air, and soil); and to make preliminary determinations regarding releases of concern and the need for further action and interim measures at the facility.

Under Work Assignment No. R04804-1, EPA Region 4 requested that Booz Allen Hamilton (Booz Allen) conduct an RFA at the Porcelanite, Inc., (Porcelanite) facility located in Lexington, North Carolina. This RFA report outlines the findings of the preliminary review (PR) and the visual site inspection (VSI). The purpose of the RFA was to identify, gather information on, and evaluate the potential for releases to the environment from AOCs, including SWMUs, where releases of hazardous constituents may have occurred in the past.

The specific objectives of the RFA are to:

- Perform a PR of the file material and conduct a VSI to assess the potential for release of hazardous wastes or hazardous constituents from each SWMU and AOC

- Identify all SWMUs and AOCs located at the Porcelanite facility in Lexington, North Carolina

- Make preliminary determinations regarding releases of concern and the need for further actions, including confirmatory sampling (CS), RCRA facility investigations (RFIs) and/or interim measures (IMs) for each SWMU at the facility

- Rank each facility as a high, medium, or low priority facility utilizing the RCRA National Corrective Action Prioritization System (NCAPS).

2.1 File search and Visual Site Inspection

A file search of EPA Region 4 and North Carolina Department of Environment and Natural Resources (NCDENR) file material for the site was conducted in November 2002. Following the completion of the file search, a PR of the file material was conducted in July and August 2003 to develop an understanding of the site prior to conducting the VSI. A list of references used to prepare this report is provided in Section 7.0.

Primarily, the PR focused on past and current facility waste management practices involving waste generation, treatment, and storage and/or disposal. The PR also included a review of other activities and areas, not involving waste, which may have exhibited a potential for releasing contaminants to the environment (e.g., drum, raw materials, or product storage areas, fuel storage or transfer areas; and other areas of contamination). As a result of the PR, a tentative list of SWMUs was identified and used to plan the VSI. The PR also identified additional information that needed to be gathered during the VSI to fully assess the potential for releases from SWMUs.

On September 30, 2003, a three-person EPA/contractor team (John Johnston, EPA Region 4, and John Belin and Jeremy Hogard, Booz Allen Hamilton) performed the VSI. Also present were Bob Glazer and **Karim Pathan** from NCDENR. The primary facility participants were Tony Shaw for Mannington and Phil Rhan, a consultant for Mannington from Waters Edge Environmental, LLC. The purpose of the VSI was to address information gaps identified during the PR and to identify and document information associated with all SWMUs identified in the PR. Each SWMU identified during the PR was inspected and a meeting with facility representatives was conducted to obtain additional information (Booz Allen, 2003).

3.0 FACILITY DESCRIPTION

The EPA ID Number for the facility is NCD 986 181 451. The Porcelanite facility is an inactive ceramic tile manufacturing facility located at 20 Victor Street, Lexington, North Carolina, in Davidson County. The geographical location of the facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The location of the facility is shown on Figure 1. The Porcelanite facility is bounded on the north by the Charles Avenue right of way and the Lexington City Cemetery; on the east by Cotton Grove Road (North Carolina Highway 8); on the south by Victor Street (State Road 1261); and on the west the Winston-Salem southbound railway and undeveloped wooden property. Several residential homes are located immediately to the south of the facility property, across Victor Street. The entire Porcelanite property comprises approximately 7.5 acres and includes a 126,000 square foot process building that was used for manufacturing and office space, a small maintenance garage, and a small guard shack. The facility property is surrounded by a seven-foot chain-link fence topped with barbed wire and access is controlled by a key-coded security gate (Aquaterra, 1997b; Booz Allen, 2003).

4.0 DESCRIPTION OF SITE ACTIVITIES AND HISTORY

Mid-State Tile began operations at the Porcelanite property in approximately 1960. Prior to use by Mid-State Tile, the property was undeveloped, forested land. According to facility representatives, Mannington Ceramic Tile (Mannington) began operating at the site in 1985. Mannington ceased operations at the Porcelanite site and sold the property to P&M Tile, Inc., in 1994. P&M Tile, Inc., was later renamed Porcelanite, Inc. Porcelanite is currently the owner of the facility and property; however, Mannington retained responsibility for closure of the Ceramic Tile Pile (SWMU 3) and the Sludge Settling Ponds (SWMU 2). The tile manufacturing operations at the Porcelanite facility were shut down in 1999. Shortly after the operations were terminated by Porcelanite, the tile manufacturing equipment was dismantled, sold, and removed from the property (Aquaterra, 1997b; Booz Allen, 2003).

According to facility representatives, the tile manufacturing process conducted at the Porcelanite property began when raw materials, such as clay, silica, feldspar, zinc oxide, limestone, zirconium silicate, and glass frit, were trucked to the site and stored in silos. These materials were then blended in various proportions and sent via belt conveyors to the Ball Mills, where they were mixed with water. After mixing, the materials were transferred to the spray dryer for drying. Using belt conveyors, the materials were then sent to the tile presses where they were formed into various sizes of tile. Three automatic presses for floor tile and as many as twenty small presses for producing trim tile were operated at the facility. After pressing, the green tiles were heated to remove moisture to less than one percent and they were sent to the spray lines to receive color. From the spray lines, the tiles were sent through one of three kilns where they were fired at approximately 2000 degrees Fahrenheit. Tiles removed from the kilns were allowed to cool before being boxed for shipment. The finished products were sold to retail tile outlets. The Standard Industry Classification (SIC) code listed on the facility's permit application was 3253 and the facility was operated for the production of glazed ceramic floor and wall tile (Aquaterra, 1997b; Booz Allen, 2003; Mannington, 2004).

4.1 Waste Management Practices

Currently, the site is inactive and the only waste management unit that is operational is the Wastewater Pretreatment System (SWMU 1), which manages limited quantities of sanitary sewage before it is discharged directly to the City of Lexington sewer system.

Historically, the facility generated several waste streams when it was operated by Mannington and Porcelanite to produce ceramic tile. It should be noted that prior to March 1990, the raw materials (i.e., clay) and glazes used by Mannington in their ceramic tile manufacturing operations contained various metals, primarily lead and chromium, which were considered hazardous. Several different waste characterizations performed on the waste tile fragments generated by the facility prior to March 1990 confirmed that leachable lead concentrations exceeded regulatory levels for the toxicity characteristic using either the Extraction Procedure (EP) Toxicity Test or the Toxicity Characteristic Leaching Procedure (TCLP). Therefore, the waste tile fragments are characteristic for lead (D008). By March 1990, Mannington had modified its processes to utilize raw materials and glazes that contained only de minimis quantities of metals.

According to a 1990 report entitled "Existing Waste Stream, Solid Waste Determination" prepared by NCDENR, the waste streams generated by the facility in 1990 were categorized into five separate waste streams:

- Unfired Glaze Ceramic Tile – This waste stream consisted of unfired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. Prior to 1990, this waste stream was disposed of in the Ceramic Tile Pile (SWMU 3). From 1990 until the facility stopped operating in 1999, this waste stream was stored on site before it was disposed of in an off-site landfill. According to correspondence from NCDENR to Mannington in 1990, ceramic tile manufacturing operations generated as much as 20,000 pounds per week of unfired glaze ceramic tile.

- Fired Glaze Ceramic Tile – This waste stream consisted of fired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. Prior to 1990, this waste stream was disposed of in the Ceramic Tile Pile (SWMU 3). From 1990 until the facility stopped operating in 1999, this waste stream was stored on site before it was disposed of in an off-site landfill. According to correspondence from NCDENR to Mannington in 1990, ceramic tile manufacturing operations generated as much as 110,000 pounds per week of fired glaze ceramic tile.

- Ceramic Process Glaze Overspray Liquid Wastewater – This waste stream consists of cooling and wash water from the various tile manufacturing process. The wastewater contains high concentrations of solids, which contain metals. Between 1972 and 1989, the liquid wastewater was passed through two Sludge Settling Ponds (SWMU 2) before it was discharged to Rat Springs Branch. After 1989, a Wastewater Pretreatment System (SWMU 1) processed the liquid wastewater before discharging it to the City of Lexington sewer system.

- Liquid Wastewater Pretreatment System Filter Cake – Prior to discharge, the liquid wastewater passes through the Wastewater Pretreatment System (SWMU 1), which includes a filter press as the final pretreatment step. The filter cake is generated by the filter press and is stored on site before it is disposed of in an off-site landfill. According to correspondence from NCDENR to Mannington in 1990, ceramic tile manufacturing operations generated as much as 22,000 pounds per week of filter cake waste.

- Floor Sweepings – This waste stream consists of daily sweepings from the floor of the process area in the main building. This waste stream was stored on site before it was disposed of in an off-site landfill. According to correspondence from NCDENR to Mannington in 1990, ceramic tile manufacturing operations generated as much as 5,000 pounds per week of floor sweepings.

In 1990, samples were collected from each of these waste streams. The samples were analyzed for RCRA primary metals in extracted leachate (EP Toxicity Test via EPA Method 1310), volatile organic compounds (VOCs) (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The samples collected from the fired glaze ceramic tile waste stream did not contain any constituents at concentrations above detection limits. The unfired glaze ceramic tile and the filter cake waste stream samples contained bis(2-ethylhexyl)phthalate at concentrations of 5.6 mg/kg and 1.5 mg/kg, respectively. The floor sweepings samples contained 1,1,1-trichloroethane (0.087 mg/kg), bis(2-ethylhexyl)phthalate (15 mg/kg), and benzyl butyl phthalate (3.6 mg/kg). In addition, the extractable leachate from the floor sweepings sample also contained 0.84 mg/L of lead. All other constituents in all of the waste stream samples were not detected above detection limits (NCDENR, 1990b, 1990c, 1990d, 1993; Aquaterra, 1990b, 1997b).

Prior to January 1, 1989, wastewater treatment conducted at the Porcelanite facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU 2), which allowed solids to settle prior to discharge. Wastewater was generated, primarily during the glazing of ceramic tile at the spray lines. After wastewater had passed through the second settling pond, Mannington discharged wastewater directly into Rat Spring Branch of the Yadkin-Pee Dee River basin, pursuant to National Pollutant Discharge Elimination System (NPDES) permit #NC0006459 (ENSCI, 1992).

On January 1, 1989, after installation of the Wastewater Pretreatment System (SWMU 1), Mannington stopped discharging to Rat Springs Branch and commenced discharging to the City of Lexington sewer system. The pretreatment system installed by Mannington consisted of wastewater holding tanks and open-top solids precipitation tanks with pH control. The solids generated by the precipitation tanks are processed by a filter press. According to facility representatives, the filter cake is stored on site before it is transported to the Davidson County Sanitary Landfill for disposal. According to facility representatives, the solids generated by the filter press are characterized annually to ensure that the wastes are nonhazardous (NCDENR, 1990b, 1990c, 1990d, 1993; Aquaterra, 1990b, 1997b).

Once the wastewater system was operational, the Sludge Settling Ponds (SWMU 2) were no longer needed. As a result, after soil, sludge, and groundwater samples were collected, the Sludge Settling Ponds (SWMU 2) were closed in 1993 by removing the sludge, stabilizing the sludge, returning some of the sludge to SWMU 2, and constructing a cap over the unit to include an asphalt roadway used by facility personnel. According to the closure plan, some of the sludge from the Sludge Settling Ponds (SWMU 2) was deposited in the Ceramic Tile Pile (SWMU 3) and some was taken to the Davidson County landfill. A closure report for the Sludge Settling Ponds (SWMU 2) was submitted to NCDENR in May 1992 and was approved in August 1992 (ENSCI, 1992; NCDENR, 1990b, 1990c, 1990d, 1993; Aquaterra, 1990b, 1997b).

The Ceramic Tile Pile (SWMU 3) received glazed and unglazed, fired and unfired ceramic tile scraps and wastes generated by the manufacturing process operated by Mannington and Porcelanite. In addition, some sludge from the two former Sludge Settling Ponds (SWMU 2) was deposited in SWMU 3 during closure activities. Both the sludge from the Sludge Settling Ponds (SWMU 2) and the glazed and unglazed, fired and unfired ceramic tile scraps and wastes deposited in the Ceramic Tile Pile prior to March 1990 contained significant concentrations of metals, primarily lead and chromium, that are considered hazardous. According to the available file material, as much as 20,000 pounds per week of unfired glaze ceramic tile and 110,000 pounds per week of fired glaze ceramic tile were deposited in the Ceramic Tile Pile (SWMU 3). Since 1990, waste tile has been stored on site in the Off-Speculation Tile Accumulation Roll-Off Container (SWMU 9) before it is disposed of off site in a solid waste landfill. Several assessments of the tile pile waste materials conducted by Porcelanite indicated that lead, methylene chloride, and bis(2-ethylhexyl)phthalate were the primary constituents detected in the tile pile waste materials. Several radionuclides were also detected, including gross alpha, gross beta, radium 226, radium 228, and uranium 238; however, concentrations of these constituents were found to be consistent with concentrations detected in background soil samples from the area (NCDENR, 1990b, 1990c, 1990d, 1993; Aquaterra, 1990b, 1997b).

4.2 Regulatory History

The following is a list of significant regulatory events at the Porcelanite facility:

Prior to January 1, 1989, wastewater treatment conducted at the Porcelanite facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU 2), which allowed solids to settle prior to discharge. After wastewater treatment, Mannington discharged wastewater directly into Rat Spring Branch of the Yadkin-Pee Dee River basin, pursuant to NPDES permit #NC0006459 (ENSCI, 1992).

On February 26, 1990, Charles T. Main, Inc., performed a preliminary site assessment. Based on the findings of this site assessment and the fact that soil and groundwater at the site had likely been impacted, on June 11, 1990, NCDENR issued a Compliance Order with Administrative Penalty (NCDENR, 1990b).

On July 5, 1990, Mannington submitted a consolidated Hazardous Waste Permit Application, Part A to EPA. This permit application listed two hazardous waste management units – a 69,300 cubic yard waste pile and a 8,240 cubic yard surface impoundment. Both units were listed as managing D008 wastes, which are wastes that exhibit the toxicity characteristic for lead. These two units are reported to be the Ceramic Tile Pile (SWMU 3) and the Sludge Ponds (SWMU 2), respectively (Mannington, 1990).

On September 24, 1991, NCDENR issued a Notice of Violation to Mannington for several violations of groundwater monitoring requirements documented during a comprehensive groundwater monitoring evaluation conducted on February 19, 1991 (NCDENR, 1991a).

On May 29, 1992, Mannington submitted a Hazardous Waste Permit Application, Part A, to EPA. This permit application provided the same information as the previous permit application; however, it also indicated that Mannington had two other environmental permits. The first permit listed was a publicly owned treatment works (POTW) permit with the City of Lexington. The second permit was Air Permit #5408R5, which was issued the City of Lexington. The permit application also lists a request for change in the air permit requirements. No other information regarding these permits is provided (Mannington, 1992).

In May 1992, Porcelanite submitted a Closure Plan for the Sludge Settling Ponds (SWMU 2) to NCDENR. On August 13, 1992, NCDENR provisionally approved the Closure Plan for the Settling Ponds. In July 1993, closure of the Sludge Settling Ponds (SWMU 2) was completed and a certified closure report was submitted to NCDENR. No approval of the certified closure report by NCDENR was identified in the available file material (ENSCI, 1992).

In July 1992, Phase I construction work was performed to stabilize the tile pile area/parking area. Phase II work was completed to pipe the Walltown Drain (SWMU 7) (Aquaterra, 1997a, 1997b).

Between 1992 and 1998, numerous investigations of the Ceramic Tile Pile (SWMU 3) were conducted. These included assessments of soil and groundwater, investigation and characterization of the wastes stored in SWMU 3, and performing a treatability study to evaluate possible remediation techniques for the Ceramic Tile Pile (SWMU 3) (Aquaterra, 1997a, 1997b).

According to facility representatives, "dirty" closure of the Ceramic Tile Pile (SWMU 3) was initiated in 1997, prior to approval from NCDENR, and was completed in 1999. The closure of SWMU 3 involved covering and grading the area around the unit to make it level with the facility parking lot, and installation of a vegetated/gravel cap over the impacted area. Recent correspondence to NCDENR from Porcelanite's consultants dated January 28, 2004, indicates that the closure plan is currently being reviewed and has gone through the public notice process (Aquaterra, 1997a, 1997b; Mannington, 2004).

5.0 ENVIRONMENTAL SETTING

5.1 Site Location and Setting

The Porcelanite facility is located at 20 Victor Street, Lexington, North Carolina, in Davidson County. The geographical location of the facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The location of the facility is shown on Figure 1. The Porcelanite facility is bounded on the north by the Charles Avenue right of way, the Lexington City Cemetery, and undeveloped wooded property, and on the east by Cotton Grove Road (North Carolina Highway 8). The facility is bounded on the south by Victor Street (State Road 1261) and on the west by the Winston-Salem southbound railway and undeveloped wooded property. The property is located in a relatively rural area but is zoned for light industrial use. The entire Porcelanite property comprises approximately 7.5 acres and includes a 126,000 square foot building that was used for manufacturing and office space, a small maintenance garage, and a small security shack. The buildings located on the property are not currently in use (Aquaterra, 1997b; Booz Allen, 2003).

5.1.2 Land Use

The Porcelanite facility is currently inactive and has not been used for manufacturing activities in approximately four years. As a result, workers do not regularly occupy the property. According to facility representatives, the only workers who access the property at any time are remediation workers and consultants working on closure activities. In addition, there are no plans to reuse the property in the immediate future (Booz Allen, 2003).

The nearest residences to the facility property are located to the south, across Victor Street. Additionally, a residence and small convenience store is located on the property adjacent to the northeast corner of the facility property. These residences are located approximately 100 feet from the Ceramic Tile Pile (SWMU 3). A middle school is located across Cotton Grove Road, approximately 750 feet northeast of the Ceramic Tile Pile (SWMU 3) (Booz Allen, 2003).

According to the North Carolina Division of Parks and Recreation, no records of any rare or threatened species or critical habitats have been identified at the Porcelanite site. The closest recreational areas are Washington Park and Pool facility and a golf course located approximately 3,200 feet east of the facility (Aquaterra, 1997b).

5.1.3 Topography and Surface Water

The Davidson County area is characterized by gently rolling hills divided by small streams. The Porcelanite facility is situated on a hillside, above a small stream called Walltown Drain (SWMU 7). The elevation of the site varies from approximately 770 feet above mean sea level (MSL) to approximately 730 feet MSL at the Walltown Drain (SWMU 7). Walltown Drain (SWMU 7), a creek that flows northward through the eastern portion of the property, was previously piped to prevent surface water runoff from the Ceramic Tile Pile (SWMU 3) from entering the creek. At the time the piping was installed at Walltown Drain (SWMU 7), a permanent 25-foot easement was conveyed to the City of Lexington. A sanitary sewer line and storm sewer lines also run parallel to Walltown Drain (SWMU 7) northward across the eastern portion of the property and a permanent 25-foot easement for these lines was also conveyed to the City of Lexington (Aquaterra, 1997b).

Runoff from the site discharges primarily to the Walltown Drain (SWMU 7). The Walltown Drain runs north approximately 0.5 miles to Rat Springs Branch, which flows to the northwest approximately 2 miles to Swearing Creek, a tributary of the Yadkin River. As of 1997, the Winston-Salem Regional Water Quality Office classified Rat Springs Creek as a "C" surface water designation, which is applied to freshwater protected for secondary recreation, fishing, aquatic life propagation and survival, and wildlife (Aquaterra, 1997b).

The Walltown Drain (SWMU 7), located at the toe of the Ceramic Tile Pile (SWMU 3), was enclosed in pipe in 1992/1993 under a Nationwide 26 permit from the U.S. Army Corps of Engineers (USACE). This permit was issued based on the determination by the USACE that no significant wetlands were present at the site (Aquaterra, 1997b).

5.1.4 Geology and Hydrogeology

The Porcelanite site is located in the Lexington area of Davidson County, North Carolina, which lies within the eastern portion of the Charlotte litho-tectonic belt in the Piedmont Physiographic Province. This is a zone of regionally metamorphosed amphibolite facies igneous rocks, bounded on the east and west sides by shear zones. The site is underlain by Late Proterozoic-aged undivided metavolcanic rocks. Bedrock lithologies at the site consist of massive, quartz-potassium feldspar-muscovite granite to granodiorite that could be associated with the Pennsylvanian to Permian-aged Churchland Pluton or the Devonian-aged Yadkin Pluton. No significant ores deposits have been recognized or mined extensively in the immediate Lexington area. However, silver, lead, cobalt, zinc, gold and copper have been recognized and mined in areas located 5 to 20 miles south and east of the site (USEPA, 2002).

The predominant lithology at the site has been described as pink to tan, silty sand-textured residual soils (saprolite) weathered in place from the underlying bedrock. The saprolite grades from intensely weathered rock near the surface to slightly weathered rock at depth. In some areas, sandy clay and clayey sand soils have developed in the upper 5 to 10 feet of saprolite (USEPA, 2002).

Groundwater occurs in two interconnected zones underlying the site. These zones included the unconsolidated (saprolite) water table aquifer and the underlying fractured bedrock aquifer. Groundwater in the water table aquifer is transmitted in a generally laminar fashion through the B- and C- soil zone horizons. These zones tend to have a fairly uniform porosity and permeability and have a relatively large storage capacity in the regolith overlying fractured bedrock. The two water-bearing zones do not appear to have a confining unit separating them. The saprolite/regolith zone acts as the storage reservoir for the underlying bedrock zone, and recharges the bedrock aquifer in response to water withdrawal (USEPA, 2002).

Based on previous site investigations, groundwater saturated soils in the uppermost aquifer occur at a depth of about 5.5 to 24 feet below ground surface (bgs) and extend to the top of the partially weathered rock unit at a subsurface depth of between 27 and 50 feet. From previous investigations, groundwater in the water table aquifer was found to be flowing from the southwest towards the northeast under a hydraulic gradient of about 0.024 to 0.038 feet/foot. There is a pronounced flattening of the gradient in the area under the building, the parking lot, and the capped Ceramic Tile Pile (SWMU 3) before the gradient generally steepens on the northeastern side of the property as groundwater approaches the tributary stream known as the Walltown Drain branch (ENSCI, 1993).

According to a memorandum by NCDENR dated January 12, 1998, 19 residences were identified immediately north of the facility and at least seven of these residences have groundwater wells. Sampling data indicate that these wells have not been impacted; however, they are located hydraulically downgradient from the facility (NCDENR, 1998a).

Initially, groundwater monitoring wells were installed in September 1989 in response to a request by NCDENR to investigate possible groundwater contamination. It appears that these wells included MW-1 through MW-6. Prior to May 1992, MW-5 and MW-6 were abandoned. In April 1990, MW-7 and MW-8 were installed and MW-9 thru MW-13 were drilled at some point between 1990 and 1992. Well logs indicate that wells MW-14 through MW-26 were installed in August or September 1992. Well MW-28 was installed in June 1993. Wells MW-3A, MW-7A, MW-21A, MW-22A, and MW-23A were installed in September 1998. These wells were installed to replace wells that had been previously abandoned. MW-26A was installed in May 1999 to replace well MW-26, which was abandoned in 1996 or 1997 (USEPA, 2002).

Of the eighteen monitoring wells currently on site, fourteen are completed into the saprolite/shallow aquifer and wells MW-9, MW-11, MW-19, and MW-28 are completed in the bedrock/deeper saprolite aquifer. The wells are all 2-inch PVC with 5 to 15 feet of 0.010 slotted PVC screen (USEPA, 2002).

In November 1992, single slug tests were conducted on fifteen monitoring wells. Results from the tests indicated a derived aquifer permeability of 0.40 ft/d. Groundwater flow velocity was calculated to range from 0.030 ft/d to 0.054 ft/d. Groundwater flows toward the northeast at an average hydraulic gradient of 0.04 ft/ft. The gradient steepens on the northeastern side of the property as groundwater approaches the tributary stream known as Walltown Drain. Recharge to the water table zone apparently occurs as surface water infiltration over the topographically higher regions southwest of the site (USEPA, 2002).

The most recent groundwater sampling event conducted at the site occurred in March 2003 and involved sampling of 19 wells (MW-1, MW-3A, MW-7A, MW-8, MW-9D, MW-10, MW-11D, MW-12D, MW-12, MW-14, MW-18, MW-19D, MW-21A, MW-22A, MW-23A, MW-24, MW-25, MW-26A, and MW-28D). It should be noted that MW-13 could not be sampled because the well was found to be dry. Groundwater samples were analyzed for boron, cobalt, fluoride, lead, sulfate, iron, and aluminum. Results from analysis of the groundwater samples indicate that boron was detected in nine wells at concentrations exceeding the 15 North Carolina Administrative Code 2L drinking water standards (NC 2L DWS) of 0.32 mg/L (MW-3A, MW-9, MW-12, MW-14, MW-22A, MW-23A, MW-25, MW-26A, and MW-28). The maximum detected concentration was 32.1 mg/L in MW-26A, which is located northeast of the Sludge Settling Ponds (SWMU 2). In addition, lead was detected above the NC 2L DWS of 0.015 mg/L in one well (MW-14) at a concentration of 0.028 mg/L (Mannington, 2004).

6.0 SWMU AND AOC DESCRIPTIONS

Based on the PR and information gathered during the VSI, a total of 11 SWMUs and three areas of concern (AOCs) were identified at the Porcelanite facility. The names of these SWMUs and AOCs are listed in Attachment 1 and their locations are identified on Figure 2. Photographs of the SWMUs taken during the VSI are included in Appendix B.

6.1 SWMU 1 - Wastewater Pretreatment System

a. Holding Tanks
b. Precipitation Tanks
c. Filter Press
4. Sump

TYPE OF UNIT: Wastewater Pretreatment System

PERIOD OF OPERATION: January 1989 to present

PHOTOGRAPH NUMBER(S): 24 through 30

PHYSICAL DESCRIPTION AND CONDITION:

Historically, wastewater generated by the tile manufacturing operations was discharged to the Sludge Settling Ponds (SWMU 2). In 1988, a substantial modification of the wastewater treatment system at the Porcelanite facility occurred – all wastewater that had previously been discharged to the Sludge Ponds (SWMU 2) was channeled to a new Wastewater Pretreatment System (SWMU 1) (ENSCI, 1993).

The Wastewater Pretreatment System (SWMU 1) is located in a 60-foot long by 30-foot wide by 25-feet high room in the northwest corner of the main process building. The floor of this room was covered in tile, and a sump six inches wide and 12 inches deep bisects the room into eastern and western halves. According to facility representatives, this sump collects wastewater that is spilled during treatment so it can be pumped back into the holding tanks. The two halves of the room form two distinct areas – the holding tank area in the eastern half and the precipitation tank/filter press area in the western half. The holding tank area is a rectangular area surrounded by a six-foot high, concrete secondary containment wall that is 55 feet long and 25 feet wide. This area contains two 3,000-gallon fiberglass tanks that receive wastewater from the process area. According to facility representatives, wastewater is primarily generated by spray lines used to cool the fired tile that exits the kilns. The tiles were conveyed from the tile presses via a conveyor belt to the spray lines where water, glaze and stains were applied to green tile before it was sent to the kilns. The water from the spray heads were captured beneath the conveyor belt through floor grates that covered a series of subsurface trenches. This wastewater is conveyed to the holding tanks by a series of open trenches and grate-covered sumps that make up the Spray

Line Area Sumps (SWMU 11) (Booz Allen, 2003).

The western portion of the wastewater treatment room contains four precipitating tanks of various sizes (estimated to be between 250 and 500 gallons) located in the northwestern corner and a filter press located in the west-central portion of the room. Wastewater from the holding tanks is pumped to the precipitation tanks where solids are allowed to settle. Flocculent is added to increase the rate of precipitation and pH-adjusting solutions are added. At the time of the VSI, four drums of chemicals were stored near the precipitation tanks. The first two drums – labeled Selfloc and PolySep 1127 – were described as a flocculent by facility representatives. The second two drums – one unlabeled and one labeled as caustic soda – were described as pH-adjusting solutions by facility representatives. Treated wastewater from the precipitation tanks is discharged to the City of Lexington sewer system. In the past, some of the treated wastewater was reclaimed and returned to the spray lines. Sludge from the precipitation tanks is pumped to the filter press, where additional water is extracted from the solids by compressing it into a filter cake. The extracted water is returned to the precipitating tanks. The filter cake leaves the filter press via a conveyer belt that drops it through a hole in the western wall of the main process building, into the Filter Cake Waste Pile Area (SWMU 9) (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Because manufacturing operations no longer occur at the site, the unit currently only treats small amounts of rainwater that accumulate in the Spray Line Area Sumps (SWMU 11) due to leaks in the roof of the process building. Previously, this unit received wastewater that was primarily generated by spray lines associated with the tile manufacturing operation. According to facility representatives, the wastewater contains high concentrations of solids – primarily clay and silica raw materials used to make the tile – and overspray from the glazing of fired tile. Prior to 1990, the clay and silica contained hazardous constituents such as lead and chromium; however, it is unclear if this unit received wastewater contaminated with metals. If this unit did receive wastewater contaminated with metals, it is possible that it would be characteristic for toxicity, most likely for lead (D008); however, no sampling data are available to confirm this possibility. In addition, the pH of the incoming wastewater is usually in the range of 4 to 6. As a result, caustic soda is added to neutralize the pH to a nominal range of 7 to 8 before discharge to the sanitary sewer system (ENSCI, 1993; Booz Allen, 2003; Mannington, 2004).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

At the time of the VSI, this unit was in poor condition. Numerous stains were observed both inside the secondary containment and on the tile floor beneath the precipitating tanks and the filter press. In addition, the tile floor was cracked and deteriorating in several places and a substantial amount of an unknown white powdery residue was observed on the floor and secondary containment walls. Also, a significant amount of liquid was observed in the sump and on the tile floor. The source of the liquid could not be determined; however, it appeared that the liquid was untreated or partially treated wastewater that had spilled or leaked from the precipitating tanks. Finally, the bung on the metal drum containing PolySep 1127 was open and a significant amount of rust was observed on the top and sides of the drum. In general, very poor housekeeping procedures were observed associated with the Wastewater Pretreatment System (SWMU 1) (Booz Allen, 2003).

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)[1]
	RFI Necessary	( )

COMMENTS:
[1] Because of the extremely poor housekeeping procedures associated with this unit, the poor structural condition of the floor (e.g., cracks), and the extensive staining that was observed, it is recommended that sampling be performed to further investigate the potential for release of hazardous constituents. Most likely, this sampling should include wipe sampling of the floor and walls in the areas of staining, an investigation to determine the integrity of the sump and floor of the unit, and, if it is determined that the sump or floor integrity has been compromised, sampling of the soils beneath the unit. Samples should be analyzed for RCRA metals, specifically lead.

6.2 SWMU 2 - Sludge Settling Ponds

TYPE OF UNIT: Surface Impoundments

PERIOD OF OPERATION: 1972 to 1989

PHOTOGRAPH NUMBER(S): 11

PHYSICAL DESCRIPTION AND CONDITION:

SWMU 2 consisted of two surface impoundments of unknown dimensions located in the northwestern corner of the property, between the northern property boundary and the northern wall of the main building. Calculations indicate a total volume for both ponds to be approximately 8,240 cubic yards, consisting of approximately 3,625 cubic yards in the western pond and approximately 4,615 cubic yards in the eastern pond. Prior to January 1, 1989, wastewater treatment conducted at the Porcelanite facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU 2), which allowed solids to settle prior to discharge. After wastewater passed through the second (eastern) settling pond, Mannington discharged wastewater directly into Rat Spring Branch of the Yadkin-Pee Dee River basin pursuant to NPDES permit #NC0006459 (ENSCI, 1993, 1994).

In July 1993, closure of the Sludge Settling Ponds (SWMU 2) was completed according to the approved closure plan and a certified closure report was submitted to NCDENR. As a result of closure activities, sludge was removed from both sludge ponds, some of the surrounding soils were excavated, all piping associated with the sludge ponds was removed, and an asphalt cap was placed over the area. According to facility representatives, the cap installed during closure of the Sludge Settling Ponds (SWMU 2) included a 30-millimeter synthetic liner and an asphalt top layer. According to a September 1992 Consent Agreement, sludge from the Sludge Settling Ponds (SWMU 2) was deposited in the Ceramic Tile Pile (SWMU 3). At the time of the VSI, the asphalt cover appeared to be in good condition with no significant cracks, staining, or erosion identified (ENSCI, 1993, 1994).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The Sludge Settling Ponds (SWMU 2) received process wastewater generated by spray lines associated with the tile manufacturing operation. According to facility representatives, the wastewater contained high concentrations of solids – primarily clay and silica raw materials used to make the tile – and overspray from the glazing of fired tile. Prior to 1990, the clay and silica contained hazardous constituents such as lead and chromium. In addition, according to facility representatives, the pH of the incoming wastewater is usually in the range of 4 to 6. A site assessment of the facility, prepared by Mannington, and dated April 12, 1990, consisted of a field investigation in which samples were collected from the sludge ponds. TCLP analysis results detected leachable lead levels in the sludge from the sludge ponds ranging from 230 mg/L to

1,230 mg/L. All VOCs and semi-volatile organic compounds (SVOCs) were below detection limits with the exception of methylene chloride, acetone, and carbon disulfide. As a result, the solid waste (i.e., sludge) disposed of in the sludge ponds is a characteristic hazardous waste (D008) because samples from three different areas contain TCLP lead levels in excess of the regulatory limit of 5.0 mg/L (NCDENR, 1990b; ENSCI, 1993, 1994).

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (H) Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Prior to initiating closure activities at this unit, groundwater monitoring results indicated the presence of cadmium, iron, lead, manganese, nickel, and zinc in shallow and deep wells at concentrations that exceeded the North Carolina (NC) 2L Drinking Water Standards (DWSs). Specifically, groundwater samples collected from monitoring wells MW-9, MW-11, MW-12, and MW-13 all contained exceedances of the NC 2L DWSs during the 1990, 1991, and/or 1992 groundwater sampling events (ENSCI, 1993, 1994; NCDENR, 1999a, 1999b, 1999d).

In addition, sample analysis results detected leachable lead levels in the sludge from the sludge ponds ranging from 230 mg/L to 1,230 mg/L. These concentrations exceed the TCLP regulatory limit of 5.0 mg/L, which supports the conclusion that lead in sludges from SWMU 2 may have been released to subsurface soils and, ultimately, to groundwater (ENSCI, 1993, 1994; NCDENR, 1999a, 1999b, 1999d).

The initial closure for the Sludge Settling Ponds (SWMU 2) involved stabilizing the sludges in the ponds using Portland cement. The stabilization process reduced the leachable (TCLP) concentrations of the metals in the sludge. After stabilization, an asphalt cap was placed over the former ponds. At the time of the VSI, the asphalt cover constructed over the Sludge Settling Pond (SWMU 2) area appeared to be in good condition with no significant cracks, staining, or erosion identified (ENSCI, 1993, 1994; NCDENR, 1999a, 1999b, 1999d; Aquaterra, 1997a, 1997c; Booz Allen, 2003). Confirmatory samples collected outside the capped ponds indicated the presence of contaminants of concern above the unrestricted use level. At one location SS-2 outside the northeastern fence line, the surface soil contained 6.64 mg/L of leachable lead, which exceeds the 5 mg/L TCLP regulatory limit. Based upon the results of the confirmatory sampling and a risk evaluation of the contaminants of concern remaining in the soil outside the capped area additional contaminated soil was removed. This removal action and risk evaluation is documented in the July 14, 2004 Revised Closure Plan for the Former Settling Ponds.

Soil sampling conducted in the Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch (AOC 1), which received wastewater discharged from SWMU 2 until 1990, identified concentrations of RCRA metals, primarily lead, above background

concentrations. Section 6.14 provides additional discussion of soil contamination associated with AOC 1.

RECOMMENDATION:	No Further Action	(X)[1]
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
[1] A No Further Action recommendation for SWMU 2 is contingent upon continued compliance with the approved closure and post-closure plans.

6.3 SWMU 3 - Ceramic Tile Pile

TYPE OF UNIT: Waste Pile

PERIOD OF OPERATION: 1950s or 1960s to Present (off line-1993; capped-1995)

PHOTOGRAPH NUMBER(S): 2 through 5

PHYSICAL DESCRIPTION AND CONDITION:

The Ceramic Tile Pile (SWMU 3) is located east of the main process building and immediately west of the Walltown Drain (SWMU 7). The unit extends from approximately 12 feet from the southern fence line to the Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch (AOC 1). The total volume of the unit is approximately 260,000 tons (Transmittal of Revised Closure and Post-Closure Care Plans, July 30, 1997). The facility used the unit to store waste glazed and unglazed ceramic tile, fired and unfired ceramic tile scraps, and some sludge from the Sludge Settling Ponds (SWMU 2). The facility initiated "dirty" closure (i.e., wastes were to be left in place) of the unit in 1997 (Closure and Post-closure Care Plan, April 1, 1997). The unit is currently capped with a "flat top surface cap" and a "slope surface cap" using a clayey silt to silty clay soil. The top portion of the unit is level with the facility parking lot and has gravel covering the majority of the top of the unit. The sloped sides of the unit are covered with native vegetation (Aquaterra, 1997b; Mannington, 2004; NCDENR, 1997a, 1997b; Booz Allen 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Prior to 1990, these waste streams were disposed of in the Ceramic Tile Pile:

- Unfired Glaze Ceramic Tile – This waste stream consisted of unfired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. According to correspondence from NCDENR to Mannington in 1990, as much as 20,000 pounds per week of unfired glaze ceramic tile were generated by ceramic tile manufacturing operations.

- Fired Glaze Ceramic Tile – This waste stream consisted of fired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. According to correspondence from NCDENR to Mannington in 1990, ceramic tile manufacturing operations generated as much as 110,000 pounds per week of fired glaze ceramic tile.

In 1990, Mannington stopped depositing waste tile material in SWMU 3 (NCDENR, 1990d, 1990e, 1990f).

A site assessment of the facility, prepared by Mannington, and dated April 12, 1990, consisted of a field investigation where samples were collected from the Ceramic Tile Pile (SWMU 3). Sample analysis results detected leachable lead levels in the ceramic tile pile ranging from 9.26 mg/L to 79.9 mg/L. As a result, the solid waste (i.e., ceramic tile) disposed of in the ceramic tile pile is a characteristic hazardous waste (D008) in that samples from three different areas contained TCLP lead levels in excess of the regulatory limit of 5.0 mg/L (NCDENR, 1990b).

In addition, during closure activities associated with the Sludge Settling Ponds (SWMU 2), an unknown quantity of partially stabilized sludge was deposited on the Ceramic Tile Pile (SWMU 3). According to the closure report for the Sludge Settling Ponds (SWMU 2), the partially stabilized sludge exceeded the NC 2L DWS for mercury and zinc and the TCLP regulatory limit for lead at the time it was deposited in the Ceramic Tile Pile (SWMU 3) (Aquaterra, 1997b; Mannington, 2004; NCDENR, 1997a, 1997b; Booz Allen 2003).

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H) Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

The Ceramic Tile Pile received glazed and unglazed, fired and unfired ceramic tile scraps and wastes generated by the manufacturing process operated by Mannington and Porcelanite. In addition, some sludge was deposited from the two former Sludge Settling Ponds (SWMU 2) during closure activities. Both the sludge from the Sludge Settling Ponds (SWMU 2) and the glazed and unglazed, fired and unfired ceramic tile scraps and wastes deposited in the Ceramic Tile Pile (SWMU 3) prior to March 1990 contained significant concentrations of metals, primarily lead and chromium, that are considered hazardous based on TCLP results (Aquaterra, 1997b; Mannington, 2004; NCDENR, 1997a, 1997b; Booz Allen 2003).

Groundwater monitoring and shallow aquifer assessments have been conducted at this site since 1989. A total of twenty-six groundwater monitoring wells were installed for detection and assessment monitoring around the former holding ponds and the waste ceramic tile pile. Exceedences of groundwater standards (e.g., MCLs and NC 2L DWS) have been detected in the monitoring wells, so the wells are monitored on a quarterly basis. According to a 1999 Annual Groundwater Assessment Report, the two wastewater holding ponds were closed in 1993 and the ceramic tile pile was closed at this point. Evaluations of the waste management units indicated that both units are RCRA-regulated units due to the leachable lead content of the waste. A total of 18 groundwater monitoring wells are currently monitoring groundwater at the site. In the December 1999 sampling event, boron was the only targeted compound analyzed for and it was detected in 3 wells (MW-1, MW-22< and MW-23). Of those three wells, only MW-22 was above the NC 2L groundwater standards at 8.54 mg/l. Also, during the other quarters of that year, seven targeted analytes were detected in excess of the NC 2L groundwater standards: boron, cobalt, manganese, zinc, titanium, vanadium, and gross beta radionuclides. Boron was detected above these standards in 14 wells (MW-3, MW-9, MW-10, MW-12, MW-13, MW-14, MW-18,

MW-19, MW-22, MW-23, MW-24, MW-25, MW-26A, and MW-28). Cobalt was detected in three wells (MW-1, MW-12, and MW-13). Manganese was detected above the standards in five wells (MW-9, MW-12, MW-13, MW-14, and MW-28). Zinc was detected above the standards in two wells (MW-9 and MW-12). Titanium was detected above the standards in four wells (MW-7, MW-21, MW-25, and MW-26A). Vanadium was detected above the standards in three wells (MW-7, MW-22 and MW-25). Fluoride was not detected above the standards during the 1999 sampling events. Only MW-10 has consistently shown any exceedence for fluoride. Gross Beta was detected above the standards in four wells (MW-9, MW-12, MW-13, and MW-14). Gross beta is routinely detected in every sample including MW-1, which is upgradient of the site. Three of these compounds (cobalt, gross beta and vanadium) do not have a codified standard so the method detection limit is considered the standard. VOCs were not detected in any constituents during the September sampling period in 1999 (Aquaterra, 1997b, 2000; Mannington, 2004; NCDENR, 1997a, 1997b; USEPA, 2002; Booz Allen 2003).

Finally, although limited sampling data were identified in the available file material, it is likely that runoff from the Ceramic Tile Pile (SWMU 3) to the Walltown Drain (SWMU 7), which drains to the Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch (AOC 1), is a concern. This runoff is likely to have resulted in a release of hazardous constituents to soil/sediment and surface water associated with SWMU 7 and AOC 1. Sections 6.7 and 6.14 provide additional discussion of the releases associated with these units.

RECOMMENDATION:	No Further Action	(X)[1]
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

[1] A No Further Action recommendation for SWMU 3 is contingent upon continued compliance with the approved closure and post-closure plans.

6.4 SWMU 4 - 20 Cubic Yard Sludge Roll-Off Container

TYPE OF UNIT: Roll-Off Container

PERIOD OF OPERATION: Unknown to present

PHOTOGRAPH NUMBER(S): 15

PHYSICAL DESCRIPTION AND CONDITION:

This unit was situated adjacent to the western wall of the main building, approximately 40 feet south of SWMU 9. SWMU 4 consisted of a concrete pad with no secondary containment where 20 cubic yard steel roll-off containers were placed to receive sludge filter cake from the Wastewater Pretreatment System (SWMU 1). The concrete pad was approximately 15 feet wide and 40 feet long. At the time of the VSI, no roll-off box was present at SWMU 4 and the concrete pad was in fair condition. Some cracks in the concrete pad and some vegetation growing in the cracks were noted during the site visit (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to facility representatives, a small front-end loader (e.g., Bobcat®) was used to transfer the sludge from the Filter Cake Waste Pile Area (SWMU 9) to roll-off containers in SWMU 4. Once the roll-off container was full, it was sent to the Davidson County landfill for disposal. According to correspondence from NCDENR to Mannington in 1990, as much as 22,000 pounds per week of fired glaze ceramic tile were generated by ceramic tile manufacturing operations (Booz Allen, 2003).

In 1990, samples were collected from the filter cake and were analyzed for RCRA primary metals in extracted leachate (EP Toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The filter cake waste stream samples contained bis(2-ethylhexyl)phthalate at a concentration of 1.5 mg/kg. All other constituents were not detected above detection limits. Based on these sampling results, it was determined by NCDENR that the filter cake waste stream was nonhazardous waste that could be disposed of in a Subtitle D landfill. According to facility representatives, the solids generated by the filter press were characterized annually to ensure that the wastes are nonhazardous (USEPA, 1993).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

6.5 SWMU 5 - 20 Cubic Yard Floor Sweeping Roll-Off Container

TYPE OF UNIT: Roll-Off Container

PERIOD OF OPERATION: Unknown to 1999

PHOTOGRAPH NUMBER(S): 8

PHYSICAL DESCRIPTION AND CONDITION:

This unit was located adjacent to the eastern central wall of the main process building and consisted of a 20 cubic yard steel roll-off container placed on the asphalt parking area. Floor sweepings from the main process building, containing dust, small tile pieces, and other wastes spilled on the floor during tile manufacturing operations, and were swept up daily and deposited in SWMU 5. According to facility representatives, a tarpaulin was used to cover the top of the roll-off container. At the time of the VSI, the area where the roll-off container formerly was placed appeared to be in good condition (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The waste stream managed by this unit consisted of daily sweepings from the floor of the process area in the main building. According to correspondence from NCDENR to Mannington in 1990, as much as 5,000 pounds per week of floor sweepings were generated by ceramic tile manufacturing operations.

In 1990, samples were collected and were analyzed for RCRA primary metals using the EP Toxicity Test (EP Toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The floor sweepings samples contained 1,1,1-trichloroethane (0.087 mg/kg), bis(2-ethylhexyl)phthalate (15 mg/kg), and benzyl butyl phthalate (3.6 mg/kg). In addition, the extractable leachate from the floor sweepings sample also contained 0.84 mg/L of lead. Based on these sampling results, it was determined by NCDENR that the floor sweepings were not hazardous waste (USEPA, 1993; NCDENR, 1990d, 1990e, 1990f).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

6.6 SWMU 6 - Baghouse

TYPE OF UNIT: Baghouse

PERIOD OF OPERATION: 1960's to 1999

PHOTOGRAPH NUMBER(S): 17

PHYSICAL DESCRIPTION AND CONDITION:

The baghouse was historically located at the southwest corner of the main process building. The remaining footprint of the baghouse is located above a concrete pad, which is approximately 2 feet high by 30 feet long by 8 feet wide. The baghouse was used to collect particulates originating from the process area generated during production of the green tile. The unit operated under Air Permit #5408R5, which was issued by the City of Lexington. The dates of this permit are unknown. No information on the physical characteristics of this unit were identified in the available file material and facility representatives could not provide any specific details. In addition, no information regarding the waste management practices associated with this unit, such as handling and disposal of spent filters, was available. Finally, no information on permit conditions or violations was identified in the available file material. According to facility representatives, the particulates captured by this unit were recycled back into the raw materials stage of the tile production process. The unit was reportedly removed in 1999 or 2000 and was not present at the time of the VSI. No information regarding the removal of this unit was identified in the available file material and facility representatives could only provide the removal date (Booz Allen, 2003; Mannington 1992).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to facility representatives, this unit captured dust generated during production of the green tile, primarily from the pressing operations that molded raw materials into various sizes of tile. Facility representatives also indicated that the dust collected by this unit was generated prior to addition of lead-containing glaze. Therefore, no hazardous waste was managed by this unit (Booz Allen, 2003; Mannington 1992).

RELEASE PATHWAYS: Air (M) Surface Water (L) Soil (L) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. At the time of the VSI, no visual evidence of a release (i.e., staining) was observed. However, it is important to note that facility representatives and the file material provided very limited information on this unit.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

6.7 SWMU 7 - Walltown Drain

TYPE OF UNIT: Surface Water Drainage Ditch

PERIOD OF OPERATION: 1960s to present

PHOTOGRAPH NUMBER(S): 6, 9, and 10

PHYSICAL DESCRIPTION AND CONDITION:

Walltown Drain runs north approximately 0.5 miles to Rat Springs Branch, which flows to the northwest approximately 2 miles to Swearing Creek, a tributary of the Yadkin River. As of 1997, the Winston-Salem Regional Water Quality Office classified Rat Springs Creek as a "C" surface water designation (Aquaterra, 1997 - Tile Pile closure plan). The Walltown Drain was enclosed in pipe in 1992/1993 under a Nationwide 26 permit from the USACE. This permit was issued based on the determination by the USACE that no significant wetlands were present at the site (Aquaterra, 1997 - Tile Pile closure plan). The piping was installed to prevent surface water runoff from the Ceramic Tile Pile (SWMU 3) to discharge into the creek. At the time the piping was installed at Walltown Drain, a permanent 25-foot easement was conveyed to the City of Lexington. A sanitary sewer line and storm sewer lines also run parallel to Walltown Drain (SWMU 7) northward across the eastern portion of the property and a permanent 25-foot easement for these lines was also conveyed to the City of Lexington (Aquaterra, 1997b, 2000; Booz Allen, 2003; Mannington, 2004).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

This unit was not designed to manage or handle waste. This unit is a tributary that was located on the facility property prior to the property being purchased. The Ceramic Tile Pile (SWMU 3) is located southwest and adjacent to the Walltown Drain. The ceramic tile pile is up gradient of the Walltown Drain. Prior to its enclosure, runoff from the ceramic tile pile and facility entered into the Walltown Drain. As a result, SWMU 7 may have received hazardous constituents from the waste tile fragments primarily consisting of RCRA metals such as lead (Booz Allen, 2003).

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Groundwater (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

There are four groundwater monitoring wells located adjacent to the Walltown Drain, which were installed primarily to monitor the Ceramic Tile Pile (SWMU 3) but are located in the vicinity of SWMU 7. The four wells are identified as MW-7, MW-8, MW-21, and MW-22. Groundwater samples, taken during the Spring and Summer 1994 monitoring event, revealed exceedances of manganese, iron, and tin. While these exceedances were for nonhazardous constituents only, the NCDENR requested that the facility obtain surface water and sediment samples from the area of the Walltown Drain tributary in 1998. Specifically, the facility was asked to sample the up gradient and downgradient areas of the Walltown Drain (before and after the enclosed areas). The facility conducted the sampling event March 1999 in response to the NCDENR request. The sample results for the surface water identified increases in levels of RCRA metals and other identified elements in the downgradient (DG) samples versus the up gradient (UG) samples. The increases identified include levels of barium at 0.059 mg/l UG to 0.127 mg/l DG; boron at below detection limit (BDL) UG to 1.06 mg/l DG (which exceeds the North Carlina (NC) 2L levels); copper at 0.010 mg/l UG to 0.110 DG; iron at 1.34 mg/l UG to 2.58 mg/l DG (which exceeds the NC 2L levels); and zinc at 0.035 mg/l UG to 0.142 mg/l DG. The sample results for the sediment identified increases in levels of RCRA metals, metals, and other identified elements in the downgradient samples versus the up gradient samples. The increases identified include levels of barium at 49.9 mg/l UG to 93.9 mg/l DG; boron at 13.7 mg/l UG to 33.0 mg/l DG (which exceeds the North Carolina soil screening levels (SSL)); chromium at 12.9 mg/l UG to 20.7 mg/l DG; lead at 48.6 mg/l UG to 125 mg/l DG; nickel at 4.00 mg/l UG to 5.03 mg/l DG; barium TCLP at 0.349 mg/l UG to 0.988 mg/l DG; and lead TCLP at 0.013 mg/l UG to 0.130 mg/l DG. These levels of increase identify potential releases originating from the facility that have impacted the Walltown Drain and its recipient waters (NCDENR, 1998b, 1999c; Aquaterra, 1997b; USEPA, 2002; Mannington, 2004).

Results of a 1997 surface soil sampling investigation detected lead at a maximum concentration of 12,700 mg/kg in soils in the northern edge of SWMU 7. In addition, the maximum detected leachable lead concentration from a soil sample was 93.5 mg/L, which exceeds the regulatory limit of 5 mg/L. The location of these maximum detected concentrations is in the northeastern corner of the property (Aquaterra, 1997b; Mannington, 2004; NCDENR, 1997a, 1997b; Booz Allen 2003).

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)[1]

COMMENTS:

[1] Because elevated levels of RCRA metals, specifically lead, have been identified in the soil in the northern portion of this unit, a more thorough investigation of the Walltown Drain (SWMU 7) is recommended to determine the extent of contamination. Specifically, it is important to more fully investigate the downgradient contamination to determine the furthest extent of the release.

6.8 SWMU 8 - Off-Specification Tile Accumulation Roll-Off Container

TYPE OF UNIT: Roll-Off Container

PERIOD OF OPERATION: Unknown to 1999

PHOTOGRAPH NUMBER(S): 12

PHYSICAL DESCRIPTION AND CONDITION:

This unit was located on the asphalt roadway covering the area formerly occupied by the Sludge Settling Ponds (SWMU 2), adjacent to the north central wall of the main process building. This unit consisted of a 40 cubic yard roll-off container placed on an asphalt surface. According to facility representatives, once waste tile was no longer deposited in the Ceramic Tile Pile (SWMU 3), this unit was used to store broken and off-specification tile from the manufacturing operation before it was disposed of off site. At the time of the VSI, the roll-off container associated with this unit was no longer present at the facility; however, a metal frame with corrugated metal roof was observed in the unit location. Facility representatives indicated that the metal frame roof had been installed to cover the roll-off container at an unknown date (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to several RCRA Inspection Reports, since closure of the Ceramic Tile Pile (SWMU 3) in 1990, ceramic tile wastes accumulated at the facility were stored in this unit before it was transported to the Davidson County landfill for disposal. The waste stream managed by this unit consisted of unfired and fired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. According to correspondence from NCDENR to Mannington in 1990, as much as 20,000 pounds per week of unfired glaze ceramic tile and 110,000 pounds per week of fired glaze ceramic tile were generated by ceramic tile manufacturing operations (USEPA, 1991; NCDENR, 1990d, 1990e, 1990f).

In 1990, samples were collected from each of the fired and unfired tile waste streams. The samples were analyzed for RCRA primary metals in extracted leachate (EP toxicity characteristic via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The samples collected from the fired glaze ceramic tile waste stream did not contain any constituents at concentrations above detection limits. The unfired glaze ceramic tile waste stream samples contained bis(2-ethylhexyl)phthalate at concentrations of 5.6 mg/kg. All other constituents in all of the waste stream samples were not detected above detection limits. Based on these sampling results, it was determined by NCDENR that the fired and unfired glaze ceramic tile waste steams were nonhazardous waste that could be disposed of in a Subtitle D landfill. As a result, waste from SWMU 8 was sent to the Davidson County landfill for disposal (USEPA, 1991; NCDENR, 1990d, 1990e, 1990f).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

6.9 SWMU 9 - Filter Cake Waste Pile Area

TYPE OF UNIT: Waste Pile

PERIOD OF OPERATION: 1988/89 - present

PHOTOGRAPH NUMBER(S): 14

PHYSICAL DESCRIPTION AND CONDITION:

This unit is the location of the discharged waste cake from the facility filter press. The unit is comprised of a concrete floor, three partial concrete walls with three partial metal sides, and a roof. The unit dimensions are 8 feet wide by 8 feet deep by 10 feet tall. A conveyer belt extends from the filter press unit located in the Wastewater Pretreatment System (SWMU 1) room through the west wall of the main process building, which was used to convey the filter cake outside to the floor of the unit. The open western wall of SWMU 9 was used to allow a front-end loader (e.g., Bobcat®) to transfer the filter cake waste pile to the 20-Cubic Yard Sludge Roll-Off Container (SWMU 4) for disposal. At the time of the inspection, the unit contained residual solids and staining on the concrete floor from the filter press (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The filter press received wastewater from the facility spray lines and sump pumps. In 1990, samples were collected from the filter cake and were analyzed for RCRA primary metals in extracted leachate (EP toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The filter cake waste stream samples contained bis(2-ethylhexyl)phthalate at a concentration of 1.5 mg/kg. All other constituents were not detected above detection limits. Based on these sampling results, it was determined by NCDENR that the filter cake waste stream was no-hazardous waste that could be disposed of in a Subtitle D landfill. According to facility representatives, the solids generated by the filter press were characterized annually to ensure that the wastes were nonhazardous (NCDENR, 1993).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. According to facility representatives, the conveyor deposited solids from the filter press outside of the covered unit to an area as far as the chain-link fence located parallel to the facility western property line. Also, runoff from rain events may have allowed the filter cake and residual materials to leach onto the surrounding soils. An asphalt cover was reportedly added to AOC 2 to inhibit impact from the solids or potential runoff. Finally, solids and residual dust were identified on the concrete floor and walls and on the soils directly in front of the unit at the time of the VSI (Booz Allen, 2003).

RECOMMENDATION:	No Further Action	(X)[1]
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
[1] Improved storage procedures are recommended to prevent further release of the filter cake solids to the soils in front of the unit.

6.10 SWMU 10 - Maintenance Building Waste Management Areas

TYPE OF UNIT: a. Drum Storage Area
b. Parts Washer

PERIOD OF OPERATION: 1960s to 1999

PHOTOGRAPH NUMBER(S): 18 and 19

PHYSICAL DESCRIPTION AND CONDITION:

The Maintenance Building Waste Management Areas (SWMU 10) is located in the southwest corner of the facility property, west of the Former UST and AST Area (AOC 3) and east of the Baghouse (SWMU 6). The maintenance building is a metal, enclosed building with two large rolling bay doors and a concrete floor. The building is approximately 40 feet long by 40 feet wide by 20 feet high. The facility reportedly ceased using this building in 2000. The building was used to store chemicals, such as wastewater treatment chemicals, bulk chemicals, solvents, used oil, and lubricants, used at the facility and perform maintenance on forklifts. The chemicals were stored primarily in 55-gallon drums, which were stored in various locations inside the maintenance building. Safety Kleen parts washing tank was also stored in the maintenance building. Finally, a subsurface work area that was used to allow mechanics better access to the forklifts is located in the western central portion of the maintenance building. The subsurface work area was approximately 4 feet wide by 8 feet long by 3 feet deep. Dark staining was observed on the concrete west of the two bay doors and some minor staining was observed in the subsurface work area (Booz Allen, 2003; USEPA, 1991, 1992a, 1993).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The facility used the maintenance building to store 55-gallon drums containing chemicals used at the facility. The chemicals stored include wastewater treatment chemicals, bulk chemicals, and used oil. According to a RCRA Inspection Report dated December 4, 1991, wastes generated at this unit included flammable waste petroleum naphthalene (D001) used in a Safety Kleen parts washing tank and used oil stored in drums generated by routine maintenance activities. Spent parts washing solvents and used oil were removed from the site monthly for recycling/reprocessing by Safety Kleen in High Point, North Carolina (RCRA Inspection 1991). According to a RCRA Inspection Report dated May 27, 1994, Mannington had discontinued the use of Safety Kleen parts washers, thereby eliminating the generation of flammable waste petroleum naphthalene (D001) (Booz Allen, 2003; USEPA, 1991, 1992a, 1993).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. At the time of the VSI, dark staining was observed on the concrete west of the two bay doors on the concrete pad and some minor staining was observed in the subsurface work area. However, it should be noted that the staining did not extend off of the concrete surfaces and no cracks were identified in the concrete. According to facility representatives, the source of this staining is not known. At the time of the VSI, the staining appeared to be due to rusting of the metal walls of SWMU 10 (Booz Allen, 2003).

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

6.11 SWMU 11 - Spray Line Area Sumps

TYPE OF UNIT: Wastewater Sumps

PERIOD OF OPERATION: 1960's or 1970's to present

PHOTOGRAPH NUMBER(S): 31 and 32

PHYSICAL DESCRIPTION AND CONDITION:

The spray lines and associated sumps were previously located in one of the large process rooms in the northern portion the main process building. According to facility representatives, the tiles were conveyed from the tile presses via a conveyor belt to the spray lines where water, glaze and stains were applied to green tile before they were sent to the kilns. The water from the spray heads was captured beneath the conveyor belt through several floor grates, which covered a series of subsurface trenches. The wastewater was then channeled, by use of sumps, to the Wastewater Pretreatment System (SWMU 1) or, historically, to the Sludge Settling Ponds (SWMU 3), to be treated and disposed of. According to facility representatives, some of the wastewater from the Wastewater Pretreatment System (SWMU 1) was also looped back into the spray lines. At the time of the VSI, the spray lines and equipment were no longer present. The equipment was reportedly removed in 2000 and transferred to another company facility. During the VSI, the area appeared to be in good condition; however, the unit was overflowing with water so the bottom and sides of the sump could not be inspected. The trenches were overflowing with water that, according to facility representatives, originated from leaks in the roof of the building (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

This unit managed wastewater generated by the spray lines. According to facility representatives, the wastewater contained high concentrations of solids – primarily clay and silica raw materials used to make the tile – and glaze and stain overspray from the coloring of unfired tile. The clay, silica, glaze, and stain have formerly contained metals such as lead and chromium. In addition, the wastewater entering the Wastewater Pretreatment System (SWMU 1) from the Spray Line Area Sumps (SWMU 11) had a pH in the range of 4 - 6 (Booz Allen, 2003; Mannington, 2004).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the VSI, no visual evidence of a release (i.e., staining) was observed; however, the unit was overflowing with water so the bottom and sides of the sump could not be inspected (Booz Allen, 2003; Mannington, 2004).

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)[1]
	RFI Necessary	( )

COMMENTS:

[1] Because the unit was filled with water at the time of the VSI, a more thorough inspection of this unit is recommended. The inspection should include draining of the sumps and inspection of the walls and floor to document the integrity of the concrete. If no evidence of cracks or breaching of the concrete is identified, then no further action is recommended for this unit. However, if evidence of cracks or breaching is observed, confirmatory sampling of the potentially impacted area (i.e., soil beneath the sump) should be conducted to determine if a release may have occurred.

6.12 AOC 1 - Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch

TYPE OF UNIT: Discharge Area from Sludge Settling Ponds and the Ceramic Tile Pile

PERIOD OF OPERATION: 1972 to present (No wastewater discharge received after 1990)

PHOTOGRAPH NUMBER(S): 10

PHYSICAL DESCRIPTION AND CONDITION:

The Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch (AOC 1) is located adjacent to the northeast corner of the Porcelanite facility property line. This area is specifically located at the intersection of Rat Springs Branch and the Walltown Drain (SWMU 7). Rat Springs Branch is located parallel to the northern boundary of the facility property line and flows east to intersect with the Walltown Drain (SWMU 7). Rat Springs Branch continues to flow to the north approximately two miles to Swearing Creek, a tributary of the Yadkin-Pee Dee River. As of 1997, the Winston-Salem Regional Water Quality Office classified Rat Springs Creek as a "C" surface water designation (Aquaterra, 1997 - Tile Pile closure plan). Rat Springs Branch is reportedly an intermittent stream that flows only when rainfall is present (Booz Allen, 2003). The Walltown Drain (SWMU 7) is a creek that flows north, inside the Porcelanite facility property, adjacent to the closed Ceramic Tile Pile (SMWU 3). The total length of this creek flows approximately 0.05 miles across the Porcelanite property, until it intersects with Rat Springs Branch. The Walltown Drain (SWMU 7) was enclosed in pipe in 1992/1993 under a Nationwide 26 permit from the USACE. This permit was issued based on the determination by the USACE that no significant wetlands were present at the site (Aquaterra, 1997b; Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The facility utilized several spray lines to spray the tile pieces with glazes and colorings on a conveyor line as part of the product process. Until 1990, the raw materials used to produce the tile contained metals that are considered hazardous, such as lead and chromium. The wastewater generated by the spray lines was then pumped to the wastewater processing unit located at the facility, which was conducted at the Sludge Settling Ponds (SWMU 2). The two settling ponds were utilized to allow the solids in the wastewater to settle out of the water before discharge. Sample analysis results detected leachable lead levels in the sludge from the sludge ponds, which discharged wastewater to AOC 1 (Aquaterra, 1997b; Booz Allen, 2003).

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (M)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S):

The facility conducted several site assessments to analyze the potential for releases of contamination located at or originating from the subject property. One such assessment of the facility, prepared by Mannington, and dated April 12, 1990, consisted of a field investigation in which samples were collected from the sludge ponds. Sample analysis results detected leachable lead levels in the sludge from the sludge ponds ranging from 230 mg/L to 1,230 mg/L. All VOCs and SVOCs were below detection limits with the exception of methylene chloride, acetone, and carbon disulfide. As a result, the solid waste (i.e., sludge) disposed of in the sludge ponds is a characteristic hazardous waste (D008) in that samples from three different areas contain extractable lead levels in excess of the regulatory limit of 5.0 mg/L. On August 28, 1991, the facility extracted groundwater samples from designated monitoring wells. The specific monitoring well located in the area of AOC 1 is MW-3. The groundwater samples resulted in the following detections: barium 0.28 mg/L, iron 9.8 mg/L, manganese 0.25 mg/L, sodium 30 mg/L, lead 0.014 mg/L, selenium 0.011 mg/L, chloride 33 mg/L, sulfate 130 mg/L, total organic carbon 4.9 mg/L, and mercury 0.0006 mg/L. A follow-up sample was obtained October 15, 1991, from MW-3 to confirm the selenium concentration. This sample contained 0.006 mg/L of selenium (NCDENR, 1990a; Aquaterra, 1997b; Booz Allen, 2003).

Additional soil samples collected from this area during a 1997 site investigation also identified several areas containing elevated metals concentrations. Specifically, hand auger soil samples collected north of the waste pile in AOC 1 contained significantly elevated concentrations of lead, barium, and boron. Lead concentrations in sampling locations 4HA-48, 4HA-47, and 2HA-23 were 5,140 mg/kg, 2,720 mg/kg, and 458 mg/kg, respectively. In addition, TCLP results for lead from soil samples from 4HA-48 and 4HA-47 were 91.0 mg/L and 93.5 mg/L, respectively. These sample locations appear to be located on the vegetated bank in the southern portion of this unit, adjacent to the northern property boundary of the site. Sampling locations 2HA-24, 2HA-25, and 2HA-26 were collected north of sampling locations 4HA-48 and 4HA-47 and detected lead concentrations were similar to background levels. Finally, hand auger samples were collected north of these locations in the AOC 1 area; however, sampling results were not identified in the available file material (NCDENR, 1990a, 1998b, 1999c; Aquaterra, 1997b; Booz Allen, 2003).

RECOMMENDATION:		
	No Further Action	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)[1]

COMMENTS:

[1] Additional investigation of the soil contamination, specifically lead and leachable lead concentrations, identified in AOC 1 is recommended. This investigation should include a vertical and horizontal characterization of contaminant concentrations. While an RFI has been recommended for AOC 1, it is likely that the further investigation of AOC 1 will occur based on

an investigation of releases from SWMU 3, which is the potential source of contaminants detected in AOC 1.

6.13 AOC 2 - Broken Ceramic Tile Roadway

TYPE OF UNIT: Road paved with broken ceramic tile

PERIOD OF OPERATION: Unknown date prior 1992 to present

PHOTOGRAPH NUMBER(S): 15 and 16

PHYSICAL DESCRIPTION AND CONDITION:

The Broken Ceramic Tile Roadway (AOC 2) consists of an eight-foot wide roadway that begins in the southwest corner of the property beneath the asphalt cap that was constructed as part of the Sludge Settling Ponds (SWMU 2) closure activities. It extends eastward for approximately 300 yards and terminates in the vicinity of the Baghouse (SWMU 6) and the Maintenance Building Waste Management Areas (SWMU 10). AOC 2 was partially constructed of waste tile fragments that were applied to the ground in the 1980s. At an unknown later date, the roadway was partially covered with asphalt and gravel. The asphalt portion of the roadway is located at the western and eastern ends of the road. The asphalt was applied to the road at the same time the Sludge Settling Ponds (SWMU 2) were closed. The gravel-covered portion of this unit is located in the middle portion of the road near the Filter Cake Waste Pile Area (SWMU 9) and the 20-Cubic Yard Sludge Container (SWMU 4). At the time of the VSI, the roadway appeared to be in good physical condition, with little significant cracking or deterioration of the asphalt (ENSCI, 1992; Booz Allen, 2003; ENSCI, 1994).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to the facility representatives, the facility applied tile fragments to pave the road at various times in the 1980's. Prior to 1990, the tile used reportedly contained metals that are considered hazardous including lead and chromium. Sample analysis results detected leachable lead levels in the ceramic tile waste deposited in the Ceramic Tile Pile (SWMU 3) ranging from 9.26mg/L to 79.9 mg/L. As a result, the solid waste (i.e., ceramic tile fragments) used to construct AOC 2 are most likely a characteristic hazardous waste (D008) in that samples from three different areas contain TCLP lead levels in excess of the regulatory limit of 5.0 mg/L (NCDENR, 1990a; ENSCI, 1992; Booz Allen, 2003; ENSCI, 1994).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Results from a TCLP analysis of soil samples collected outside of the northwestern property boundary, adjacent and parallel to AOC 2 in May 1994 indicated one exceedance (6.31 mg/L) of the regulatory level of lead, which is 5.0 mg/L. Three other soil samples located north, south, and west of this sampling location did not exceed the regulatory limit for lead. Based on the figure provided with the sampling results, it does not appear that this sampling location is located beneath the asphalt cap installed associated with SWMU 2. As a result, the potential for additional migration still exists. In addition, it is unclear if samples were analyzed for other metals (Aquaterra, 1997c; NCDENR, 1990a; ENSCI, 1992; Booz Allen, 2003; ENSCI, 1994).

RECOMMENDATION: No Further Action ( )
Confirmatory Sampling (X)[1]
RFI Necessary ( )

COMMENTS:

[1] Confirmatory sampling is recommended to fully characterize the horizontal and vertical extent of the lead contamination located outside the fence line in the railroad right-of-way. The intent of this confirmatory sampling is to determine if lead concentrations exceed either risk-based screening levels for human or ecological receptors and/or leachability criteria for the protection of groundwater.

6.14 AOC 3 - Former UST and AST Area

TYPE OF UNIT: USTs and ASTs

PERIOD OF OPERATION: Unknown (Estimated 1960s) to 1989

PHOTOGRAPH NUMBER(S): 20

PHYSICAL DESCRIPTION AND CONDITION:

The Former UST and AST Area (AOC 3) is located in the southwest portion of the property, between the road running parallel to the southern wall of the main building and Victor Street. The Maintenance Building Waste Management Areas (SWMU 10) are located immediately west of AOC 3. Currently, AOC 3 is a grass-covered area with a short concrete curb running along the northern edge of the area and the barbed-wire topped fence, marking the facility property boundary, on the southern edge of the area (Aquaterra, 1990a; NCDENR, 1990a; Booz Allen, 2003).

According to facility representatives, two steel, 2,000-gallon underground storage tanks (USTs) were installed at an unknown time that was estimated to be in the 1960's. These USTs were used to store gasoline and #2 fuel oil that was used in vehicles operated at the facility, such as forklifts. In November 1989, the USTs and associated piping were removed and soil samples were collected from the excavation. Initially, four soil samples were collected from the bottom of the excavation, which ranged from 9 to 15 feet deep. The samples were analyzed for total petroleum hydrocarbons (TPHs) by EPA Methods 3550 and 5030. The excavation was backfilled with clean fill. On May 29, 1990, NCDENR issued a letter indicating that the UST system had been closed in accordance with UST regulations (40 CFR §§ 280.71 and 280.72) (Aquaterra, 1990a; NCDENR, 1990a; Booz Allen, 2003).

According to facility representatives, in 1993, a 750-gallon steel aboveground storage tank (AST) was installed in the location formerly occupied by the USTs. The AST was surrounded by a steel secondary containment system. This AST was used to store diesel fuel for facility vehicles. At some point between 1999 and 2000, facility representatives indicated that the AST was removed and that no releases or staining were observed during removal activities; however, no sampling was conducted (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No wastes were managed at this unit; however, the gasoline, #2 fuel oil, and diesel fuel stored in the USTs and ASTs all contain hazardous constituents, such as metals and benzene, toluene, ethylbenzene, and xylene (Aquaterra, 1990a; NCDENR, 1990a; Booz Allen, 2003).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

In November 1989, the USTs and associated piping were removed and soil samples were collected from the excavation. Initially, four soil samples were collected from the bottom of the excavation with ranged from 9 to 15 feet deep. The samples were analyzed for TPHs by EPA Methods 3550 and 5030. Results of the analysis indicated that elevated levels of TPH (2,600 mg/kg) were present in the westernmost soil sample at a depth of 13 feet bgs. As a result, additional excavation, both vertically and horizontally, was conducted in the western portion of the original excavation down to a depth of 21 feet bgs. Three additional soil samples were collected from the bottom of the excavation. Soil from the western end of the excavation extension showed low levels of TPH contamination (43 mg/kg); however, it was determined that this concentration was not sufficient to warrant additional action. The excavation was backfilled with clean fill. On May 29, 1990, NCDENR issued a letter indicating that the UST system had been closed in accordance with 40 CFR §§ 280.71 and 280.72 (Aquaterra, 1990a; NCDENR, 1990a; Booz Allen, 2003).

RECOMMENDATION: No Further Action (X)
Confirmatory Sampling ( )
RFI Necessary ( )

COMMENTS:

7.0 REFERENCES

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North Carolina Department of Environment and Natural Resources (NCDENR). 1990a. Correspondence to Mannington Ceramic Tile Regarding Underground Storage Tank Closure. May 29, 1990.

NCDENR. 1990b. Compliance Order with Administrative Penalty. June 11, 1990.

NCDENR. 1990c. Correspondence to Mannington Ceramic Tile Regarding Disposal of Approximately 5,000 Pounds/Week of Floor Sweepings at the Davidson County Landfill. May 30, 1990.

NCDENR. 1990d. Disposal of Approximately 20,000 Pounds/Week of Unfired Glaze-Ceramic Tile at the Davidson County Landfill. May 30, 1990.

NCDENR. 1990e. Disposal of Approximately 20,000 Pounds/Week of Ceramic Process Glaze Overspray Filter Cake at the Davidson County Landfill. May 30, 1990.

NCDENR. 1990f. Disposal of Approximately 110,000 Pounds/Week of Fired Glaze-Ceramic Tile at the Davidson County Landfill. May 30, 1990.

NCDENR. 1990g. Compliance Order with Administrative Penalty. June 11, 1990.

NCDENR. 1991a. Notice of Violation for Mannington Ceramic Tile. September 24, 1991.

NCDENR. 1991b. RCRA Inspection Report for Mannington Ceramic Tile, Inc. December 4, 1991.

NCDENR. 1993. Comprehensive Groundwater Monitoring Evaluation Report for Mannington Ceramic Tile. March 8, 1993.

NCDENR. 1994a. Additional Closure Activities, Sludge Ponds, Mannington Ceramic Tile. February 24, 1994.

NCDENR. 1994b. RCRA Inspection Report for Mannington Ceramic Tile, Inc. May 27, 1994.

NCDENR. 1996a. March 26, 1996 Comprehensive Groundwater Monitoring Evaluation, Porcelanite, Inc. November 8, 1996.

NCDENR. 1996b. Transmittal of Radiological Data. December 20, 1996.

NCDENR. 1997a. Revised Post-Closure Care Plan Approval and Review of Revised Groundwater Sampling and Analysis Plan (SAP). April 29, 1997.

NCDENR. 1997b. Review of Closure Plan Activities. September 12, 1997.

NCDENR. 1998a. Memorandum: Porcelanite, Inc. Domestic Supply Wells Survey. January 12, 1998.

NCDENR. 1998b. Memorandum: Porcelanite, Inc. Surface Water and Sediment Data. December 3, 1998.

NCDENR. 1999a. Sludge Pond Closure. January 4, 1999.

NCDENR. 1999b. Sludge Pond Closure. February 11, 1999.

NCDENR. 1999c. Memorandum: Additional Surface Water/Sediment Data. May 27, 1999.

NCDENR. 1999d. Sludge Pond Closure, Porcelanite, Inc. (PI). September 23, 1999.

United States Environmental Protection Agency (USEPA). 1990. Hazardous Waste Permit Application for Mannington Ceramic Tile. July 5, 1990.

USEPA. 1991. RCRA Inspection Report. December 4, 1991.

USEPA. 1992a. Hazardous Waste Permit Application, Part A for Mannington Ceramic Tile. May 29, 1992.

USEPA Region 4. 1992b. Comprehensive Monitoring Evaluation Inspection Report. December 17, 1992.

USEPA Region 4. 1993. Comprehensive Monitoring Evaluation Inspection Report. June 24, 1993.

USEPA Region 4. 2002. SESD-ES Comprehensive Groundwater Monitoring Evaluation for Porcelanite, Inc. April 26, 2002.

FIGURE 1

Location Map for the Porcelanite, Inc. Facility

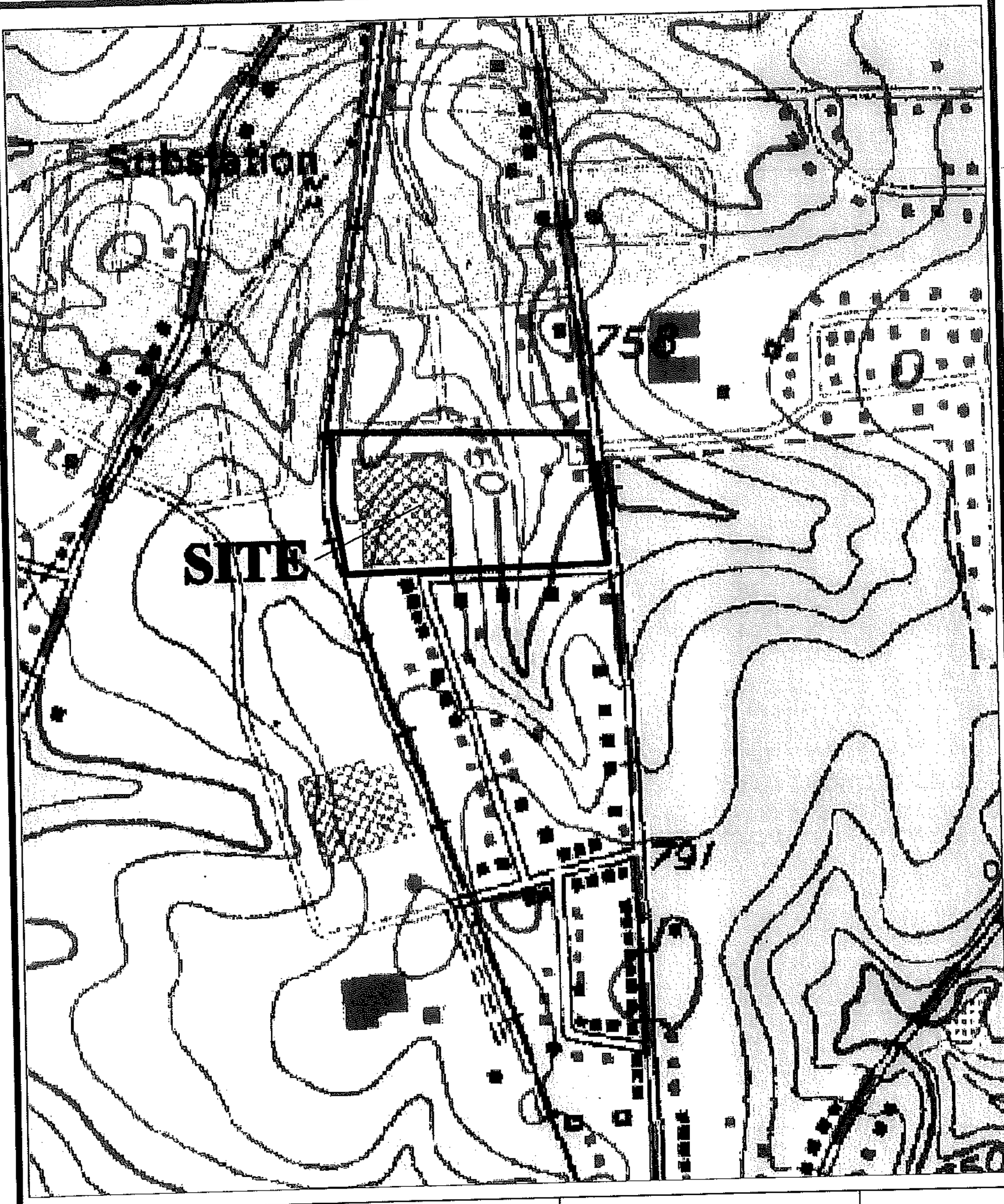


FIGURE 1

LOCATION MAP FOR THE PORCELANITE, INC. PLANT

LEXINGTON, NORTH CAROLINA

Date: DECEMBER 29, 2003

Drawn By: AER

(Based on 1:25,000 scale)

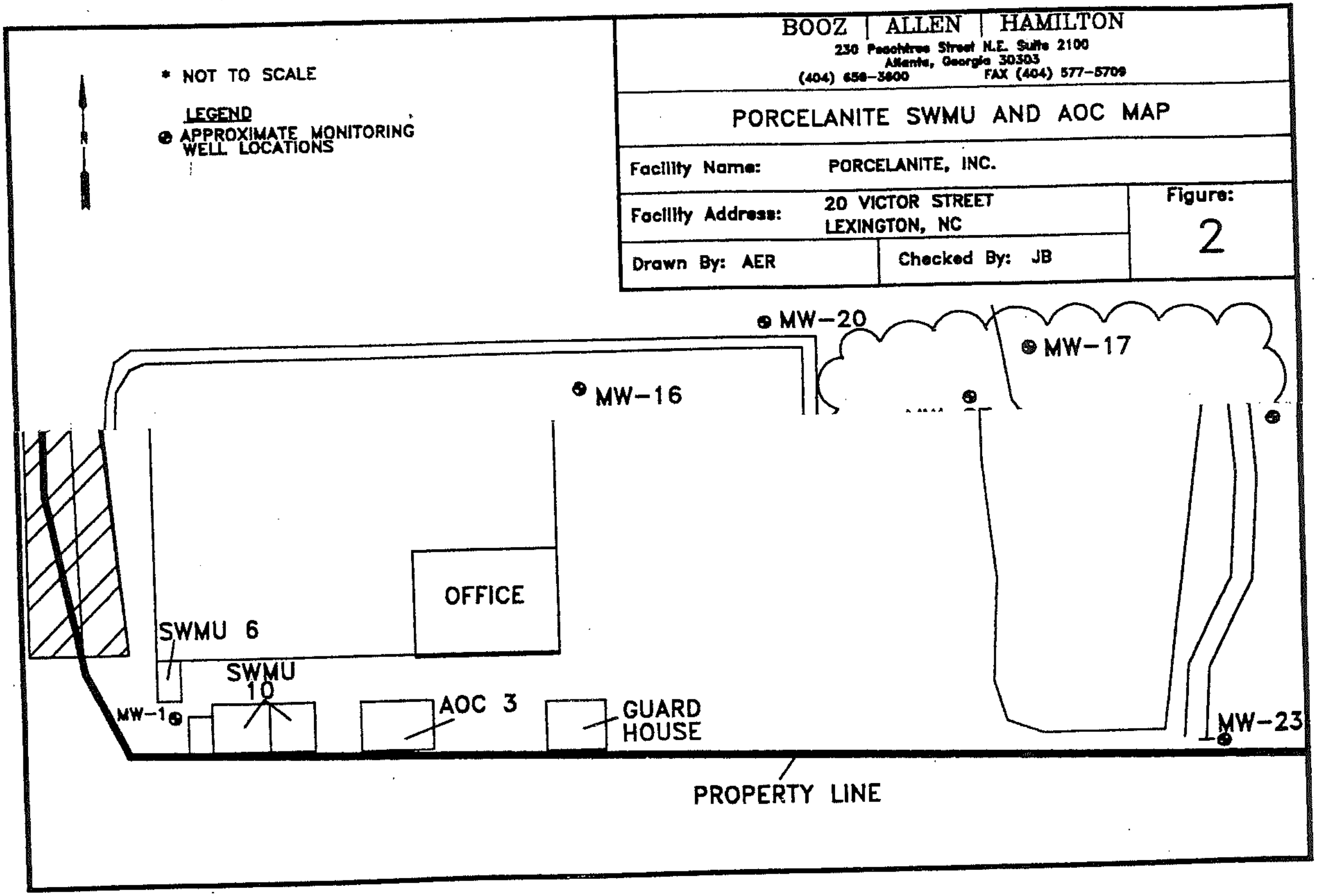
NOT TO SCALE

BOOZ|ALLEN|HAMILTON

230 Peachtree Street N.W. Suite 2100
Atlanta, Georgia 30303
(404) 659-3600 FAX (404) 577-5709

FIGURE 2

Porcelanite, Inc. SWMU and AOC Map


BOOZ | ALLEN | HAMILTON
230 Peachtree Street N.E. Suite 2100
Atlanta, Georgia 30303
(404) 658-3600 FAX (404) 577-5709
PORCELANITE SWMU AND AOC MAP
Facility Name: PORCELANITE, INC.
Facility Address: 20 VICTOR STREET
LEXINGTON, NC
Figure:
2
Drawn By: AER
Checked By: JB
* NOT TO SCALE
LEGEND
APPROXIMATE MONITORING WELL LOCATIONS
N
MW-20
MW-17
MW-16
OFFICE
SWMU 6
SWMU 10
MW-1
AOC 3
GUARD HOUSE
MW-23
PROPERTY LINE

ATTACHMENT 1

Porcelanite, Inc.
Solid Waste Management Unit (SWMU) and
Areas of Concern (AOC) List

Porcelanite, Inc.

Solid Waste Management Unit (SWMU) and Areas of Concern (AOC) List

SWMU

1. Wastewater Pretreatment System
   a. Precipitating Tanks
   b. Filter Press
   c. Wastewater Holding Tanks
   d. Sump
2. Sludge Settling Ponds
   a. Pond 1
   b. Pond 2
3. Ceramic Tile Pile
4. 20 Cubic Yard Sludge Container
5. 20 Cubic Yard Floor Sweepings Roll-Off Container
6. Baghouse
7. Walltown Drain
8. Off-Specification Tile Accumulation Roll-Off Container
9. Filter Cake Waste Pile Area
10. Maintenance Building Waste Management Areas
    a. Drum Storage Area
    b. Parts Washer
11. Spray Line Area Sump

AOC

1. Area of Discharge from Settling Ponds into Rat Spring Branch
2. Broken Ceramic Tile Roadway
3. Former UST and AST Area

ATTACHMENT 2

Photographic Log

Photo Number: 1
Direction: Facing south
Description: Security fence and guardhouse at main entrance to property

Photographer: Jeremy Hogard
Date: 9/30/2003

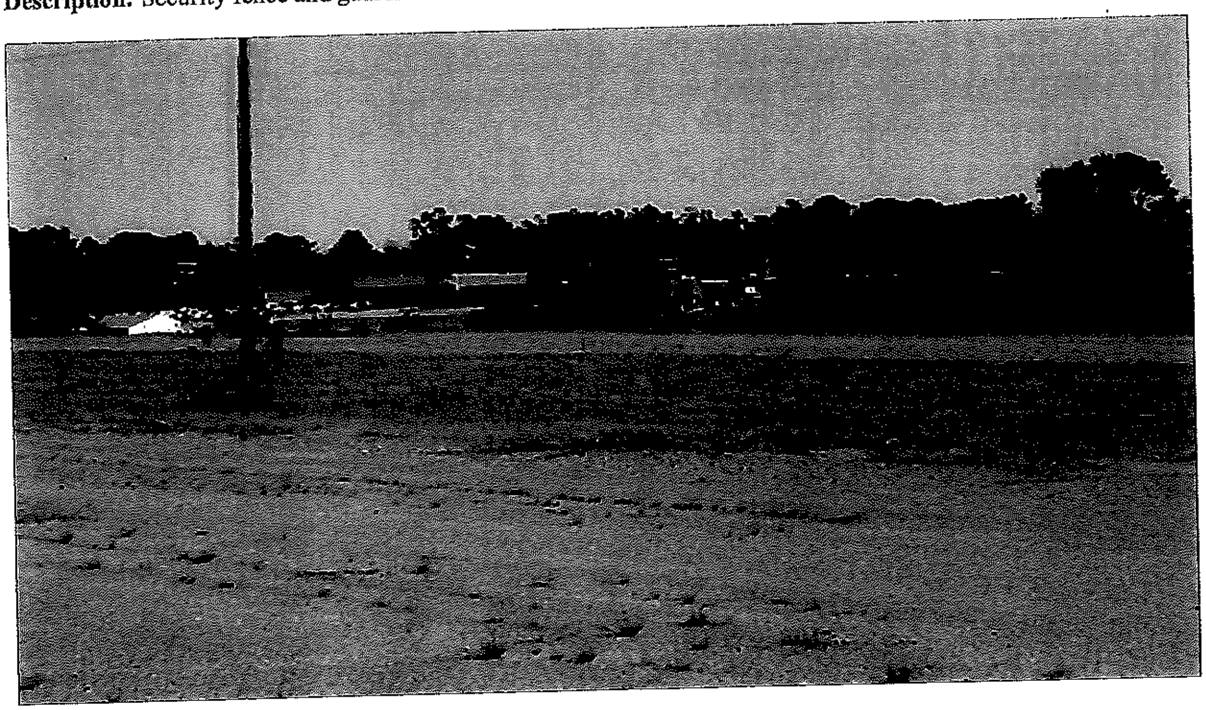


Photo Number: 2
Direction: Facing northeast
Description: Former location of the Ceramic Tile Pile (SWMU 3)

Photographer: Jeremy Hogard
Date: 9/30/2003

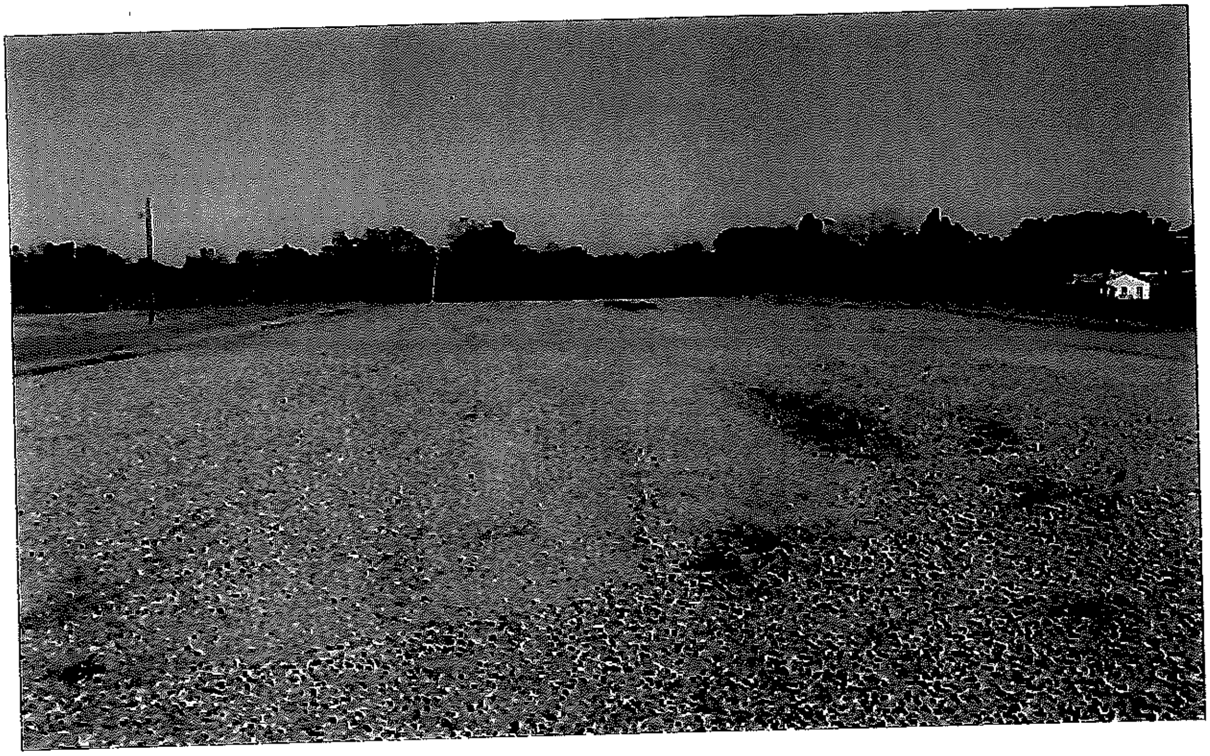


Photo Number: 3
Direction: Facing north
Description: Gravel cap installed over the Ceramic Tile Pile (SWMU 3)

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 4
Direction: Facing north
Description: Vegetated north side of the former Ceramic Tile Pile (SWMU 3)

Photographer: Jeremy Hogard
Date: 9/30/2003

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 5
Direction: Facing northwest
Description: Eastern side of the former Ceramic Tile Pile (SWMU 3)

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 6
Direction: Facing west
Description: View of the Walltown Drain (SWMU 7) area, which is covered with large gravel and vegetation

Photo Number: 7
Photographer: Jeremy Hogard
Direction: Facing northeast
Date: 9/30/2003
Description: View of Walltown Drain (SWMU 7) area, which is covered with gravel and vegetation

Photo Number: 8
Photographer: Jeremy Hogard
Direction: Facing west
Date: 9/30/2003
Description: Former location of the 20 Cubic Yard Floor Sweepings Roll-Off Container (SWMU 5)

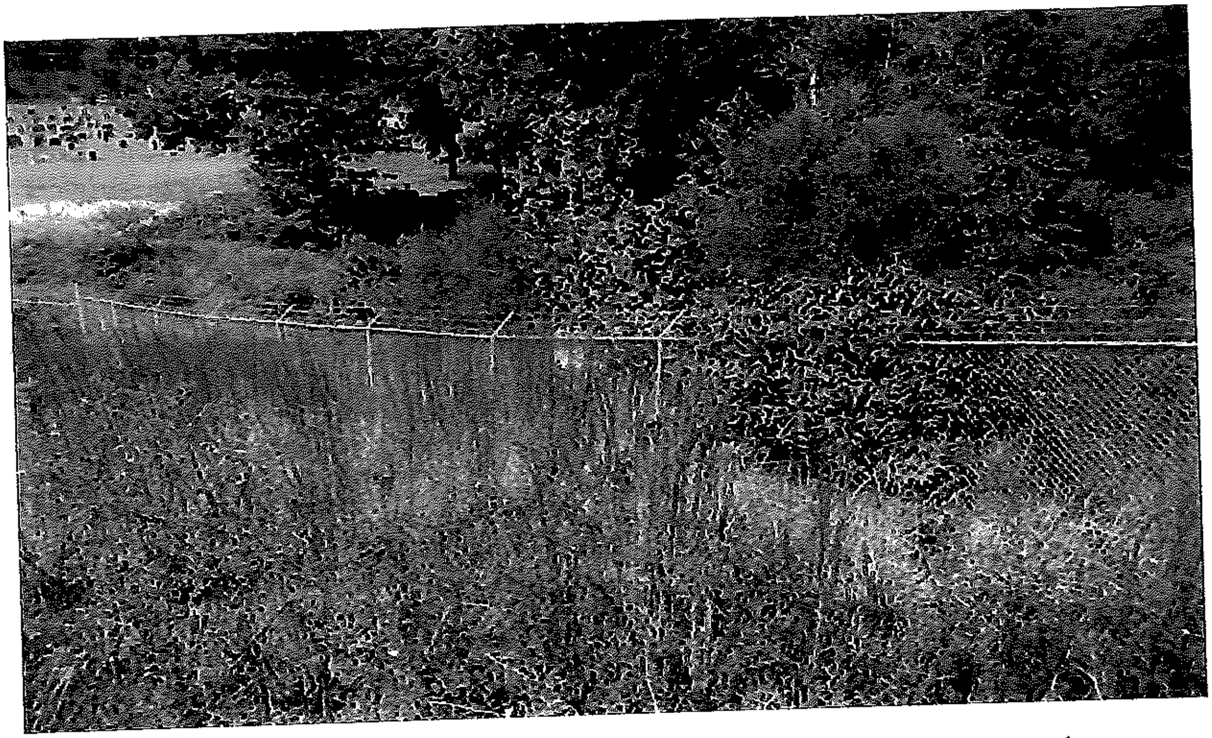


Photo Number: 9
Photographer: Jeremy Hogard
Date: 9/30/2003
Direction: Facing northwest
Description: View of the Rat Springs Branch and Walltown Drain (SWMU 7) intersection

Photo Number: 10
Photographer: Jeremy Hogard
Date: 9/30/2003
Direction: Facing northeast
Description: View of the Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch (AOC 1)

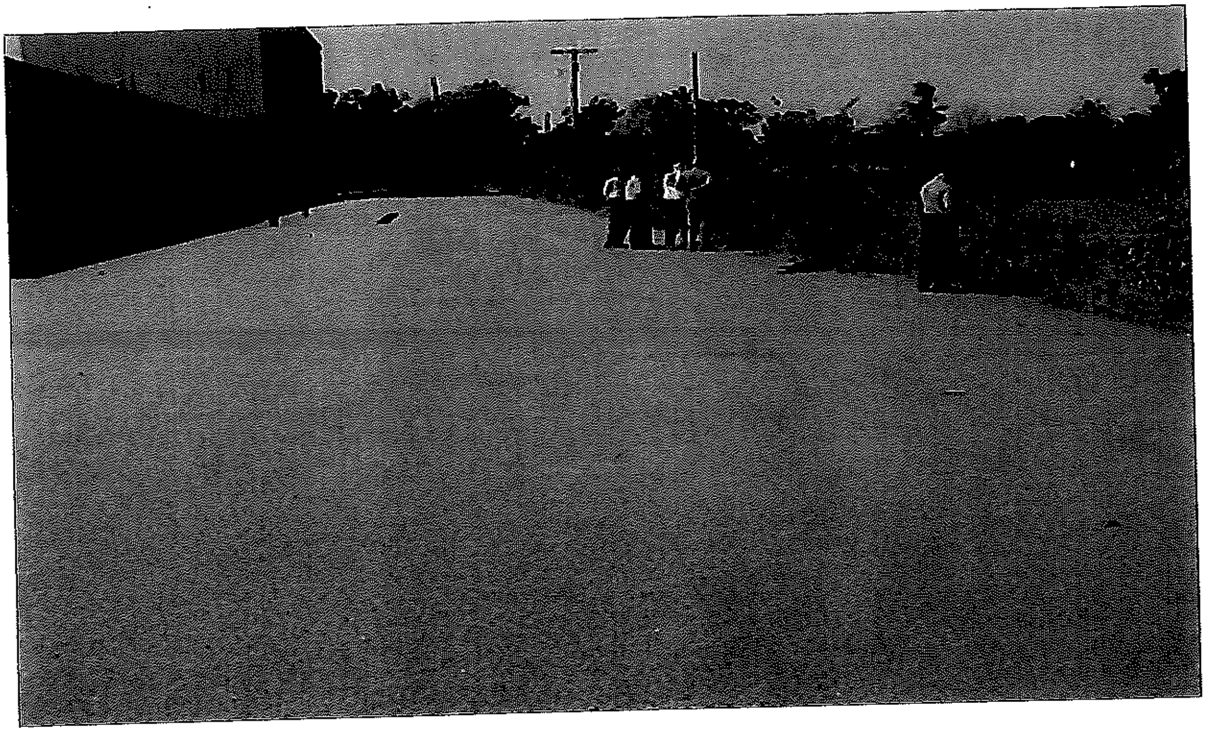


Photo Number: 11
Direction: Facing west
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the former location of the Sludge Settling Ponds (SWMU 2)

Photo Number: 12
Direction: Facing south
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the former location of the Off-Speculation Tile Accumulation Roll-Off Container (SWMU 8)

Photo Number: 13
Direction: Facing east
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the northern bank of the cap covering the former Sludge Settling Ponds (SWMU 2)

Photo Number: 14
Direction: Facing east
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the Filter Cake Waste Pile Area (SWMU 9)

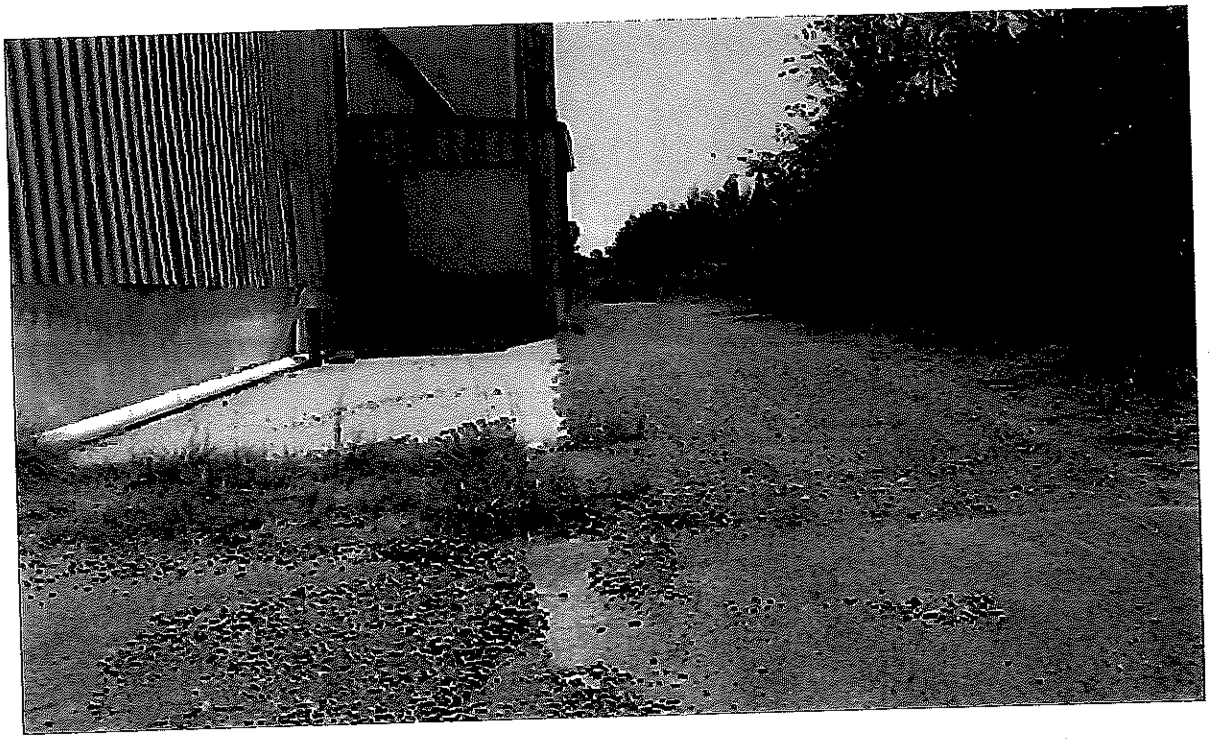


Photo Number: 15
Direction: Facing south
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the former location of the 20 Cubic Yard Sludge Roll-Off Container (SWMU 4) on the left and the Broken Ceramic Tile Roadway (AOC 2) on the right.

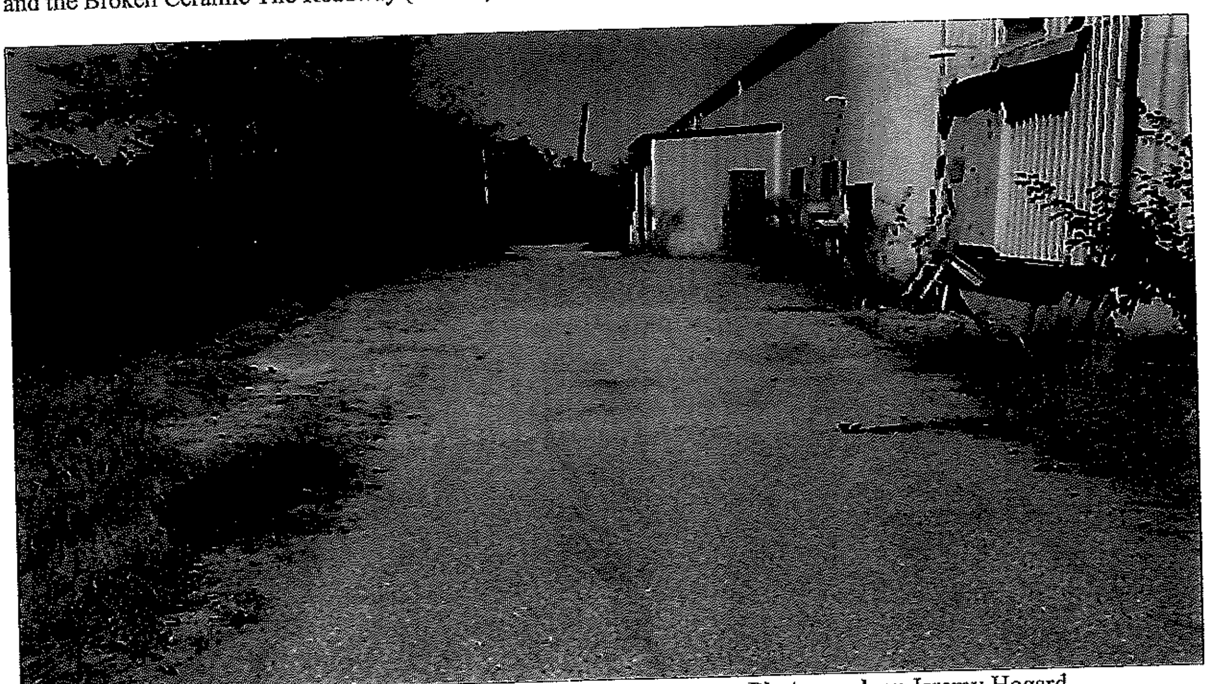


Photo Number: 16
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the Broken Ceramic Tile Roadway (AOC 2)

Photo Number: 17
Photographer: Jeremy Hogard
Direction: Facing north
Date: 9/30/2003
Description: View of the former location of the Baghouse (SWMU 6), which was situated on the concrete pilings shown in the left-central portion of the photograph.

Photo Number: 18
Photographer: Jeremy Hogard
Direction: Facing south
Date: 9/30/2003
Description: View of the concrete equipment storage pad located in front of the Maintenance Building (SWMU 10)

Photo Number: 19
Direction: Facing east
Description: View of the Maintenance Building (SWMU 10)

Photographer: Jeremy Hogard
Date: 9/30/2003

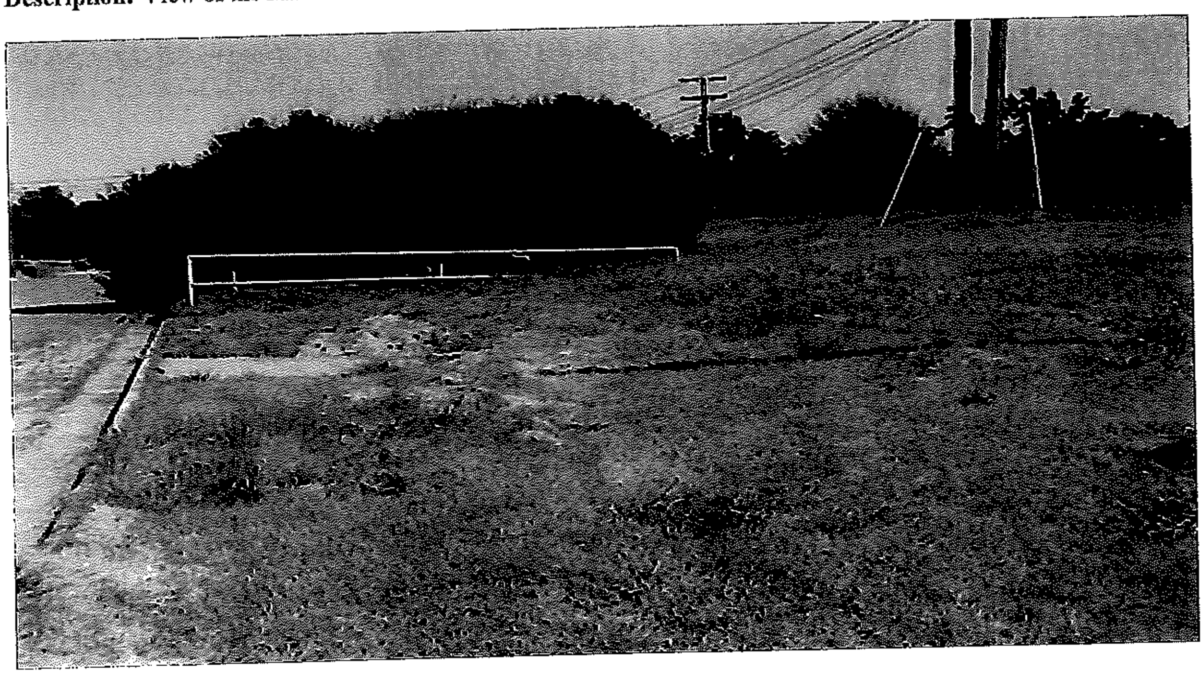


Photo Number: 20
Direction: Facing east
Description: View of the Former UST and AST Area (AOC 3)

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 21
Direction: Facing northwest
Description: View of the inside of the main process building

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 22
Direction: Facing southwest
Description: View of the inside of the main process building

Photographer: Jeremy Hogard
Date: 9/30/2003

Photo Number: 23
Photographer: Jeremy Hogard
Direction: Facing west
Date: 9/30/2003
Description: View of the inside of the main process building where one of the kilns was formerly located

Photo Number: 24
Photographer: Jeremy Hogard
Direction: Facing north
Date: 9/30/2003
Description: View of the Wastewater Pretreatment System (SWMU 1) room

Photo Number: 25
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the Filter Press (SWMU 1c) showing the discharge point to the Filter Cake Waste Pile Area (SWMU 10)

Photo Number: 26
Direction: Facing east
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of four drums located in the Wastewater Pretreatment System (SWMU 1) room from right to left (Caustic soda, SelfLoc, Polysep1127, unknown caustic) and grate-covered sump (SWMU 1d)

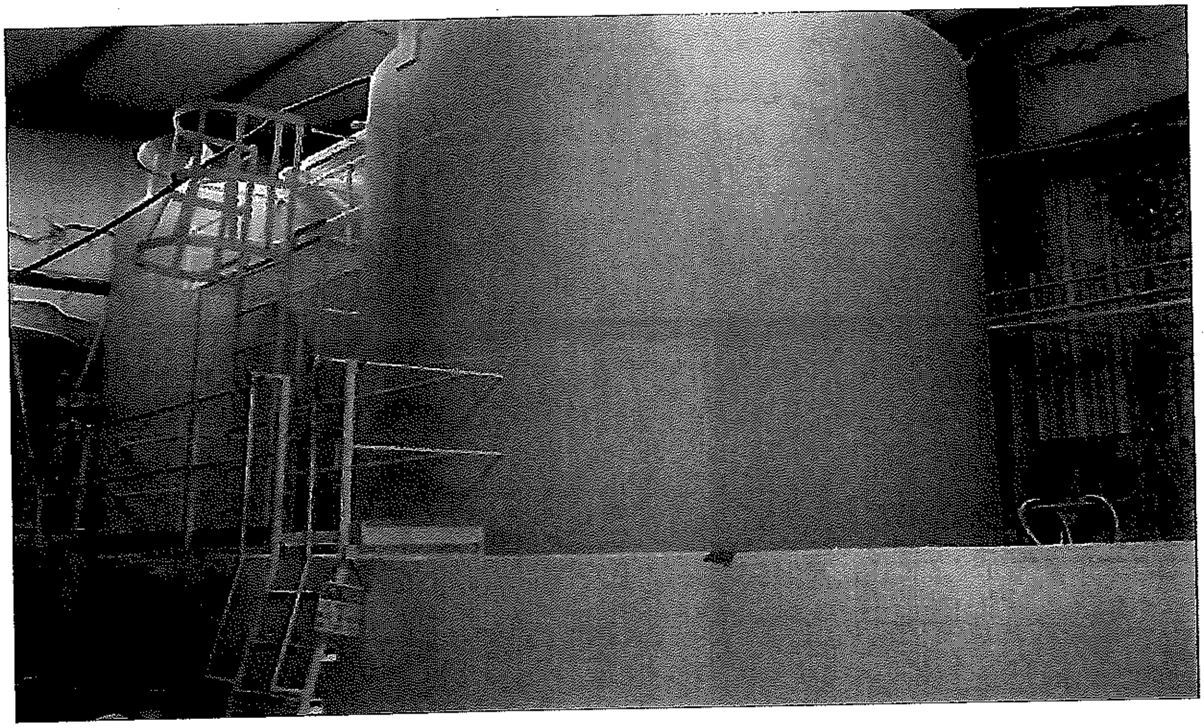


Photo Number: 27
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of Holding Tanks (SWMU 1a) associated with the Wastewater Pretreatment System (SWMU 1)

Photo Number: 28
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of Precipitation Tanks (SWMU 1b) associated with the Wastewater Pretreatment System (SWMU 1)

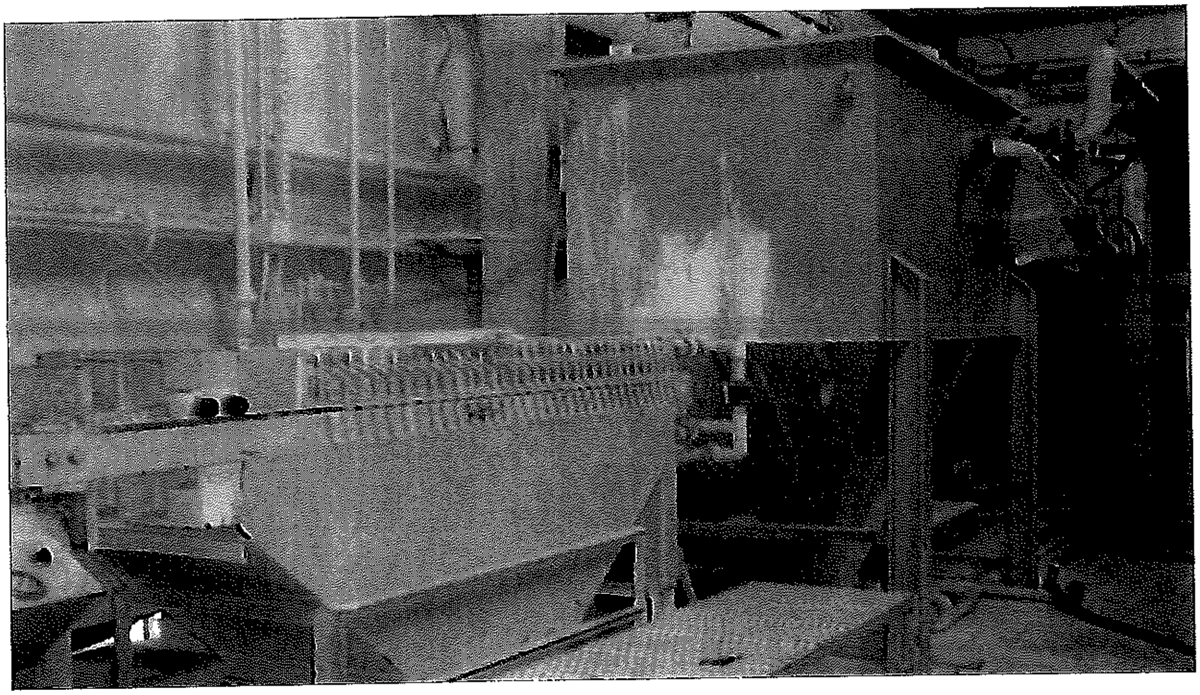


Photo Number: 29
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the Filter Press (SWMU 1c) associated with the Wastewater Pretreatment System (SWMU 1)

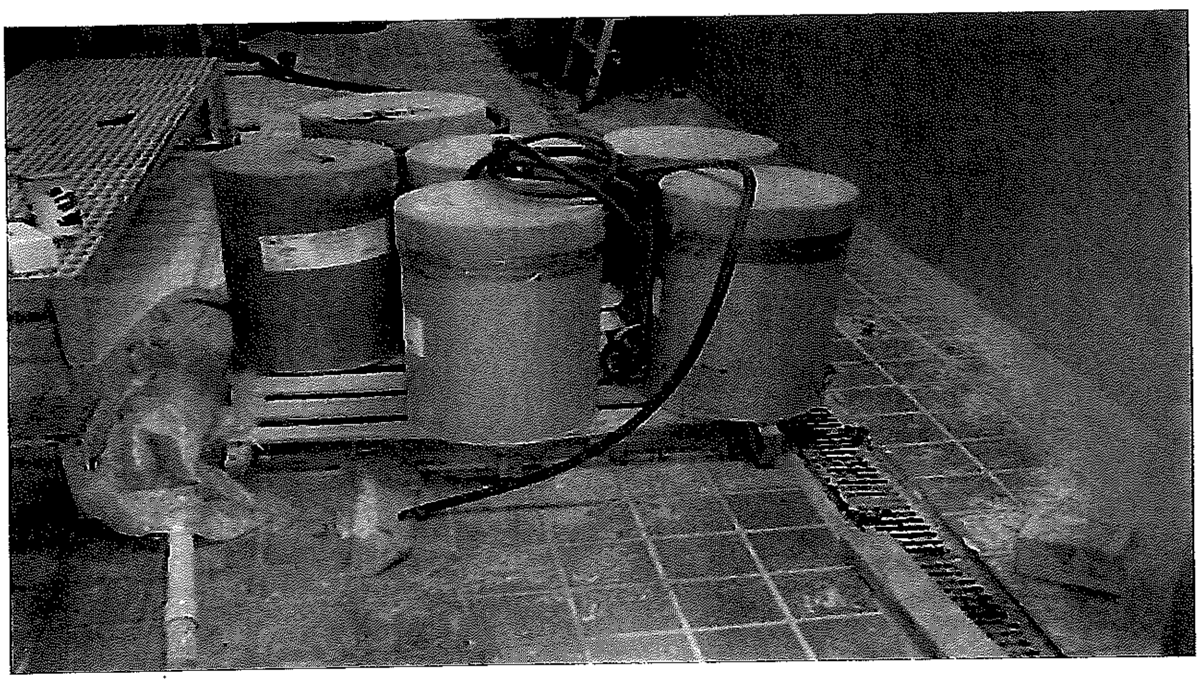


Photo Number: 30
Direction: Facing north
Photographer: Jeremy Hogard
Date: 9/30/2003
Description: View of the floor of the Wastewater Pretreatment System (SWMU 1) room showing the white staining and the generally poor housekeeping conditions of the area

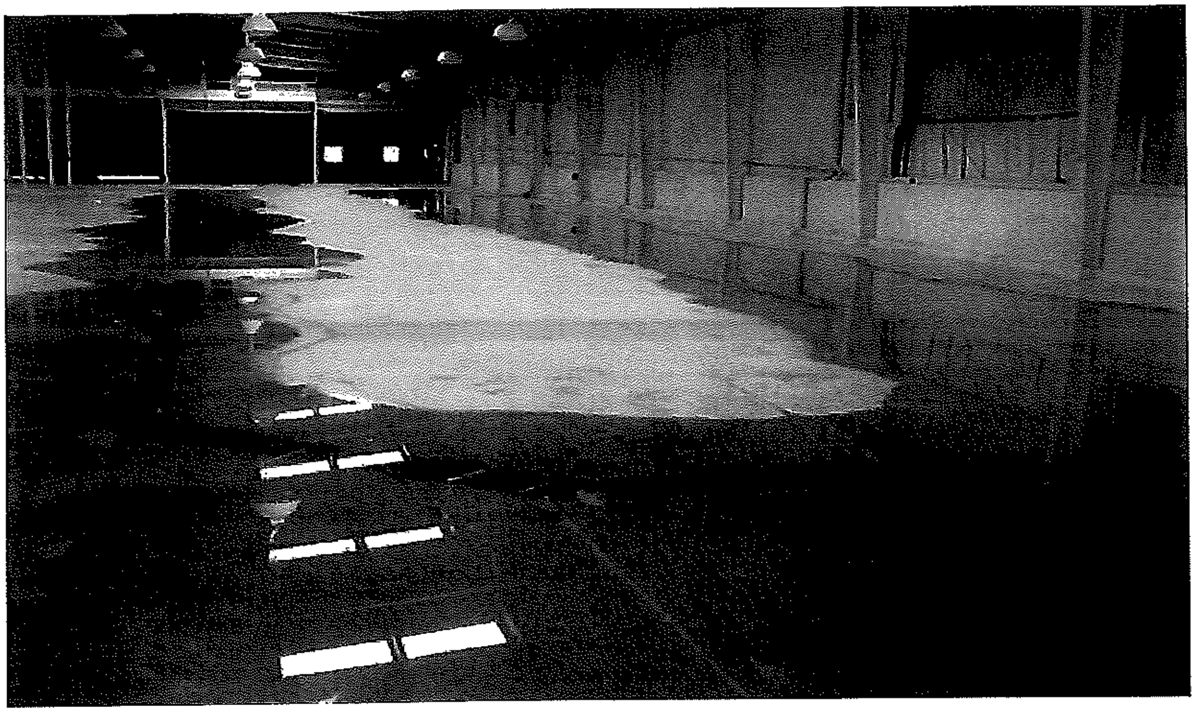


Photo Number: 31
Direction: Facing east
Description: View of the Spray Line Area Sumps (SWMU 11)

Photographer: Jeremy Hogard
Date: 9/30/2003

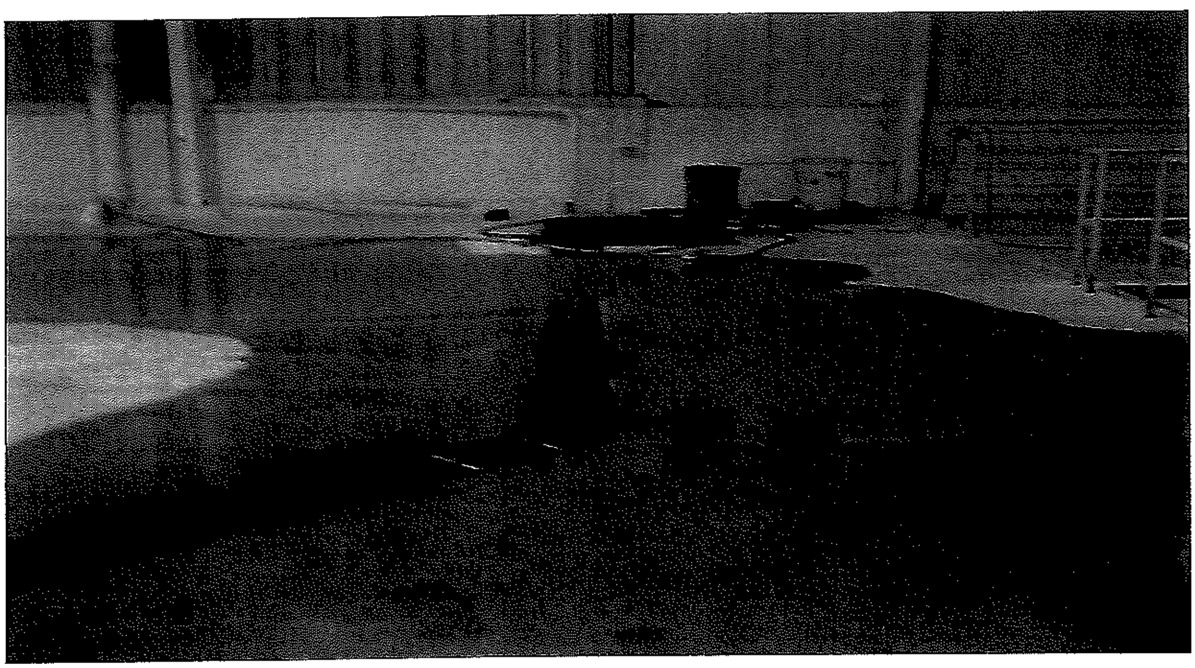


Photo Number: 32
Direction: Facing south
Description: View of the Spray Line Area Sumps (SWMU 11)

Photographer: Jeremy Hogard
Date: 9/30/2003

ATTACHMENT 3

VSI Logbooks

Part B Appendix B-2
FEMA FIRM
Mapping

Northing: = 748,304, Easting = 1,623,818

Northing: = 748,304, Easting = 1,627,287

Northing: = 744,836, Easting = 1,623,818

Northing: = 744,836, Easting = 1,627,287

This is an official copy of a portion of the above referenced flood map. This map incorporates changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov.

Without Base Flood Elevation (BFE)
Zone A, V, A99
With BFE or Depth
Zone AE, AO, AH, VE, AR

Regulatory Floodway

0.2% Annual Chance Flood Hazard

Future Conditions 1% Annual Chance Flood Hazard *Zone X*

Areas Determined to be Outside the 0.2% Annual Chance Flood Hazard
Zone X

Jurisdiction Boundary

FIRM Panel Boundary

North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6000

0 125 250 500 Feet

0 25 50 100 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

Panel(s):6724

CONTAINS:

COMMUNITY	**CID**
CITY OF LEXINGTON	370081

Notice to User: The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.

SELECTED PANELS:

MAP NUMBER	**EFFECTIVE DATE**
3710672400J	3/16/2009

FEMA: National Flood Insurance Program

Panel(s):6724

CONTAINS:

COMMUNITY	**CID**
CITY OF LEXINGTON	370081

Notice to User: The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.

SELECTED PANELS:

MAP NUMBER	**EFFECTIVE DATE**
3710672400J	3/16/2009

NOTES TO USERS

This is an official FIRMette of a portion of the effective panels listed in the Title Block shown on Page 1. The information represented on this FIRMette was extracted from the effective digital flood hazard data available at www.floodmaps.nc.gov/fmis.

Base flood elevation data, floodway, nonencroachment widths, information on certain areas no in the Special Flood Hazard Areas protected by flood control structures, and other pertinent data are available in the Flood Insurance Study (FIS) available at www.floodmaps.nc.gov/fmis. Users should be aware that flood elevations shown on this FIRMette represent elevations rounded to one tenth of a foot (0.1') and should be utilized in conjunction with data available in the FIS.

NOTES TO USERS

Base map information and geospatial data used to develop this FIRMette were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by the State in 2010. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map.

See geospatial metadata for the associated digital FIRMette for additional information about base map preparation. Base map features shown on this FIRMette, such as corporate limits, are based on the most up-to-date data available at the time of publication. Changes in the corporate limits may have occurred since this map was published. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

Flood elevations on this map are referenced to either or both the North American Vertical Datum of 1988 (NAVD 88) or National Geodetic Datum of 1929 (NGVD 29), and are labeled accordingly. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. To obtain current elevation, description, and/or location information for bench marks shown on this map, or for information regarding conversion between NGVD 29 and NAVD 88, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov/.

MORE INFORMATION

Letters of Map Amendment (LOMA)	1-877-336-2627
	http://msc.fema.gov/
Letters of Map Revision (LOMR)	919-715-5711
	www.ncfloodmaps.com
Flood Insurance Availability	
North Carolina Division of Emergency Management (NCDEM)	919-715-5711
	http://www.nccrimecontrol.org/nfip
National Flood Insurance Program (NFIP)	1-877-638-6620
	http://www.fema.gov/business/nfip
Questions about this FIRMette	1-877-336-2627
	http://fema.gov

LEGEND

Coastal Barrier Resources System (CBRS) Areas

Otherwise Protected Areas (OPAs)

Letters of Map Revision (LOMR)

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway Boundary

Limit of Study

Channel, Culvert, Aqueduct, or Storm Sewer

Accredited or Provisionally Accredited Levee, Dike or Floodwall

Non-accredited Levee, Dike or Floodwall

Hydrographic Feature

Profile Baseline

012 1% Annual Chance Cross Sections

8 Coastal Transect

BM5510 North Carolina Geodetic Survey Bench Mark (for more information visit http://www.ncgs.state.nc.us)

BM5510 National Geodetic Survey Bench Mark (for more information visit http://www.ngs.noaa.gov)

BM5510 NGS-58 GPS 2-5 cm Vertical Control Marks or Contractor-Established NCFMP Bench Marks (for more information visit http://www.ncgs.state.nc.us)

M 1.5 River Mile Marker

MAP REVISIONS

There are no map revisions for the selected area.

Appendix B-3

Documentation of Correspondence with NCAC 13A .0113(c)(3), and .0113(c)(5)

Susan Kite

From:	Susan Kite <skite@charter.net>
Sent:	Monday, January 23, 2017 11:30 AM
To:	'natural.heritage@ncdenr.gov'
Subject:	Request for information, 20 Victor Street, Lexington, Davidson County, NC

Good Morning,
I would like to request any information that is available through your database with respect to the above-referenced address. The property is located on the Lexington, West quadrangle map. Please respond regarding the following:

- Endangered species habitats
- Parks
- Forests
- Wilderness areas
- Historical sites

If you have any questions, or need additional information, please contact me.
Thank You,
Susan

Susan Kite, PG
Senior Environmental Geologist
c: 678.640.5268
skite@charter.net

Susan Kite

From: Susan Kite <skite@charter.net>
Sent: Monday, January 23, 2017 11:35 AM
To: 'anitabarnett@nps.gov'
Subject: Request for information, 20 Victor Street, Lexington, Davidson County, NC

Good Morning,
I would like to request any information that is available through your database with respect to the above-referenced address. The property is located on the Lexington, West quadrangle map. Please respond regarding the following:

- National Seashore, Lakeshore, and River Recreational Areas
- National Parks or Monuments
- Federal Designated Wild & Scenic Rivers

If you have any questions, or need additional information, please contact me.
Thank You,
Susan

Susan Kite, PG
Senior Environmental Geologist
c: 678.640.5268
skite@charter.net

Susan Kite

From: Luczak, Heather L -FS <hluczak@fs.fed.us>
Sent: Tuesday, January 24, 2017 10:16 AM
To: Susan Kite
Subject: RE: Request for Information: 20 Victor Street, Lexington, Davidson County, NC

Ms. Kite,
There are no Designated and Proposed Federal Wilderness and Natural Areas, National Preserves and Forests, or Federal Land Designated for the Protection of Natural Ecosystems within 1.0 miles of the site located at 20 Victor Street Lexington, NC.
Have a wonderful day!

Heather Luczak
Forest NEPA Coordinator

Forest Service
National Forests in NC

p: 828-257-4817
f: 828-259-0567
hluczak@fs.fed.us

160 Zillicoa St. Suite A
Asheville, NC 28805
www.fs.fed.us

Caring for the land and serving people

From: Susan Kite [mailto:skite@charter.net]
Sent: Tuesday, January 24, 2017 6:30 AM
To: Luczak, Heather L -FS <hluczak@fs.fed.us>
Subject: Request for Information: 20 Victor Street, Lexington, Davidson County, NC

Good Morning,
At the request of the NC Department of Environmental Quality (DEQ), we are working on a RCRA Part B Permit Application for the closed Former Porcelanite Facility, located at 20 Victor Street, Lexington, Davidson County, NC, approximately 1 mile north of Interstate 85. The Assessor's Parcel Number (APN) is 1134200000022. The geographical location of the Facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The property is located on the Lexington, West quadrangle map. I have attached a copy of the topo map for your use. I would like to request any information that is available through your database with respect to the above-referenced address. Please let me know if any Designated and Proposed Federal Wilderness and Natural Areas, National Preserves and Forests, or Federal Land Designated for the Protection of Natural Ecosystems are identified on or within a 1.0-mile radius of the property.

If you have any questions, or need additional information, please contact me.
Thank You,
Susan

Susan Kite, PG
Senior Environmental Geologist

c: 678.640.5268
skite@charter.net

Susan Kite

From: Susan Kite <skite@charter.net>
Sent: Tuesday, January 24, 2017 6:26 AM
To: 'melanie.williams@ncdenr.gov'
Subject: Request for Information: State-Designated Areas for Protection or Maintenance of Aquatic Life, 20 Victor Street, Lexington, Davidson County, NC
Attachments: img144.pdf

Good Morning,
At the request of the NC Department of Environmental Quality (DEQ), we are working on a RCRA Part B Permit Application for the closed Former Porcelanite Facility, located at 20 Victor Street, Lexington, Davidson County, NC, approximately 1 mile north of Interstate 85. The Assessor's Parcel Number (APN) is 1134200000022. The geographical location of the Facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The property is located on the Lexington, West quadrangle map. I have attached a copy of the topo map for your use. I would like to request any information that is available through your database with respect to the above-referenced address. Please let me know if any State-Designated Areas for Protection or Maintenance of Aquatic Life are identified on or within a 1.0-mile radius of the property (Clean Water Act 305b report).

If you have any questions, or need additional information, please contact me.
Thank You,
Susan

Susan Kite, PG
Senior Environmental Geologist
c: 678.640.5268
skite@charter.net

Susan Kite

From:	Ratzlaff, Allen <allen_ratzlaff@fws.gov>
Sent:	Wednesday, February 1, 2017 1:59 PM
To:	skite@charter.net
Subject:	17-164 20 Victor Street, Lexington, Davidson County
Flag Status:	Flagged

Dear Ms. Kite:

Subject: Site assessment for 20 Victor Street, Lexington, Davidson County, North Carolina

We received your email dated January 23, 2017, requesting information on federally listed species within 0.5 mile of the subject site. The following comments are provided in accordance with the provisions of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

According to our records and a review of the information you provided, no federally listed species or their habitats occur in the project area. Therefore, we believe the requirements under section 7 of the Act are fulfilled. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of these identified actions that may affect listed species or critical habitat in a manner not previously considered, (2) these actions are subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified actions.

We appreciate the opportunity to provide these comments and request that you continue to keep us informed as to the progress of this proposed project. If we can be of assistance or if you have any questions, please contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229. In any future correspondence concerning this project, please reference our Log Number 4-2-17-164.

--

Allen Ratzlaff
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
160 Zillicoa Street
Asheville, NC 28801

828-258-3939. x229

North Carolina Department of Natural and Cultural Resources
State Historic Preservation Office
Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

February 17, 2017

Susan Kite
skite@charter.net

Re: Former Porcelanite Facility, 20 Victor Street, Lexington, Davidson County, ER 17-0156

Dear Ms. Kite:

Thank you for your email of January 24, 2017, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

January 30, 2017

Ms. Susan Kite
Waters Edge Environmental, LLC
Senior Geologist
4901 Waters Edge Dr # 201
Raleigh, North Carolina 27606

Subject: Request for Environmental Sensitive Areas
Condumex Facility, Lexington, Davidson County, NC
Waters Edge Environmental, LLC Project Number: R1-21

Dear Ms. Kite,

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject information. Comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667e) and North Carolina General Statutes (G.S. 113-131 et seq.).

Waters Edge Environmental, LLC is requesting a review of environmentally sensitive areas within 1.0 mile of the Condumex Facility, located at 20 Victor Street, Lexington, Davidson County. At the request of the NC Department of Environmental Quality, Waters Edge Environmental LLC is working on a RCRA Part B Permit Application for the former Porcelanite Facility. The site is located on parcel number 1134200000022 and is approximately 12.4 acres in size. An unnamed tributary of Rat Spring Branch in the Yadkin – Pee Dee River basin flows through the site. Rat Spring Branch is classified as a Class C stream by N.C. Division of Water Resources (NCDWR).

There are no national refuges or state-owned, wildlife-designated or management lands within 1.0 mile of the site. However, lands managed by Davidson County as Open Space are located within 1.0 mile of the site. There are no migratory or feeding grounds for anadromous fish or spawning areas critical for the maintenance of fish/shellfish species, or large lakes or reservoirs with areas that fish spend extended periods of time occur within 1.0 mile of the site.

There is a historical record of the Carolina birdfoot-trefoil (*Acmispon helleri*), a state species of special concern – vulnerable, within 1.0 mile of the site. A current record of a northern-long eared bat (*Myotis septentrionalis*), a state significantly rare and federally threatened species, occurs in Davidson County with no specific location provided. Therefore, the northern long-eared bat may be present or within 1.0 mile of the site. As such, consultation with the USFWS may be required. For more information, please

January 30, 2017
Condumex Site
Lexington, Davidson County

see https://www.fws.gov/Midwest/endangered/mammals/nleb/index.html or contact the USFWS at (828) 258-3939 to ensure that potential issues related to this species are addressed.

The project footprint should be surveyed for wetlands and streams to ensure there are no impacts to surface waters. In addition to providing wildlife habitat, wetland areas and streams aid in flood control and water quality protection. United States Army Corps of Engineers Section 404 Permits and NCDWR Section 401 Certifications are required for any impacts to jurisdictional streams or wetlands. Furthermore, the NCWRC recommends maintaining a minimum 100-foot undisturbed, native, forested buffer along perennial streams, and a minimum 50-foot buffer along intermittent streams and wetlands. Wide riparian buffers are helpful in maintaining stream bank stability. In addition, these buffers provide a travel corridor for wildlife species.

Sediment and erosion control measures should be installed prior to any land clearing, construction or disturbance. The use of biodegradable and wildlife-friendly sediment and erosion control devices is strongly recommended. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of natural fiber materials with movable joints between the vertical and horizontal twines. Silt fencing or similar products that have been reinforced with plastic or metal mesh should be avoided as they impede the movement of terrestrial wildlife species. Excessive silt and sediment loads can have detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs and clogging of gills.

If I can provide further assistance, please call (336) 290-0056 or email olivia.munzer@ncwildlife.org.

Sincerely,

Olivia Munzer
Western Piedmont Habitat Conservation Coordinator
Habitat Conservation Program

Susan Kite

From:	Gibby, Jean B CIV USARMY CESAW (US) <Jean.B.Gibby@usace.army.mil>
Sent:	Saturday, February 4, 2017 11:51 AM
To:	Susan Kite
Subject:	RE: [EXTERNAL] Request for Information: 20 Victor Street, Lexington, Davidson County, NC
Flag Status:	Flagged

Susan,

I have looked at the map and there is no record in our system about the town ever having acquired a permit for the fill at the referenced facility. As I had mentioned to you, we had permits back in 1992 that would have allowed such activities. The is a site off of Cotton Grove Road that had a permit and that stream flows from that property through the referenced property.

In our conversation, I missed the fact that you desire to know about jurisdictional features within a 1-mile radius of the project. I am unable to do anything more that what you likely could do which is to review USGS topo maps, NRCS soil maps along with NWI maps. In order to access property, we must have permission from a property owner and in this case I don't have that. In addition, in light of the fact of the area you are desiring to gain this information, I suggest that you get an environmental consultant to obtain that information. Otherwise, you would have to personally contact all property owners within that 1-mile radius, get their permission for me to go on their property to look for jurisdictional features and I personally could only give you about 2 hours every 2 months to do such an effort. Even if a consultant were to perform the work, I would still need to have the necessary information to provide either a preliminary or approved jurisdiction. Instructions for that paperwork can be found on our website at www.saw.usace.army.mil, go to Regulatory and then look at the information under jurisdictional determinations. All of the necessary paperwork would need to be provided to our office prior to making a site visit as we are not allowed to trespass on property.

I wish I could have been more helpful, but that is all I can provide based upon the limited information that you have provided to me.

Should you have additional questions, please do not hesitate to contact me; however, I might not be in the office much this week as I am on-call for jury duty through the rest of the week and will not be released from that obligation until 9 Feb 17.

V/R,
Jean B. Gibby

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

Jean B. Gibby
Chief, Raleigh Field Office
U.S. Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587
(919) 554-4884, Ext. 24

e-mail: Jean.B.Gibby@usace.army.mil

-----Original Message-----
From: Susan Kite [mailto:skite@charter.net]
Sent: Monday, January 30, 2017 10:42 AM
To: Gibby, Jean B CIV USARMY CESAW (US) <Jean.B.Gibby@usace.army.mil>
Subject: [EXTERNAL] Request for Information: 20 Victor Street, Lexington, Davidson County, NC

Jean: Thank you for your time this morning.

Mannington Ceramic Tile, Inc. was the owner in 1992, but as I understand it, the City of Lexington obtained the permit and installed the pipe at Walltown Branch. The stream has also been referred to as Walltown Drain.

At the request of the NC Department of Environmental Quality (DEQ), we are working on a RCRA Part B Permit Application for the closed Former Porcelanite Facility, located at 20 Victor Street, Lexington, Davidson County, NC. The geographical location of the Facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The property is located on the Lexington, West quadrangle map. I have attached a copy of the topo map for your use. As we discussed I am looking for wetlands information regarding the Facility and a 1-mile radius of the property.

If you have any questions, or need additional information, please contact me.

Thank You,

Susan

Susan Kite, PG

Senior Environmental Geologist

c: 678.640.5268

skite@charter.net <mailto:skite@charter.net>

Susan Kite

From:	Munger, Bridget <bridget.munger@ncdenr.gov>
Sent:	Wednesday, January 25, 2017 4:17 PM
To:	Susan Kite
Cc:	Munger, Bridget
Subject:	RE: Request for Information: 20 Victor Street, Lexington, Davidson County, NC
Attachments:	Davidson County mines.xls

Hello Ms. Kite,
Here is a list of active and released Davidson County mines from the state mining program database. This should cover everything within the one-mile radius. The lat/long is listed for each location. Please let me know if you have any questions.
Thank you,

Bridget Munger
Public Information Officer
N.C. Department of Environmental Quality
Division of Energy, Mineral and Land Resources
Division of Water Resources

919-807-6363 office
919-207-7786 mobile
bridget.munger@ncdenr.gov

1612 Mail Service Center
Raleigh, NC 27699-1612

Nothing Compares

From: Susan Kite [mailto:skite@charter.net]
Sent: Wednesday, January 25, 2017 10:34 AM
To: Munger, Bridget <bridget.munger@ncdenr.gov>
Subject: Request for Information: 20 Victor Street, Lexington, Davidson County, NC

Good Morning,
At the request of the NC Department of Environmental Quality (DEQ), we are working on a RCRA Part B Permit Application for the closed Former Porcelanite Facility, located at 20 Victor Street, Lexington, Davidson County, NC, approximately 1 mile north of Interstate 85. The Assessor's Parcel Number (APN) is 1134200000022. The geographical location of the Facility is latitude 35° 47' 42" N and longitude 80° 15' 51" W. The property is located on the Lexington, West quadrangle map. I have attached a copy of the topo map for your use. I would like to request any information that is available concerning active and inactive mines within a 1.0-mile radius of the property.

If you have any questions, or need additional information, please contact me.
Thank You,
Susan

Susan Kite, PG

Senior Environmental Geologist
c: 678.640.5268
skite@charter.net

North Carolina Department of Environment and Natural Resources	Division of Land Resources, Land Quality Section	Mining Permit Inventory Report					
PERMIT_NUMBER	Permittee_Bus_Name	LOCATION_ NAME	ORIG_ISSUE_ DATE	EXPIRATION_ DATE	Select Contact Person	Select Addr, City, State, Zip	Phone
29-03	Martin Marietta Materials, Inc.	Thomasville Quarry	08/10/1972	09/14/2022	Jay Nivens	413 South Chimney Rock RoadGreensboro, NC 27409	
29-04	Jacob'S Creek Stone	Davidson Mine	09/11/1972	05/21/2023	Jeff Mckinney	P O Box 608Denton, NC 27239	336-857-2602
29-06	Cunningham Brick Company	Davidson II Mine	06/17/1975	03/30/2017	Cunningham Brick Company	PO Box 2063Lexington, NC 27293	
29-13	Hanson Aggregates Southeast LLC	Lexington Quarry	11/02/1992	03/25/2025	Hanson Aggregates Southeast LLC	2101 Gateway Centre Blvd.Suite 100Morrisville, NC 27560	
29-01	Cunningham Brick Co	Davidson Mine	08/19/1972	07/20/1982	Donald Beck	Route 2Thomasville, NC 27360	919-476-6181
29-02	Martin Marietta Materials, Inc.	Lexington Quarry	08/24/1972	06/24/1992	Martin Marietta Materials, Inc.	P O Box 30013Raleigh, NC 27622-0013	
29-05	White And Sink	I-85 Gravel Pit	03/25/1973	07/06/1983	Joe S. Sink	P O Box 1207Lexington, NC 27292	704-246-2310
29-07	Cecile Crushed Stone	Pilot Quarry	08/13/1976	07/15/1986	Danny Cecile	Route 1 Box 143Germanton, NC 27109	919-767-0636
29-08	Rea Construction Co	Sand Pit #115	07/09/1974	12/15/1993	Claude Hildreth	P O Box 32487Charlotte, NC 28232	704-373-1331
29-09	Triad Sand Co	Triad Sand Mine	09/12/1987	06/19/1997	Oscar L. Jones	4565 Frye Bridge RoadClemmons, NC 27012	919-766-6508
29-10	Walser Sand Co	Walser Sand Pit	08/08/1987	10/01/1997	Johnny Walser	317 Frye Bridge RoadClemmons, NC 27012	919-764-4193
29-11	Larco Construction	Larco #57 Mine	04/19/1989	03/15/2010	John Couture	P O Box 16279Winston Salem, NC 27115	336-767-3500
29-12	Carolina Gold Mines	Conrad Hill Mine	06/03/1989	06/09/1994	Tom Kleeberg	2316 Maple AvenueBurlington, NC 27215	336-570-1997

ORIGINAL_APP_ RECEIVED_ DATE	PERMIT_ REVISION_ DATE	RELEASE_ DATE	MINE_ STATUS	COMMODITY_ CODE	TOTAL_ACRES_ PERMITTED	BONDED	BOND_ TYPE_CODE	ARR_RECEIVED_I	BOND_AMOU	QUADRANGL E NAME	LATITUDE_ MEASURE	LONGITUDE_ MEASURE	ACRES_ CURRENT	LAST_ UPDATE_DATE
08/07/1972	07/15/2013		Active	Crushed Stone	350	159	Surety Bond - Mul	01/13/2016	500,000.00	Lexington East	35.8497	-80.1631	182	04/07/2016
03/30/1972	05/21/2013		Active	Flag Stone	441	77	Letter of Credit - M	02/03/2016	217,800.00	Handy	35.5297	-80.1067	77	03/28/2012
04/07/1975	03/30/2007		Active	Brick Clay	128	36	Surety Bond - Sing	02/09/2016	97,200.00	Fair Grove	35.7779	-80.11	29	03/08/2016
08/19/1991	03/25/2014		Inactive	Crushed Stone	158	66	Surety Bond - Mul	01/29/2016	500,000.00	Lexington East	35.77200	-80.23840	1	11/16/2005
04/19/1972		08/30/1982	Released	Brick Clay	140	0	Surety Bond - Single Site		25,000.00		35.79500	-80.12833	0	10/08/2003
04/24/1972	06/24/1982	06/04/1985	Released	Crushed Stone	187	0	Surety Bond - Single Site		25,000.00		35.85166	-80.23483	0	
11/25/1972		09/01/1980	Released	Sand and Gravel	13	0	Surety Bond - Single Site		5,000.00		35.87833	-80.12833	0	
04/13/1976		01/08/1982	Released	Dimension Stone	40	0	Surety Bond - Single Site		25,000.00		35.86500	-80.15500	0	
03/09/1974	12/15/1983	06/25/1986	Released	Sand and Gravel	2	0	Surety Bond - Single Site		25,000.00				0	
05/12/1987		06/05/1998	Released	Sand Dredging	2	0	Assignment - Sing	01/23/1997	2,500.00		35.9831	-80.3605	0	10/08/2003
06/08/1987		01/06/1992	Released	Sand and Gravel	2	0	Assignment - Sing	02/02/1990	2,500.00		35.97483	-80.33833	0	10/08/2003
11/21/1988	08/14/2001	02/05/2008	Released	Sand Dredging	5	5	Surety Bond - Sing	02/15/2008	10,000.00	Welcome	35.9355	-80.3697	0	01/22/2008
02/03/1989		05/31/2001	Released	Gold	73	0	Assignment - Sing	01/01/2001	25,000.00		35.7923	-80.1602	0	11/16/2005

Part E
Groundwater Monitoring

Part E – Groundwater Monitoring

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Figures

Tables

Appendices

Acronym List

ACL	Alternative Concentration Limits
BGS	below ground surface
BQL	below quantitation limits
CAP	Corrective Action Plan
°C	Celsius
COCs	Constituents of Concern
EP	Extraction Procedure
Ft/ft	Foot per foot
HWMU	Hazardous Waste Management Unit
HWS	Hazardous Waste Section
Mannington	Mannington Ceramic Tile
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilograms or parts per million
NC	North Carolina
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality (formerly NCDENR, and renamed effective September 18, 2015).
NCGS	North Carolina Groundwater Standards
Porcelanite	Porcelanite, Inc.
PGW	Protection of Groundwater
PQL	Practical Quantitation Limit
PSRG	Preliminary Soil Remediation Goal
PVC	Polyvinyl Chloride
SAP	Sampling and Analysis Plan
SIC	Standard Industrial Classification

SWMU	Solid Waste Management Units
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
Waters Edge	Waters Edge Environmental, LLC

Part E – Groundwater Monitoring

E-1 Interim Status Monitoring Data

Interim status groundwater monitoring was performed at the Facility both at the Settling Ponds and the Ceramic Tile Pile beginning in the late 1980s with one upgradient (MW-1) and seventeen (17) downgradient and cross-gradient monitoring wells (MW-3A, MW-7A, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-18, MW-19, MW-21A, MW-22A, MW-24, MW-25, MW-26-A-2, MW-28, and MW-29). The monitoring well data was evaluated and found to show exceedances of NCGS Standards which would also demonstrate a statistically significant variance in groundwater quality between the upgradient and downgradient wells.

The current set of groundwater monitoring wells (see Figure E-1A) existing at the Facility were installed as follows:

- The initial groundwater monitoring wells were installed in September 1989 in response to a request by NCDEQ to investigate possible groundwater contamination for lead which was identified in the unfired tile and glaze. It appears that these wells included MW-1 through MW-6.
- Prior to May 1992, MW-5 and MW-6 were abandoned.
- In April 1990, MW-7 and MW-8 were installed.
- Between 1990 and 1992, MW-9D through MW-13 were installed.
- In August or September 1992, MW-14 through MW-26 were installed.
- In June 1993, MW-28D was installed.
- In September 1998, MW-3A, MW-7A, MW-21A, MW-22A, and MW-23A were installed to replace wells that had been previously abandoned.
- In May 1999, MW-26A was installed to replace MW-26, which was abandoned in 1996 or 1997. In October 2006, MW-26A-2 was installed and replaced MW-26A.

Adverse impacts to groundwater quality were investigated through a series of phased assessments beginning in 1989. In the December 1999 sampling event, boron was the only targeted compound analyzed for and it was detected in three (3) wells (MW-1 (upgradient), MW-22 (east of SWMU-3, Ceramic Tile Pile), and MW-23 (south of SWMU-3, Ceramic Tile Pile)). Of those three (3) wells, only MW-22 was above the NCGS groundwater standard of 0.7 mg/L for boron at a concentration of 8.54 mg/L. Also, during the other quarterly groundwater sampling events of 1999, seven (7) targeted analytes were detected in excess of the NCGS groundwater standards: boron, cobalt, manganese, zinc, titanium, vanadium, and gross beta radionuclides. Boron was detected above the NCGS in fourteen (14) wells (MW-3, MW-9, MW-10, MW-12, MW-13, MW-14, MW-18, MW-19, MW-22, MW-23, MW-24, MW-25, MW-26A, and MW-28). Cobalt was detected in three (3) wells (MW-l, MW-12, and MW-13) above the NCGS. Manganese was detected above the NCGS in five (5) wells (MW-9, MW-12, MW-13, MW-14, and MW-28). Zinc was detected above the NCGS in two (2) wells (MW -9 and MW-12). Titanium was detected above the standard in four (4) wells (MW-7, MW-21, MW-25, and MW-26A). Vanadium was detected above the standard in three (3) wells (MW-7, MW-22 and MW-25). Fluoride was not detected above the standard during the 1999 sampling events. Only well

MW-10 has consistently shown any exceedance for fluoride. Gross beta was detected above the standard in four (4) wells (MW-9, MW-12, MW-13, and MW-14). Gross beta was routinely detected in every sample including MW-1, which is upgradient of the Facility. Three (3) of these compounds (cobalt, gross beta and vanadium) do not have a codified standard so the method detection limit is considered the standard. VOCs were not detected in any monitoring wells during the September 1999 sampling period (Aquaterra, 1997b, 2000; Mannington, 2004; NCDEQ, 1997a, 1997b; USEPA, 2002; Booz Allen 2003).

Summarizing past sampling events conducted in the 1990s, the following analytes were measured at concentrations exceeding their respective NCGS: arsenic, barium, boron, cadmium, chromium, fluoride, iron, lead, manganese, nickel, and zinc. Aluminum, cobalt, gross beta, potassium, sodium, titanium, and vanadium were also measured in groundwater at concentrations exceeding the laboratory method detection limits. These compounds do not have a North Carolina codified groundwater standard so the method detection limit is considered the standard. VOCs have not been detected consistently in the groundwater. Although a limited number of SVOCs have been detected, their presence was not considered indicative of a release. Neither VOCs nor SVOCs are currently monitored as part of the routine groundwater monitoring protocol.

Through subsequent quarterly and then semi-annual sampling, most of these previous NCGS exceedances have dropped below their respective NCGS and have been eliminated from the most recently approved SAP. The most recently approved SAP includes analysis for boron, cadmium, chromium, cobalt, lead, manganese, and zinc in six (6) monitoring wells. Monitoring wells MW-1, MW-12, and MW-22A are installed in the saprolite/shallow aquifer, and wells MW-9D, MW-26A-2, and MW-28D monitor groundwater quality in the bedrock/deeper saprolite aquifer.

Boron is consistently detected at elevated concentrations in groundwater collected at and around the Facility but manganese and zinc are also detected in multiple groundwater monitoring wells above their respective NCGS. Although boron has been consistently documented in concentrations below the NCGS in the upgradient monitoring well (MW-1) suggesting that upgradient sources of boron may exist, the consistently elevated levels of boron in groundwater collected downgradient of the regulated units (MW-26A-2) indicate that an additional source of boron potentially exists, although its specific location is unknown. Although the boron concentration fluctuates, boron was recently measured at 44.1 mg/L in groundwater collected from the most consistently elevated monitoring well (MW-26A-2) in September 2016. The NCGS for boron is 0.7 mg/L. We would consider that some of the plume dimensions are unknown.

All data from past monitoring events are summarized in Table E-1A for 1995-2004 (summarized by primary COCs) and Table E-1B for 2005-2016 (summarized by monitoring wells routinely sampled as part of the most recently approved SAP) and all past groundwater monitoring reports referenced and annual reports listed in Appendix E-1.

We would state here that boron is not a RCRA regulated hazardous waste or hazardous constituent pursuant to: 40 CFR Part 261, Appendix VIII (Hazardous Constituents); 40 CFR §261.24, Table 1 (Toxicity Table); 40 CFR Part 264, Appendix IX (Groundwater Monitoring List); 40 CFR §264.94, Table 1 (SWMU Hazardous Constituent Concentration Limits), or any other applicable RCRA regulation. At the direction of NCDEQ, boron monitoring data, however, has been included hereafter for reference.

E-1a Description of Wells

There are currently eighteen (18) groundwater monitoring wells at the Facility as shown in Figure E-1A. Fourteen (14) are Type II shallow groundwater monitoring wells and four (4) are Type III bedrock groundwater monitoring wells (MW-9 and MW-11, MW-19, and MW-28). Depth and screen intervals are contained in Table E-2 and well completion data for most of the monitoring wells are contained in Appendix E-2 including any water levels at the time of drilling and changes within 24 hours.

E-1b Description of Sampling /Analysis Procedures

The sample collection, sample preservation and shipment, analytical procedures, and chain-of-custody control are contained in the most recently approved SAP in Appendix E-3. Monitoring wells MW-1 (upgradient well for the Facility), MW-9D, MW-12, MW-22A, MW-26A-2, and MW-28D are sampled on a semiannual basis in accordance with the SAP. Details of the procedures are described below.

E-1b (1) Sample Collection

E-1b (1)-1 Groundwater Sample Collection Log Book

A groundwater sample collection log book is maintained to document each sampling event. Information is entered for each item contained on the form shown in Appendix E-3. The Groundwater Sample Collection Log Book is maintained at the retired Facility manager’s residence in a locked cabinet since there are no longer any structures at the Facility. This Log Book is made available to an Inspector during any onsite inspection at the Facility.

E-1b (1)-2 Water Level Monitoring

The water level is measured in each well using an Actat Olympic well probe or equivalent before beginning the well purging/sampling procedures. The distance to the water level is measured to

+0.01 foot and recorded in the Groundwater Sample Collection Log Book. Measurements are collected from a reference point, established by a licensed surveyor, located at the top of the well casing with the locking cap off. These reference points have been established in relation to mean sea level and are listed in Table E-2.

E-1b (1)-3 Equipment for Well Purging/Sampling

Equipment for purging includes either a closed top, bottom loading Teflon bailer with a new nylon rope or a low flow electrical submersible Redi-Flo pump or its equivalent. Field measurements are collected to document pH, conductivity, and temperature.

E-1b (1)-4 Groundwater Sampling/Analysis Procedures

Purging

Prior to the purging procedure, water level measurements are taken for each well, using equipment and procedures described in the previous section, Section E-1b-2.

Well Purging/Sampling

Each well is purged to remove standing water so that water which is representative of the formation can replace the standing water. The order of groundwater purging and sample collection proceeds from the well with the most recent lowest concentrations of constituents to the well with the most recent highest constituent concentrations. This order of groundwater purging and sample collection helps to minimize the potential for cross contamination between wells. Clean, disposable nitrile gloves (powder free) worn by sampling personnel during water level monitoring, purging, sampling, and decontamination procedures. New gloves are utilized for each activity and each well.

Utilizing the well volume information gathered from the water level measurement procedures, three well volumes are calculated for each well to determine the minimum volume to be purged prior to sampling. Removal of the minimum three casing volumes and allowing the wells to stabilize insures that all of standing water in the well casing is removed. Newly installed wells will be allowed to stabilize for a minimum of one week following development before being purged and sampled.

A dedicated Grundfos Redi-Fl02 brand electric submersible impeller pump is used to purge and sample each well if feasible. If this is not feasible due to obstructions in the well, disposable bailers are attempted. Table E-2 specifies the top of casing elevations (wellhead measuring points, and pump intake in relation to the top of well casing for all monitoring wells currently located at the facility.

An individual pump is dedicated to each well, thus eliminating the potential for cross contamination and eliminating the need for decontamination between sampling events. The pump is secured in the well with a stainless-steel cable. Discharge tubing is Teflon and is dedicated, eliminating the need for decontamination between sampling events.

The purging process involves pumping a minimum of three well volumes of water continuously at a low flow rate (approximately 0.25 gallons per minute). Pumping at the low flow rate reduces or eliminates the collection of well bore sediments and provides a more representative groundwater sample. Field parameters of pH, temperature and conductivity are measured for each well volume. The purging continues until field parameters and water level stabilize. Stabilization consists of three consecutive readings collected at approximate 5 minute intervals over a 15-minute period of time. Each well is purged until visibly clear water flows from the discharge hose of the pump. We also note the stabilized water level to ensure that the sample is entering the pump directly from the formation.

In the event that an existing well contains insufficient water to purge three well volumes or until field parameters have stabilized, the Redi-Fl02 pump is operated until it will not yield water and the groundwater samples are obtained following sufficient recharge of the well.

Groundwater Sample Collection

The order of groundwater purging and sample collection proceeds from the well with the most recent lowest concentrations of constituents to the well with the most recent highest constituent concentrations. This order of groundwater purging and sample collection helps minimize the potential for cross contamination between wells. Clean, disposable nitrile gloves (powder free) are be worn by sampling personnel during water level monitoring, purging, sampling, and decontamination procedures. New gloves are utilized for each activity and each well. Once the purging process is completed, the water is transferred into the appropriate sample containers without interrupting the pumping/purging process. Prior to commencement of field activities, the contracting laboratory prepares the appropriate sample containers for the sampling event. The target analyte list is contained in Table E-3. Containers are labeled for each well and sample parameter. If required, the laboratory facility adds preservatives to the appropriate sample containers. Sample containers, preservation techniques and holding times utilized in the sampling event are conducted in accordance with the methods presented in EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Table 2-33. Table E-4 specifies the sample container volume, preservative, holding time and analytical method to be employed to analyze the sample at the laboratory.

E-1b (1)-5 Sample Identification and Shipment

Upon filling, the sample containers are immediately labeled. Legible labels will be affixed to each sample container to prevent the misidentifications of samples. The labels are sufficiently durable, to remain legible even when wet, and contain the following type of information:

- Sample of identification number

- Parameters

Containers are numbered according to well numbers. Samples are packed in an ice chest with ice pack and transferred to the laboratory within 24-hours of collection. The chain-of-custody program includes the following:

1. Sample labels which prevent misidentification of samples
2. Field log book (Groundwater Sample Collection Log Book) to record information about each sample collection during the groundwater monitoring programs (see Appendix E-3). This is maintained at the Facility manager's residence in a locked filing cabinet.
3. Chain of custody record to establish the documentation necessary to trace sample possessions from the time of collection to analysis

A field log book (Groundwater Sample Collection Log Book) is maintained by Waters Edge or equivalent. The log book is kept up-to-date at all times. To establish the documentation necessary to trace sample possession from time of collection, a chain-of-custody record is completed and accompanies every sample.

Chain-of-Custody Record
A form is supplied by the laboratory in a format for recording all pertinent sampling data to maintain a record of the chain of custody of samples collected. The form is completed in the field prior to delivery of the samples to the laboratory. Information included on the chain of custody record includes, at a minimum, the following:

- project name
- project number
- sample location, well number
- sampling date & time
- requested analysis
- preservatives & number of containers
- sampler identification
- custody signatures
- laboratory North Carolina Certification Number
- inclusive dates of sample possession

Once the sample has been transported and received in the laboratory, the sample custodian and/or laboratory personnel clearly document the processing steps applied to the sample. All sample preparation techniques and instrumented methods are identified in a laboratory log book. Experimental conditions such as the use of specific reagents, temperatures, reaction times, and instrument settings are noted. The results of the analysis of quality control samples are identified specific to each batch of groundwater samples analyzed. The laboratory log book includes the time, date, and name of the person who performed each processing step.

E-1b (1)-6 Analytical Methods

The semiannual sampling analyses for compliance monitoring has been performed by Research & Analytical Laboratories located in Kernersville, North Carolina. The most recently approved

SAP requires analysis of six metals (boron, cadmium, chromium, cobalt, lead, manganese, and zinc) which are analyzed according to EPA Method 200.7. We have included the monitoring parameters and schedule in Table E-3 and the container size, preservative, holding time and analytical methodology in Table E-4.

E1-b (1)-7 Reporting

A report is generated within 60 days of sample collection to document details of the sample collection event and laboratory results.

E-1c Monitoring Data

Since the Facility is in post-closure, we would conclude that providing interim status monitoring results (265.92(c)(1) and 265.92(d)), water levels (26592(e), and initial background arithmetic mean and variance for each indicator parameter based on replicate measurements from upgradient wells during the first year is not applicable. All available past monitoring data is included in Tables E-1A and E-1B and a listing of past monitoring reports summarized in Appendix E-1.

E-1d Statistical Procedures

Since the Facility is in post-closure, a description of the statistical procedures employed to make the required statistical comparisons between the upgradient and downgradient wells is not deemed applicable because there is documented impact and the statistical comparison was never completed during interim status.

E-1e Groundwater Assessment Plan

Since the semiannual plume monitoring continues to indicate continued plume migration, additional assessment of the groundwater is being considered. Additional assessment would follow this general plan outlined below.

Additional monitoring wells would be located ahead of the observed plume in order to delineate the contaminant plume to North Carolina 2L groundwater standards or ACL standards if accepted by NCDEQ. Similarly, intermediate to deep monitoring wells may need to be installed to delineate the plume vertically.

E-1e (1) Well Construction Procedures

Three types of monitoring wells may be proposed as follows:

- shallow wells from 0 to 45 feet

- intermediate wells from 46 to 75 feet
- deep wells from 75 feet

Shallow wells (0 to 45 feet) would be constructed of Schedule 40 2-inch PVC casing and screen. The PVC casing and screen would be connected by flush-threaded end connections. No PVC solvent or glue would be used to connect the pipe. Screens would consist of a 10-foot length of PVC slotted screen with screen openings between 0.010 to 0.015 inches.

The intermediate wells (46 to 75 feet) and deep wells (76 feet plus) would be constructed of schedule 40 2-inch or 4-inch PVC casing and screen. All end connections would be flush-threaded. No PVC solvents or glues would be used. Screen length would be 10-foot and screen openings would be between 0.010 and 0.015 inches.

The drilling would be conducted with a hollow-stem auger or air rotary drill rig. The hole would be drilled to a diameter of approximately 7-7/8 to 8-1/14 inches. Cuttings would be collected every 5 feet and logged by a geologist. The geologist would also record drilling rates, rod drops, etc. to help develop the geology of the boring. Plastic would be placed around the proposed boring location with a hole for the drill rods and bit to pass. The plastic would collect the groundwater and drill cuttings during the drilling process. A plastic lined ditch would convey the groundwater to a small sump where it would be pumped into 55-gallon drums and eventually disposed as a non-hazardous waste.

If a highly-contaminated zone is encountered above the proposed screened interval, it may need to be cased to prevent the contamination from being carried down with the drilling process. A boring drilled to a diameter of approximately 10-12 inches would be completed through the contaminated zone. Then a 6 or 8-inch diameter casing would be installed and grouted in place to seal the contaminated zone. The drilling would then proceed using the smaller 5-7/8 or 7-7/8-inch bit until the desired screen depth is reached. Following the completion of the drilling, the monitoring well would be installed. All screens would have centralizers installed at their base and top to ensure that the screen would be centered within the boring. A sandpack consisting of clean washed sand would be tremied around the screen and carried from 2 to 4 feet above the screen top. Above the sandpack, bentonite would be placed to form a seal between the annular space and the well. After the seal, a cement grout or bentonite grout would be poured to within 30 feet of ground surface. From 30 feet to ground surface, a neat bentonite/cement grout would be poured.

A lockable protective steel casing would be installed around the well which would then be locked. The well location to the nearest foot and vertical elevations to the nearest 0.01 foot would be surveyed following well installation by a registered surveyor in the State of North Carolina.

After the well is installed, the well would be cleaned of all clay, silt, or sand that may have accumulated in the well. The well would be pumped or bailed for a sufficient length of time to settle the sandpack and remove any fines. The well would be considered developed when the water removed from the well is reasonably free of sand, silt, and clay. All development water would be containerized and eventually discharged into the City of Lexington POTW which has been accepted by that entity. No dispersing agents, acids, disinfectants, or other additives would be used during development or would at any other time be introduced to the well. The installed well shall be depicted in a well diagram. This diagram would graphically denote by depth from ground surface (unless otherwise specified):

- screen location
- bottom of boring
- granular backfill
- seals
- grout
- cave in
- height of casing stickup (above ground surface)
- protective casing details

Upon completion of the monitoring wells, Waters Edge would submit Well Completion Form GW-1 for the wells as required by North Carolina law. The originals would be submitted to the NCDEQ HWS and NCDEQ Groundwater Section or equivalent.

E-1e (2) Sampling and Analysis

The purging and sampling of any new monitoring wells would follow the most recently approved SAP contained in Appendix E-3 which is detailed in Part E-1b.

E-1e (3) Evaluation of Data

After any new monitoring wells have been sampled and the analytical results received, they would be evaluated to determine if the plume boundary has been defined. Any additional drilling and well locations would be reviewed with the HWS and the need for continued plume assessment determined.

E-1e (4) Reporting

A report would be prepared after the plume boundaries have been defined. The report would contain the following items:

- copies of all geologic logs, monitoring well construction logs, and well survey data
- updated geologic cross section based on the new monitoring wells

- a hydrogeology discussion that includes the geology, hydrogeology, and water quality for the entire plume and contains:
  - a shallow depth groundwater map
  - an intermediate depth groundwater map
  - a plume map using the nearest semiannual sampling results and the new monitoring well data for shallow and intermediate depth groundwater quality.

E-2 General Hydrological Information

E-2a Topography and Surface Water Bodies

The Davidson County area is characterized by gently rolling hills divided by small streams. The former Porcelanite facility is situated on a hillside, above a small perennial stream named Walltown Branch (see Figures E-1 and E-2). The elevation of the Facility varies from approximately 770 feet above MSL to approximately 730 feet above MSL at Walltown Branch. Walltown Branch is a small stream with its origin approximately 200' south of the Facility, and running to the north along the east side of the property. Walltown Drain is a creek with its origin approximately 1,100' east of the Facility, and running northwest, intersecting with the Walltown Branch on the northeast portion of the Facility. Walltown Branch was piped in 1992/1993 to prevent surface water runoff from the Ceramic Tile Pile (SWMU-3) from entering the creek. A sanitary sewer line and storm sewer lines also run parallel to Walltown Branch northward across the eastern portion of the property and a permanent 25-foot easement for these lines was also conveyed to the City of Lexington.

Runoff from the site primarily discharges toward the Walltown Branch feature; however, since the Walltown Branch has been piped in on the eastern portion of the Facility, much of the discharge no longer enters the actual surface water body east of the Ceramic Tile Pile until it reaches the northern extent of the piping at the Facility's northern boundary. There may also be some runoff which flows over the Walltown Branch east of the Ceramic Tile Pile which would enter into the groundwater. Additionally, there would be a component of groundwater migration from the western portion of the Facility which would enter the Walltown Branch north of the Facility. Walltown Branch migrates north approximately 1,600' and then west after the confluence with Yarborough Drain which discharges into Rat Springs Branch. Rat Springs Branch flows to the west/northwest approximately 2 miles to Swearing Creek, a tributary of the Yadkin River. As of 1997, the Winston-Salem Regional Water Quality Office classified Rat Springs Creek as a "C" surface water designation, which is applied to freshwater protected for secondary recreation, fishing, aquatic life propagation and survival, and wildlife. When the Walltown Branch was enclosed in pipe in 1992/1993 under a Nationwide 26 permit from the U.S. Army Corps of Engineers (USACE), it was determined there were no significant wetlands present at the site (Booz Allen, 2004).

Stream water is not classified as suitable for swimming or drinking water purposes. An updated description of the "C" surface water designation obtained from the NCDEQ website states "Waters protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life including propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner." Rat Springs Branch is not on the 303(d) list of impaired streams.

E-2b Geology

The former Porcelanite facility is located in the Lexington municipality, part of Davidson County, North Carolina. The Facility lies within the eastern portion of the Charlotte litho-tectonic belt in the Piedmont Physiographic Province. This is a zone of regionally metamorphosed amphibolite igneous rocks, bounded on the east and west sides by shear zones. The Facility is underlain by Late Proterozoic-aged undivided metavolcanic rocks. Bedrock lithologies at the site consist of massive, quartz-potassium feldspar-muscovite granite to granodiorite that could be associated with the Pennsylvanian to Permian-aged Churchland Pluton or the Devonian-aged Yadkin Pluton. No significant ore deposits have been discovered or mined extensively in the immediate Lexington area. However, silver, lead, cobalt, zinc, gold, and copper have been discovered and mined in areas located 5 to 20 miles south and east of the site.

E-2c Site Specific Geology and Hydrogeology

The predominant lithology at the site has been described as pink to tan, silty sand-textured residual soils (saprolite) weathered in-place from the underlying bedrock. The saprolite grades from intensely weathered rock near the surface to slightly weathered rock at depth. In some areas, sandy clay and clayey sand soils have developed in the upper 5 to 10 feet of saprolite.

Groundwater occurs in two interconnected zones underlying the site. These zones include the unconsolidated (saprolite) water table aquifer and the underlying fractured bedrock aquifer. Groundwater in the water table aquifer is transmitted in a generally laminar fashion through the B- and C- soil zone horizons. These zones tend to have a fairly uniform porosity and permeability and have a relatively large storage capacity in the regolith overlying fractured bedrock. The two water-bearing zones do not appear to have a confining unit separating them. The saprolite/regolith zone acts as the storage reservoir for the underlying bedrock zone, and recharges the bedrock aquifer in response to water withdrawal. Based on previous site investigations, groundwater saturated soils in the uppermost aquifer occur at depths ranging from 5.5 to 24 feet bgs and extend to the top of the partially weathered rock unit at subsurface depths ranging from 27 to 50 feet bgs. Two geologic cross-sections and flow nets across the site are included in Appendix E-4.

In November 1992, single slug tests were conducted on fifteen (15) monitoring wells. Results from the tests indicated a derived aquifer permeability of 0.40 ft./d. Groundwater flow velocity was calculated to range from 0.030 ft./d to 0.054 ft./d. Groundwater flow is directed toward the northeast with an average hydraulic gradient of 0.04 ft./ft. (approximately though individual groundwater sampling events vary slightly (see the more recent groundwater contour map from September 2016 in Figure E-2). The gradient steepens on the northeastern side of the property as groundwater approaches the tributary stream known as Walltown Branch. Recharge to the water table zone apparently occurs as surface water infiltration over the topographically higher regions southwest of the site.

E-3 Topographic Map Requirements

A Topographic Map depicting the following information is included on Figure E-1A:

- Groundwater monitoring wells
- Estimated extent of boron impacted groundwater (horizontal depicted in Figure E-1A with the vertical extent cross-sections diagrams estimated in Appendix E-4).

There are also NCGS exceedances for manganese and zinc in multiple groundwater monitoring wells with isopleth maps depicted in Figure E-1B and Figure E-1C (manganese and zinc respectively from the September 2016 sampling event)

- Hazardous waste management area for Settling Ponds and Ceramic Tile Pile
- Property boundary

The groundwater flow rate, boundaries and underlying interconnection of the uppermost saprolite and deeper bedrock aquifer, hydraulic downgradient direction, and waste management areas have been previously described in Section E-2.

E-4 Contaminant Plume Description

As depicted in Figure E-1A and cross-sections contained in Appendix E-4, boron has impacted both the shallow saprolite and the deeper bedrock aquifer in the vicinity of the closed Settling Ponds, the closed Ceramic Tile Pile, and hydraulically downgradient of these HWMUs to the northeast. Manganese and zinc have also been detected above NCGS in multiple monitoring wells with September 2016 results depicted in Figures E-1B and E-1C. Tabulated results of semiannual groundwater analysis collected from post-closure compliance monitoring wells in the plume between 2005 and 2017 are presented in Table E-1B.

The most recent extent of groundwater impact for the plume was presented in the September 2016 Groundwater Monitoring Report that was submitted to the NCDEQ on December 19, 2016. The following conclusions and recommendations are based on the most recent sampling event:

- During this semiannual sampling event, the six groundwater monitoring wells specified in the most recently accepted SAP (See Appendix E-3) were sampled and analyzed. Based on these results, there are inorganic exceedances above NCGS for monitoring wells MW-1 (upgradient well for the Facility), MW-9D, MW-12, MW-22A, MW-26A-2, and MW-28D with the main constituents being boron, manganese, and zinc.

- Most of the monitoring wells are depicting stable to slightly decreasing trends; however, increasing trends for inorganic constituents are noted for the following:

    1. Increasing trend for manganese for MW-1 (upgradient well) with the zinc trend considered widely fluctuating (large increases and decreases between sampling events)
    2. Widely fluctuating trend for boron (large increases and decreases between sampling events) for MW-12 and MW-26A-2
    3. Recent increasing trend for boron and manganese in MW-28D.

- Lead was analyzed and was ND or below the NCGS in all groundwater monitoring wells. The only detected value was at MW-9D at a concentration of 0.006 mg/L which is below the NCGS of 0.015 mg/L.

The horizontal and vertical extent of the boron contaminant plume is not yet fully defined. The necessity for corrective action and for a broader monitoring program would be determined once the plume has been further defined.

E-5 General Monitoring Program Requirements

A groundwater quality assessment program for the plume was initiated in 1990 and an assessment monitoring program was subsequently developed which is detailed in the most recently approved SAP (Appendix E-3) and in Part E-1b. Since there has been migration from the HWMUs to the uppermost and deeper aquifer, Porcelanite will not ask for a waiver.

E-5a Description of Wells

This is previously described in Section E-1a.

E-5b Description of Sampling/Analysis Procedures

This is previously described in Sections E-1b.

E-5c Procedure for Establishing Background Quality

Monitoring well MW-1 will be used as a background well for comparing results from POC and other monitoring wells. Per 40CFR 264.97(a)(1), we would conclude that the results from MW-1 "represents the quality of background groundwater that has not been affected by leakage from a regulated unit". Per 40CFR264.97(g), "in detection monitoring or where appropriate in compliance monitoring, data on each hazardous constituent specified in the permit will be collected from background wells and wells at the compliance point(s). The number and kinds of samples collected to establish background shall be appropriate for the form of statistical test employed, following generally accepted statistical principles. The sample size shall be as large as necessary to ensure with reasonable confidence that a contaminant release to groundwater from a facility will be detected. The owner or operator will determine an appropriate sampling procedure and interval for each hazardous constituent listed in the facility permit which shall be specified in the unit permit upon approval by the Regional Administrator. This sampling procedure shall be:

> (1) A sequence of at least four samples, taken at an interval that assures, to the greatest extent technically feasible, that an independent sample is obtained, by reference to the uppermost aquifer's effective porosity, hydraulic conductivity, and hydraulic gradient, and the fate and transport characteristics of the potential contaminants, or
> (2) an alternate sampling procedure proposed by the owner or operator and approved by the Regional Administrator."

Analytical data have been tabulated since the 1995 with no indication that the well is showing contamination from the HWMUs. The analytical results for MW-1 are summarized in Tables E-1A and E-1B. We would choose to use the background arithmetic mean for each constituent at MW-1 utilizing all past sampling data documented in Tables E-1A and E-1B. We would also specify that one half of the detection limit would be used for non-detect values. Based on our November 22, 2017 conference call, we will also use the statistical methods provided in the November 6, 2017 DEQ Comments on Site Conceptual Model and Identified Data Gaps. It is our understanding that this would have to be approved by the Regional Administrator before it can be utilized.

E-5d Statistical Procedures

Since there is contaminated groundwater associated with the HWMUs and the site downgradient from the HWMUs, there is no need for a groundwater monitoring program to detect contamination or measure compliance with the groundwater protection standards. Porcelanite does need a monitoring program to track the contaminant plume and to potentially evaluate the effectiveness of the corrective action program which will be submitted at a later date.

Even though the contaminants were fixated in the Settling Ponds and capped in the Ceramic Tile Pile, monitoring continues to assess the upgradient and downgradient monitoring wells to determine contaminant impact and historical trends. Since the background levels and NCGS are not influenced by seasonal variations, and any potential cleanup period will be of sufficient duration that seasonal variations will be averaged; there is no need to correct for seasonal variations.

E-6 Description of Detection Monitoring Program for Facilities Not Detecting the Presence of Hazardous Constituents

Not Applicable.

E-7 Compliance Monitoring Program for Facilities Which Have Detected Presence of Hazardous Constituents

Not currently applicable. This would be part of the CAP submittal at a future date.

E-8 Corrective Action Program

A CAP has not been implemented at the Facility but will be implemented once assessment is complete.

E-8a Characterization of Contamination

The nature and extent of the hazardous constituents detected at the Facility since the 1995 sampling event include the following:

Contaminant	Highest Detected Concentration (mg/L)
Boron	102.6 mg/L (MW-26-A-2 on September 1996)
Cadmium	<0.005 mg/L since 2007
Chromium	0.031 mg/L (MW-22A on September 17, 2008)
Cobalt	0.402 mg/L (MW-1 on March 2000)
Fluoride	2.72 mg/L (MW-10 on September 1998)
Lead	0.024 mg/L (MW-26-A-2 on October 17, 2011)
Manganese	2.88 mg/L (MW-12 on September 29, 2009)
Zinc	2.97 mg/L (MW-26-A-2 on March 29, 2013)

The lowest detected concentration for each of these constituents would be ND.

E-8b Concentration Limits

E-8b (1) Concentration Limits Established Under 264.94(a)

The nature and extent of hazardous constituents at the Facility from the past sampling events exceeding the MCLs or PQLs of Method 200.7 include the following:

Contaminant	MCL/PQL (mg/L)
Boron	PQL (0.05 mg/L)
Cadmium	MCL (0.01 mg/L)
Chromium	MCL (0.05 mg/L)
Cobalt	PQL (0.01 mg/L)
Lead	MCL (0.05 mg/L)
Manganese	PQL (0.01 mg/L)
Zinc	PQL (0.01 mg/L)

E-8 b (2) Alternate Concentration Limits

Concentration limits are the standard limits to be applied at Points of Compliance or the Facility boundary. However, based on the current data trends and site-specific factors, it may not be possible to remediate the groundwater plume to the current NCGS. Therefore, ACLs or risk based clean up levels, if accepted, may be established that must be obtained at a point within the property boundary prior to termination of the groundwater recovery program. These limits will be defined as the steady state or equilibrium concentration of a given contaminant at a Point of Compliance that would not cause an exceedance of the concentration limit at the facility boundary. These concentrations cannot be established at this time. The ACLs may be established in the future and applied based on a demonstration that the levels will not cause an exceedance of the concentration limits at the Facility boundary. Such a demonstration shall be based on an appropriate contaminant fate and transport analysis using historical corrective action monitoring data.

E-8c Corrective Action Plan

Corrective measures for groundwater and land based SWMUs have not been implemented at the Facility; however, these will be implemented in the future, as deemed necessary, and will include a CAP. This CAP will be designed to prevent hazardous constituents from exceeding their respective concentration limits at the property boundary. The CAP will consist of detailed engineering plans, if required, and will report and address the following:

- Identification of compliance point
- Plans for removing and handling hazardous waste
- Design and construction plans and specifications for any proposed features to contain groundwater or redirect its flow (e.g. drains, engineered barriers, wells)
- A description of the treatment technologies to be employed to remove hazardous constituents from contaminated groundwater
- Description of the operations and maintenance plans for the corrective action measures
- Description of any additional hydrogeologic data collected for use in designing the corrective action measures
- Schedule for implementation of the corrective action measures

E-8d Groundwater Monitoring Program

Implemented as part of the CAP, a groundwater monitoring program will be utilized to determine compliance with the concentration limits established under 40CFR Part 264.94, and to determine the effectiveness of the CAP.

E-8d (1) Description of Monitoring System

The groundwater monitoring program will include a description of the following:

- Number of wells
- Locations
- Depths and screen intervals
- Casing descriptions
- Other well construction details
- Description of how the groundwater monitoring program will demonstrate the adequacy of the correction action.

This monitoring program will continue until such time that the NCDEQ approves a petition for the Facility to modify or terminate the Corrective Action program based on a comparison of monitoring data to the concentration limits or ACLs proposed in the future. The Facility may also petition the NCDEQ to discontinue monitoring at any well or wells where three (3) consecutive monitoring events indicate contaminant concentrations are below the concentration limits or detection limits.

The frequency and points of monitoring in the program will provide sufficient data for a complete evaluation of the adequacy of corrective measures underway at the facility. The proposed monitoring will be performed in and around the defined extent of the contaminant plume for an evaluation of plume migration and capture by the groundwater recovery system.

E-8d (2) Description of Sampling and Analysis Procedures

The most recently approved SAP, located in Appendix E-3, contains detailed information regarding the sample collection, handling and analysis.

<u>Procedures for Annual Determination of Groundwater Flow and Direction</u>

The direction and rate of groundwater flow will continue to be determined annually using the following procedure:

- Static groundwater elevations will be measured on the same date at the monitoring well locations with an electronic interface probe with an accuracy of 0.01 feet.
- Water level measurements from all monitoring wells will be made on the date of the most recent sampling event for the annual groundwater flow determination.

- Maps of the shallow water table aquifer and deeper water aquifer will be constructed from the static water level measurements. The flow direction and gradient will be determined directly from the maps.
- The range of flow gradients and hydraulic conductivities previously determined at the site will be used to calculate the range of the groundwater flow rate from the equation:

$$Vs=ki/n$$

where: Vs = flow seepage velocity in ft/day,

k = hydraulic conductivity in ft/day,

i = flow gradient ft/ft,

n =effective porosity (assumed to be 0.25)

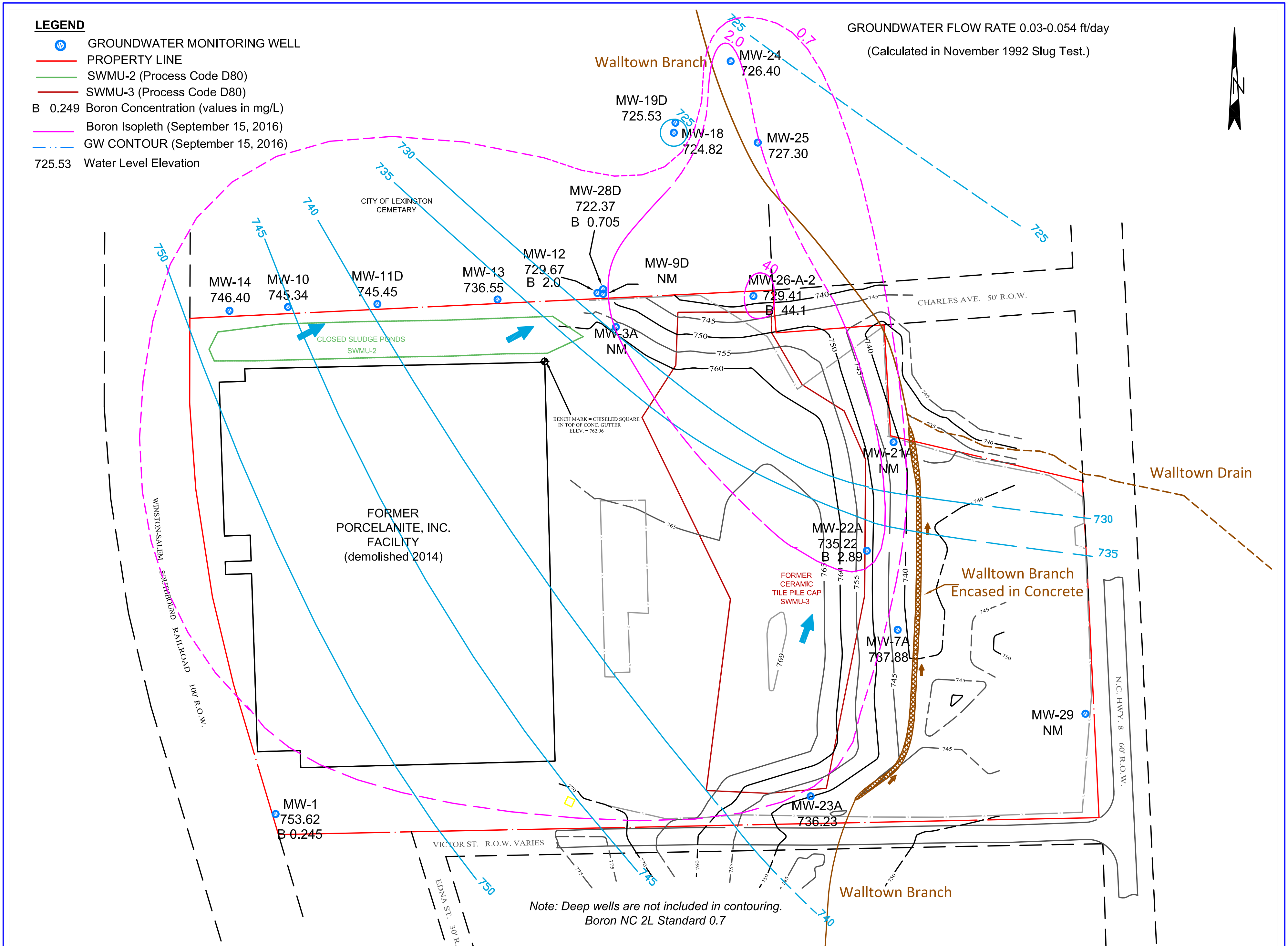
E-8d (3) Monitoring Data and Statistical Analysis Procedure

No statistical analysis of the monitoring data is required. The MCLs or PQLs presented in Section E-8b (l), or potentially ACLs (to be established in the future), will be used to evaluate the effectiveness and scope of the corrective action system. Corrective action will continue until the NCDEQ approves a petition to modify or terminate the system as described in Section E-8d. Any constituent with a concentration remaining below the MCL or PQL for three (3) consecutive years may be dropped from the monitoring program in accordance with 264.96(c).

E-8d (4) Reporting Requirements

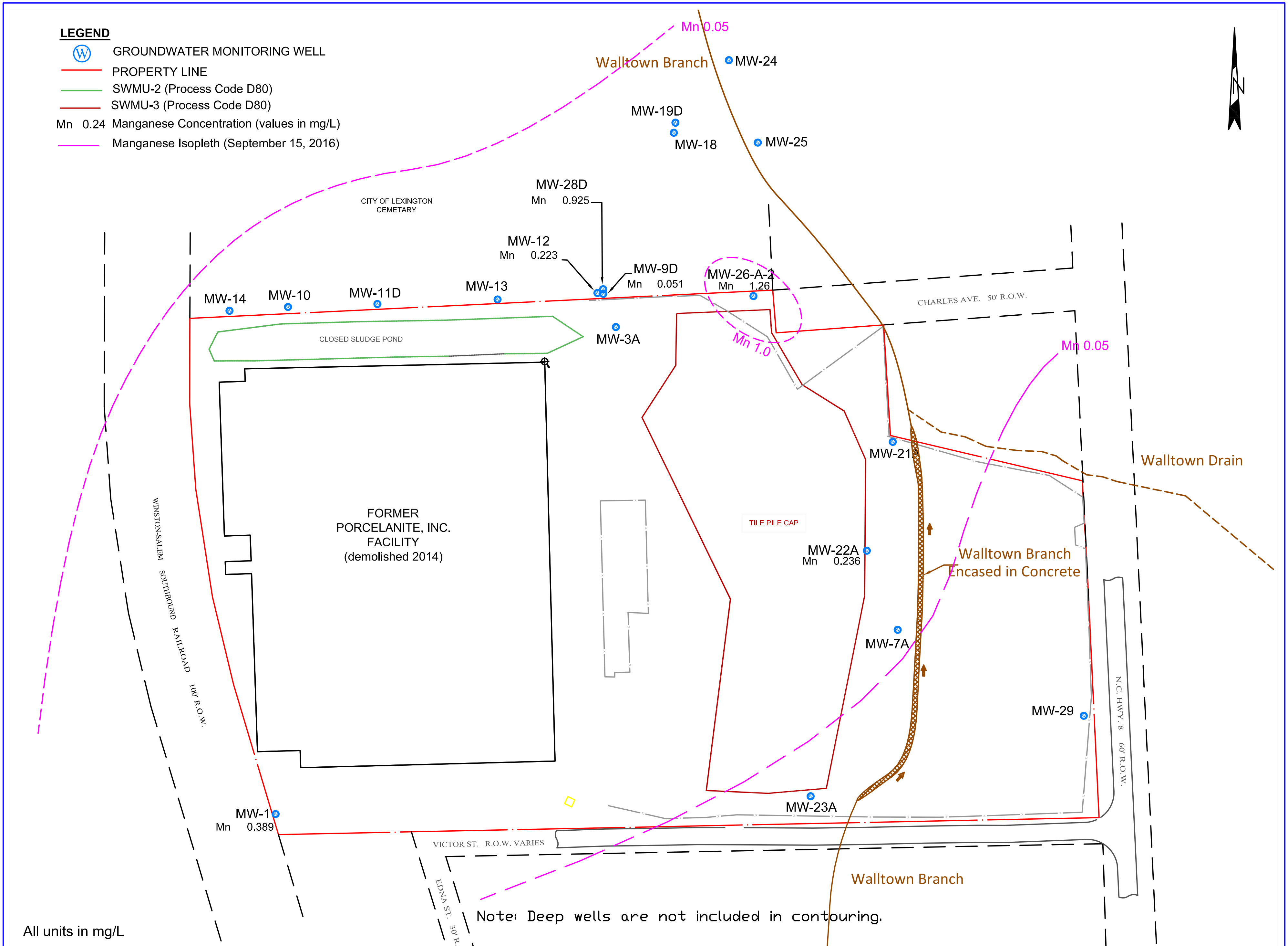
Records of the performance of the Corrective Measures and the progress of remediation will be kept neat and orderly in both hard and electronic format files. Reports will be submitted as required in the approved Corrective Measures Study Work Plan

Part E Figures

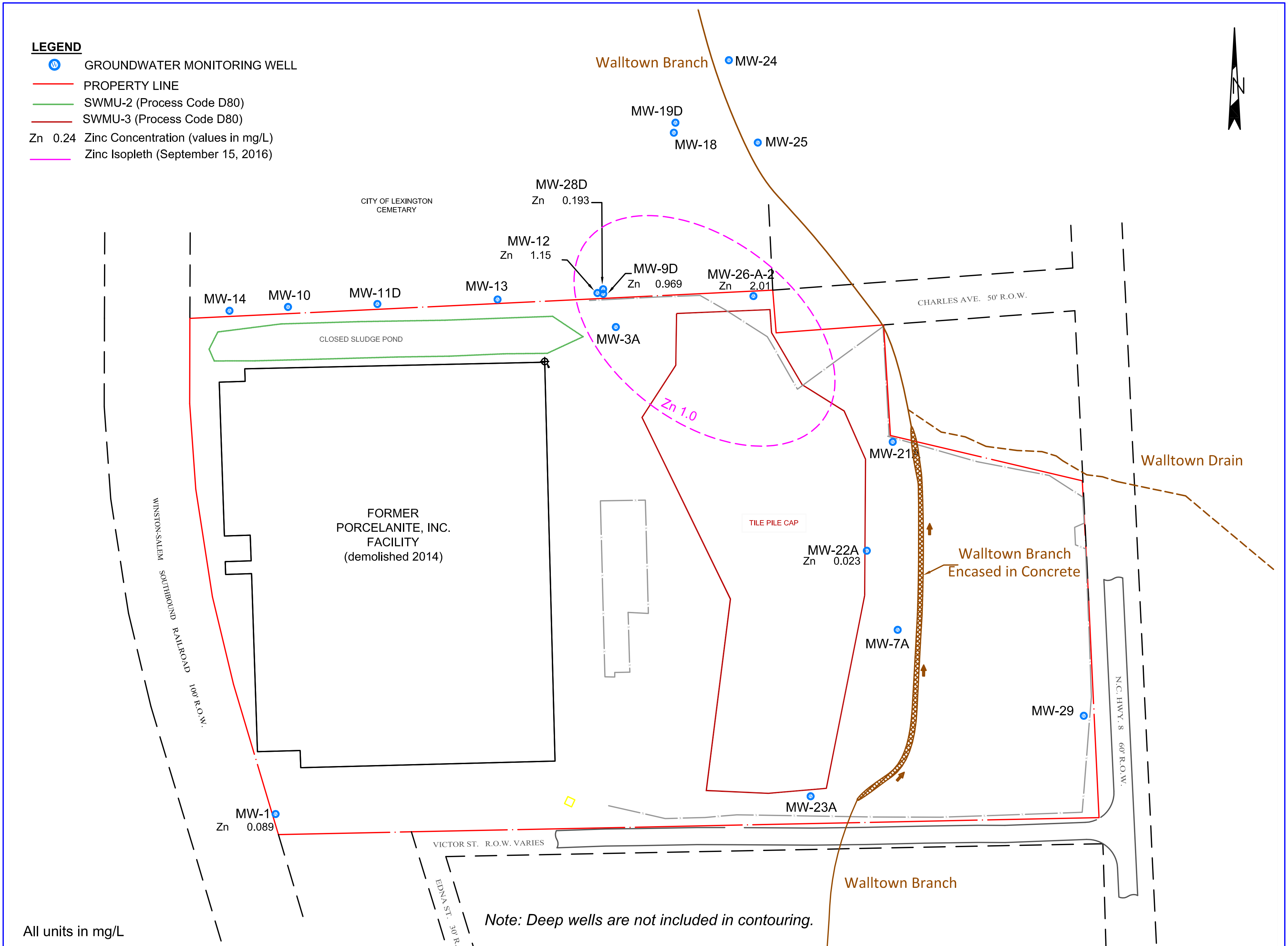


WATERS EDGE ENVIRONMENTAL, LLC

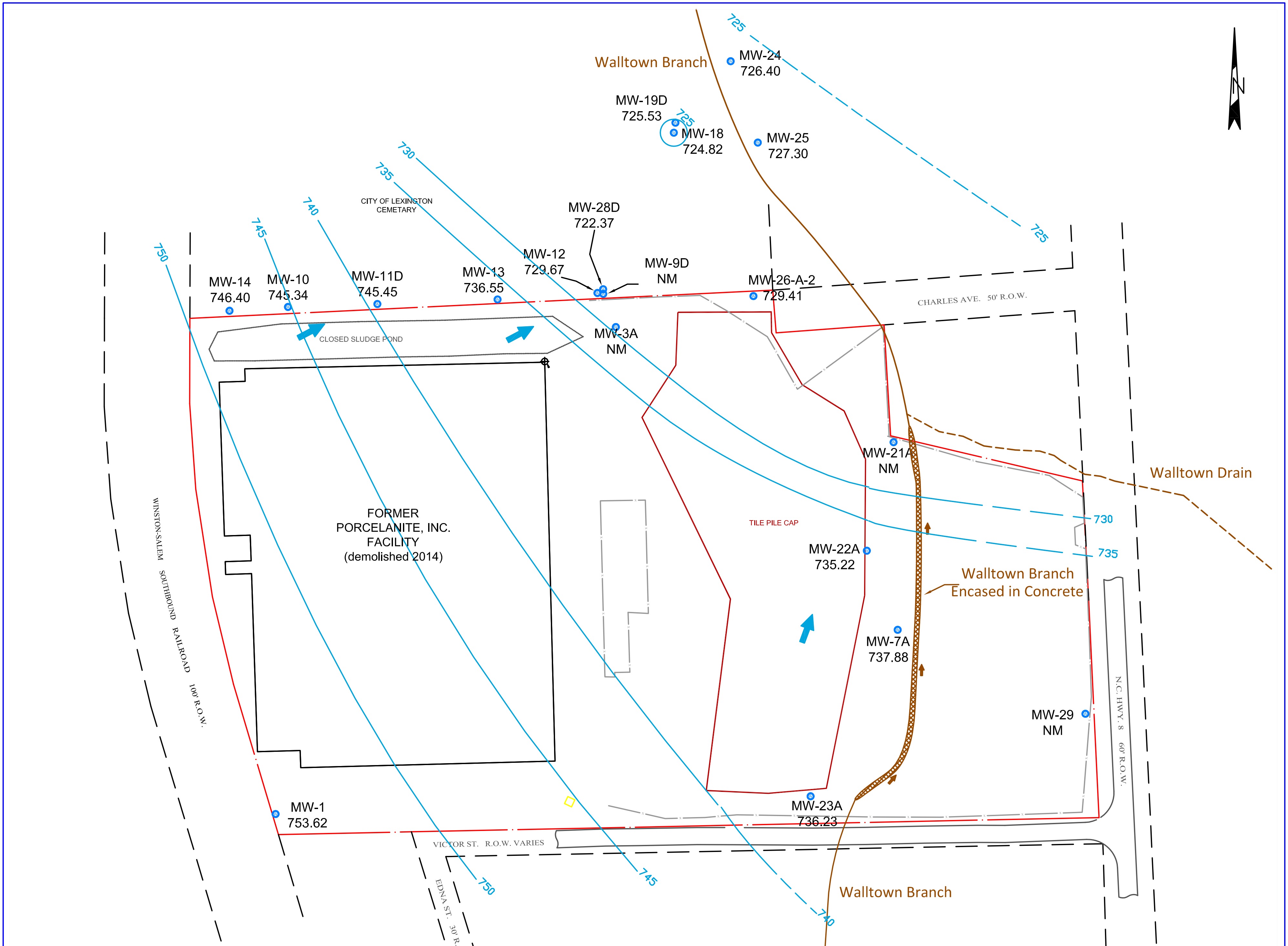
Author	Drawing	Layers	Date	Title
plr	Part E Fig E1-A		12.20.2016	Topographic and Monitoring Well Location Map with Groundwater Flow and Boron Isopleths- September 15, 2016
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	12.6.2017	E-1A	1" = 150'	Former Porelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author plr	Drawing base 16-078 F03	Layers	Date 12.20.2016	Title Mn Exceedance Map (September 15, 2016 Data)
	Job No. R1-21	Revision 12.6.2017	Figure E-1B	Scale 1" = 150'	Project Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author plr	Drawing base 16-078 F03	Layers	Date 12.20.2016	Title Zn Exceedance Map (September 15, 2016 Data)
	Job No. R1-21	Revision 12.6.2017	Figure E-1C	Scale 1" = 150'	Project Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC

Author: plr	Drawing: Part E Fig E-2	Layers	Date: 12.20.2016	Title	Groundwater Contour Map (September 15, 2016)
Job No.: R1-21	Revision: 12.20.2016	Figure: E-2	Scale: 1" = 150'	Project	Former Porcelanite Facility Lexington, North Carolina

Part E Tables

Table E-1A
1995-2004 Summary of Analytical Result for Boron
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-95	Jun-95	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
MW-1	0.341	0.202	0.31	0.332	0.232	0.209	0.24	0.228	0.232	0.186	0.189	NA	0.435	0.108
MW-3A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.18**	NA
MW-10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**7.42**	NA
MW-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**22.8**	NA
MW-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**8.56**	NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-21A	**6.18**	**9.72**	**11.2**	**4.07**	**5.48**	**5.47**	**6.34**	**4.92**	**3.81**	NA	NA	NA	NA	NA
MW-22A	**5.64**	**6.2**	**4.89**	**6.24**	**3.58**	**4.06**	BDL	**3.99**	**4.0**	NA	NA	NA	NA	NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.43**	**1.55**
MW-26A	**80.8**	**37**	**29.3**	**43.8**	**70.9**	**52.2**	**102.6**	NA	NA	NA	NA	NA	NA	NA
MW-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.83**	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (0.7 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Boron
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01
MW-1	0.28	0.249	0.254	0.22	0.179	0.239	0.24	0.237	0.281	0.225	0.236	0.267	0.236	0.482
MW-3A	NA	NA	**1.32**	NA	NA	NA	**0.93**	NA	**1.04**	NA	NA	NA	**1.07**	NA
MW-7A	NA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	**1.12**	NA	**1.07**	NA	**0.798**	NA	**0.812**	NA	**0.806**	NA	**0.713**	NA	**0.802**	NA
MW-10	**14.5**	NA	NA	NA	**17.4**	NA	NA	NA	**9.01**	NA	NA	NA	NA	NA
MW-11	0.217	NA	NA	NA	0.281	NA	NA	NA	BDL	NA	NA	NA	BDL	NA
MW-12	**4.78**	NA	**2.12**	NA	**5.0**	NA	**4.8**	NA	**4.32**	NA	**2.86**	NA	**4.72**	NA
MW-13	**10.2**	NA	**10.7**	NA	**10.5**	NA	**8.14**	NA	NA	NA	NA	NA	NA	NA
MW-14	**8.31**	NA	**9.46**	NA	**5.75**	NA	**4.8**	NA	**6.5**	NA	**5.2**	NA	NA	NA
MW-18	0.237	NA	NA	NA	0.613	NA	NA	NA	0.283	NA	NA	NA	0.38	NA
MW-19	0.625	NA	NA	NA	0.499	NA	NA	NA	BDL	NA	NA	NA	0.129	NA
MW-21A	NA	0.148	BDL	BDL	BDL	BDL	0.115	BDL	BDL	0.234	BDL	0.25	BDL	BDL
MW-22A	NA	**8.47**	**1.08**	**12**	**13.8**	**8.54**	**8.25**	**8.98**	**8.88**	**8.69**	**7.66**	**11**	**8.86**	**13**
MW-23A	NA	NA	NA	0.302	**0.74**	0.211	**0.527**	0.272	0.104	0.111	**1.31**	0.181	BDL	0.181
MW-24	**3.2**	NA	NA	NA	**3.52**	NA	NA	NA	**3.05**	NA	NA	NA	**3.92**	NA
MW-25	**1.71**	**1.58**	**1.77**	**1.83**	**3.12**	NA	**1.79**	**1.7**	**1.75**	**1.55**	BDL	**2.04**	**2.2**	**2.02**
MW-26A	NA	NA	NA	0.262	**10.4**	NA	**6.54**	**6.88**	**13.8**	**13**	**1.68**	**17.5**	**21.4**	**40.9**
MW-28	**3.86**	NA	**3.23**	NA	**3.33**	NA	**2.77**	NA	**2.37**	NA	**0.956**	NA	**2.34**	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (0.7 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Boron
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04
MW-1	0.251	0.208	NA	0.303	0.261	0.157	0.426	0.323	1st Quarter sampling not performed due to SAP revisions.	0.248	3rd Quarter sampling not performed due to SAP revisions.	0.288
MW-3A	**0.976**	NA	**1.14**	NA	**1.48**	NA	**2.97**	NA		NA		NA
MW-7A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL		0.163
MW-8	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-9	**0.794**	NA	**1.99**	NA	**0.538**	NA	0.516	NA		NA		NA
MW-10	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-11	NA	NA	0.118	NA	NA	NA	0.162	NA		NA		NA
MW-12	**2.67**	NA	NA	NA	**4.56**	NA	**6.5**	NA		NA		NA
MW-13	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-14	**4.22**	NA	NA	NA	**2.47**	NA	**2.42**	NA		NA		NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-19	NA	NA	0.441	NA	NA	NA	0.112	NA		NA		NA
MW-21A	BDL	BDL	0.456	0.336	0.117	BDL	BDL	0.147		BDL		0.177
MW-22A	**7.9**	**10**	**16.3**	**8.93**	**7.13**	**3.46**	**3.1**	**2.86**		**4.25**		*pump broken*
MW-23A	BDL	BDL	0.37	**2.3**	0.7	0.402	**1.72**	**2.32**		**3.19**		**2.61**
MW-24	NA	NA	**5.22**	NA	NA	NA	**4.98**	NA		NA		NA
MW-25	**2.47**	**2.55**	**3.37**	**2.9**	**3.59**	**2.29**	**2.57**	**2.24**		**1.57**		**2.13**
MW-26A	**37.4**	**31.7**	**68**	**34.6**	**32.1**	**20.8**	**19.8**	**18.1**		**17.8**		**13.3**
MW-28	**2.54**	NA	**3.56**	NA	**2.17**	NA	NA	NA		NA		NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (0.7 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Cobalt
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-95	Jun-95	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
MW-1	NA	**0.0033**	**0.033**	**0.036**	**0.029**	**0.037**	NA	BDL	NA	**0.074**	NA	NA	**0.04**	NA
MW-3A	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	NA	NA	NA
MW-7A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-9	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	BDL	NA
MW-10	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA
MW-11	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA
MW-12	NA	**0.21**	NA	**0.117**	NA	**0.099**	NA	**0.062**	NA	**0.083**	NA	**0.091**	**0.055**	NA
MW-13	NA	**0.042**	NA	NA	NA	**0.032**	NA	BDL	NA	**0.026**	NA	**0.026**	**0.027**	NA
MW-14	NA	BDL	NA	NA	NA	BDL	NA	BDL	NA	NA	NA	BDL	BDL	NA
MW-18	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	BDL	BDL	NA	NA
MW-19	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	NA	NA	BDL	NA	NA
MW-21A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-22A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-23A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-24	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA	NA
MW-25	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA	NA
MW-26A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	BDL	NA	NA
MW-28	NA	BDL	NA	**0.0029**	NA	BDL	NA	BDL	NA	NA	NA	BDL	BDL	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Cobalt
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01
MW-1	**0.184**	NA	**0.101**	NA	**0.148**	NA	**0.402**	NA	**0.057**	NA	**0.195**	NA	**0.951**	NA
MW-3A	NA	NA	BDL	NA	NA	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA
MW-10	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	NA	NA
MW-11	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA
MW-12	**0.083**	NA	**0.083**	NA	**0.056**	NA	**0.046**	NA	**0.056**	NA	**0.049**	NA	**0.047**	NA
MW-13	**0.037**	NA	**0.033**	NA	**0.026**	NA	**0.026**	NA	NA	NA	NA	NA	NA	NA
MW-14	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	**0.12**	NA	NA	NA
MW-18	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA
MW-19	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-28	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	**0.013**	NA	BDL	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Cobalt
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04
MW-1	**0.178**	NA	NA	NA	**0.228**	NA	**0.123**	NA	1st Quarter sampling not performed due to SAP revisions.	NA	3rd Quarter sampling not performed due to SAP revisions.	NA
MW-3A	BDL	NA	BDL	NA	BDL	NA	BDL	NA		NA		NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-9	BDL	NA	BDL	NA	BDL	NA	BDL	NA		NA		NA
MW-10	NA	NA	NA	NA	NA	NA	BDL	NA		NA		NA
MW-11	NA	NA	BDL	NA	NA	NA	BDL	NA		NA		NA
MW-12	**0.038**	NA	NA	NA	BDL	NA	**0.017**	NA		NA		NA
MW-13	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-14	BDL	NA	NA	NA	BDL	NA	BDL	NA		NA		NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-19	NA	NA	BDL	NA	NA	NA	BDL	NA		NA		NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-28	**0.01**	NA	BDL	NA	BDL	NA	NA	NA		NA		NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL = Below Detection Limit
NA = Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Fluoride
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-95	Jun-95	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
MW-1	NA	BDL	0.141	BDL	BDL	BDL	NA	0.1	NA	BDL	NA	NA	BDL	NA
MW-3A	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	NA	NA	NA
MW-7A	BDL	BDL	BDL	BDL	BDL	BDL	0.19	BDL	BDL	NA	NA	NA	NA	NA
MW-8	BDL	BDL	BDL	BDL	BDL	BDL	0.14	BDL	BDL	NA	NA	NA	NA	NA
MW-9	NA	0.4	NA	0.62	NA	0.43	NA	0.3	NA	0.34	NA	BDL	0.216	NA
MW-10	NA	0.8	NA	1.4	NA	**2.6**	NA	1.6	NA	1.68	NA	1.5	NA	NA
MW-11	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA
MW-12	NA	0.58	NA	0.62	NA	0.38	NA	0.265	NA	0.3	NA	0.17	0.134	NA
MW-13	NA	BDL	NA	BDL	NA	0.1	NA	0.3	NA	0.17	NA	BDL	0.22	NA
MW-14	NA	BDL	NA	BDL	NA	0.1	NA	BDL	NA	BDL	NA	BDL	BDL	NA
MW-18	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NA	BDL	BDL	NA	NA
MW-19	NA	0.32	NA	0.27	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA	NA
MW-21A	BDL	BDL	BDL	BDL	BDL	BDL	0.12	BDL	BDL	NA	NA	NA	NA	NA
MW-22A	BDL	0.17	BDL	BDL	BDL	BDL	0.14	BDL	BDL	NA	NA	NA	NA	NA
MW-23A	BDL	BDL	BDL	0.38	BDL	BDL	BDL	BDL	BDL	NA	NA	NA	NA	NA
MW-24	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA	NA
MW-25	NA	BDL	NA	BDL	NA	BDL	NA	0.1	NA	NA	NA	BDL	NA	NA
MW-26A	1.34	0.14	1.68	0.14	1.58	0.17	1.8	BDL	NA	NA	NA	NA	NA	NA
MW-28	NA	BDL	NA	BDL	NA	0.1	NA	BDL	NA	NA	NA	BDL	BDL	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (2 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Fluoride
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01
MW-1	BDL	NA	BDL	NA	BDL	NA	0.108	NA	BDL	NA	BDL	NA	0.188	NA
MW-3A	NA	NA	BDL	NA	NA	NA	BDL	NA	BDL	NA	NA	NA	BDL	NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	0.23	NA	0.2	NA	0.15	NA	0.157	NA	0.24	NA	BDL	NA	0.37	NA
MW-10	**2.72**	NA	NA	NA	1.47	NA	NA	NA	0.82	NA	NA	NA	NA	NA
MW-11	0.15	NA	NA	NA	0.12	NA	NA	NA	0.132	NA	NA	NA	0.163	NA
MW-12	0.2	NA	NA	NA	BDL	NA	0.142	NA	0.189	NA	BDL	NA	0.275	NA
MW-13	BDL	NA	BDL	NA	BDL	NA	BDL	NA	NA	NA	NA	NA	NA	NA
MW-14	BDL	NA	BDL	NA	BDL	NA	BDL	NA	BDL	NA	0.149	NA	NA	NA
MW-18	0.33	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	0.107	NA
MW-19	BDL	NA	NA	NA	BDL	NA	NA	NA	BDL	NA	NA	NA	0.329	NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-28	BDL	NA	BDL	NA	1.62	NA	0.123	NA	0.111	NA	BDL	NA	0.609	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (2 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Fluoride
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-03	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04
MW-1	BDL	NA	NA	NA	0.381	NA	0.124	NA	1st Quarter sampling not performed due to SAP revisions.	NA	3rd Quarter sampling not performed due to SAP revisions.	NA
MW-3A	BDL	NA	BDL	NA	0.137	NA	BDL	NA		NA		NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-9	0.124	NA	BDL	NA	0.225	NA	BDL	NA		NA		NA
MW-10	NA	NA	NA	NA	NA	NA	0.107	NA		NA		NA
MW-11	NA	NA	0.209	NA	NA	NA	BDL	NA		NA		NA
MW-12	0.165	NA	NA	NA	0.141	NA	BDL	NA		NA		NA
MW-13	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-14	BDL	NA	NA	NA	0.159	NA	BDL	NA		NA		NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-19	NA	NA	0.153	NA	NA	NA	0.109	NA		NA		NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-28	0.125	NA	BDL	NA	0.198	NA	NA	NA		NA		NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (2 mg/L).

Table E-1A
1995-2004 Summary of Analytical Result for Gross Beta
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-95	Jun-95	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
MW-1	**3.7**	**3.1**	**3.2**	**3.1**	**3.4**	**3.1**	**3.7**	**3.8**	**2.7**	**2.5**	**3.5**	NA	NA	NA
MW-3A	NA	NA	NA	BDL	NA	NA	NA	**11.7**	NA	NA	NA	NA	NA	NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	**1.8**	NA	NA	NA	NA	NA	NA
MW-8	NA	NA	NA	NA	NA	NA	NA	**2.9**	NA	NA	NA	NA	NA	NA
MW-9	NA	NA	NA	NA	NA	NA	NA	**6.8**	NA	NA	NA	**5.5**	NA	NA
MW-10	NA	NA	NA	NA	NA	NA	NA	**18.1**	NA	NA	NA	**20.6**	NA	NA
MW-11	NA	NA	NA	NA	NA	NA	NA	**1.9**	NA	NA	NA	**1.8**	NA	NA
MW-12	NA	NA	NA	NA	NA	NA	NA	**8.3**	NA	NA	NA	**13.4**	NA	NA
MW-13	NA	NA	NA	NA	NA	NA	NA	**8.8**	NA	NA	NA	**7.0**	NA	NA
MW-14	NA	NA	NA	NA	NA	NA	NA	**8.8**	NA	NA	NA	**5.5**	NA	NA
MW-18	NA	NA	NA	NA	NA	NA	NA	**3**	NA	NA	BDL	**2.4**	NA	NA
MW-19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**10.4**	NA	NA
MW-21A	**3.2**	**3.3**	**4.1**	BDL	**3.7**	**3.6**	**2.3**	**3.1**	**3.0**	NA	NA	NA	NA	NA
MW-22A	**1.4**	NA	**1.4**	**3.8**	**1.7**	**1.3**	**1.1**	**1.8**	BDL	NA	NA	NA	NA	NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	**1.6**	NA	NA	NA	NA	NA	NA
MW-24	NA	NA	NA	NA	NA	NA	NA	**2.1**	NA	NA	NA	BDL	NA	NA
MW-25	NA	NA	NA	NA	NA	NA	NA	**1.7**	NA	NA	NA	**2.2**	NA	NA
MW-26A	**20.4**	**21.1**	NA	**14.6**	**15**	**14.6**	**20.5**	NA	NA	NA	NA	**8.5**	NA	NA
MW-28	NA	NA	NA	NA	NA	NA	NA	**9.0**	NA	NA	NA	**9.9**	NA	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Gross Beta
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01
MW-1	BDL	NA	NA	NA	NA	NA	NA	NA	**5.4**	NA	NA	NA	**4**	NA
MW-3A	NA	NA	NA	NA	NA	NA	NA	NA	**16.2**	NA	NA	NA	**11.3**	NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9	**6.3**	NA	NA	NA	**5.3**	NA	NA	NA	**5.4**	NA	NA	NA	**4.2**	NA
MW-10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	**9.3**	NA	NA	NA	**9.8**	NA	NA	NA	**11.5**	NA	NA	NA	**11.4**	NA
MW-13	**7.5**	NA	NA	NA	**8.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	**8.8**	NA	NA	NA	**8.1**	NA	NA	NA	**8.5**	NA	NA	NA	NA	NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-28	**7.7**	NA	NA	NA	NA	NA	NA	NA	**59.3**	NA	NA	NA	**5.4**	NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Gross Beta
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04
MW-1	NA	NA	NA	NA	NA	NA	NA	NA	1st Quarter sampling not performed due to SAP revisions.	NA	3rd Quarter sampling not performed due to SAP revisions.	NA
MW-3A	NA	NA	**17.4**	NA	NA	NA	NA	NA		NA		NA
MW-7A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-8	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-9	NA	NA	**5.2**	NA	NA	NA	NA	NA		NA		NA
MW-10	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-11	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-12	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-13	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-14	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-18	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-19	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-21A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-22A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-23A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-24	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-25	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-26A	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-28	NA	NA	**9.1**	NA	NA	NA	NA	NA		NA		NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (detection limit).

Table E-1A
1995-2004 Summary of Analytical Result for Manganese
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	Mar-98	Jun-98	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01
MW-1	NA	NA	0.025	NA	NA	NA	0.025	NA	NA	NA	**0.093**	NA	NA	NA
MW-3A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.316**	NA	NA	NA
MW-9	NA	NA	**0.163**	NA	NA	NA	**0.113**	NA	NA	NA	**0.124**	NA	NA	NA
MW-12	NA	NA	**0.568**	NA	NA	NA	**0.512**	NA	NA	NA	**0.55**	NA	NA	NA
MW-13	NA	NA	**0.278**	NA	NA	NA	**0.262**	NA	NA	NA	dry	NA	NA	NA
MW-14	NA	NA	**0.092**	NA	NA	NA	**0.094**	NA	NA	NA	**0.104**	NA	NA	NA
MW-28	NA	NA	**0.133**	NA	NA	NA	**0.361**	NA	NA	NA	**0.952**	NA	NA	NA

Well ID #	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04
MW-1	**0.139**	NA	NA	NA	NA	NA	NA	NA	**0.123**	NA	1st Quarter sampling not performed due to SAP revisions.	NA	3rd Quarter sampling not performed due to SAP revisions.	NA
MW-3A	NA	NA	NA	NA	**1.1**	NA	NA	NA	**0.348**	NA		NA		NA
MW-9	**0.066**	NA	NA	NA	**0.082**	NA	NA	NA	**0.068**	NA		NA		NA
MW-12	**0.567**	NA	NA	NA	NA	NA	NA	NA	**0.291**	NA		NA		NA
MW-13	dry	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA
MW-14	dry	NA	NA	NA	NA	NA	NA	NA	**0.127**	NA		NA		NA
MW-28	**0.314**	NA	NA	NA	**0.761**	NA	NA	NA	NA	NA		NA		NA

Additional compounds were analyzed but determinted not to be COCs.
All results in mg/L
BDL=Below Detection Limit
NA=Not Analyzed
Highlighted blocks indicate concentration in excess of current GW standard (0.05 mg/L).

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-1

Parameter	Units	Quantitation Limit	2L Standard	9/8/05	8/18/06	3/28/07	9/12/07	3/18/08	9/17/08	3/25/09	9/29/09
Metals											
Boron	mg/L	0.100	0.7	0.226	0.254	0.268	0.369	BQL	0.288	0.236	0.322
Cadmium	mg/L	0.005	0.002	NA	NA	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	0.344	0.818	0.222	0.042	0.259	0.295
Chromium	mg/L	0.010	0.01	NA	NA	BQL	**0.013**	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	**0.026**	BQL	0.007	0.012	0.009	0.012	**0.018**
Manganese	mg/L	0.010	0.05	NA	NA	**0.102**	**0.147**	**0.131**	0.034	0.039	**0.210**
Zinc	mg/L	0.020	1.0	NA	NA	0.138	0.381	0.268	0.231	0.283	0.085

MW-1 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/23/10	9/21/10	3/22/11	10/17/11	3/27/12	9/20/12	3/29/13	9/17/13
Metals											
Boron	mg/L	0.100	0.7	0.224	0.362	0.294	0.314	0.310	0.292	0.266	0.321
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	0.074	0.056	0.279	0.158	0.124	0.124
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	0.009	0.007	BQL	0.006	0.006	0.007
Manganese	mg/L	0.010	0.05	**0.086**	**0.118**	**0.086**	0.021	**0.073**	0.023	0.014	0.036
Zinc	mg/L	0.020	1.0	0.283	0.096	0.108	0.208	0.182	0.132	0.330	0.222

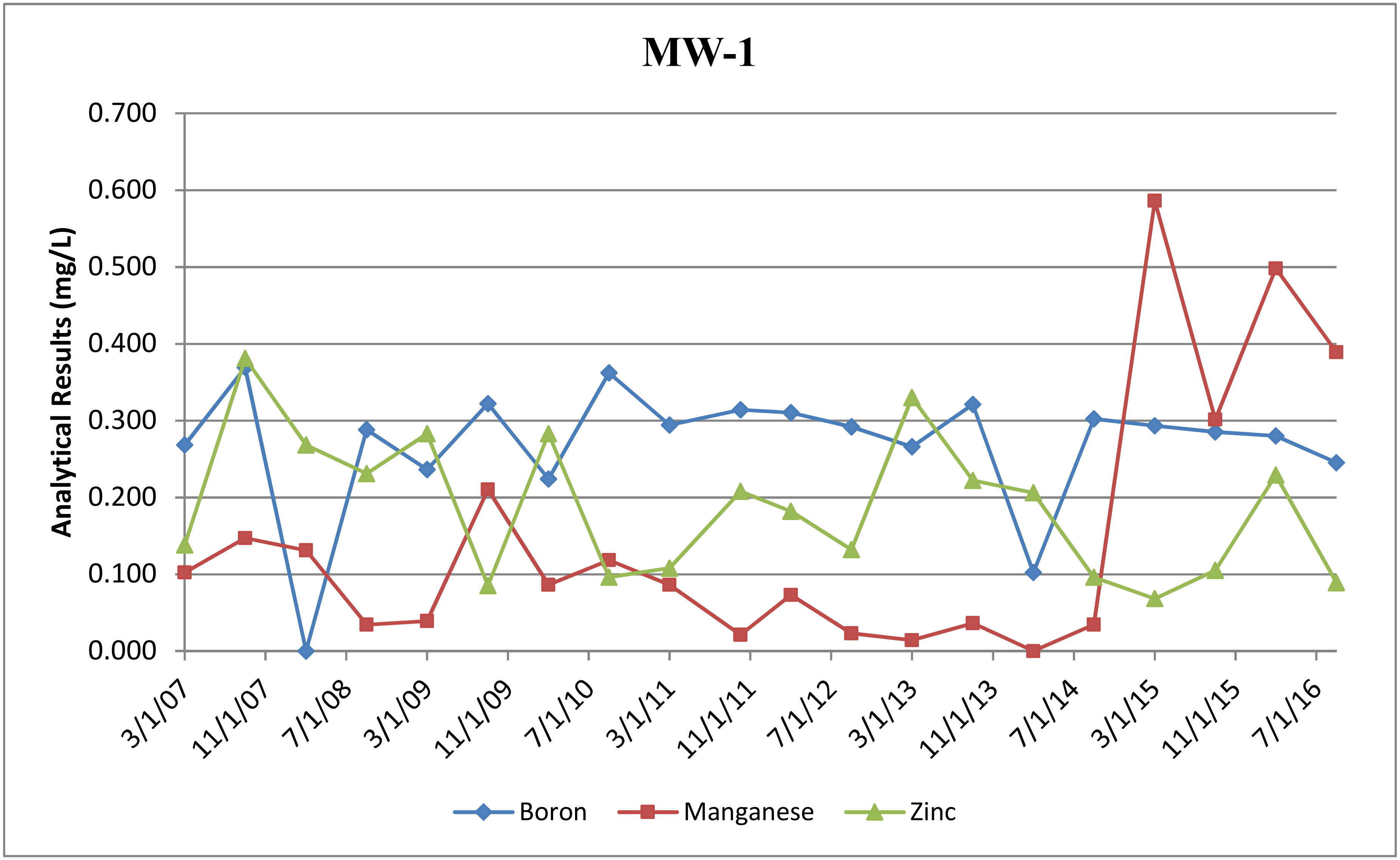
BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-1 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16		
Metals											
Boron	mg/L	0.100	0.7	0.102	0.302	0.293	0.285	0.280	0.245		
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL		
Cobalt	mg/L	0.025	NS	BQL	0.062	0.036	BQL	**0.026**	BQL		
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL		
Lead	mg/L	0.005	0.015	BQL	0.010	0.005	BQL	0.015	BQL		
Manganese	mg/L	0.010	0.05	BQL	0.034	**0.586**	**0.301**	**0.498**	**0.389**		
Zinc	mg/L	0.020	1.0	0.206	0.096	0.068	0.105	0.229	0.089		

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established



MW-1
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Analytical Results (mg/L)
3/1/07
11/1/07
7/1/08
3/1/09
11/1/09
7/1/10
3/1/11
11/1/11
7/1/12
3/1/13
11/1/13
7/1/14
3/1/15
11/1/15
7/1/16
Boron
Manganese
Zinc

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-9D

Parameter	Units	Quantitation Limit	2L Standard	3/30/05	9/8/05	5/19/06	10/18/06	3/28/07	9/12/07	3/18/08	9/17/08
Metals											
Boron	mg/L	0.100	0.7	**1.41**	**0.744**	**0.738**	0.694	0.578	**1.69**	BQL	**0.738**
Cadmium	mg/L	0.005	0.002	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	BQL	BQL	BQL	BQL	0.006
Manganese	mg/L	0.010	0.05	NA	NA	NA	NA	0.033	**0.412**	**0.058**	**0.160**
Zinc	mg/L	0.020	1.0	NA	NA	NA	NA	**1.30**	**2.50**	**1.5**	**1.01**

MW-9D (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/25/09	9/29/09	3/23/10	9/21/10	3/22/11	10/17/11	3/27/12	9/20/12
Metals											
Boron	mg/L	0.100	0.7	0.419	0.59	0.332	0.441	0.613	0.136	0.527	0.497
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	0.006	BQL	0.006	BQL	BQL
Manganese	mg/L	0.010	0.05	0.035	0.034	**0.058**	0.043	**0.142**	0.013	0.041	**0.10**
Zinc	mg/L	0.020	1.0	**1.09**	**1.10**	**1.16**	**1.21**	0.971	0.473	**1.09**	**1.10**

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-9D (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/29/13	9/17/13	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16
Metals											
Boron	mg/L	0.100	0.7	BQL	0.385	0.260	0.355	0.266	**0.737**	0.249	0.262
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	0.008	BQL	0.014	0.009	BQL	BQL	BQL	0.006
Manganese	mg/L	0.010	0.05	0.014	**0.058**	**0.070**	**0.062**	0.05	0.039	**0.056**	**0.051**
Zinc	mg/L	0.020	1.0	0.48	**1.13**	**1.26**	**1.13**	0.768	0.996	**1.06**	0.969

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

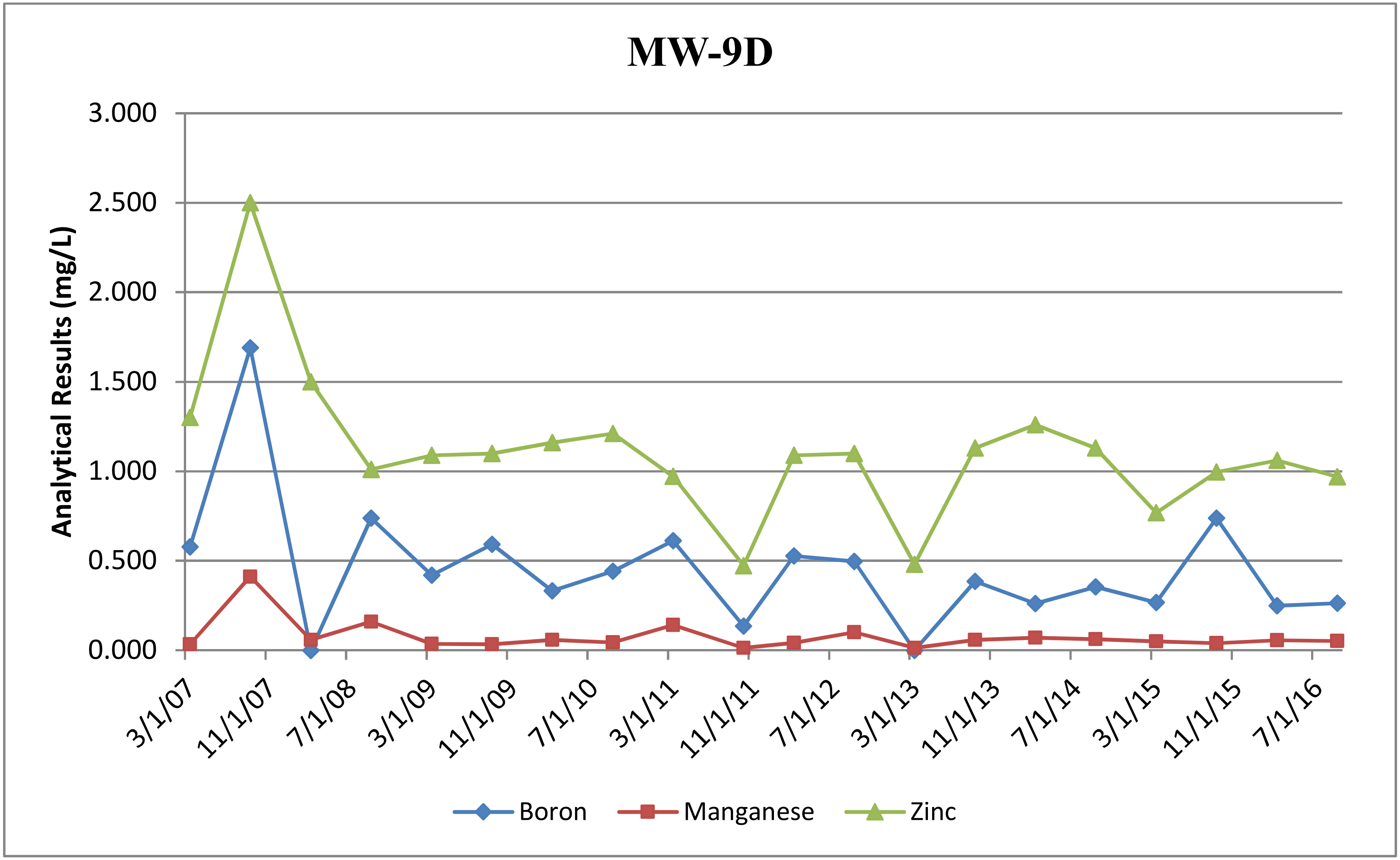

MW-9D
Analytical Results (mg/L)
3.000
2.500
2.000
1.500
1.000
0.500
0.000
3/1/07
11/1/07
7/1/08
3/1/09
11/1/09
7/1/10
3/1/11
11/1/11
7/1/12
3/1/13
11/1/13
7/1/14
3/1/15
11/1/15
7/1/16
Boron
Manganese
Zinc

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-12

Parameter	Units	Quantitation Limit	2L Standard	3/30/05	9/8/05	5/19/06	10/18/06	3/28/07	9/12/07	3/18/08	9/17/08
Metals											
Boron	mg/L	0.100	0.7	**3.33**	**1.79**	**1.95**	**0.823**	**3.70**	**1.79**	BQL	**1.35**
Cadmium	mg/L	0.005	0.002	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	NA	NA	NA	NA	**0.269**	**0.412**	**0.336**	**0.243**
Zinc	mg/L	0.020	1.0	NA	NA	NA	NA	**1.60**	**2.49**	**2.01**	**1.33**

MW-12 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/25/09	9/29/09	3/23/120	9/21/10	3/22/11	10/17/11	3/28/12	9/20/12
Metals											
Boron	mg/L	0.100	0.7	**2.34**	**1.23**	**2.49**	**2.65**	**1.81**	**1.77**	**2.08**	**1.91**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	0.005	BQL	BQL	BQL	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	**0.224**	**2.880**	**0.116**	**0.234**	**0.242**	**0.284**	**0.205**	**0.229**
Zinc	mg/L	0.020	1.0	**1.34**	**1.58**	0.772	**1.26**	**1.33**	**1.49**	**1.17**	**1.27**

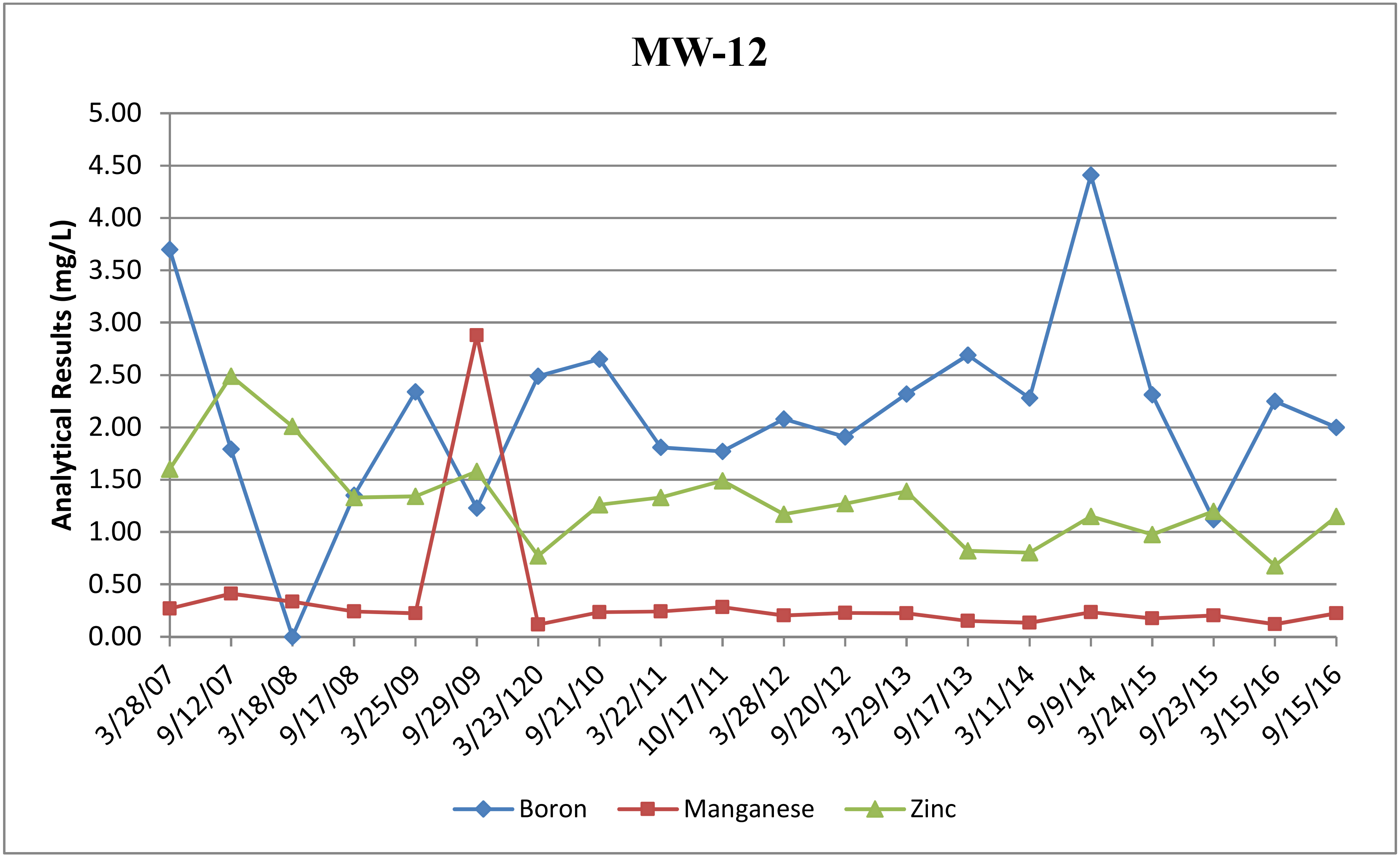
BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-12 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/29/13	9/17/13	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16
Metals											
Boron	mg/L	0.100	0.7	**2.32**	**2.69**	**2.28**	**4.41**	**2.31**	**1.12**	**2.25**	**2.00**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	**0.225**	**0.150**	**0.135**	**0.235**	**0.175**	**0.205**	**0.121**	**0.223**
Zinc	mg/L	0.020	1.0	**1.39**	0.82	0.802	**1.15**	0.978	**1.2**	0.679	**1.15**

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established



MW-12
Analytical Results (mg/L)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
3/28/07
9/12/07
3/18/08
9/17/08
3/25/09
9/29/09
3/23/120
9/21/10
3/22/11
10/17/11
3/28/12
9/20/12
3/29/13
9/17/13
3/11/14
9/9/14
3/24/15
9/23/15
3/15/16
9/15/16
Boron
Manganese
Zinc

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-22A

Parameter	Units	Quantitation Limit	2L Standard	9/8/05	10/18/06	3/28/07	9/12/07	3/18/08	9/17/08	3/25/09	9/29/09
Metals											
Boron	mg/L	0.100	0.7	**4.5**	**2.5**	**1.98**	**11.3**	0.187	**5.30**	**1.79**	**3.28**
Cadmium	mg/L	0.005	0.002	NA	NA	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	NA	NA	BQL	BQL	BQL	0.031	0.022	0.010
Lead	mg/L	0.005	0.015	BQL	**0.028**	BQL	BQL	BQL	0.015	**0.024**	**0.017**
Manganese	mg/L	0.010	0.05	NA	NA	**0.185**	**0.345**	**0.290**	**0.310**	**0.218**	**0.288**
Zinc	mg/L	0.020	1.0	NA	NA	BQL	0.117	BQL	0.028	0.047	0.033

MW-22A (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/23/10	9/201/2010	3/22/11	10/17/11	3/27/12	9/20/12	3/29/13	9/17/13
Metals											
Boron	mg/L	0.100	0.7	**1.60**	**2.04**	**1.29**	**2.82**	**1.08**	**3.63**	**2.86**	**2.03**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	0.006	0.005	0.008	BQL	BQL	0.008	BQL	0.006
Manganese	mg/L	0.010	0.05	**0.167**	**0.225**	**0.195**	**0.254**	**0.284**	**0.242**	**0.248**	**0.232**
Zinc	mg/L	0.020	1.0	BQL	0.039	0.048	BQL	0.042	BQL	BQL	0.020

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-22A (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16		
Metals											
Boron	mg/L	0.100	0.7	**0.99**	**2.86**	**1.67**	**2.74**	**1.29**	**2.89**		
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL		
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL		
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL		
Lead	mg/L	0.005	0.015	BQL	0.007	BQL	0.006	0.011	BQL		
Manganese	mg/L	0.010	0.05	**0.188**	**0.256**	**0.216**	**0.260**	**0.251**	**0.236**		
Zinc	mg/L	0.020	1.0	BQL	BQL	BQL	0.027	0.025	0.023		

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

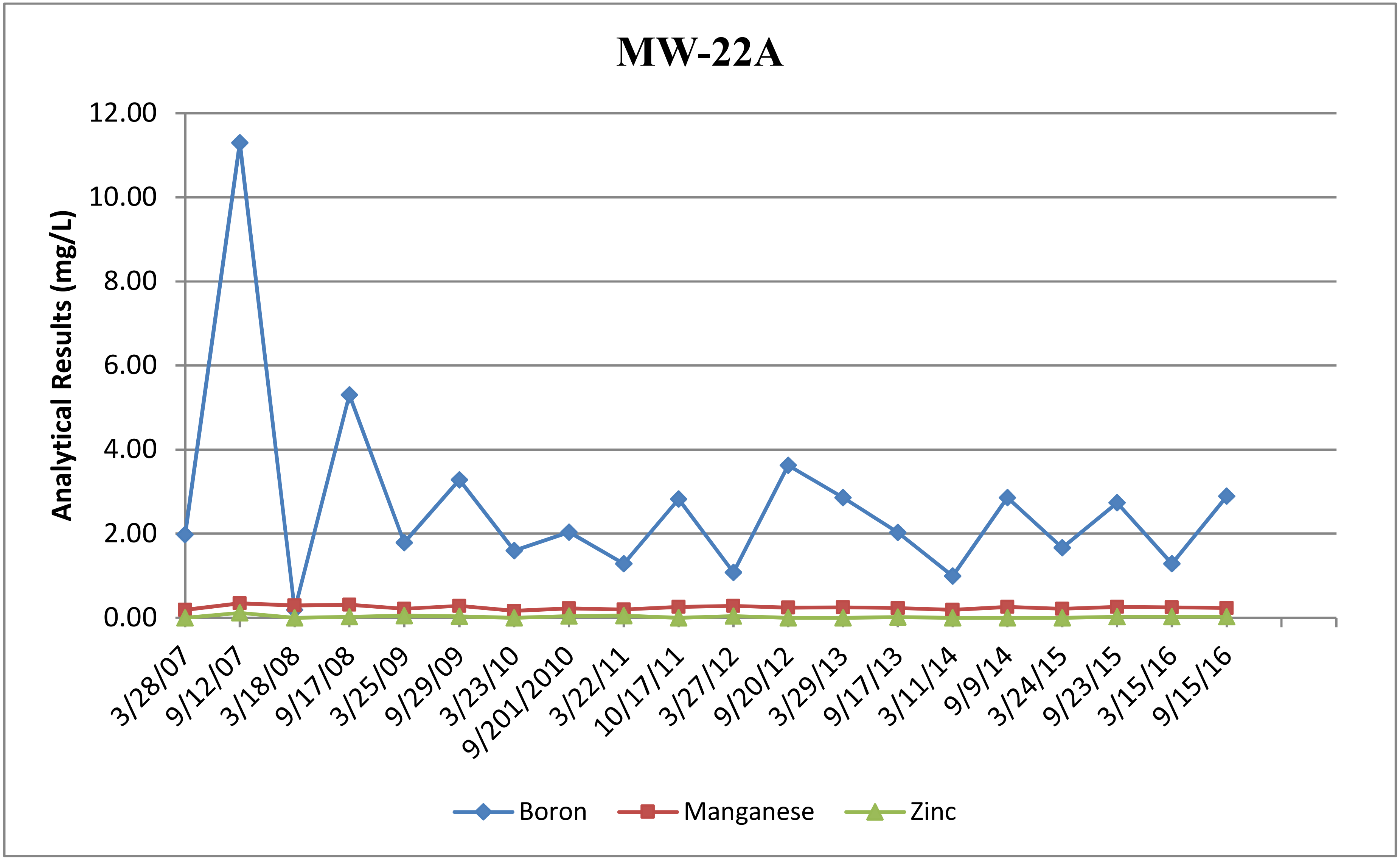

MW-22A
Analytical Results (mg/L)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
3/28/07
9/12/07
3/18/08
9/17/08
3/25/09
9/29/09
3/23/10
9/201/2010
3/22/11
10/17/11
3/27/12
9/20/12
3/29/13
9/17/13
3/11/14
9/9/14
3/24/15
9/23/15
3/15/16
9/15/16
Boron
Manganese
Zinc

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-26A-2

Parameter	Units	Quantitation Limit	2L Standard	3/30/05	9/8/05	5/19/06	10/18/06	3/28/07	9/12/07	3/18/08	9/17/08
Metals											
Boron	mg/L	0.100	0.7	**24.3**	**16.5**	**30.8**	**31.9**	**18.5**	**56.6**	**3.560**	**64.3**
Cadmium	mg/L	0.005	0.002	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	NA	NA	0.028	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	**0.023**	**0.037**	**0.075**	**0.187**	**0.126**	BQL	BQL	0.008
Manganese	mg/L	0.010	0.05	NA	NA	NA	NA	**0.788**	**2.24**	**1.52**	**1.66**
Zinc	mg/L	0.020	1.0	NA	NA	NA	NA	**1.54**	0.119	0.102	0.223

MW-26A-2 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/25/09	9/29/09	3/23/10	9/21/10	3/22/11	10/17/11	3/28/12	9/20/12
Metals											
Boron	mg/L	0.100	0.7	**57.1**	**73.3**	**1.44**	**63.5**	**64.7**	**30.6**	**47.0**	**62.7**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	0.007	BQL	0.010	0.008	0.005	0.012	BQL	0.006
Manganese	mg/L	0.010	0.05	**1.27**	**1.41**	**1.37**	**1.57**	**1.84**	**0.669**	**1.42**	**2.43**
Zinc	mg/L	0.020	1.0	**1.03**	0.367	**1.36**	0.912	0.912	**2.73**	**1.55**	0.43

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-26A-2 (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/29/13	9/17/13	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16
Metals											
Boron	mg/L	0.100	0.7	**17.9**	**29.2**	**18.6**	**66.4**	**17.6**	**69.9**	**11.0**	**44.1**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	**0.22**	**0.242**	**0.271**	**2.33**	**0.268**	**2.49**	**0.152**	**1.26**
Zinc	mg/L	0.020	1.0	**2.97**	**2.88**	**2.11**	**1.56**	**1.68**	0.754	**2.92**	**2.01**

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

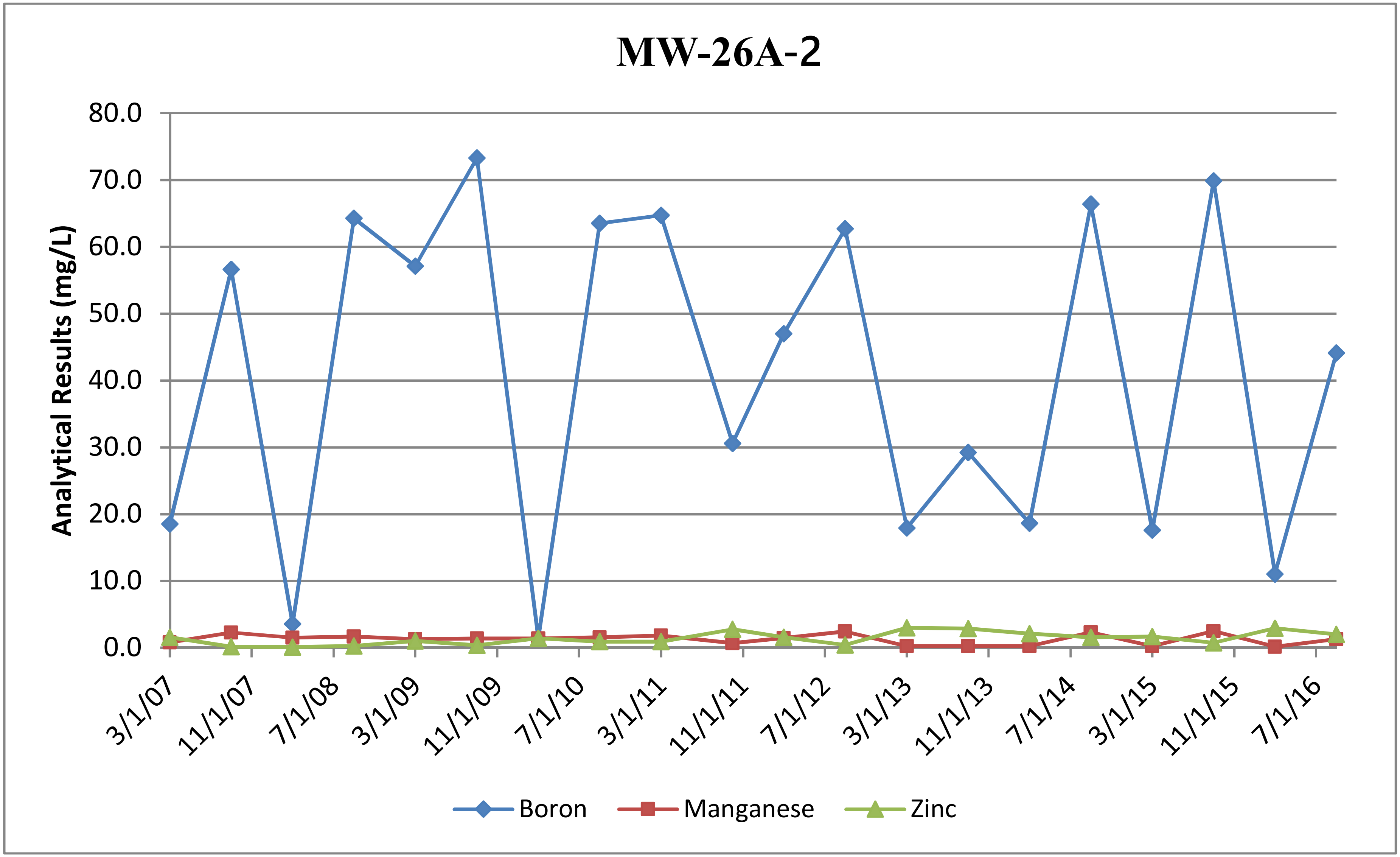

MW-26A-2
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Analytical Results (mg/L)
3/1/07
11/1/07
7/1/08
3/1/09
11/1/09
7/1/10
3/1/11
11/1/11
7/1/12
3/1/13
11/1/13
7/1/14
3/1/15
11/1/15
7/1/16
Boron
Manganese
Zinc

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-28D

Parameter	Units	Quantitation Limit	2L Standard	3/30/05	9/8/05	5/19/06	10/18/06	3/28/07	9/12/07	3/18/08	9/17/08
Metals											
Boron	mg/L	0.100	0.7	**1.13**	**1.09**	**1.54**	**1.05**	**1.09**	**2.10**	BQL	0.186
Cadmium	mg/L	0.005	0.002	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	NA	NA	NA	NA	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	NA	NA	NA	NA	**0.102**	BQL	0.016	**0.024**
Lead	mg/L	0.005	0.015	BQL	BQL	0.012	0.012	BQL	BQL	0.005	BQL
Manganese	mg/L	0.010	0.05	NA	NA	NA	NA	**0.588**	**0.762**	**0.566**	0.043
Zinc	mg/L	0.020	1.0	NA	NA	NA	NA	0.092	0.224	0.136	0.140

MW-28D (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/25/09	9/29/09	3/23/10	9/21/10	3/22/11	10/17/11	3/28/12	9/20/12
Metals											
Boron	mg/L	0.100	0.7	**0.869**	**1.17**	**1.24**	**1.55**	**1.25**	0.187	0.745	0.561
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	**0.021**	**0.023**	**0.018**	**0.024**	**0.019**	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	0.010	0.006	0.007	**0.019**	0.007	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	**0.744**	**0.797**	**0.821**	**0.778**	**0.895**	**0.132**	**0.525**	**0.428**
Zinc	mg/L	0.020	1.0	0.054	0.202	0.235	0.143	0.168	0.108	0.045	0.149

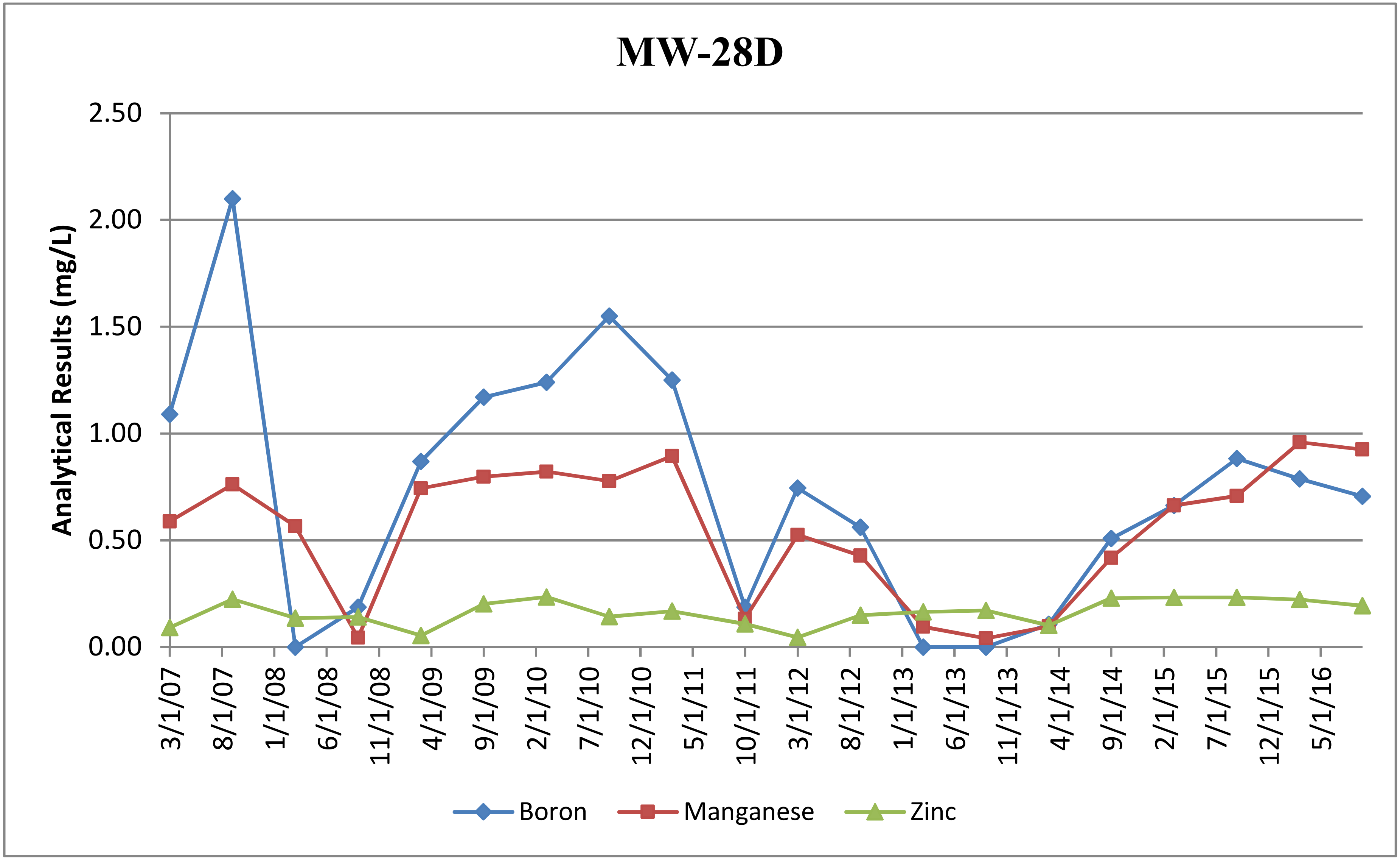
BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established

Table E-1B
Groundwater Monitoring Well Data- 2005-2016
Former Porcelanite
Lexington, North Carolina

MW-28D (cont.)

Parameter	Units	Quantitation Limit	2L Standard	3/29/13	9/17/13	3/11/14	9/9/14	3/24/15	9/23/15	3/15/16	9/15/16
Metals											
Boron	mg/L	0.100	0.7	BQL	BQL	0.106	0.508	0.664	**0.883**	**0.787**	**0.705**
Cadmium	mg/L	0.005	0.002	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Cobalt	mg/L	0.025	NS	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Chromium	mg/L	0.010	0.01	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Lead	mg/L	0.005	0.015	BQL	BQL	BQL	0.007	BQL	BQL	BQL	BQL
Manganese	mg/L	0.010	0.05	**0.095**	0.041	**0.096**	**0.418**	**0.664**	**0.707**	**0.959**	**0.925**
Zinc	mg/L	0.020	1.0	0.165	0.171	0.101	0.230	0.232	0.232	0.222	0.193

BQL = Below Quantitation Limit
NA = Compound Not Analyzed
NS = No Standard Established



MW-28D
Analytical Results (mg/L)
2.50
2.00
1.50
1.00
0.50
0.00
3/1/07
8/1/07
1/1/08
6/1/08
11/1/08
4/1/09
9/1/09
2/1/10
7/1/10
12/1/10
5/1/11
10/1/11
3/1/12
8/1/12
1/1/13
6/1/13
11/1/13
4/1/14
9/1/14
2/1/15
7/1/15
12/1/15
5/1/16
Boron
Manganese
Zinc

Table E-2
Former Porcelanite, Inc.
September 2016
Groundwater Monitoring Well Construction and Elevation Data

Monitoring Well Identification	Top of Casing Elevation	Water Level Reading (9.15.16)	Total Depth (ft bgs)	Screen Interval (ft bgs)	Ground Water Elevation	Pump Intake Elevation
MW-1	769.71	12.81	25	15-25	756.9	749.41
MW-3A	NM	NM	31	16-31	NM	NM
MW-7A	742.69	NM	16	6-16.0	NC	NM
MW-9D	749.79	21.57	55.50	45.5-55.5	728.22	699.97
MW-10	757.81	NM	20	10-20.0	NC	643.42
MW-11D	755.10	NM	70	60-70	NC	690.62
MW-12	749.59	17.78	27	17-27	731.81	727.80
MW-13	752.86	NM	23	13-23	NC	736.11
MW-14	756.92	NM	17	7-17.0	NC	744.54
MW-18	733.44	NM	18	8-18.0	NC	NM
MW-19D	732.4	NM	38	33-38	NC	NM
MW-21A	739.31	NM	12.5	2.5-12.5	NC	NM
MW-22A	753.25	18.45	22.5	12.5-22.5	734.80	730.73
MW-23A	748.57	NM	16	6-16.0	NC	NM
MW-24	729.42	NM	15	5-15.0	NC	NM
MW-25	731.59	NM	15	5-15.0	NC	NM
MW-26A-2	749.44	19.64	17.3	7.3-17.3	729.80	722.44
MW-28D	749.39	25.81	81	71-81	723.58	669.72
MW-29	753.19	NM	20	10-20.0	NC	NM

NC= Not Calculable
NM= Not Measured
Ground surface datum collected on May 15, 1999, August 2000 and September 2008
Waters Edge Environmental Job No. R1-21

Table E-3
October 2007 Sampling and Analysis Plan
Target Analyte List and Sampling Schedule
Former Porcelanite Facility
Lexington, North Carolina

Well ID #	March	September
MW-1	A	A
MW-9	A	A
MW-12	A	A
MW-22A	A	A
MW-26-A-2	A	A
MW-28	A	A

PARAMETERS A: Boron, Cadmium, Chromium, Cobalt, Lead, Manganese and Zinc

Table E-4

Target Analyte List
Container Size, Preservative, Holding Time and Analytical Methodology
Former Porcelanite Facility
Lexington, North Carolina

Parameter	**Container**	**Preservative**	**Holding Time**	**Analytical Method**
Boron	950 ml	HNO_3	6 months	200.7
Cadmium	950 ml	HNO_3	6 months	200.7
Chromium	950 ml	HNO_3	6 months	200.7
Cobalt	950 ml	HNO_3	6 months	200.7
Lead	950 ml	HNO_3	6 months	200.7
Manganese	950 ml	HNO_3	6 months	200.7
Zinc	950 ml	HNO_3	6 months	200.7

Note: With use of EPA Method 200.7, the lowest possible detection limit will be obtained with each analyte tested. Sample containers, preservation techniques and holding times utilized in the sampling events are conducted in accordance with the methods presented in *EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Table 2-33.*

Part E
Appendices

Appendix E-1
Historic Groundwater Monitoring Reports

Appendix E-1- Past Groundwater Monitoring Reports

1. Aquaterra, Inc., 1991 Annual Summary, Ground Water Quality Assessment Program, March 31, 1992
2. Applied Environmental Services Inc., End of Year Groundwater Assessment Report and Phase II Groundwater Assessment Plan for Former Waste Water Holding Ponds, December 31, 1992
3. ENSCI Environmental, Inc., 1993 Annual Groundwater Assessment Update Report, March 10, 1994
4. ENSCI Environmental, Inc., Fall and Year-End 1994 Groundwater Sampling Reports, March 21, 1995
5. Terra Technologies Group, P.A., 1995 Annual Groundwater Assessment Update Report, March 14, 1996
6. Waters Edge Environmental, 2000 Annual Ground Water Assessment Report and Fourth Quarter 2000 Monitoring Report, January 4, 2001.
7. Waters Edge Environmental, Second Quarter 2001 Report, July 26, 2001.
8. Waters Edge Environmental, Third Quarter 2001 Report, November 14, 2001.
9. Waters Edge Environmental, 2001 Annual Ground Water Assessment Report and Fourth Quarter 2001 Monitoring Report, February 19, 2001.
10. Waters Edge Environmental, First Quarter 2002 Report, May 30, 2002.
11. Waters Edge Environmental, First Quarter 2002 Resampling Monitoring Report, July 1, 2002.
12. Waters Edge Environmental, Second Quarter 2002 Monitoring Report, July 15, 2002.
13. Waters Edge Environmental, Third Quarter 2002 Monitoring Report, October 30, 2002.
14. Waters Edge Environmental, 2002 Annual Ground Water Assessment Report and Fourth Quarter 2002, January 27, 2003.
15. Waters Edge Environmental, First Quarter 2003 Monitoring Report, April 29, 2003.
16. Waters Edge Environmental, Second Quarter 2003 Monitoring Report, July 24, 2003.
17. Waters Edge Environmental, Third Quarter 2003 Monitoring Report, December 9, 2003.
18. Waters Edge Environmental, 2003 Annual Ground Water Assessment Report and Fourth Quarter 2003 Monitoring Report, January 14, 2004.
19. Waters Edge Environmental, Second Quarter 2004 Monitoring Report, July 12, 2004.
20. Waters Edge Environmental, Fourth Quarter 2004 Monitoring, Surface Water/Sediment Sampling and 2004 Annual Ground Water Assessment Report, January 24, 2005.
21. Waters Edge Environmental, March 2005 Semiannual Ground Water Monitoring Report, April 12, 2005.
22. Waters Edge Environmental, Amended September 2005 Semiannual Ground Water Monitoring Report, November 18, 2005.
23. Waters Edge Environmental, May 2006 Semiannual Ground Water Monitoring Report, June 13, 2006.
24. Waters Edge Environmental, October 2006 Semiannual Ground Water Monitoring Report, November 9, 2006.
25. Waters Edge Environmental, March 2007 Semiannual Groundwater Assessment Report, April 26, 2007.
26. Waters Edge Environmental, September 2007 Ground Water Monitoring Report, October

9, 2013 (modified 12.6.13).
27. Waters Edge Environmental, March 2008 Semiannual Ground Water Monitoring Report, June 4, 2008.
28. Waters Edge Environmental, September 2008 Semiannual Ground Water Monitoring Report, November 11, 2008.
29. Waters Edge Environmental, March 2009 Semiannual Ground Water Monitoring Report, May 22, 2009.
30. Waters Edge Environmental, September 2009 Groundwater Assessment Report, December 10, 2009.
31. Waters Edge Environmental, March 2010 Groundwater Assessment Report, April 22, 2010.
32. Waters Edge Environmental, September 2010 Groundwater Assessment Report, November 8, 2010.
33. Waters Edge Environmental, March 2011 Groundwater Assessment Report, May 6, 2011.
34. Waters Edge Environmental, September 2011 Groundwater Assessment Report, December 12, 2011 Revised March 19, 2012.
35. Waters Edge Environmental, March/April 2012 Groundwater Assessment Report, April 30, 2012.
36. Waters Edge Environmental, September 2013 Semi-annual Groundwater Assessment Report, October 9, 2013.
37. Waters Edge Environmental, March 2014 Semi-annual Groundwater Assessment Report, July 17, 2014 (revised).
38. Waters Edge Environmental, September 2014 Semi-annual Groundwater Assessment Report, September 15, 2014.
39. Waters Edge Environmental, March 2015 Semi-annual Groundwater Assessment Report, April 29, 2015.
40. Waters Edge Environmental, September 2015 Semi-annual Groundwater Assessment Report, October 30, 2015.
41. Waters Edge Environmental, March 2016 Semi-annual Groundwater Assessment Report, April 19, 2016.
42. Waters Edge Environmental, September 2016 Semi-annual Groundwater Assessment Report, December 19, 2016.

Appendix E-2
Well Construction Diagrams

Boring /Well Construction Log

Well Construction Permit Number ______________________

Aquaterra, Inc.

I. D. Number	*MW-3A*	**Purpose**	*Monitoring Well Replacement*
Project Name	*Porcelanite*	**Contractor**	*Aquadrill*
Project No.	*3105804*	**Registration No.**	*1361*
Geologist	*Tom Haynes*	**Driller**	*Paul Waddell*
Start Date	*9/17/98* **Complete Date** *9/17/98*	**Equipment**	*Ingersoll-Rand A-300*

Drilling Metho *Hollow Stem Auger*

Comments *Well set at 31'. Past boring logs indicated MW-3 was 30.25' deep with water level of ~17'.*

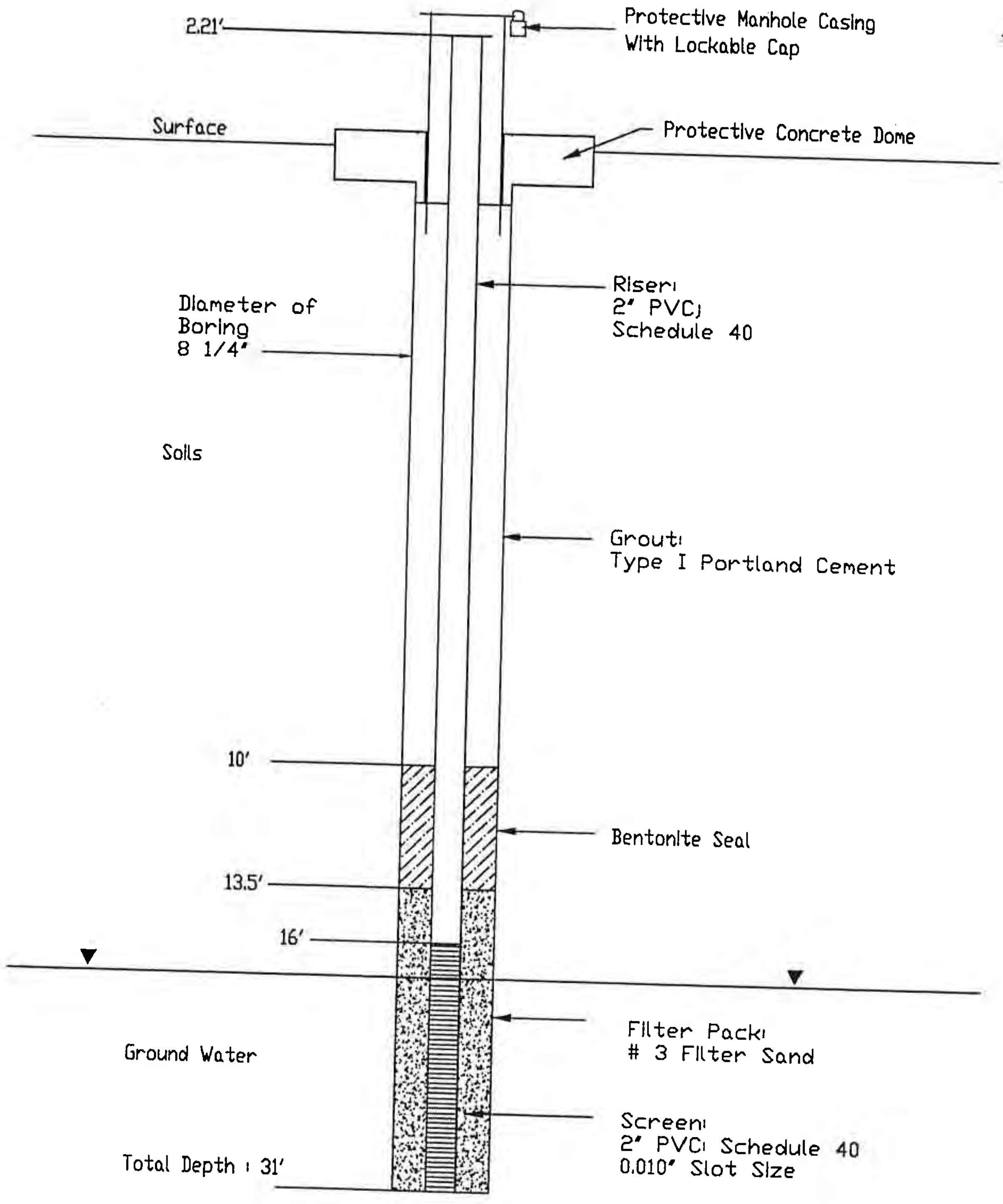
Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	8 1/4" 0.0	0-2'	Crushed Stone	
Riser Type	PVC Sch 40	2'-4'	Yellow, medium grain Sand	
Diameter	2"	4'-5'	Red, brown clayey Sand	
Screen Type	PVC Sch 40	5'-7'	Red, brown slightly micaceous	
Diameter	2"		slightly sandy Clay	
Riser Interval	16-0'	7'-9'	Yellow, brown slightly micaceous	
Screen Interval	31-16'		sandy Clay, moist	
Slot Size	0.010"	9'-13'	Red brown sandy Clay with tile pieces intermingled	
Grout Type	Type I Portand		also old grass / wood, also crushed stone included.	
Interval	10-0'			
Bentonite Type	3/8" Pellets			
Interval	13.5"-10'	13'-14'	Brown, clayey sand, sandy Clay	
Filter Pack	#3 Filter Sand	14'-20'	Red, brown slightly sandy Clay	
Interval	31'-13.5'	20'-31'	Yellow, brown sandy Clay	
Total Depth	31'			
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-3A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only	
Quad. No.	Serial No.
Lat. Long.	Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

WELL CONSTRUCTION RECORD

Well Identification: MW-3A

Drilling Contractor: Aquadrill
Driller Registration Number: 1361

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)
Nearest Town: Lexington, NC
County: Davidson Co.
NC Hwy. 8 and Victor St.
(Road, Community, or Subdivision and Lot No.)

2. Owner: Mannington Mills, Inc.
Address: P.O. Box 30
(Street or Route No.)
Salem | NJ | 08079
City | State | Zip Code

3. Date Drilled: 9/17/98 Use of Well: Monitoring
4. Total Depth: 31' Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: 17 Feet Below Top Of Casing
Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA Test Method
8. Water Zones: (depth) NA
9. Chlorination: NA Amount

Depth From To	Drill Log Formation Description
0-2'	Crushed Stone
2'-4'	Yellow, medium grain Sand
4'-5'	Red, brown clayey Sand
5'-7'	Red, brown slightly micaceous
	slightly sandy Clay
7'-9'	Yellow, brown slightly micaceous
	sandy Clay, moist
9'-13'	Red brown sandy Clay with tile pieces intermingled
	also old grass / wood, also crushed stone included.
13'-14'	Brown, clayey sand, sandy Clay
14'-20'	Red, brown slightly sandy Clay
20'-31'	Yellow, brown sandy Clay

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From To	Diameter	Wall Thickness	Material
16-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From To	Material	Method
10-0'	Type I Portand	Pour
13.5"-10'	Bentonite	Pour

12. Screen:

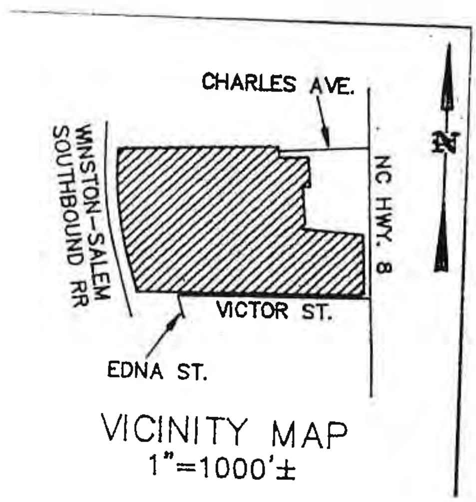
Depth (ft.) From To	Diameter	Slot Size	Material
31-16'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From To	Size	Material
31'-13.5'	#3 Filter Sand	#3 Filter Sand

14. Remarks:

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)



I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent Date

Submit original to Division of Environmental Management & copy to well owner.

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

WELL CONSTRUCTION RECORD

For Office Use Only	
Quad. No.	Serial No.
Lat.	Long. Pc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent.

Well Identification: MW-7A

Drilling Contractor: Aquadrill
Driller Registration Number: 1361

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)
Nearest Town: Lexington, NC
County: Davidson Co.
NC Hwy. 8 and Victor St.
(Road, Community, or Subdivision and Lot No.)

2. Owner: Mannington Mills, Inc.
Address: P.O. Box 30
(Street or Route No.)
Salem (City) NJ (State) 08079 (Zip Code)

3. Date Drilled: 9/17/98 Use of Well: Monitoring
4. Total Depth: 16' Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: NM Feet Below Top Of Casing
Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA Test Method:
8. Water Zones: (depth) NA
9. Chlorination: NA Amount:

Depth From-To	Drill Log Formation Description
0-1"	Grass
1"-2'	Red, brown sandy silty Clay
2'-5'	Brown sandy Clay
5'-8'	Grey, brown sandy Clay, moist
8'-13'	Tan sandy Clay, moist
13'-14'	Tan, red sandy Clay, wet
14'-16'	Tan, grey sandy Clay, wet

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From To	Diameter	Wall Thickness	Material
6-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From To	Material	Method
2-0'	Type I Portland	Pour
4-2'	Bentonite	Pour

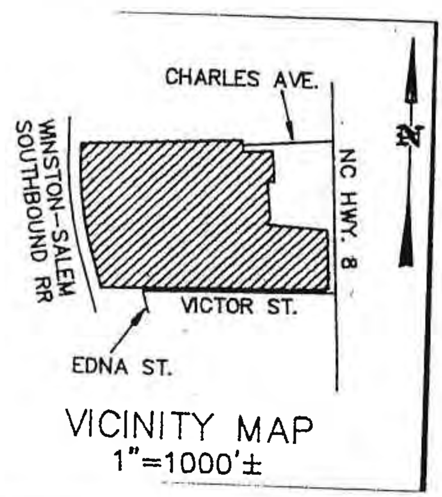
12. Screen:

Depth (ft.) From To	Diameter	Slot Size	Material
16-6'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From To	Size	Material
16-4'	#3 Filter Sand	#3 Filter Sand

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)



14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent Date

Submit original to Division of Environmental Management & copy to well owner

Boring /Well Construction Log

Well Construction Permit Number ______________________

Aquaterra, Inc.

I. D. Number	MW-7A	**Purpose**	Monitoring Well Replacement
Project Name	Porcelanite	**Contractor**	Aquadrill
Project No.	3105804	**Registration No.**	1361
Geologist	Tom Haynes	**Driller**	Paul Waddell
Start Date	9/16/98 **Complete Date** 9/17/98	**Equipment**	Ingersoll-Rand A-300

Drilling Metho Hollow Stem Auger

Comments

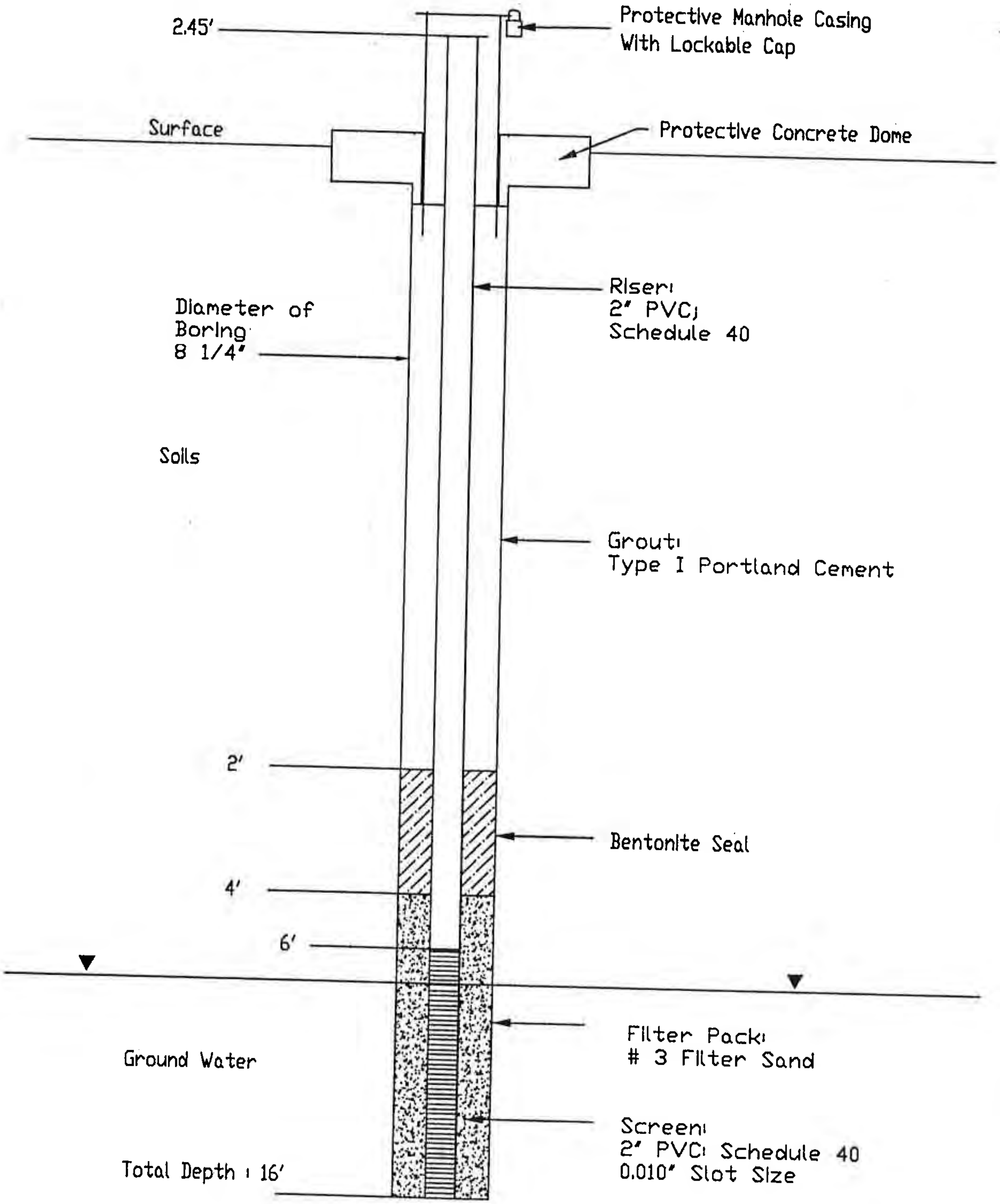
Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	8 1/4" O.D.	0-1"	Grass	
Riser Type	PVC Sch 40	1"-2'	Red, brown sandy silty Clay	
Diameter	2"	2'-5'	Brown sandy Clay	
Screen Type	PVC Sch 40	5'-8'	Grey, brown sandy Clay, moist	
Diameter	2"	8'-13'	Tan sandy Clay, moist	
Riser Interval	6-0'	13'-14'	Tan, red sandy Clay, wet	
Screen Interval	16-6'	14'-16'	Tan, grey sandy Clay, wet	
Slot Size	0.010"			
Grout Type	Type I Portland			
Interval	2-0'			
Bentonite Type	3/8" Pellets			
Interval	4-2'			
Filter Pack	#3 Filter Sand			
Interval	16-4'			
Total Depth	16'			
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-7A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

direction of Aquaterra, Inc.

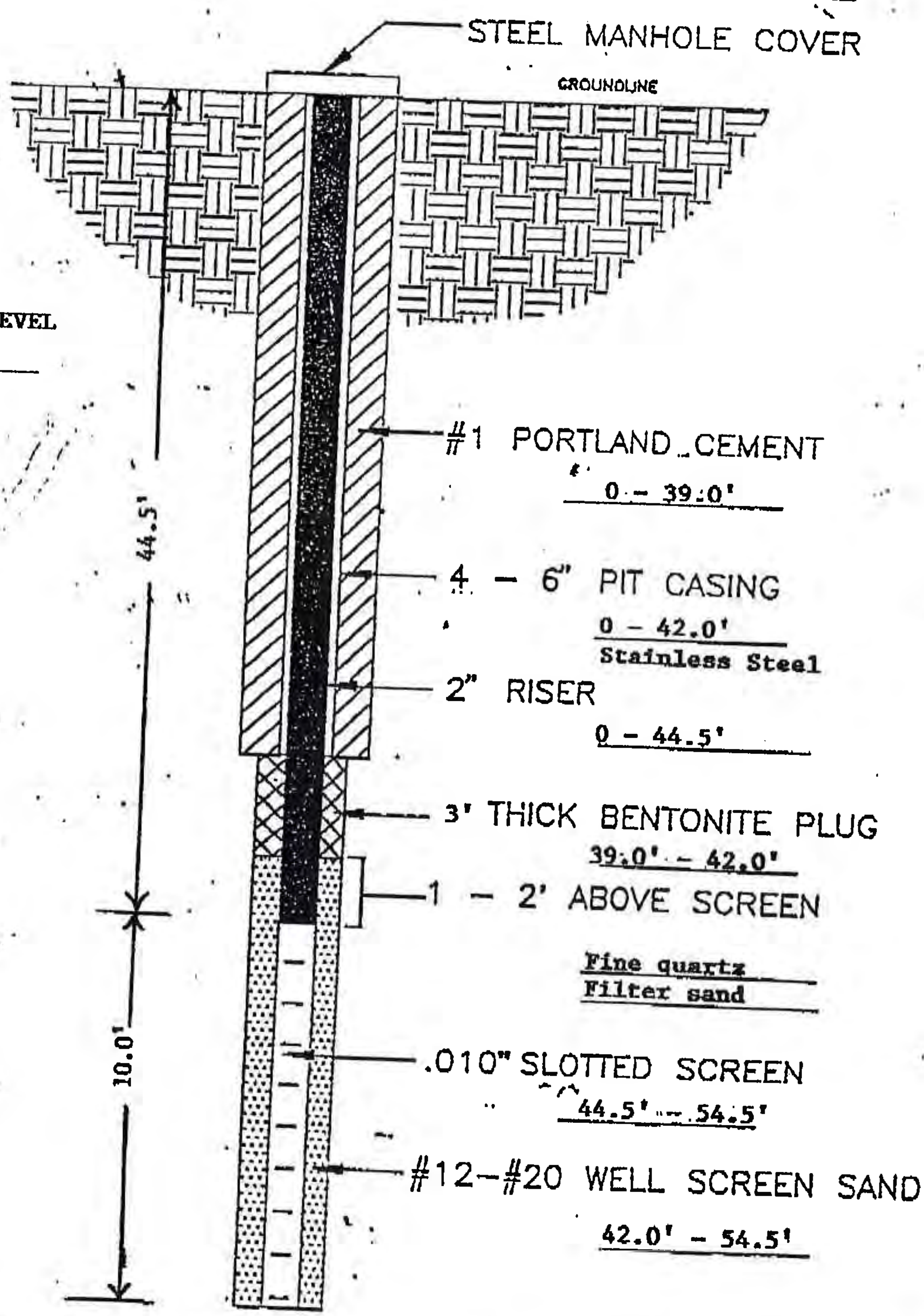
MW-9

ENSCI
ENVIRONMENTAL SERVICES GROUP
HIGH POINT, NORTH CAROLINA

DRILLING CONTRACTOR
Well Drillers, In

TYPE III MONITORING WELL

DEPTH TO WATER LEVEL
20.87'



PROJECT Mann. gton

GROUND ELEVATION

BENCH MARK DATA

ELEVATION OF TOP OF PIEZOMETER

PIEZOMETER NUMBER MW-12

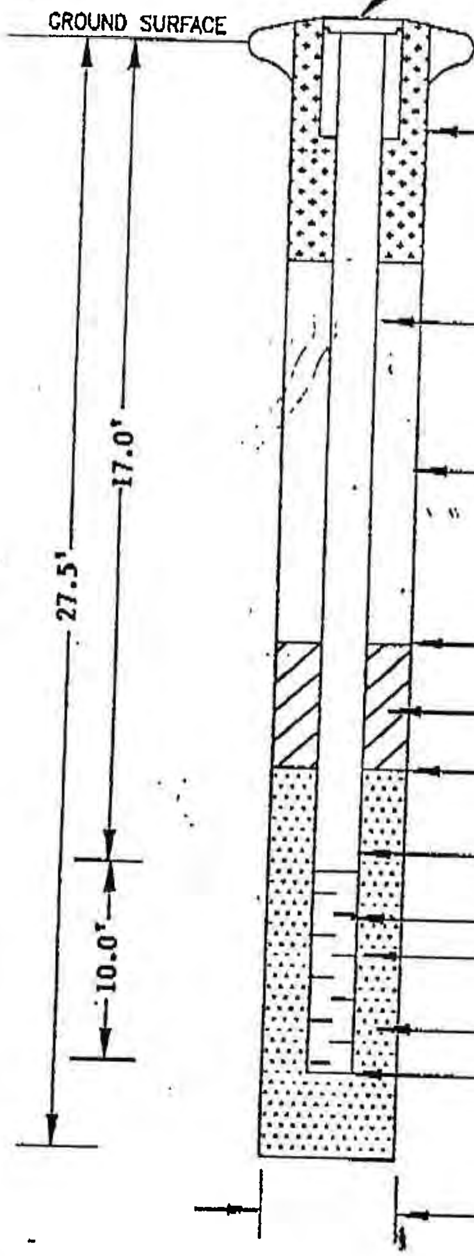
DEPTH TO WATER LEVEL 18.42'

ELEVATION OF WATER LEVEL

DRILLING CONTRACTOR Well Drillers, Inc.

ENSCI CORPORATION
HIGH POINT, NORTH CAROLINA

NOTE: Well installed under direction Aquaterra, Inc.



LOCKING STEEL COVER	
THICKNESS OF SURFACE SEAL	13.0
TYPE OF SURFACE SEAL	#1 Portland
I.D. OF RISER PIPE	2" Sch 40 F
TYPE OF RISER PIPE	PVC
TYPE OF BACKFILL	#1 Portland
ELEVATION OF TOP OF SEAL	-13.0'
TYPE OF SEAL	Bentonite
TOP ELEVATION OF FILTER SAND	-15.0
BOTTOM ELEVATION OF RISER	-17.0'
SIZE OF SCREEN OPENINGS	0.010"
PIEZOMETER SCREEN DIAMETER	2"
TYPE OF FILTER SAND	Fine sand
BOTTOM ELEVATION OF PIEZOMETER	-27.0'
DIAMETER OF BOREHOLE	8.25'

MONITORING WELL INSTALLATION SKETCH

PROJECT Mannington

GROUND ELEVATION ______

BENCH MARK DATA ______

ELEVATION OF TOP OF PIEZOMETER ______

DRILLING CONTRACTOR Well Drillers, Inc.

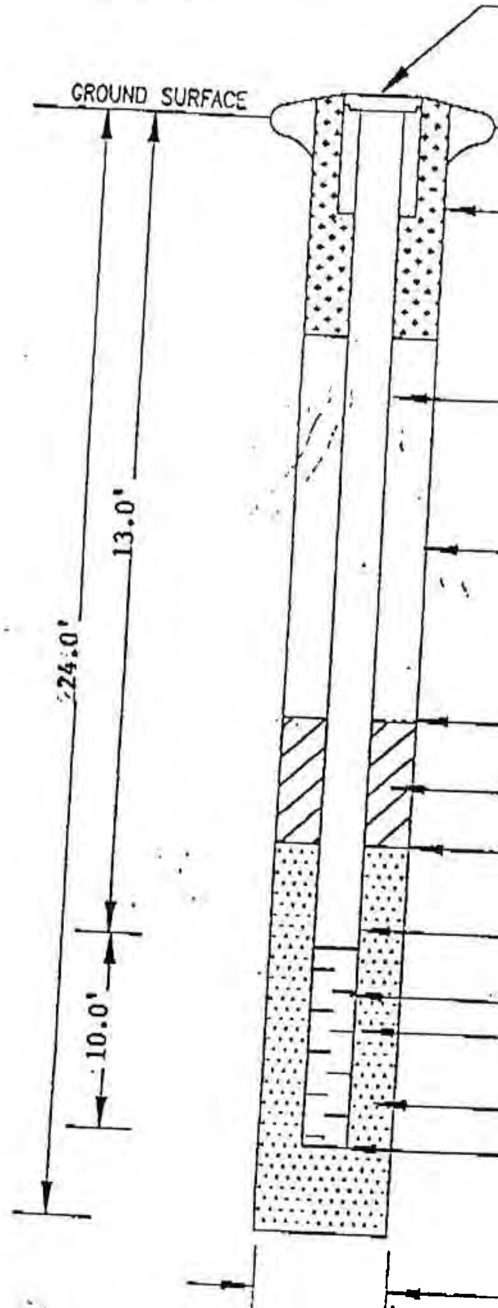
PIEZOMETER NUMBER MW-13

DEPTH TO WATER LEVEL 16.09'

ELEVATION OF WATER LEVEL ______

ENSCI CORPORATION HIGH POINT, NORTH CAROLINA

NOTE: Well installed under directior Aquaterra, Inc.



LOCKING STEEL COVER	
THICKNESS OF SURFACE SEAL	8'
TYPE OF SURFACE SEAL	#1 Portland
I.D. OF RISER PIPE	2" Sch 40 P
TYPE OF RISER PIPE	PVC
TYPE OF BACKFILL	#1 Portland
ELEVATION OF TOP OF SEAL	-8.0'
TYPE OF SEAL	Bentonite
TOP ELEVATION OF FILTER SAND	-10.0'
BOTTOM ELEVATION OF RISER	-13.0'
SIZE OF SCREEN OPENINGS	0.010"
PIEZOMETER SCREEN DIAMETER	2"
TYPE OF FILTER SAND	Fine sand
BOTTOM ELEVATION OF PIEZOMETER	-23.0'
DIAMETER OF BOREHOLE	8.25"

FIELD DRILLING RECORD

BORING #	MW - 14	LOCATION:	Mannington
START DATE:	9-9-92	COMPLETED:	9-9-92
GEOLOGIST:	C. Boggs	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	17 Feet	CASING DEPTH:	7 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
0	10	Water level in former					
		piezometer on 9-9-92					
		9.8 feet.					
		Over drilled piezometer:					
		no samples. 0 - 10 ft.					
		Brown sandy clay loam					
		in cuttings.					
13	15	Brown - pink mottled					
		medium to coarse grained					
		quartz-k-feldspar muscovite.					
		Friable weathered granite					
		saprolite.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 7' DEPTH(ft) 0 - 7 DIAMETER(in) 2' MATERIAL PVC
SCREEN LENGTH(ft) 10' DEPTH(ft) 7 - 17 DIAMETER(in) 2 MATERIAL PVC
DEPTH TO TOP OF SAND 5 BAGS OF SAND 3 ½
DEPTH TO TOP SEAL 3.5 BENTONITE USED ½
BAGS OF CEMENT USED 1 Portland 4 Sakrete

DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE (919)733-3221

Quad. No. ________ Serial No. ________
Lat. ________ Long. ________ Pc ________
Minor Basin ________
Basin Code ________
Header Ent. ________ GW-1 Ent. ________

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR ENSCI

DRILLER REGISTRATION NUMBER 1233

STATE WELL CONSTRUCTION PERMIT NUMBER: 28-0331-WM-0098 MW-14

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Lexington County: Davidson

(Road, Community, or Subdivision and Lot No.)

2. OWNER Mannington Ceramic Tile

ADDRESS Post Office Box 1777
(Street or Route No.)
Lexington, NC 27693
City or Town State Zip Code

3. DATE DRILLED 9/9/92 USE OF WELL Monitoring

4. TOTAL DEPTH 17' CUTTINGS COLLECTED ☐ Yes ☒ No

5. DOES WELL REPLACE EXISTING WELL? ☒ Yes ☐ No

6. STATIC WATER LEVEL: 10 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): - METHOD OF TEST -

8. WATER ZONES (depth): 10-17'

9. CHLORINATION: Type - Amount -

10. CASING:

Depth From	To	Ft. Diameter	Wall Thickness or Weight/Ft.	Material
0	7	2	Sch 40	PVC

11. GROUT:

Depth From	To	Material	Method
.5	3.5	#1 Portland	Poured
3.5	5	Bentonite	

12. SCREEN:

Depth From	To	Diameter (in.)	Slot Size (in.)	Material
7	17	2	0.010	PVC

13. GRAVEL PACK:

Depth From	To	Size	Material
5	17	#3	Sand

14. REMARKS:

DRILLING LOG

Depth From	To	Formation Description
0	10	Brown sandy clay
10	17	Brown pink granitic saprol

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

MONITORING WELL INSTALLATION SKETCH

PROJECT Mannington

GROUND ELEVATION

BENCH MARK DATA

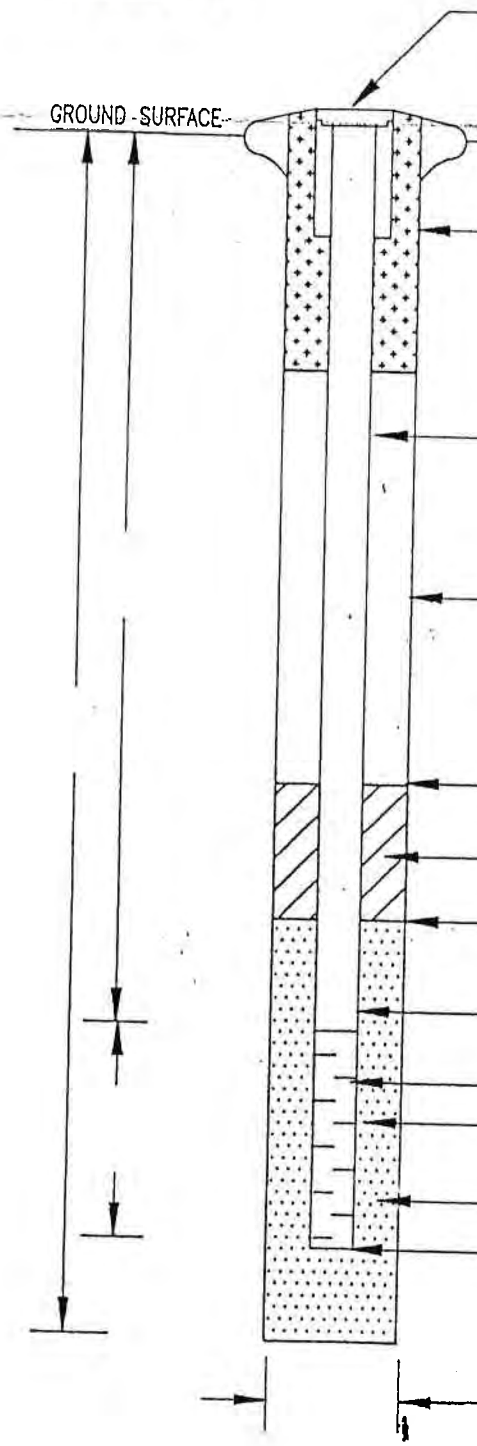
ELEVATION OF TOP OF PIEZOMETER

PIEZOMETER NUMBER MW-14

DEPTH TO WATER LEVEL

ELEVATION OF WATER LEVEL

ENSCI CORPORATION
HIGH POINT, NORTH CAROLINA



LOCKING STEEL COVER	
THICKNESS OF SURFACE SEAL	0.5
TYPE OF SURFACE SEAL	Sakrete
I.D. OF RISER PIPE	2" Sch 40 Pvc
TYPE OF RISER PIPE	
TYPE OF BACKFILL	#1 Portland
ELEVATION OF TOP OF SEAL	-3.5
TYPE OF SEAL	Bentonite
TOP ELEVATION OF FILTER SAND	-5
BOTTOM ELEVATION OF RISER	-7
SIZE OF SCREEN OPENINGS	0.010"
PIEZOMETER SCREEN DIAMETER	2"
TYPE OF FILTER SAND	#3
BOTTOM ELEVATION OF PIEZOMETER	-17
DIAMETER OF BOREHOLE	6.25"

FIELD DRILLING RECORD

BORING #	MW - 18	LOCATION:	Mannington
START DATE:	9-9-92	COMPLETED:	9-9-92
GEOLOGIST:	C. Boggs	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	18 Feet	CASING DEPTH:	8 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
0	3	Brown, organic rich sandy, clay loam.					
3	5	Tan - red, mottled, massive stiff, sandy, clay. Damp	24"	4	5	7	9
8	10	No sample. Recovered split spoon. Wet.	0	3	4	7	11
13	15	Tan-brown, friable, quartz, k-feldspar, muscovite, granitic, saprolite. Wet.	6"	6	11	30/3	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 8' DEPTH(ft) 0 - 8 DIAMETER(in) 2" MATERIAL PVC
SCREEN LENGTH(ft) 10' DEPTH(ft) 8 - 18 DIAMETER(in) 2" MATERIAL PVC
DEPTH TO TOP OF SAND 6 BAGS OF SAND 4
DEPTH TO TOP SEAL 5 BENTONITE USED ½
BAGS OF CEMENT USED 1 Portland 4 Sakrete

P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE (919)733-3221

WELL CONSTRUCTION RECORD

Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

DRILLING CONTRACTOR ENSCI

DRILLER REGISTRATION NUMBER 1233

MW-18

STATE WELL CONSTRUCTION PERMIT NUMBER: 28-0331-WM-0098

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Lexington   County: Davidson

(Road, Community, or Subdivision and Lot No.)

2. OWNER Mannington Ceramic Tile

ADDRESS Post Office Box 1777 (Street or Route No.)

Lexington, NC 27293
City or Town   State   Zip Code

3. DATE DRILLED 9/9/92   USE OF WELL Monitoring

4. TOTAL DEPTH ______ CUTTINGS COLLECTED ☐ Yes ☒ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 5 FT. ☐ above ☐ below TOP OF CASING.

TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): – METHOD OF TEST –

8. WATER ZONES (depth): 5-18

9. CHLORINATION: Type – Amount –

10. CASING:

Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
0	8 Ft.	2	Sch 40	PVC
	Ft.			
	Ft.			

11. GROUT:

Depth From	To	Material	Method
0.5	5 Ft.	#1 Portland	Poured
	Ft.		

12. SCREEN:

Depth From	To	Diameter	Slot Size	Material
8	18 Ft.	2 in.	0.010 in.	PVC
	Ft.	in.	in.	
	Ft.	in.	in.	

13. GRAVEL PACK:

Depth From	To	Size	Material
6	18 Ft.	#3	Sand
	Ft.		

14. REMARKS:

DRILLING LOG

Depth From	To	Formation Description
0	3	Brown sandy clay loam
3	5	Red sandy clay
5	15	Brown granitic saprolite

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT   DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

MONITORING WELL INSTALLATION SKETCH

PROJECT: Mannington

GROUND ELEVATION:

BENCH MARK DATA:

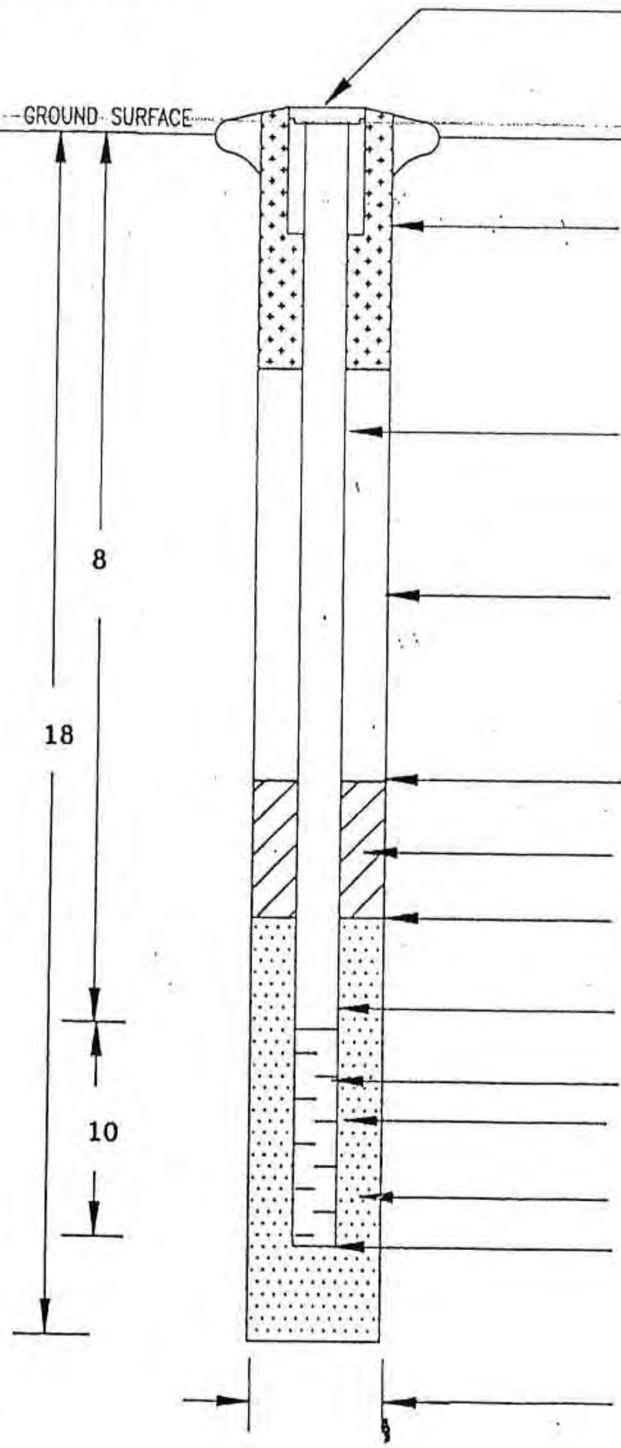
ELEVATION OF TOP OF PIEZOMETER:

PIEZOMETER NUMBER: MW-18

DEPTH TO WATER LEVEL:

ELEVATION OF WATER LEVEL:

ENSCI
CORPORATION
HIGH POINT, NORTH CAROLINA



LOCKING STEEL COVER

THICKNESS OF SURFACE SEAL: .5"

TYPE OF SURFACE SEAL: Sakrete

I.D. OF RISER PIPE: 2" Sch 40 PVC

TYPE OF RISER PIPE:

TYPE OF BACKFILL: #1 Portland

ELEVATION OF TOP OF SEAL: -5'

TYPE OF SEAL: Bentonite

TOP ELEVATION OF FILTER SAND: -6'

BOTTOM ELEVATION OF RISER: -8'

SIZE OF SCREEN OPENINGS: 0.010"

PIEZOMETER SCREEN DIAMETER: 2"

TYPE OF FILTER SAND: #3

BOTTOM ELEVATION OF PIEZOMETER: -15'

DIAMETER OF BOREHOLE: 6.25"

FIELD DRILLING RECORD

BORING #	MW - 19	LOCATION:	Mannington
START DATE:	8-31-92	COMPLETED:	9-1-92
GEOLOGIST:	S. Stadelman	DRILLER:	Engineering Tectonics
DRILL METHOD:	Hollow Stem Auger 0 to 25' Roller Cone 25'	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	25'/6" 33'/2"
TOTAL DEPTH:	38 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
3.5	5.0	Red clay. Highly	0-8	18/18	6	5	6
		weathered saprolite.					
		yellowish-brown Clay. Highly	8-16				
		weathered saprolite.					
		Common light gray mottles.					
8.5	10.0	Yellowish-brown clay loam to clay.	0-6		4	5	8
		Few red stains. Highly weathered					
		saprolite. Abrupt lower					
		boundary.					
		Moderately weathered saprolite with	6-8				
		rock structure. Resembles					
		granite. Slightly altered micas.					
		Saprolite. Crushes to sand. Resembles granite.	8-15				
		Crushes to sand. Brown					
		staining. Moderately					
		weathered micas/Fe minerals.					
		Crushes to loamy sand.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft)________DEPTH(ft)________DIAMETER(in)________MATERIAL________
SCREEN LENGTH(ft)_______DEPTH(ft)_______DIAMETER(in)_______MATERIAL________
DEPTH TO TOP OF SAND________________BAGS OF SAND________________
DEPTH TO TOP SEAL________________BENTONITE USED________________
BAGS OF CEMENT USED________________

FIELD DRILLING RECORD

BORING #	MW - 19 (Continued)	LOCATION:	Mannington
START DATE:	8-31-92	COMPLETED:	9-1-92
GEOLOGIST:	S. Stadelman	DRILLER:	Engineering Tectonics
DRILL METHOD:	Hollow Stem Auger 0 to 25' Roller Cone 25'	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	25'/6" 33'/2"
TOTAL DEPTH:	38'	CASING DEPTH:	33'

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
13.5	15	Saprolite. Moderately weathered. Resembles pink granite (high K feldspar content). Micas/FeMn minerals are slight to moderately weathered. Oxidation halos around approx. 25% of FeMn minerals. Black Mn-Oxide staining.	0-6		50/6		
18.5	20	Saprolite. Same as 13.5 to 15.	0-6		50/6		
23.5	25	Same as 18.5 - 20 feet. Set 25' - 6" PVC casing 8-31. Returned 9-1. Drilled additional 15' w/5½" air hammer. Medium grained quartz-k-feldspar-muscovite. Weathered granite. Set 35' 2" riser 5'2" .010 screen.	0-1.5		50/6		

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 33 DEPTH(ft) 0-33 DIAMETER(in) 2 MATERIAL PVC
SCREEN LENGTH(ft) 5 DEPTH(ft) 33-38 DIAMETER(in) 2 MATERIAL PVC
DEPTH TO TOP OF SAND 30 BAGS OF SAND 2
DEPTH TO TOP SEAL 29 BENTONITE USED ½
BAGS OF CEMENT USED 10 Portland 4 Sakrete

P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE (919)733-3221

Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR ENSCI

DRILLER REGISTRATION NUMBER 1233

MW-19

STATE WELL CONSTRUCTION PERMIT NUMBER: 28-0331-WM-0098

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Lexington County: Davidson

(Road, Community, or Subdivision and Lot No.)

2. OWNER Mannington Ceramic Tile

ADDRESS Post Office Box 1777
(Street or Route No.)
Lexington, NC 27293
City or Town State Zip Code

3. DATE DRILLED 8/31/92 USE OF WELL Monitoring

4. TOTAL DEPTH 40' CUTTINGS COLLECTED ☐ Yes ☒ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 5 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): – METHOD OF TEST –

8. WATER ZONES (depth): 5'-40'

9. CHLORINATION: Type – Amount –

10. CASING:

Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
0	25 Ft.	6"	Sch 40	PVC
0	33 Ft.	2"	Sch 40	PVC
	Ft.			

11. GROUT:

Depth From	To	Material	Method
0	29 Ft.	#1 Portland	Tremie
	Ft.		

12. SCREEN:

Depth From	To	Diameter	Slot Size	Material
33	38 Ft.	2" in.	0.010 in.	PVC
	Ft.	in.	in.	
	Ft.	in.	in.	

13. GRAVEL PACK:

Depth From	To	Size	Material
29	38 Ft.	#3	Washed Sand
	Ft.		

14. REMARKS:

DRILLING LOG

Depth From	To	Formation Description
0	25	Highly weathered granitic saprolite
25	38	Weathered pink granite

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

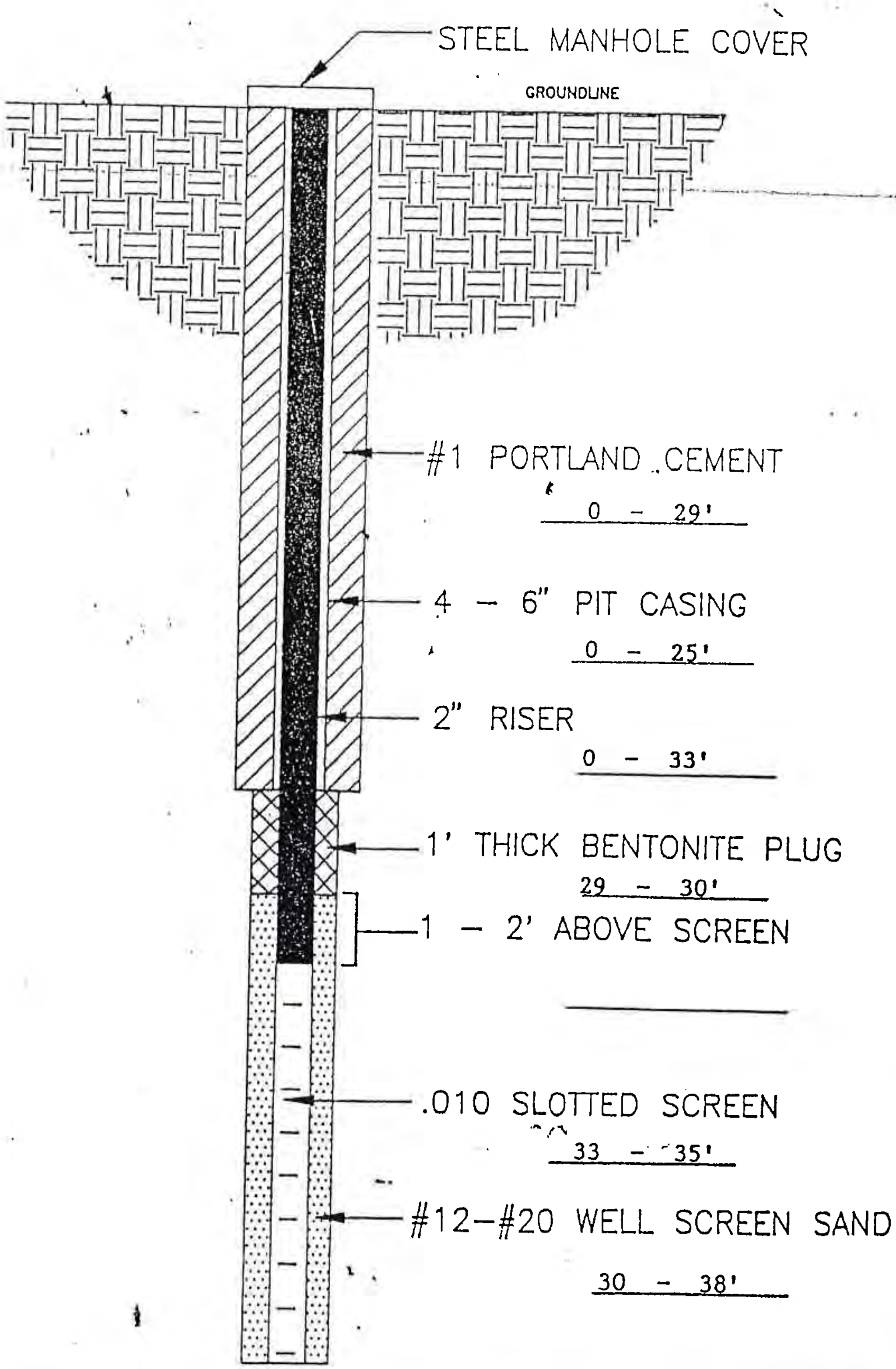
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

ENSCI
ENVIRONMENTAL SERVICES GROUP
HIGH POINT, NORTH CAROLINA

TYPE III MONITORING WELL



North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

WELL CONSTRUCTION RECORD

For Office Use Only

Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

Well Identification: MW-21A

Drilling Contractor: Aquadrill
Driller Registration Number: 1361

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)
   Nearest Town: Lexington, NC
   County: Davidson Co.
   NC Hwy. 8 and Victor St.
   (Road , Community , or Subdivision and Lot No.)
2. Owner: Mannington Mills, Inc.
   Address: P.O. Box 30
   (Street or Route No.)
   Salem / NJ / 08079
   City / State / Zip Code
3. Date Drilled: 9/17/98 — Use of Well: Monitoring
4. Total Depth: 12.5' — Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: NM Feet Below Top Of Casing
   Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA — Test Method:
8. Water Zones: (depth) NA
9. Chlorination: NA — Amount:

Drill Log

Depth From - To	Formation Description
0-3"	Topsoil grass
3"-4'	Dark brown sandy Clay, dry
4'-6'	Brown, grey slightly sandy Clay, moist
6'-8'	Grey, highly micaceous, slightly clayey Silt
8'-10'	Olive brown highly micaceous sandy Silt
10'-12.5'	Olive brown highly micaceous Sand, weathered rock

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From - To	Diameter	Wall Thickness	Material
2.5-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From - To	Material	Method
0.5-0'	Type I Portland	Pour
2-0.5'	Bentonite	Pour

12. Screen:

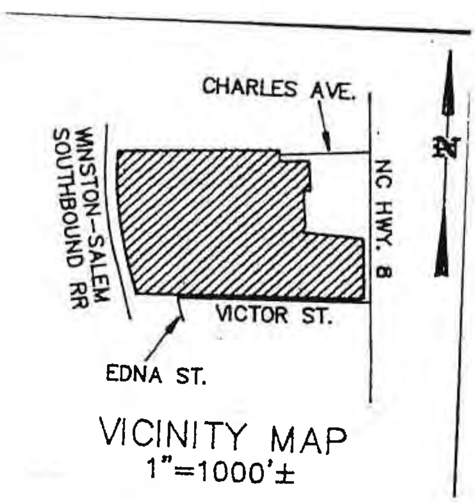
Depth (ft.) From - To	Diameter	Slot Size	Material
12.5-2.5'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From - To	Size	Material
12.5-2.0'	#3 Filter Sand	#3 Filter Sand

Location Sketch

(Show direction & distance from at least two State Roads, or other map reference points.)



14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent ______ Date ______

Submit original to Division of Environmental Management & copy to well owner

Boring /Well Construction Log

Well Construction Permit Number ______________________

Aquaterra, Inc.

I. D. Number	MW-21A	**Purpose**	Monitoring Well Replacement
Project Name	Porcelanite	**Contractor**	Aquadrill
Project No.	3105804	**Registration No.**	1361
Geologist	Tom Haynes	**Driller**	Paul Waddell
Start Date	9/16/98 **Complete Date** 9/17/98	**Equipment**	Ingersoll-Rand A-300

Drilling Metho Hollow Stem Auger

Comments Area covered with rip-rap stone.

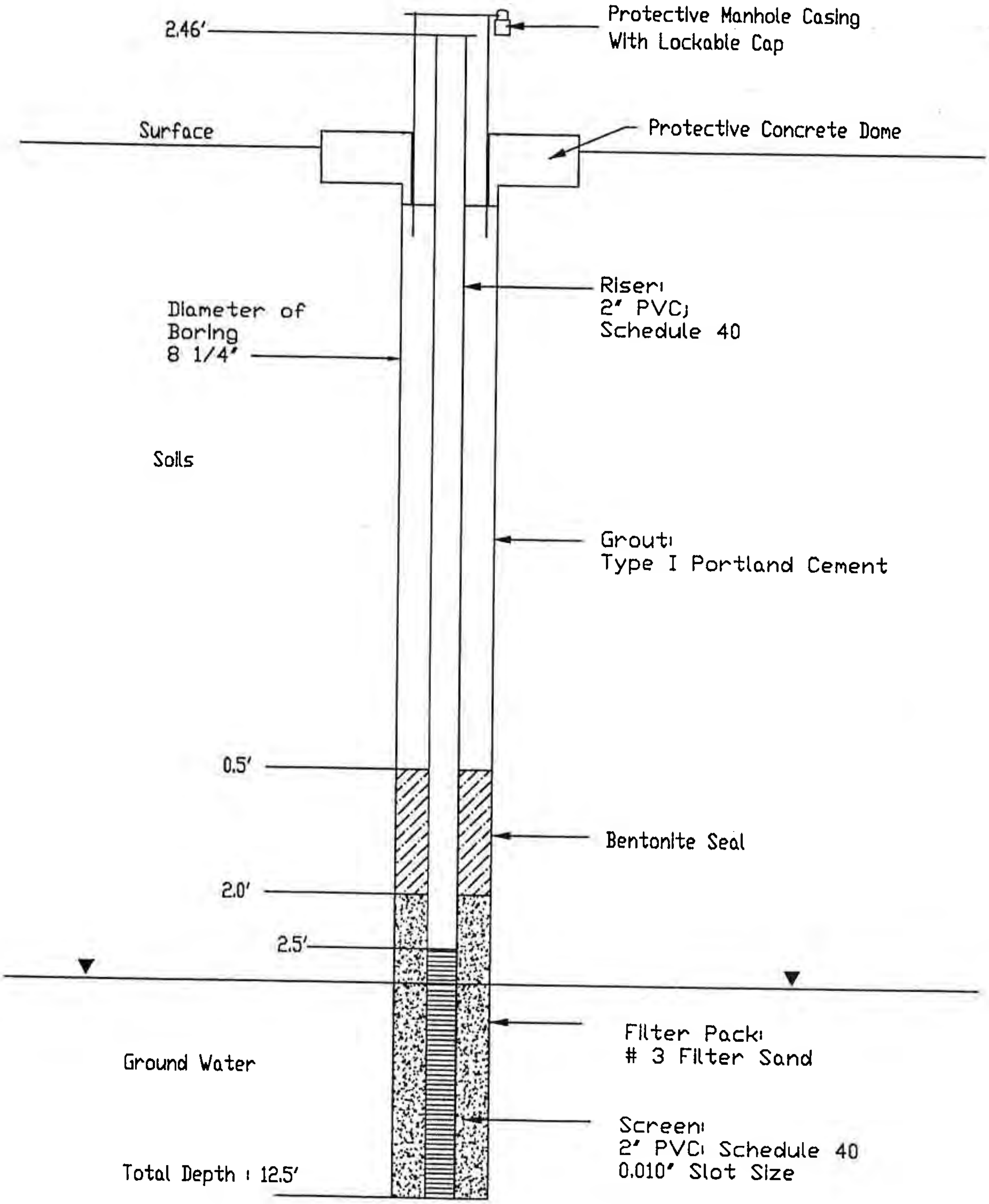
Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	8 1/4" O.D.	0-3"	Topsoil grass	
Riser Type	PVC Sch 40	3"-4'	Dark brown sandy Clay, dry	
Diameter	2"	4'-6'	Brown, grey slightly sandy Clay, moist	
Screen Type	PVC Sch 40	6'-8'	Grey, highly micaceous, slightly clayey Silt	
Diameter	2"	8'-10'	Olive brown highly micaceous sandy Silt	
Riser Interval	2.5-0'	10'-12.5'	Olive brown highly micaceous Sand, weathered rock	
Screen Interval	12.5-2.5'			
Slot Size	0.010"			
Grout Type	Type I Portland			
Interval	0.5-0'			
Bentonite Type	3/8" Pellets			
Interval	2-0.5'			
Filter Pack	#3 Filter Sand			
Interval	12.5-2.0'			
Total Depth	12.5'			
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point W.L. = Water Level TBM = Temporary Benchmark MSL = Mean Sea Level

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-21A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only
Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

WELL CONSTRUCTION RECORD

Well Identification: MW-22A

Drilling Contractor: Aquadrill
Driller Registration Number: 1361

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)
Nearest Town: Lexington, NC
County: Davidson Co.

NC Hwy. 8 and Victor St.
(Road , Community , or Subdivision and Lot No.)

2. Owner: Mannington Mills, Inc.
Address: P.O. Box 30
(Street or Route No.)

Salem	NJ	08079
City	State	Zip Code

3. Date Drilled: 9/17/98 Use of Well: Monitoring
4. Total Depth: 22.5' Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: NM Feet Below Top Of Casing
Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA Test Method ______
8. Water Zones: (depth) NA
9. Chlorination: NA Amount ______

Drill Log

Depth From - To	Formation Description
0-1"	Grass
1"-2'	Red, brown sandy Silt
2'-10'	Red, slightly sandy Clay
10'-13.5'	Red, brown slightly micaceous sandy Clay
13.5-17.5'	Brown sandy Clay
17.5-22'	Dark brown slightly sandy Clay, wet.
22'-22.5'	Olive, grey sandy silty Clay

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From - To	Diameter	Wall Thickness	Material
12.5-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From - To	Material	Method
7'-0'	Type I Portland	Pour
10.5-7'	Bentonite	Pour

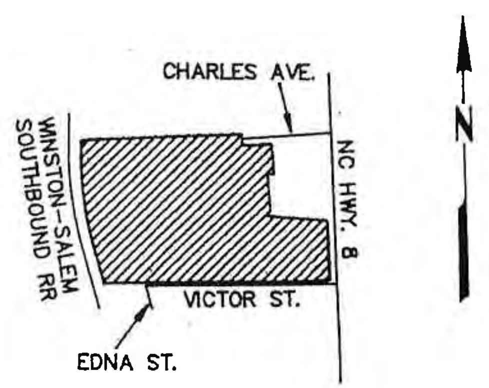
12. Screen:

Depth (ft.) From - To	Diameter	Slot Size	Material
22.5-12.5'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From - To	Size	Material
22.5'-10.5'	#3 Filter Sand	#3 Filter Sand

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)



VICINITY MAP
1"=1000'±

14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent ______ Date ______

Submit original to Division of Environmental Management & copy to well owner.

Boring /Well Construction Log

Well Construction Permit Number ______________________ **Aquaterra, Inc.**

I. D. Number	MW-22A	**Purpose**	Monitoring Well Replacement
Project Name	Porcelanite	**Contractor**	Aquadrill
Project No.	3105804	**Registration No.**	1361
Geologist	Tom Haynes	**Driller**	Paul Waddell
Start Date	9/16/98 **Complete Date** 9/17/98	**Equipment**	Ingersoll-Rand A-300

Drilling Metho Hollow Stem Auger

Comments

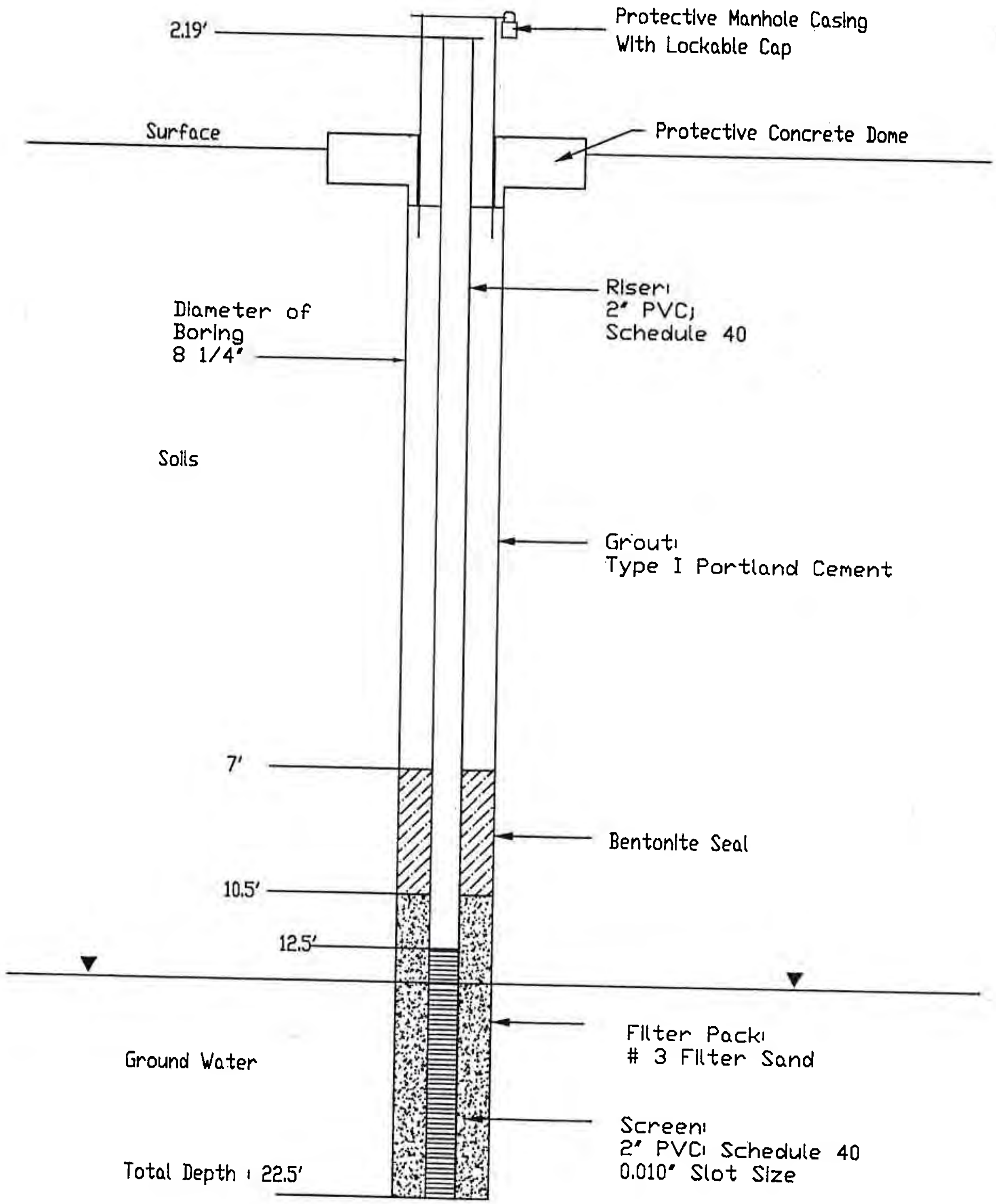
Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	8 1/4" O.D.	0-1"	Grass	
Riser Type	PVC Sch 40	1"-2'	Red, brown sandy Silt	
Diameter	2"	2'-10'	Red, slightly sandy Clay	
Screen Type	PVC Sch 40	10'-13.5'	Red, brown slightly micaceous sandy Clay	
Diameter	2"	13.5-17.5'	Brown sandy Clay	
Riser Interval	12.5-0'	17.5-22'	Dark brown slightly sandy Clay, wet.	
Screen Interval	22.5-12.5'			
Slot Size	0.010"	22'-22.5'	Olive, grey sandy silty Clay	
Grout Type	Type I Portland			
Interval	7'-0'			
Bentonite Type	3/8" Pellets			
Interval	10.5-7'			
Filter Pack	#3 Filter Sand			
Interval	22.5'-10.5'			
Total Depth	22.5'			
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point   W.L. = Water Level   TBM = Temporary Benchmark   MSL = Mean Sea Level

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-22A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

For Office Use Only
Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

WELL CONSTRUCTION RECORD

Well Identification: MW-23A

Drilling Contractor: Aquadrill
Driller Registration Number: 1361

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)
Nearest Town: Lexington, NC
County: Davidson Co.
NC Hwy. 8 and Victor St.
(Road, Community, or Subdivision and Lot No.)
2. Owner: Mannington Mills, Inc.
Address: P.O. Box 30
(Street or Route No.)
Salem NJ 08079
City State Zip Code
3. Date Drilled: 9/17/98 Use of Well: Monitoring
4. Total Depth: 16' Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: NM Feet Below Top Of Casing
Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA Test Method ______
8. Water Zones: (depth) NA
9. Chlorination: NA Amount ______

Drill Log

Depth From To	Formation Description
0-1"	Grass
1"-4'	Red slightly sandy clayey Silt
4'-8'	Red, brown slightly sandy Clay with tile chips
8'-12'	Brown sandy Clay, moist
12'-14'	Light brown clayey Sand, wet
14'-16'	Tan, olive sandy Clay, moist

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From To	Diameter	Wall Thickness	Material
6-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From To	Material	Method
2-0'	Type I Portland	Pour
4-2'	Bentonite	Pour

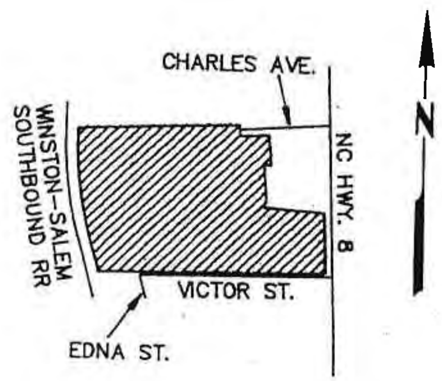
12. Screen:

Depth (ft.) From To	Diameter	Slot Size	Material
6-16'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From To	Size	Material
16-4'	#3 Filter Sand	#3 Filter Sand

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points.)



VICINITY MAP
1"=1000'±

14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent ______ Date ______

Submit original to Division of Environmental Management & copy to well owner.

Boring /Well Construction Log

Well Construction Permit Number ____________

Aquaterra, Inc.

I. D. Number	*MW-23A*	**Purpose**	*Monitoring Well Replacement*
Project Name	*Porcelanite*	**Contractor**	*Aquadrill*
Project No.	*3105804*	**Registration No.**	*1361*
Geologist	*Tom Haynes*	**Driller**	*Paul Waddell*
Start Date	*9/16/98* **Complete Date** *9/17/98*	**Equipment**	*Ingersoll-Rand A-300*

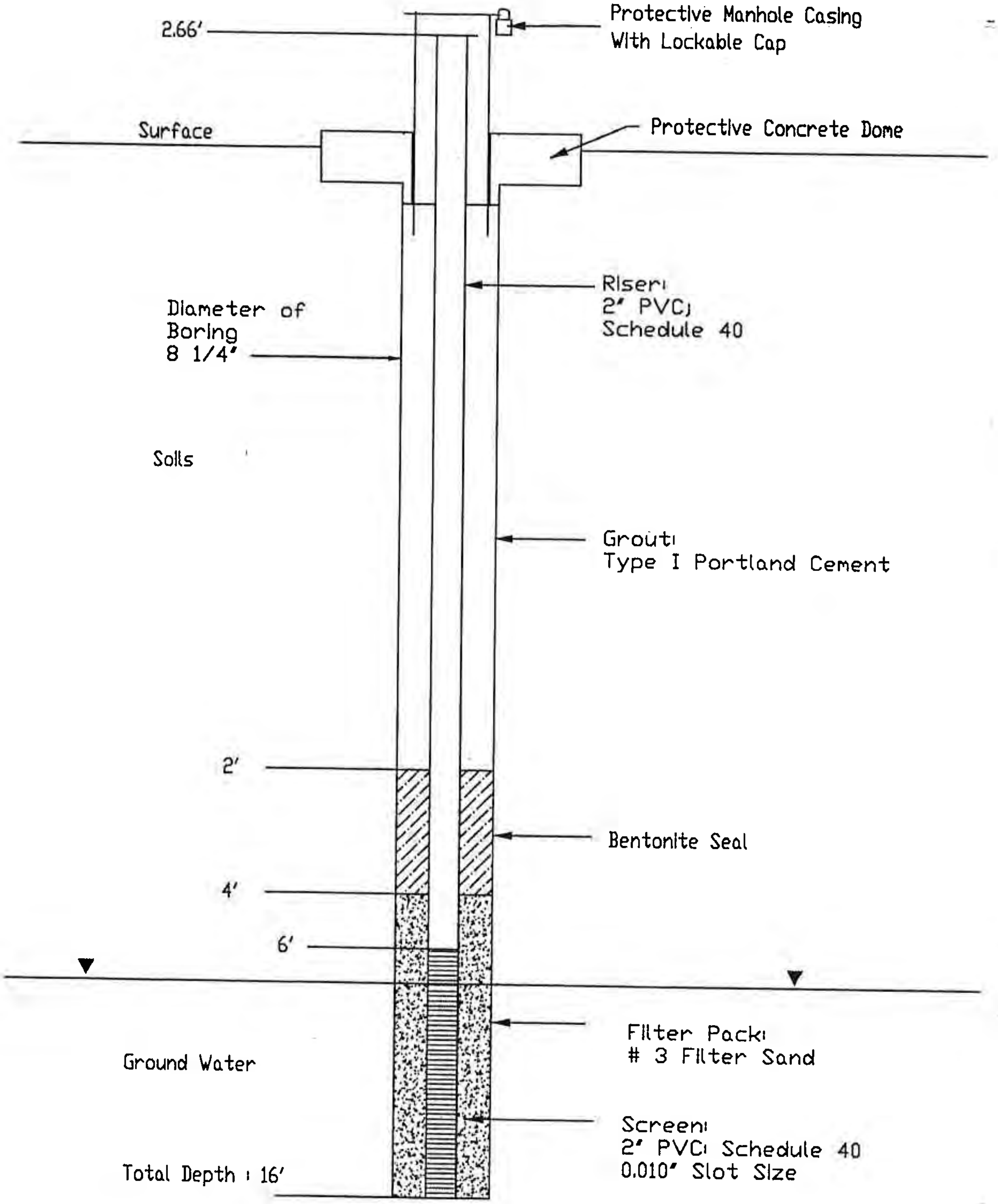
Drilling Metho *Hollow Stem Auger*

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8 1/4" O.D.*	*0-1"*	*Grass*	
Riser Type	*PVC Sch 40*	*1"-4'*	*Red slightly sandy clayey Silt*	
Diameter	*2"*	*4'-8'*	*Red, brown slightly sandy Clay with tile chips*	
Screen Type	*PVC Sch 40*	*8'-12'*	*Brown sandy Clay, moist*	
Diameter	*2"*	*12'-14'*	*Light brown clayey Sand, wet*	
Riser Interval	*6-0'*	*14'-16'*	*Tan, olive sandy Clay, moist*	
Screen Interval	*6-16'*			
Slot Size	*0.010"*			
Grout Type	*Type I Portland*			
Interval	*2-0'*			
Bentonite Type	*3/8" Pellets*			
Interval	*4-2'*			
Filter Pack	*#3 Filter Sand*			
Interval	*16-4'*			
Total Depth	*16'*			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-23A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

FIELD DRILLING RECORD

BORING #	MW - 24	LOCATION:	Mannington
START DATE:	9-1-92	COMPLETED:	9-1-92
GEOLOGIST:	C. Boggs	DRILLER:	Engineering Techtonics
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	15 Feet	CASING DEPTH:	5 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
1	3	Brown organic rich rooted					
		sandy clay loam.					
3	5	Brown sandy clay loam abrupt					
		change to gray rooted sandy					
		clay loam. Wet.					
8	10	Gray-white foliated					
		k-feldspar, plagioclase,					
		quartz muscovite granitic					
		saprolite. Wet.					
13	15	Gray-white saprolite.					
		As above.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 8 ft DEPTH(ft) +3 - 5 DIAMETER(in) 2 MATERIAL PVC
SCREEN LENGTH(ft) 10 ft DEPTH(ft) 5 - 15 DIAMETER(in) 2 MATERIAL PVC
DEPTH TO TOP OF SAND 3 feet BAGS OF SAND 4
DEPTH TO TOP SEAL 2 feet BENTONITE USED 1/2
BAGS OF CEMENT USED

PHONE (919)733-3221

Quad. No. ______ Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR ENSCI

DRILLER REGISTRATION NUMBER 1233

MW-24

STATE WELL CONSTRUCTION PERMIT NUMBER: 28-0331-WM-0098

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Lexington   County: Davidson

(Road, Community, or Subdivision and Lot No.)

2. OWNER Mannington Ceramic Tile

ADDRESS Post Office Box 1777 (Street or Route No.)

Lexington, NC 27293
City or Town State Zip Code

3. DATE DRILLED 9/1/92 USE OF WELL Monitoring

4. TOTAL DEPTH 15 CUTTINGS COLLECTED ☐ Yes ☒ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 3 FT. ☐ above ☒ below TOP OF CASING.

TOP OF CASING IS 3 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): - METHOD OF TEST -

8. WATER ZONES (depth): 3-15'

9. CHLORINATION: Type - Amount -

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	+3	To -5 Ft.	22	Sch 40	PVC
From		To Ft.			
From		To Ft.			

11. GROUT:

	Depth		Material	Method
From	0.5	To 2 Ft.	#1 Portland	Poured
From	2	To 3 Ft.	Bentonite	

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	5	To 15 Ft.	2 in.	0.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

13. GRAVEL PACK:

	Depth		Size	Material
From	3	To 15 Ft.	#3	Sand
From		To Ft.		

14. REMARKS:

DRILLING LOG

Depth From	To	Formation Description
0	5	Sandy Clay loam
5	15	Gray white weathered granite saprolite

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT   DATE

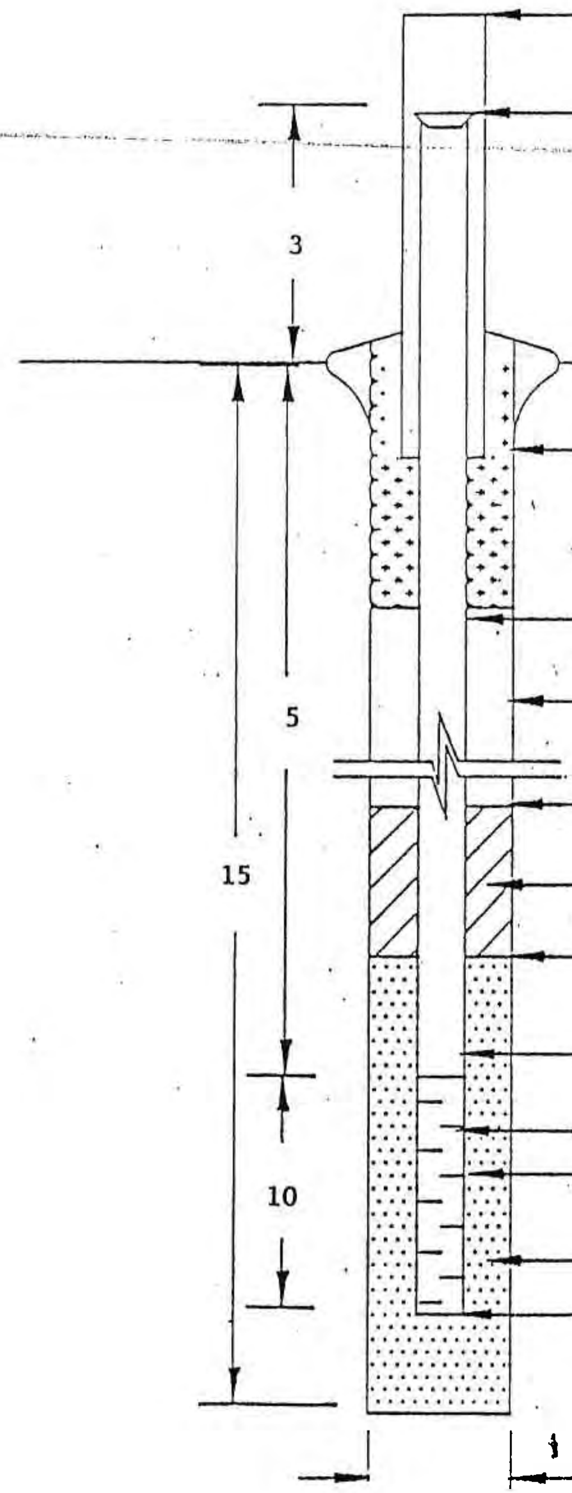
GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

CORPORATION

MONITORING WELL INSTALLATION SKETCH

PROJECT	Mannington	PIEZOMETER NUMBER	MW-24
GROUND ELEVATION		DEPTH TO WATER LEVEL	
BENCH MARK DATA		ELEVATION OF WATER LEVEL	
ELEVATION OF TOP OF PIEZOMETER			



PROTECTIVE BOX W/LOCKING CAP	
SEAL CAP	
THICKNESS OF SURFACE SEAL	6"
TYPE OF SURFACE SEAL	Sakrete
I.D. OF RISER PIPE	
TYPE OF RISER PIPE	2" Sch 40 PVC
TYPE OF BACKFILL	#1 Portland
ELEVATION OF TOP OF SEAL	-2'
TYPE OF SEAL	Bentonite
TOP ELEVATION OF FILTER SAND	-3'
BOTTOM ELEVATION OF RISER	-5'
SIZE OF SCREEN OPENINGS	0.010"
PIEZOMETER SCREEN DIAMETER	2"
TYPE OF FILTER SAND	#3
BOTTOM ELEVATION OF PIEZOMETER	-15'
DIAMETER OF BOREHOLE	6.25"

FIELD DRILLING RECORD

BORING #	MW - 25	LOCATION:	Mannington
START DATE:	9-1-92	COMPLETED:	9-1-92
GEOLOGIST:	C. Boggs	DRILLER:	Engineering Techtonics
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	15 Feet	CASING DEPTH:	5 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color,texture,structure,consistency,etc.	REC	6"	12"	18"	24"
0	3	Brown rooted organic rich sandy clay loam.					
3	5	Gray rooted organic rich sandy clay with approximately 2" coarse quartz sand in bottom of sample. Wet.					
8	10	Brown-green vertically foliated micaceous schistose saprolite. Wet.					
13	15	Tan-dark gray strongly vertically foliated micaceous schistose saprolite. Mineralology similar to granodiorite.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 8' DEPTH(ft) +3 -5 DIAMETER(in) 2 MATERIAL PVC
SCREEN LENGTH(ft) 10' DEPTH(ft) 5 - 15 DIAMETER(in) 2 MATERIAL PVC
DEPTH TO TOP OF SAND 3 BAGS OF SAND 4
DEPTH TO TOP SEAL 2 BENTONITE USED 1/2
BAGS OF CEMENT USED

P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE (919)733-3221

Quad. No. ______ Serial No. ______
Lat. ______ Long. ______ Pc ______
Minor Basin ______
Basin Code ______
Header Ent. ______ GW-1 Ent. ______

WELL CONSTRUCTION RECORD

MW-25

DRILLING CONTRACTOR ENSCI

DRILLER REGISTRATION NUMBER 1233

STATE WELL CONSTRUCTION
PERMIT NUMBER: 28-03310WM-0098

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Lexington

County: Davidson

(Road, Community, or Subdivision and Lot No.)

2. OWNER Mannington Ceramic Tile

ADDRESS Post Office Box 1777
(Street or Route No.)

Lexington, NC 27293
City or Town State Zip Code

3. DATE DRILLED 9/1/92 USE OF WELL Monitoring

4. TOTAL DEPTH 15' CUTTINGS COLLECTED ☐ Yes ☒ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 3 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 3 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): - METHOD OF TEST -

8. WATER ZONES (depth): 3-15'

9. CHLORINATION: Type - Amount -

10. CASING:

Depth From	To		Diameter	Wall Thickness or Weight/Ft.	Material
13	-5	Ft.	2"	Sch 40	PVC
		Ft.			
		Ft.			

11. GROUT:

Depth From	To		Material	Method
0.5	2	Ft.	#1 Portland	Poured
2	3	Ft.	Bentonite	

12. SCREEN:

Depth From	To		Diameter	Slot Size	Material
5	15	Ft.	2 in.	0.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

Depth From	To		Size	Material
3	15	Ft.	#3	Sand
		Ft.		

14. REMARKS:

DRILLING LOG

Depth From	To	Formation Description
0	5	Sandy Clay
5	15	Brown Vertically foliated saprolite

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

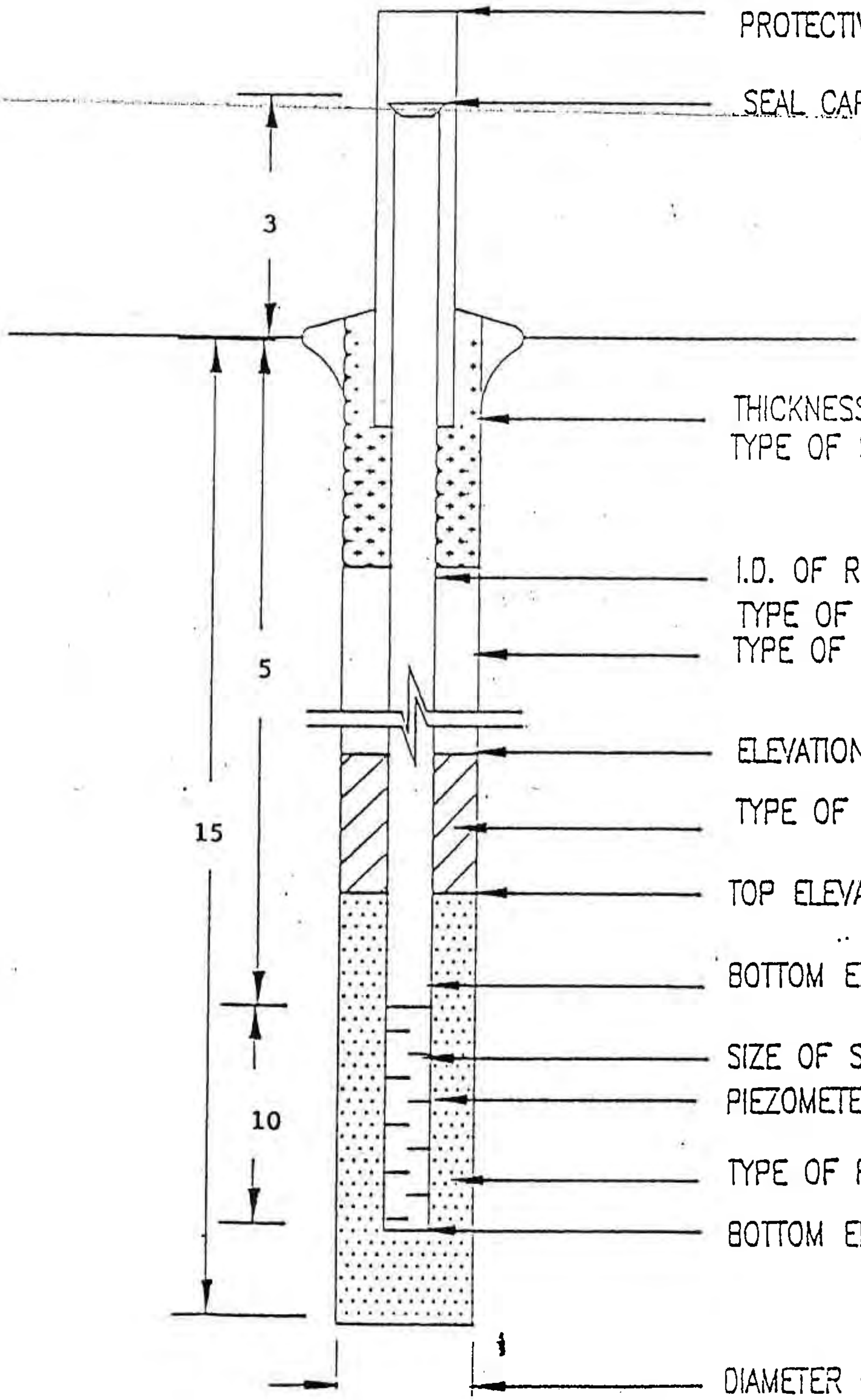
Submit original to Division of Environmental Management and copy to well owner.

CORPORATION

MONITORING WELL INSTALLATION SKETCH

PROJECT Manninton
GROUND ELEVATION
BENCH MARK DATA
ELEVATION OF TOP OF PIEZOMETER

PIEZOMETER NUMBER MW-25
DEPTH TO WATER LEVEL
ELEVATION OF WATER LEVEL



PROTECTIVE BOX W/LOCKING CAP
SEAL CAP

THICKNESS OF SURFACE SEAL	6"
TYPE OF SURFACE SEAL	Sakrete
I.D. OF RISER PIPE	
TYPE OF RISER PIPE	2" Sch 40 P
TYPE OF BACKFILL	#1 Portland
ELEVATION OF TOP OF SEAL	-2'
TYPE OF SEAL	Bentonite
TOP ELEVATION OF FILTER SAND	-3'
BOTTOM ELEVATION OF RISER	-5'
SIZE OF SCREEN OPENINGS	0.010"
PIEZOMETER SCREEN DIAMETER	2"
TYPE OF FILTER SAND	#3
BOTTOM ELEVATION OF PIEZOMETER	-15'
DIAMETER OF BOREHOLE	6.25"

North Carolina Department of Environmental, Health & Natural Resources
Division of Environmental Management- Groundwater Section
P.O. Box 27687-Raleigh, N.C. 27611-7587

WELL CONSTRUCTION RECORD

For Office Use Only			
Quad. No.		Serial No.	
Lat.		Long.	Pc
Minor Basin			
Basin Code			
Header Ent.		GW-1 Ent.	

Well Identification: MW-26A

Drilling Contractor: Geologic Exploration

Driller Registration Number: 1175

State Well Construction Permit Number: On Client Property

1. Well Location: (Show sketch of the location below)

Nearest Town: Lexington, NC

County: Davidson Co.

NC Hwy. 8 and Victor St.
(Road, Community, or Subdivision and Lot No.)

2. Owner: Mannington Mills, Inc.

Address: P.O. Box 30
(Street or Route No.)

Salem	NJ	08079
City	State	Zip Code

3. Date Drilled: 5/21/99 — Use of Well: Monitoring
4. Total Depth: 17.3' — Cuttings Collected: No
5. Does Well Replace Existing Well: Yes
6. Static Water Level: NM Feet Below Top Of Casing
Top of Casing: 3 Feet Above Land Surface
7. Yield (gpm): NA — Test Method:
8. Water Zones: (depth) NA
9. Chlorination: NA — Amount:

Depth From – To	Drill Log Formation Description
0'-6"	Grass / Topsoil
6"-3'	Red, brown sandy slightly micaceous Clay.
3'-8'	Brown, sandy Clay
8'-9'	Brown, olive slightly micaceous clayey Silt, silty Clay. Moist.
9'-11'	Grey, olive clightly micaceous fine sandy clayey Silt. Moist.
11'-12'	Brown , yellow clayey Sand. Moist. ~12' hit auger refusal.
	Will switch to roller cone then core.
13'-18'	Granite / Competant rock. Fracture zones @ ~18'

If additional space is needed, use back of form.

10. Casing:

Depth (ft.) From To	Diameter	Wall Thickness	Material
7.3'-0'	2"	Sch 40	PVC Sch 40

11. Grout:

Depth (ft.) From To	Material	Method
3'-0'	Type I Portland	Pour
5'-3'	Bentonite	Pour

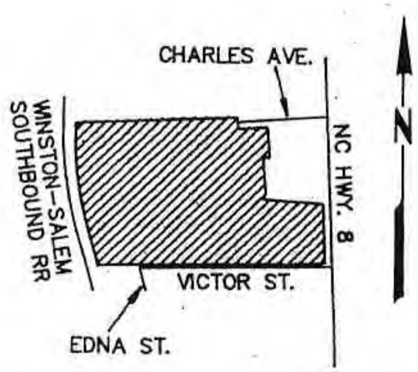
12. Screen:

Depth (ft.) From To	Diameter	Slot Size	Material
17.3'-7.3'	2"	0.010"	PVC Sch 40

13. Gravel Pack:

Depth (ft.) From To	Size	Material
17.3'-5'	#3 Filter Sand	#3 Filter Sand

Location Sketch
(Show direction & distance from at least two State Roads, or other map reference points)



VICINITY MAP
1"=1000'±

14. Remarks:

I do hereby certify that this well was constructed in accordance with 15 NCAC 2C, well construction standards, and that a copy of this record has been provided to the well owner.

GW-1 Revised 2/90

Signature of Contractor or Agent — Date

Submit original to Division of Environmental Management & copy to well owner.

Boring /Well Construction Log

Well Construction Permit Number ____________

Aquaterra, Inc.

I. D. Number	*MW-26A*	**Purpose**	*Monitoring Well Replacement*
Project Name	*Porcelanite*	**Contractor**	*Geologic Exploration*
Project No.	*3105804*	**Registration No.**	*1175*
Geologist	*Tom Haynes*	**Driller**	*Mike*
Start Date	*5/20/99* **Complete Date** *5/21/99*	**Equipment**	*Mobile B-61*

Drilling Metho *Hollow Stem Auger / Core Drill*

Comments *Auger to ~ 12', roller cone to ~13', rock core to 18'*

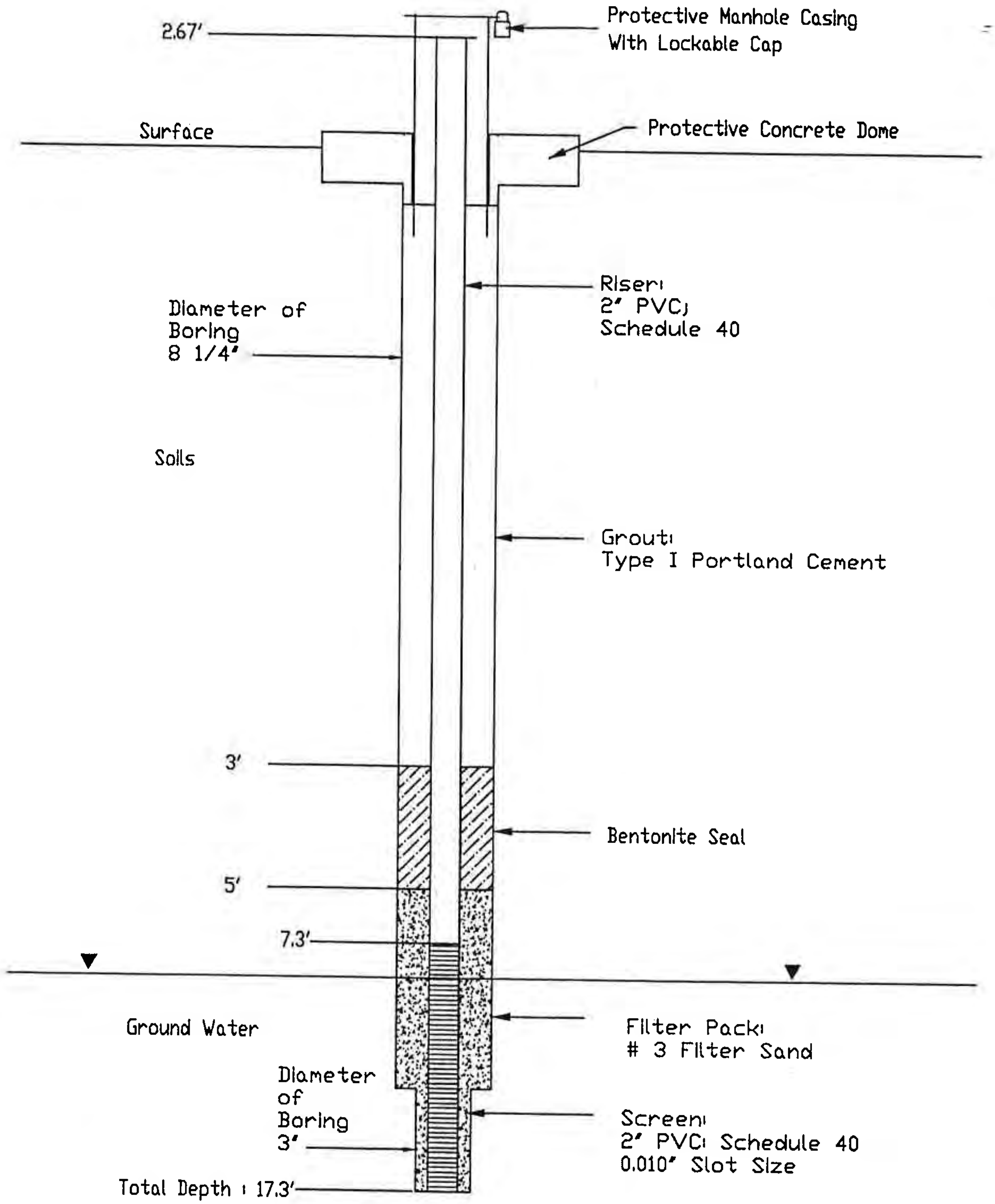
Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*8 ¼" to 12'; 3" at 12'-18'*	*0'-6"*	*Grass / Topsoil*	
Riser Type	*PVC Sch 40*	*6"-3'*	*Red, brown sandy slightly micaceous Clay.*	
Diameter	*2"*			
Screen Type	*PVC Sch 40*	*3'-8'*	*Brown, sandy Clay*	
Diameter	*2"*	*8'-9'*	*Brown, olive slightly micaceous clayey Silt, silty Clay. Moist.*	
Riser Interval	*7.3'-0'*	*9'-11'*	*Grey, olive clightly micaceous fine sandy clayey Silt. Moist.*	
Screen Interval	*17.3'-7.3'*	*11'-12'*	*Brown , yellow clayey Sand. Moist. ~12' hit auger refusal.*	
Slot Size	*0.010"*		*Will switch to roller cone then core.*	
Grout Type	*Type I Portland*	*13'-18'*	*Granite / Competant rock. Fracture zones @ ~18'*	
Interval	*3'-0'*			
Bentonite Type	*3/8" Pellets*			
Interval	*5'-3'*			
Filter Pack	*#3 Filter Sand*			
Interval	*17.3'-5'*			
Total Depth	*17.3'*			
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.



aquaterra engineering

Author	Drawing	Layers	Date	Title
mbb	105804			Well Construction Diagram Monitoring Well MW-26A
Job No.	**Revision**	**Figure**	**Scale**	**Project**
105804	9-8-00		NTS	Porcelanite Lexington, North Carolina

Appendix E-3
2007 Sampling and Analysis Plan

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

November 2, 2007

Mr. Bob Glaser
North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Reference: October 2007 Revised Sampling and Analysis Plan (SAP)
Porcelanite, Inc.
Lexington, North Carolina
Waters Edge Environmental Job No. R1-21

Dear Mr. Glaser:

Based on our October 15, 2007 meeting and recommendations made by Ms. Mary Siedlicki, we have attached the following revisions to the most recently approved SAP:

1. We would monitor wells MW-1, MW-9, MW-12, MW-22A, MW-26-A-2 and MW-28 in both March and September.

2. All wells would be analyzed for boron, cadmium, chromium, cobalt, lead, manganese and zinc.

If you have any questions regarding this report or require additional information, please call me at 919.859.9987.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip L. Rahn, P.G.
President

07-122/PLR/aht

October 2007 Revised SAP
Porcelanite, Inc.
Lexington, North Carolina
November 2, 2007

Prepared For

Porcelanite, Inc.
(Mannington Mills)
Lexington, North Carolina

Prepared By

Waters Edge Environmental, LLC
Raleigh, North Carolina

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October 2007 Revised SAP
Porcelanite, Inc.
Lexington, North Carolina
November 2, 2007

1 Introduction

Porcelanite, Inc. 1995-present (formerly Mannington Ceramic Tile 1986-1995) was a ceramic tile manufacturing company that operated a facility in Lexington, Davidson County, North Carolina (see Figure 1). Two solid waste management units were created to handle waste previously generated from the ceramic tile manufacturing process. These units include the waste water settling ponds and the waste ceramic tile pile (see Figure 2). The settling ponds were used to settle solids contained in production waste water and then discharged to the Rat Spring Branch of the Yadkin-Pee Dee River Basin under a National Pollution Discharge Elimination System (NPDES) permit. The waste ceramic tile pile was used to dispose of off-specification ceramic tile materials. Currently the plant is closed and is for sell by Porcelanite.

Previous site evaluations of the solid waste management units revealed that both units are regulated by the Resource Conservation and Recovery Act (RCRA) due to toxicity associated with leachable lead content. Closure of the settling ponds and ceramic tile pile unit are complete. A total of twenty six (26) ground water monitoring wells were originally installed for detection and assessment monitoring around the former settling ponds and the waste ceramic tile pile of which 18 currently exist. Exceedances of ground water standards have been detected in some of the monitoring wells.

This Ground water Sampling and Analysis Plan (SAP) supersedes the February 2005 SAP generated by Waters Edge. Revisions in the SAP were based on comments made by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management (DWM) in our October 15, 2007 meeting. The significant differences between this SAP and the previous SAP include:

- Increase in the amount of wells sampled and analyte list for both the March and September sampling rounds.

2 Site Setting

2.1 Topographic Setting

The site is located in the central portion of the Piedmont physiographic province in North Carolina. The Piedmont region is characterized by a rolling hill topography. This topography was developed by tectonic uplift and subsequent erosion of the region between the Blue Ridge Mountains and the Atlantic Ocean.

The site lies on the margin of a minor first order stream known as Walltown Drain. Site topography is dictated by the stream valley and is characterized by an average topographic grade of approximately 0.085 ft/ft sloping toward the northeast. A map depicting ground water flow is presented in Figure 3.

2.2 Geologic Setting

The site is situated in the eastern portion of the Charlotte Lithotectonic Belt which is a zone of regionally metamorphosed amphibolite facies igneous rocks with a similar character, bounded on the east and west sides by shear zones. Lithologies, which occur beneath the Porcelanite facility, are mapped as Late Proterozoic-aged undivided metavolcanic rocks according to the Charlotte U.S.G.S. geologic quadrangle map (Gair, 1989).

Two cross-sectional diagrams and flow nets are contained in Appendix A. These cross sections and flow nets were prepared by Waters Edge to illustrate relevant site geology and contaminant flow paths. As seen in the cross-sections, the predominant lithology encountered at the site was described as pink to tan silty sand textured residual soils (saprolite) weathered in place from the underlying bedrock. The saprolite grades from intensely weathered rock near the surface to slightly weathered rock with increasing depth. In some areas, sandy clay to clayey sand soils have developed in the upper 5 to 10 feet of saprolite.

As seen in the cross-section diagrams, underlying bedrock lithologies encountered at the site consist of partially weathered to highly fracture granite to granodiorite. This observation is contrary to the above-mentioned mapped lithologies. As confirmation of the rock types observed at the site, quartz diorite has been recognized in the vicinity of the site at the Lexington Quarry (Gair, 1989). The distribution of these intrusive rocks has been mapped or subdivided from the metavolcanics in the area. Based upon the lithology and location of these intrusive rocks, it is likely that the granite to granodiorite is associated with the Devonian-aged Yadkin Pluton. No significant ore deposits have been recognized or mined extensively in the immediate area surrounding Lexington. However, significant deposits of a number of ores including silver, lead, cobalt, zinc, gold and copper have been recognized and mined in the regions located 5 to 20 miles south and east of the site (Gair, 1989).

2.3 Hydrogeologic Setting

As is typical of the Piedmont Physiographic Province, ground water occurs in two interconnected zones underlying the site. These zones include the unconsolidated (saprolite) water table aquifer and the underlying fractured bedrock aquifer. Ground water in the water table aquifer is transmitted in a generally laminar fashion through the pores in the "B-Horizon" and "C-Horizon" soil zones. These soil zones (saprolite) tend to have a fairly uniform porosity and permeability and have a relatively large storage capacity in the regolith overlying fractured bedrock. The two water bearing zones are directly interconnected and are not separated by a confining layer at the site. The saprolite/regolith zone acts as the storage reservoir for the underlying bedrock zone, thus recharging the bedrock aquifer in response to any withdrawal of water from the bedrock.

Ground water in the saprolite water table zone has been mapped to illustrate the direction and gradient of ground water flow. To illustrate the direction and gradient of ground water flow at the site, the most recent water table contour map (December 2004) is provided in Figure 3. As seen in Figure 3, ground water is flowing toward the northeast under an average hydraulic gradient of approximately 0.028 ft/ft. The depicted ground water flow and gradient is in general agreement with previous observations. The local point of ground water discharge from the water table aquifer appears to be the Walltown Drain. Recharge to the water table zone apparently occurs as surface water infiltration over the topographically higher regions southwest of the site.

In order to gain information about the permeability of the water table and bedrock aquifers, ENSCI Environmental (November 1992) conducted single well slug tests on fifteen monitoring wells. Results of these tests indicated the hydraulic conductivity of the water table aquifer is fairly consistent across the site. The hydraulic conductivity values derived from the slug tests were averaged by calculating the geometric mean, resulting in a derived aquifer permeability of 0.40 feet/day. Utilizing the derived hydraulic conductivity, average hydraulic gradient and estimates of the effective porosity of the aquifer, ENSCI estimated that the ground water flow velocity at the site ranges from 0.030 feet/day to 0.054 feet/day.

The site is situated in the eastern portion of the Charlotte lithotectonic belt, which is a zone of regionally metamorphosed amphibolite facies igneous rocks with a similar character, bounded on the east and west sides by shear zones. According to the Charlotte geologic quadrangle map, the site is underlain by Late Proterozoic-aged undivided metavolcanic rocks. However, bedrock lithologies encountered at the site consist of massive, quartz-potassium feldspar-muscovite granite to granodiorite that are likely associated with the Pennsylvanian to Permian-aged Churchland Pluton.

2.4 Monitoring Well System

As of April 10, 1997, 19 ground water monitor wells were used to monitor ground water at the site. In preparation for closure of the ceramic tile chip pile, on April 10, 1997, the following six monitoring wells were abandoned; MW-3, MW-7, MW-8, MW-21. MW-22 and MW-26A. All wells except MW-8 were replaced in the same approximate locations upon completion of closure activities. Of the eighteen (18) monitoring wells currently existing at the site, fourteen (14) are Type II monitoring wells installed to monitor the shallow aquifer, and four Type III monitoring wells (MW-9 and MW-11, MW-19 and MW-28) installed to monitor the saprolite aquifer. Appendix B contains available monitoring well construction records for existing monitoring wells.

This SAP includes six monitoring wells (MW-1, MW-9, MW-12, MW-22A, MW-26-A-2, and MW-28) as described in Table 2 to be used to monitor the Tile Pile and Settling Ponds with sampling being accomplished in March and September of each year. The parameters for sampling will be boron, cadmium, chromium, cobalt, manganese, lead and zinc.

3 Health and Safety

As required in 29 CFR Pan 1910.120 a health and safety plan (HASP) for the hydrogeologic assessment was previously developed. The HASP includes the following items:

- safety and standard operating procedures
- anticipated hazards
- exposure limits
- levels of dermal and respiratory protection
- emergency medical care of personnel
- contingency plan for sudden releases of hazardous materials by the drilling program
- emergency procedures and ambient air monitoring

All personnel and subcontractors are monitored under an approved medical program including baseline and annual physicals. All personnel will have 32 to 40 hours of hazardous waste health and safety training. Personnel will be fit tested for respirators, OSHA trained in the use of negative and positive pressure respiratory protection, and the proper use of personal protective equipment (PPE).

4 Ground Water Sample Collection

4.1 Ground Water Sampling Preparation

The sampling team and site manager will review the ground water sampling plan prior to beginning sampling activities. The team and site manager will develop a sampling schedule and determine which samples will be duplicated for QA/QC purposes. The correct number of sample containers will be secured for each sampling round.

4.2 Ground Water Sample Collection Logbook

The following data will be recorded in the on-site water sample collection logbook (hereafter referred to as the “logbook”) maintained by the Mannington site manager:

- name(s) of people present
- date of the sampling event

- environmental conditions
- date and procedure used for equipment calibration will be documented in the logbook

For each well sampled:

- well condition
- date and time of measurement and/or purging
- equipment used for purging
- well depth below measuring point (to the nearest 0.01 feet)
- elevation of the water level
- length of water column in the well
- volume of water column in the well
- approximate volume of water removed during purging
- sample collection time and date
- equipment used for sample collection
- field measurements
- types and number of sample containers
- any special handling procedures

4.3 Measurement of Water Levels

Well caps with air/water tight seals will be removed from all of the wells, and the wells will be allowed to equilibrate with atmospheric pressure for a minimum of 15 minutes prior to measurement of water levels. Water levels will be measured to the nearest 0.01-foot using an electronic water level meter. The top of the Grundfos wellhead water level probe port has been selected as the reference measuring point for each well (see Table 1). Static water level measurements will be obtained from all wells prior to beginning the well purging procedure at any well. Water level measurements will proceed from the least to the most contaminated wells based on the "most recent" historical analytical data. This order of water level measurements will help to minimize the potential for cross contamination between wells.

All sampling personnel will wear protective non-reactive nitrile gloves throughout the water level monitoring procedures. Depth to ground water measurements (including calculated ground water elevations) and other data will be recorded in the facility ground water sample collection logbook.

4.3.1 Decontamination of Water Level Probe

The water level probe will be decontaminated prior to initial use and between each well before measuring the water levels. The electric probe and length of cable inserted into the monitoring well will be rinsed with deionized (or distilled) water, scrubbed in a phosphate-free low-residue soap, rinsed with deionized (or distilled) water, rinsed with a 5% nitric acid solution, rinsed with deionized (or distilled) water, rinsed with isopropyl alcohol, rinsed with deionized (or distilled) water and air dried as long as possible between wells.

4.4 Well Development and Purging

Clean, disposable gloves (powder free, vinyl or latex) will be worn by sampling personnel during water level monitoring, purging, sampling, and decontamination procedures. New gloves will be utilized for each activity and each well.

Utilizing the well volume information gathered from the water level measurement procedures, three well volumes will be calculated for each well to determine the minimum volume to be purged prior to sampling. Removal of the minimum three casing volumes and allowing the wells to stabilize should insure that all of standing water in the well casing is removed. Newly installed wells will be allowed to stabilize for a minimum of one week following development before being purged and sampled.

A dedicated Grundfos Redi-Flo2 brand electric submersible impeller pump will be used to purge and sample each well if feasible. If this is not feasible due to obstructions in the well, disposable bailers will be attempted. As requested in the HWS correspondence dated November 8, 1996, a new survey of the replacement monitoring well measuring points has been completed. This included surveying the top of casing elevations and surveying the Grundfos dedicated wellhead measuring point (water level probe port) for the replacement well heads. Table 1 specifies the pump intake in relation to the top of well casing for all monitoring wells currently located at the facility.

An individual pump will be dedicated to each well, thus eliminating the potential for cross contamination and eliminating the need for decontamination between sampling events. The pump will be secured in the well with a stainless steel cable. Discharge tubing will be Teflon and will also be dedicated, eliminating the need for decontamination between sampling events.

The purging process will involve pumping a minimum of three well volumes of water continuously at a low flow rate (approximately 0.25 gallons per minute). Pumping at the low flow rate will reduce or eliminate the collection of well bore sediments and provide a more representative ground water sample. Field parameters of pH, temperature and conductivity will be measured for each well volume. The purging will continue until field parameters and water level stabilize. Stabilization consists of three consecutive readings collected at 5-minute intervals over a 15 minute period. Each well will be purged until visibly clear water flows from the discharge hose of the pump. We will also note the stabilized water level to insure that the sample is entering the pump directly from the formation.

In the event that an existing well contains insufficient water to purge three well volumes or until field parameters have stabilized, the Redi-Flo2 pump will be operated until it will not yield water and the ground water samples will be obtained following sufficient recharge of the well.

4.5 Ground Water Sample Collection

The order of ground water purging and sample collection will proceed from the well with the most recent lowest concentrations of constituents to the well with the most recent highest constituent concentrations. This order of ground water purging and sample collection will help to minimize the potential for cross contamination between wells. Clean, disposable nitrile gloves (powder free) will be worn by sampling personnel during water level monitoring, purging, sampling, and decontamination procedures. New gloves will be utilized for each activity and each well.

Once the purging process is completed, the water will be transferred into the appropriate sample containers without interrupting the pumping/purging process. Prior to commencement of field activities, the contracting laboratory prepares the appropriate sample containers for the sampling event. Containers are labeled for each well and sample parameter. If required, the laboratory facility adds preservatives to the appropriate sample containers. Sample containers, preservation techniques and holding times utilized in the sampling event are conducted in accordance with the methods presented in *EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Table 2-33*. Table 3 specifies the sample container volume, preservative, holding time and analytical method to be employed to analyze the sample at the laboratory. Upon filling, the sample containers will be immediately labeled with the appropriate information and placed on ice to lower the temperature of the samples to approximately 4°C. Permanent ink will be used for all sample container label entries to ensure information remains legible when wet. Reported field parameters will be obtained following acquisition of all ground water samples that are to be sent to the laboratory for analysis.

4.6 Disposal of Purged Water

The purged ground water from the monitoring wells will be containerized in labeled 55-gallon drums, labeled as purge water and stored on site while awaiting proper disposal.

4.7 Field Quality Control

In the event that the Redi-Flo2 Pump malfunctions, the pump will be removed from the well and repaired in the field if possible. If field repair of the pump is not possible, the pump will be removed, the well head will be fitted with a temporary locking expansion cap and the pump will be shipped to the manufacturer for repair. Prior to returning the pump and discharge plumbing to the well, all downhole portions of the pump, discharge hose and suspension cable will be fully decontaminated in the same manner described in Section 4.3.1 of this report.

5 Quality Assurance/Quality Control Program

5.1 Introduction

A quality assurance (QA) program will be used to assure valid analytical data. A quality control (QC) program will be in effect in the form of the field sampling procedures. The analytical laboratory to be used is an EPA approved laboratory that will use a QA/QC program that complies with EPA SW-846 methods.

The QA programs used for the ground water will consist of duplicate samples, split samples, field blanks, and travel blanks as requested by the NCDENR. Any deviations from the specifications of this SAP and/or approved procedures will be documented in the quarterly report generated to document ground water and site conditions.

5.2 Duplicate Samples

A least one duplicate sample will be randomly collected from a monitoring well during each day of sample collection for each semiannual sampling event. The sample will be acquired from the monitoring well in a manner identical to the primary sample (same time, same location, using the same sampling equipment, etc.). These samples will be collected in identical containers that have been similarly prepared and filled to the same volume. Duplicate samples will be preserved and handled in an identical fashion.

5.3 Split Samples

Split samples are not planned for the program unless requested by the NCDENR, the analytical laboratory results become suspect, or unexpected contaminants are detected.

5.4 Field Blanks

Field blanks will consist of laboratory prepared deionized analyte free water that will be containerized, treated (if preservatives are used), and handled in the same manner as the samples collected from the monitoring wells.

5.5 Method Blanks

The analytical laboratory is required to collect, analyze, and report the data associated with a method blank. A method blank is required at the beginning and end of each day that an analysis for the site is conducted. For example, if 10 samples were submitted for analysis from this particular site, and they were all analyzed on the same day, then one set of method blanks would be submitted. However, if a portion was analyzed one day, and the remainder analyzed on another day, then two sets of method blanks, one for each day, would be submitted.

The analytical data from each sampling event is compared to the historical database developed for the site to determine whether an anomaly exists. If information is suspected of being anomalous, then the wells associated with the anomaly will be resampled for verification.

6 Monitoring Parameters / Schedule

Porcelanite will employ the schedule and analytical methods outlined in Table 2 for the ongoing evaluation of ground water at the site. For the assessment program, Porcelanite will follow the schedule, parameter list, and sample locations (i.e. wells) described in this document or applicable correspondence from NCNCDENR. As indicated in Table 2, there are currently 18 wells; however, we are only proposing to analyze six wells based on the historical analysis conducted at the site. Table 3 specifies the sample container size, preservative, holding time, and analytical test method to be utilized during the analysis of the recovered ground water sample.

7 Chain of Custody Protocols

7.1 Sample Labels

Preprinted labels will be affixed to the sample containers by the laboratory. Preprinted items on the labels will include the laboratory name, address and preservative added to the container. Once a sample is collected in the field, the date, time, sample location, project name, sampler name and target analytical methods will be recorded. All label entries will be made using permanent ink.

7.2 Chain of Custody Record

A form will be supplied by the laboratory in a format for recording all pertinent sampling data to maintain a record of the chain of custody of samples collected. The form will be completed in the field prior to delivery of the samples to the laboratory. Information to be included on the chain of custody record will include, at a minimum, the following:

- project name
- project number
- sample location, well number
- sampling date & time
- preservatives & number of containers
- sampler identification
- custody signatures
- laboratory North Carolina Certification Number

- requested analysis
- inclusive dates of sample possession

7.3 Sample Transportation

Following collection, samples will be placed in a cooler and immediately chilled on ice to approximately 4°C. Sample containers will be packed in the cooler with plastic foam packing materials or equivalent to prevent breakage of sample containers during transportation. Sample coolers will remain in custody of field sampling personnel until delivered to laboratory personnel or until shipped via a commercial overnight shipping firm to the laboratory.

8 Reporting

A report will be generated within 60 days of sample collection to document details of the sample collection event and laboratory results.

Table 1

Porcelanite, Inc.
October 2007 Sampling & Analysis Plan
Ground Water Monitoring Well Data

Monitoring Well Identification	Top of Casing Elevation	Ground Water Elevation	Pump Intake Elevation
MW-1	769.71	750.86	749.41
MW-3A	764.49	730.38	735.42
MW-7A	742.38	736.79	724.57
MW-9 (D)	749.79	727.86	699.97
MW-10	757.81	742.52	738.81*
MW-11 (D)	755.10	742.72	690.62
MW-12 (D)	749.59	729.6	727.80
MW-13	752.86	734.94	729.86*
MW-14	756.92	744.22	740.92*
MW-18	733.44	726.09	721.28
MW-19 (D)	732.40	725.8	699.73
MW-21A	739.11	734.26	725.09
MW-22A	753.25	735.1	730.73
MW-23A	752.31	740.28	737.02
MW-24	729.42	725.59	716.30
MW-25	731.59	725.64	718.93
MW-26-A-2	749.59	NM	NM
MW-28 (D)	749.39	726.75	669.72

NM – Not Measured since MW-26-A-2 installed in September 2007
D = Deep Well
Ground surface datum collected on May 15, 1997 and August 2000
**- Pump intakes lowered on October 3, 2001*
Waters Edge Environmental Job No. R1-21

Table 2

Porcelanite, Inc.
October 2007 Sampling and Analysis Plan
Target Analyte List and Sampling Schedule

Well ID #	March	September
MW-1	A	A
MW-9	A	A
MW-12	A	A
MW-22A	A	A
MW-26-A-2	A	A
MW-28	A	A

PARAMETERS   A: Boron, Cadmium, Chromium, Cobalt, Lead, Manganese and Zinc

Table 3

Porcelanite, Inc.
Target Analyte List
Container Size, Preservative, Holding Time and Analytical Methodology

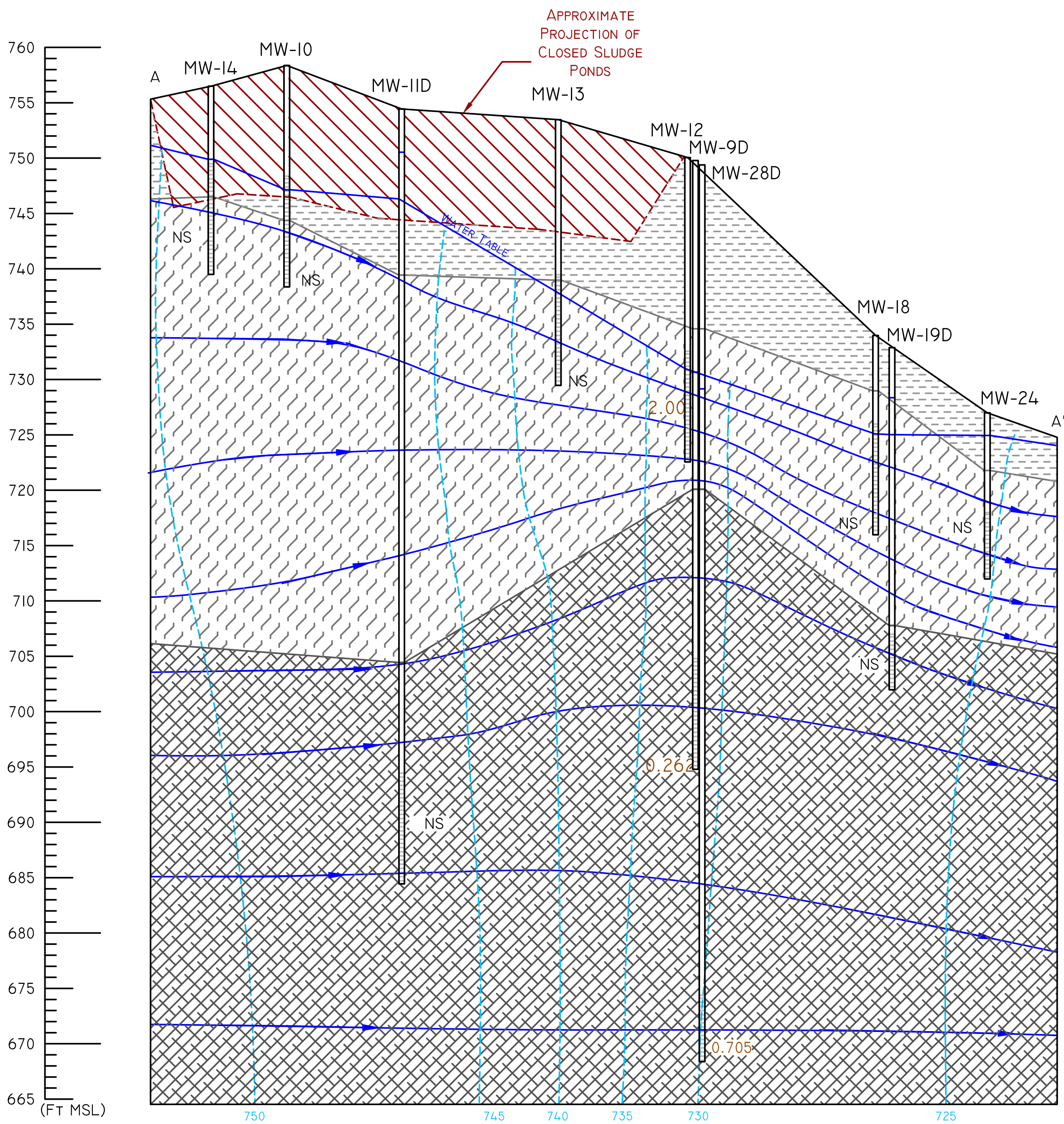
Parameter	Container	Preservative	Holding Time	Analytical Method
Boron	950 ml	HNO_3	6 months	200.7
Cadmium	950 ml	HNO_3	6 months	200.7
Chromium	950 ml	HNO_3	6 months	200.7
Cobalt	950 ml	HNO_3	6 months	200.7
Lead	950 ml	HNO_3	6 months	200.7
Manganese	950 ml	HNO_3	6 months	200.7
Zinc	950 ml	HNO_3	6 months	200.7

Note: With use of EPA Method 200.7, the lowest possible detection limit will be obtained with each analyte tested. Sample containers, preservation techniques and holding times utilized in the sampling events are conducted in accordance with the methods presented in *EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Table 2-33.*

Appendix E-4
Cross-Sections (September 2016)

Legend

- Clayey Sand Surficial Soils
- Silty Sand Saprolite Soils
- Partially Weathered Granodioritic Bedrock
- Closed Sludge Ponds
- 1.06 Boron Concentration (in mg/L)*
- NS Monitoring Well Not Sampled
- Equipotential Line
- Ground Water Flow Line / Direction

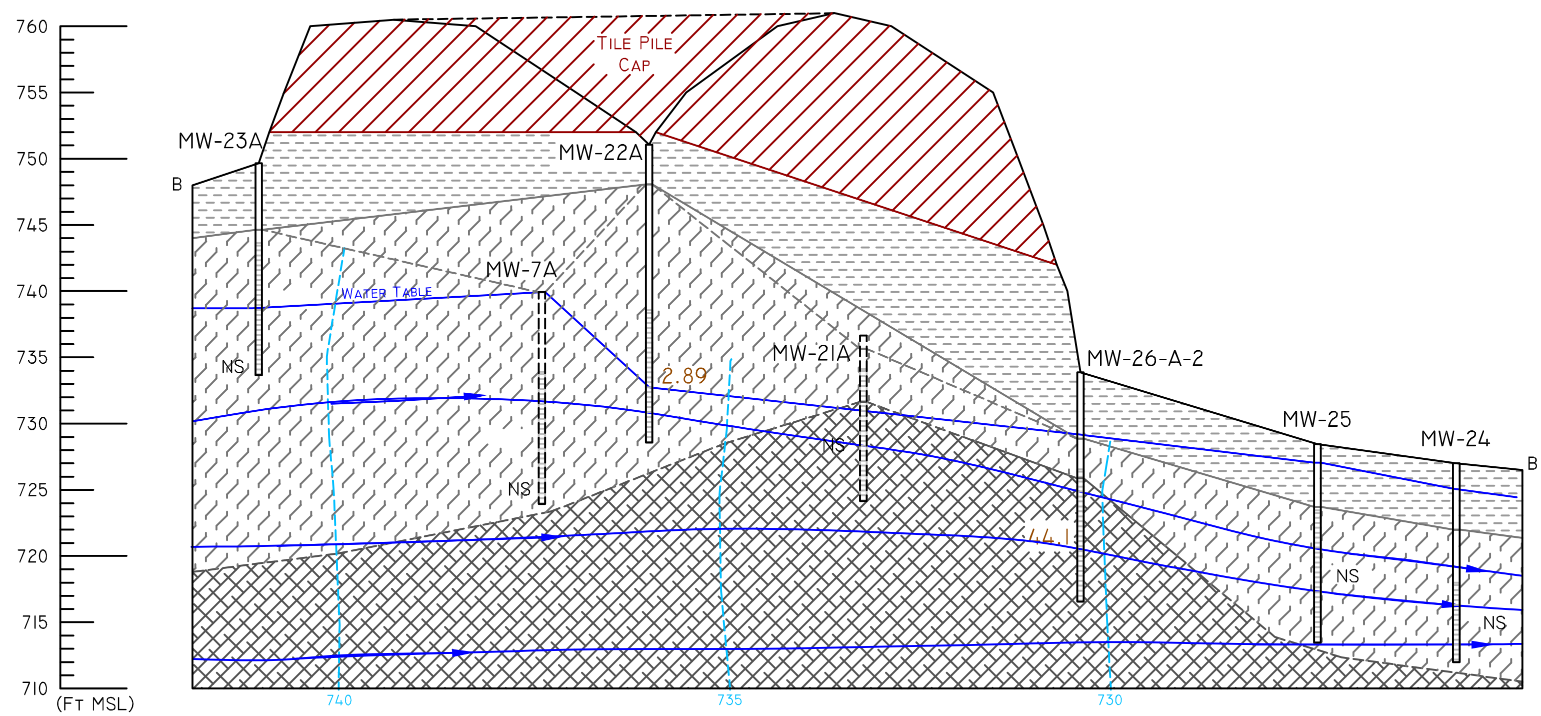


Author	Drawing	Layers	Date	Title
plr	App E-4		4.11.16	Geologic Cross Section and Flow Net A and A' (September 15, 2016)
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	10.28.16	App E-4	1"= 150' VE = 10x	Former Porcelanite Facility Lexington, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC

LEGEND

CLAYEY SAND SURFICIAL SOILS
SILTY SAND SAPROLITE SOILS
PARTIALLY WEATHERED GRANODIORITIC BEDROCK
CAPPED TILE PILE
1.06 BORON CONCENTRATION (IN MG/L)
NS MONITORING WELL NOT SAMPLED
EQUIPOTENTIAL LINE
GROUND WATER FLOW LINE / DIRECTION



WATERS EDGE ENVIRONMENTAL, LLC	Author plr	Drawing App E-4	Layers	Date 4.11.16	Title Geologic Cross Section and Flow Net B and B' (September 15, 2016)
	Job No. R1-21	Revision 10.28.16	Figure App E-4	Scale 1" =150' VE = 10x	Project Former Porcelanite Facility Lexington, North Carolina

Part F
Hazard Prevention

Part F - Procedures to Prevent Hazards
Table of Contents

__**Appendix**__

PART F – Procedures to Prevent Hazards

F-1 Security

F-1a Security Procedures and Equipment

A seven-foot chain-link fence topped with barbed wire and locked gates surround the Facility as a barrier to entry.

F-1a (1) 24-Hour Surveillance System

Not applicable – This is a closed facility with no buildings or structures remaining. No guard or 24-hour surveillance system is necessary.

F-1a (2) Barrier and Means to Control Entry

F-1a (2)(a) Barrier

A seven-foot chain-link fence topped with barbed wire and locked gates with one key-coded lock entry surround the Facility as a barrier to entry. Remaining locks use a key.

F-1a (2)(b) Means to Control Entry

Five (5) drive-thru gates and one (1) personnel entrance gate are part of the fence surrounding the Facility as depicted on Figure B-3. The gates are all locked with a chain and key padlock, with the exception of a key-coded lock on the "main gate" off Victor Drive, where employee parking and the guard house were previously located. Individuals with access to the Facility are limited to:

- Mr. George Smith, phone number (336) 752-2945, retired Porcelanite/Condumex Associate, Lexington resident, and caretaker
- Mr. Phil Rahn and Mr. Tom Haynes, Waters Edge Environmental, LLC
- a Lexington police officer who inspects areas of the Facility property
- NCDEQ individual who performs periodic post-closure care inspections for SWMU-2 and SWMU-3

F-1a (3) Warning Signs

Current signage at the Facility states: NO TRESPASSING – KEEP OUT

Condumex and Mannington has installed signs which state "No Trespassing- Keep Out" at all entrances and any other ordinal sides of the Facility.

F-1b Waiver

A Waiver is not requested.

F-1b (1) Injury to Intruder

Not applicable – This is a closed facility with no buildings, structures, or equipment remaining. Wastes remaining at the Facility are protected by NCDEQ approved caps.

F-1b (2) Violation Caused by Intruder

Not Applicable – This is a closed facility with no buildings, structures, or equipment remaining.

F-2 Inspection Schedule

The Facility is inspected quarterly by Condumex/Mannington personnel as part of the Facility's approved Post-Closure Care Plan with a Inspection Log contained in Appendix F-1. It is also inspected annually by a NCDEQ RCRA Compliance Inspector.

F-2a General Inspection Requirements

The Facility is in post-closure; therefore, many items listed in this Section are not applicable.

F-2a (1) Types of Problems

Types of potential problems related to conditions with respect to the Facility included in the quarterly inspections are as follows:

- Erosion Damage
- Vegetative/Stone/& Asphalt Covers
- Run-on/Run-off Control System
- any Subsidence
- Monitoring wells
- Security Fence and Gates

F-2a (2) Frequency of Inspection

Post-closure inspections are conducted quarterly by Condumex/Mannington personnel and annually by a NCDEQ RCRA Compliance Inspector (see Inspection Log in Appendix F-1).

F-2b Facility Inspection Requirements

F-2b (1) Monitoring Equipment

The Facility is a closed facility and no fixed monitoring systems are present.

F-2b (2) Emergency Equipment

The Facility is a closed facility, and based on the lack of buildings and manufacturing activities, no fire or spill risks requiring equipment, and no hazards requiring emergency personal protective equipment (PPE) are present.

F-2b (3) Safety Equipment

The Facility is a closed facility, and based on the lack of buildings and manufacturing activities, no hazards requiring safety equipment are present.

F-2b (4) Security Equipment

The Facility is a closed facility, and based on the lack of buildings and manufacturing activities, no security risks requiring such equipment, other than the fences and locked gates described previously are present.

F-2b (5) Operating and Structural Equipment

The Facility is a closed facility, and based on the lack of buildings and manufacturing activities, there is no operating and/or structural equipment at the Facility requiring this type of inspection.

F-2b (6) Testing of Equipment

The Facility is a closed facility, and based on the lack of buildings and manufacturing equipment, no such equipment requiring such testing is present.

F-2c Specific Process Inspection Requirements

The Facility is a closed facility, and based on the lack of buildings and manufacturing activities, there are no specific processes to inspect.

F-2c (1) Container Inspection

The Facility is a closed facility, and there are no containers to inspect.

F-2c (2) Tank System Inspection

The Facility is a closed facility, and there are no tank systems to inspect.

F-2c (3) Waste Pile Inspection

The Facility is a closed facility, and there are no waste piles to inspect.

F-2c (4) Surface Impoundment Inspection

The Facility is a closed facility, and there are no operational surface impoundments to inspect. The two closed settling ponds (SWMU-2) are inspected during quarterly post-closure inspections conducted by Condumex/Mannington personnel and annual compliance inspections conducted by NCDEQ.

F-2c (5) Incinerator Inspection

The Facility is a closed facility, and there are no incinerators to inspect.

F-2c (6) Landfill Inspection

The Facility is a closed facility, and there are no operational landfills to inspect. The closed Ceramic Tile Pile (SWMU-3) is inspected during quarterly post-closure inspections conducted by Condumex/Mannington personnel and annual compliance inspections conducted by NCDEQ.

F-2c (7) Land Treatment Inspection

The Facility is a closed facility, and there are no land treatment operations to inspect.

F-2c (8) Miscellaneous Unit Inspections

The Facility is a closed facility, and there are no miscellaneous units, as described, to inspect.

F-2c (9) Boilers and Industrial Furnaces Inspections

The Facility is a closed facility, and there are no miscellaneous boilers or industrial furnaces to inspect.

F-2c (10) Drip Pad Inspections

The Facility is a closed facility, and there are no drip pads to inspect.

F-2c (11) Containment Building Inspections

The Facility is a closed facility, and there are no containment buildings to inspect.

F-2c (12) Subpart AA - Air Emission Standards for Process Vents

The Facility is a closed facility, and there are no process vents.

F-2c (13) Subpart BB - Air Emission Standards for Equipment Leaks

The Facility is a closed facility, and there is no air emissions equipment.

F-2c (14) Subpart CC - Air Emission Standards for Tanks, Surface Impoundments, and Containers

The Facility is a closed facility, and there are no attributes as covered under the Subpart CC checklist.

F-2d Remedial Action

Only a "handful" of individuals have access to the Facility. During their visits for groundwater monitoring events and other sampling events, and during quarterly inspections, problems are rarely found. Additionally, any problems that have been identified tend to be minor: for example, a damaged or fallen fence or a missing lock on a groundwater monitoring well. Repairs/actions are coordinated promptly depending on the issue identified.

F-2e Inspection Log

A sample of a blank checklist for quarterly owner/operator inspections is included as Appendix F-1. Quarterly inspections are typically performed by Mr. Tony Shaw.

Annual inspections are also completed by NCDEQ. The last inspection was completed by Mr. Ernest Lawrence, dated July 27, 2016. There were no reported findings. The previous inspection was conducted by Mr. Mark Burnette, dated Sept. 8, 2015. The only finding was a small access hole cut in the fence, which was promptly repaired. Quarterly inspection documentation is audited by NCDEQ personnel as part of the annual inspection.

F-3 Waiver of Preparedness and Prevention Requirements

A waiver is not requested.

F-3a Equipment Requirements

Wastes are no longer handled at the Facility.

F-3a (1) Internal Communications

Internal personnel are no longer located at the Facility.

F-3a (2) External Communications

No external communication requirements are needed except for those having access to the Facility to inspect or provide maintenance carry mobile phones.

F-3a (3) Emergency Equipment

The Facility is a closed facility, and there is no fire risk requiring this type of emergency equipment.

F-3a (4) Water for Fire Control

The Facility is a closed facility, and there is no water for fire control on site.

F-3b Aisle Space Requirements

The Facility is a closed facility, and there are no buildings, therefore no aisles.

F-4 Preventive Procedures, Structures, and Equipment

The Facility is a closed facility, and there are no structures or equipment.

F-4a Loading and Unloading Operations

The Facility is a closed facility, and there are no loading/unloading operations.

F-4b Run-Off

The Facility is a closed facility, and there are no hazardous waste handling areas.

F-4c Water Supplies

The Facility is a closed facility, and there are no water supplies.

F-4d Equipment and Power Failure

The Facility is a closed facility, and there is no equipment, therefore no risk from power outage.

F-4e Personal Protection Equipment

The Facility is a closed facility, and there is no hazardous waste handling requiring PPE.

F-4f Ventilation Equipment

The Facility is a closed facility, and there is no ventilation equipment.

F-5 Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes

The Facility is a closed facility, and there is no ignitable, reactive, or incompatible waste generated at the Facility.

F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes

The Facility is a closed facility, and there is no ignitable, reactive, or incompatible waste generated at the Facility.

F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

The Facility is a closed facility, and there is no ignitable, reactive, or mixing of incompatible wastes at the Facility.

F-5c Management of Ignitable or Reactive Wastes in Containers

The Facility is a closure facility, and there are no ignitable or reactive wastes in containers to manage.

F-5d Management of Incompatible Wastes in Containers

The Facility is a closed facility, and there is no incompatible waste in containers to manage.

F-5e Management of Ignitable or Reactive Wastes in Tanks

The Facility is a closed facility, and there is no ignitable or reactive waste in tanks to manage.

F-5f Incompatible Wastes in Tanks

The Facility is a closed facility, and there is no incompatible waste in tanks.

F-5g Ignitable or Reactive Wastes in Waste Piles

The Facility is a closed facility, and there is no ignitable or reactive waste in waste piles.

F-5h Incompatible Wastes in Waste Piles

The Facility is a closed facility, and there is no incompatible waste in waste piles.

F-5i Ignitable or Reactive Wastes in Surface Impoundments

The Facility is a closed facility, and there are no ignitable or reactive wastes in surface impoundments.

F-5j Incompatible Wastes in Surface Impoundments

The Facility is a closed facility, and there is no incompatible waste in surface impoundments.

F-5k Ignitable or Reactive Wastes in Landfills

The Facility is a closed facility, and there is no ignitable or reactive waste in landfills.

F-5l Incompatible Wastes in Landfills

The Facility is a closed facility, and there is no incompatible waste in landfills.

F-5m Ignitable or Reactive Wastes in Land Treatment

The Facility is a closed facility, and there is no land treatment.

F-5n Incompatible Wastes in Land Treatment

The Facility is a closed facility, and there is no land treatment.

Part F Appendix

Appendix F-1
Quarterly Inspection Logs

Appendix A
Quarterly Inspection Log
Porcelanite Tile Plant

Lexington, North Carolina
Davidson County

Settling Ponds

	1^{s} Quarter	2^{nd} Quarter	3^{rd} Quarter	4^{th} Quarter
Asphalt roadway cover				
Run-on/Run-off Control System				
Subsidence				
Security Fence				
Monitoring wells				

Tile Pile

	1^{st} Quarter	2^{nd} Quarter	3^{rd} Quarter	4^{th} Quarter
Erosion Damage				
Vegetative/Stone/or asphalt Cover				
Run-on/Run-off Control System				
Subsidence				
Monitoring wells				
Security Fence				

	1^{st} Quarter	2^{nd} Quarter	3^{rd} Quarter	4^{th} Quarter
Date of inspections:				
Inspected By:				

Part I
Closure Plans, Post-Closure Plans, and Financial Requirements

Part I- Closure Plans, Post-Closure Plans, and Financial Requirements

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Appendices

I-1 Closure Plans and Closure Certification for Settling Ponds and Ceramic Tile Pile

I-2 Post-Closure Care Plans (SWMU-2 *Post Closure Care Plan for Settling Ponds- Revision #6, February 14, 2005* and SWMU-3- *Post-Closure Care Plan- Revision #5, Ceramic Chip Tile Pile, February 14, 2005)*

I-3 Hazardous Waste Facility Certification of Liability Insurance Policy

I-4 Indian Harbor Policy Endorsement (#31)

Acronym List

AOC	Area of Concern
HWMU	Hazardous Waste Management Unit
HWS	Hazardous Waste Section
Mannington	Mannington Ceramic Tile
NC	North Carolina
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality (formerly NCDENR, and renamed effective September 18, 2015).
NCGS	North Carolina Groundwater Standards
Porcelanite	Porcelanite, Inc.
SWMU	Solid Waste Management Units
Waters Edge	Waters Edge Environmental, LLC

Part I – Closure Plans, Post-Closure Plans, and Financial Requirements

I-1 Closure Plans, Post-Closure Plans, and Financial Requirements

This part of the application presents closure and post-closure plans, the post closure cost estimate, and financial assurance. The only HWMUs at the Facility are the Former Settling Ponds (SWMU-2) and the Former Ceramic Tile Pile (SWMU-3) which were closed in accordance with NCDEQ accepted closure plans and certified by NCDEQ on February 1, 2006 for SWMU-2 and March 14, 2005 for SWMU-3. This information is contained in Appendix I-1 which includes:

- Closure Performance Standard (Part I-1a)
- Partial closure and Final Closure Activities (Part I-1b)
- Maximum Waste Inventory (Part I-1c)
- Schedule for Closure (Part I-1d but not applicable since both HWMUs are closed)
- Closure Procedures (Part I-1e)

There was also an additional 2005 RFA conducted by Booz Allen which identified 11 additional SWMUs and three (3) Areas of Concern, four of which were recommended for further assessment (SWMU-1, SWMU-7, AOC-1, and AOC-2) while the remainder were recommended by Booz Allen for a NFA designation. Further description of these SWMUs and AOCs including any additional data gaps requiring additional assessment is discussed in Part L.

I-2 Post-Closure Plans

Post-Closure Care Plans for both units (SWMU-2- Post Closure Care Plan for Settling Ponds-Revision #6, February 14, 2005 and SWMU-3- Post-Closure Care Plan- Revision #5, Ceramic Chip Tile Pile, February 14, 2005) are included in Appendix I-2.

I-2a Inspection Plan

Both the Closed Settling Ponds and Closed Tile Pile are inspected quarterly according to the accepted Post-Closure Care Plan with an Inspection Log contained in Appendix F-1.

I-2b Monitoring Plan

The groundwater monitoring plan is specified in the most recently approved SAP which is contained in Appendix E-3. Leachate collection and removal is not applicable.

I-2c Maintenance Plan

I-2c (1) Repair of Security Control Devices

Security devices, such as fences, gates, signs, etc., will be maintained properly, and if warranted, repaired on a timely basis.

I-2c (2) Erosion Damage Repair

Repair will be made to the asphalt parking surface for SWMU-2 if there is any significant degradation of the surface which would allow for precipitation to infiltrate the cap. This would include resurfacing the asphalt when required. Repairs shall be made to the cover from any erosion damage and prevention of additional erosion for both SWMU-2 and SWMU-3. Additional topsoil, reseeding, etc. will be used for repairing for SWMU-3.

I-2c (3) Correction of Settlement, Subsidence, and Displacement

Addition of topsoil, sand, reseeding, etc. shall occur if settlement, subsidence, or displacement is evident to prevent further damage.

I-2c (4) Mowing, Fertilization, and Vegetative Cover Maintenance

The vegetation cover (Kentucky 31 Fescue) will be mowed to keep below a maximum 12-inch height. No additional watering other than rainfall will be necessary for maintenance, unless during extreme drought conditions for prevention of vegetation loss. An application of fertilizer may be warranted from time to time for proper vegetation root growth.

I-2c (5) Repair of Run-on and Runoff Control Structures

The SWMU-2 asphalt cover and SWMU-3 vegetative cap will be kept clear of any miscellaneous storage items and maintained to allow for proper run-on and run-off control. If warranted, repairs will be made in a prompt manner.

I-2c (6) Groundwater Monitoring Well Replacement

If a ground-water monitoring well becomes ineffective for monitoring, due to collapse of the well casing or some other means, it will be abandoned and filled with a grout/bentonite mixture. A replacement monitoring well will be installed in close proximity. Procedures for monitoring well installation are presented in Part E- Section E-1e (1).

I-2d Land Treatment

Not applicable

I-2e Post-Closure Care for Miscellaneous Units

This is specified in the Post-Closure Care Plans (see Appendix I-2).

I-2f Post-Closure Security

There is no exposure to hazardous waste so this is not applicable.

I-2g Post-Closure Contact

This is specified in our Part A Permit Application (Mr. David Kitts- VP Environment).

I-3 Notices Required for Disposal Facilities

This was complied with during the closure of both SWMU-2 and SWMU-3 and is currently not applicable since this is a closed facility.

I-4 Closure Cost Estimate

This was complied with during the closure of both SWMU-2 and SWMU-3 and is currently not applicable since this is a closed facility.

I-5 Financial Assurance Mechanism for Closure

This was complied with during the closure of both SWMU-2 and SWMU-3 and is currently not applicable since this is a closed facility.

I-6 Post-Closure Cost Estimate

Waters Edge Environmental, LLC routinely provides anticipated future post-closure care cost estimates. Details based on expected annual costs are:

- Quarterly inspections:
    1. Labor- (5 hrs @ $75/hour)= $375
    2. Mileage- (165 mi @ $0.75/mile) = $123.75
    3. Subtotal (rounded)= $500/event

    Subtotal- $500 x 2 per year x 30 years = $30,000

- Semiannual Sampling Plus Quarterly Inspection (2/year):
    1. Field Labor- (12 hrs @ $75/hr)= $900
    2. Quarterly Inspection- (3 hrs @ $75/hour) = $225
    3. Mileage- (285 mi @ $0.75/mile) = $213.75

4. Laboratory- (6 wells + Equipment Blank + Field Blank for 7 Metals plus 10% Markup= $853.6
5. Report Preparation (8 hrs @ $100/hour)= $800
6. Subtotal (rounded)- $3,000/event

Subtotal- $3,000 x 2 per year x 30 years = $180,000

This would total $210,000 for thirty years.

I-7 Financial Assurance Mechanism for Post-Closure

I-7a Post-Closure Trust Fund

An Escrow account is held with U.S Bank N.A. ABA091000022 Account # is 173103781824. Contact person is Ms. Lisa Moorehead (Phone # of 704-335-4597). The escrow is adjusted annually using current inflation factors provided by Ms. Jenny Lopp, Financial Analyst, NCDEQ DWM, HWS.

I-7b Surety Bond

Not applicable- see I-7a & Escrow Account

I-7c Post Closure Letter of Credit

Not applicable- see I-7a & Escrow Account

I-7d Post-Closure Insurance

Not applicable- see I-7a & Escrow Account

I-7e Financial Test and Corporate Guarantee for Post-Closure

Not applicable- see I-7a & Escrow Account

I-7f Combinations

Not applicable- see I-7a & Escrow Account

I-8 Liability Requirements

I-8a Sudden Insurance

An insurance policy is held with Indian Harbor Insurance Company, part of XL Catlin (Policy #PEC000801603). The contact person is Kevin O'Grady, Underwriter (Telephone-610-968-

9500). Included in policy is RCRA Amendatory Endorsement via Indian Harbor Insurance. A certificate of evidence was sent to NCDEQ by Anthony Gentile, VP of Indian Harbor on February 12, 2017 which is documented in Appendix I-3.

A copy of both the Indian Harbor Policy Endorsement (#31) & also the North Carolina Hazardous Waste certificate is included in Appendix I-4.

I-8b NonSudden Insurance

Not applicable-See coverage description in I-8a.

I-8c Variance Procedures and Regional Administrator Adjustments

Not applicable- There are no currently applicable variances.

I-9 State Financial Mechanism

Not applicable- There are no unique state-required financial mechanisms that apply.

Part I Appendices

Appendix I-1 Closure Plans and Closure Certifications (SWMU-2 and SWMU-3)

NCD 986 181 451 15 'B C

Closure Plan and
Post-Closure Care Plan
Ceramic Chip Tile Pile
Porcelanite, Inc.
Lexington, North Carolina
February 11, 1997

Prepared For:

Mannington Mills, Inc.
Salem, New Jersey

Porcelanite, Inc.
Lexington, North Carolina

Prepared By:

Aquaterra, Inc.
Raleigh, North Carolina

aquaterra®
A GREAT LAKES CHEMICAL CORPORATION COMPANY
CORPORATE HEADQUARTERS:
POST OFFICE BOX 37579 • RALEIGH, NC • 27627-7579 • (919) 859-9987 • FAX (919) 859-9930

Closure Plan and
Post-Closure Care Plan
Ceramic Chip Tile Pile
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Prepared By:

Aquaterra, Inc.
Raleigh, North Carolina

Contents

Contents (cont.)

Chapter 1
Introduction

1.1 Ceramic Chip Tile Pile

The Porcelanite, Inc. (Porcelanite) facility is located at 20 Victor Street in Davidson County, Lexington, North Carolina as shown on the Vicinity Map (see Figure 1-1). The facility area consists of approximately 7.5 acres. The area is bounded on the north by the Charles Avenue right of way and the Lexington City Cemetery; on the east by Cotton Grove Road (North Carolina Highway 8); on the south by Victor Street (State Road 1261); and on the west by the Porcelanite parking area. The Winston-Salem southbound railway and undeveloped wooded property are located west of the manufacturing facility. Several residential homes are located on the south side of Victor Street (see Figure 1-2).

Material in the stockpile consists of glazed and unglazed, fired and unfired ceramic tile scraps, and some sludges from the two former lagoons along the northwestern side of the manufacturing building. The stockpile contains toxic concentrations of leachable lead as analyzed using the Toxicity Leaching Characteristic Procedure (TCLP). The area of the tile pile is approximately 4 acres.

Mannington Mills, Inc. (Mannington) sold the Mannington Ceramic Tile facility in 1994 to P&M Tile, Inc. P&M Tile, Inc. later renamed to Porcelanite, Inc. Porcelanite is now the owner of the facility, and Mannington has retained responsibility for the closure of the tile pile.

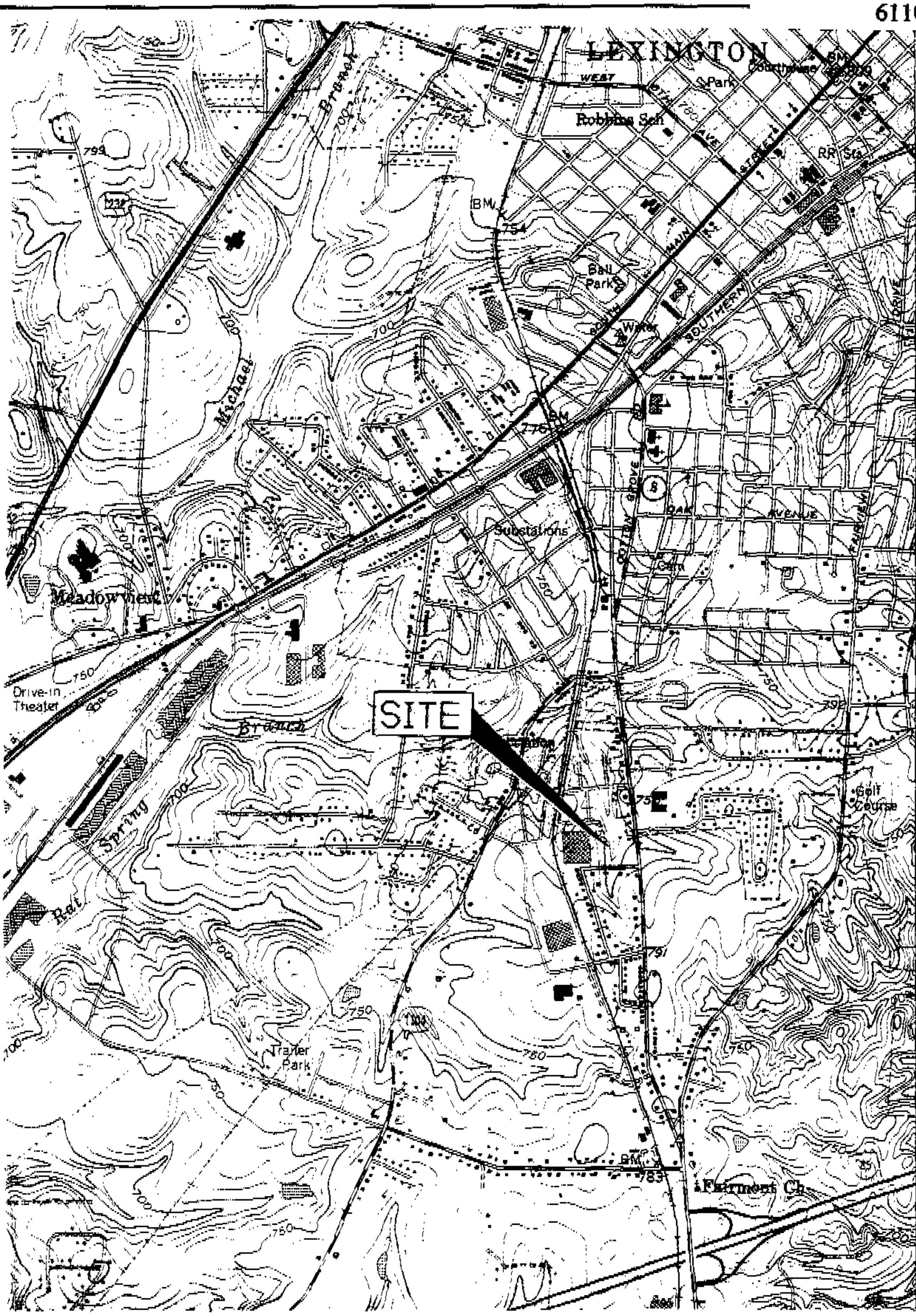
1.2 Regional and Local Hydrogeology

1.2.1 Site Topography

The elevation of the site varies from approximately 770 feet above mean sea level (MSL) to approximately 730 feet MSL at Walltown Drain. Walltown Drain, a creek which flows through the eastern portion of the site, was placed in a concrete culvert in 1992/1993.

1.2.2 Geology and Soils

The Lexington area of Davidson County is located in the southern part of the Charlotte Belt in the Piedmont Physiographic Province, which consists predominantly of igneous and meta-igneous rocks. The bedrock at the Porcelanite facility has been mapped as Precambrian to Paleozoic metamorphosed mafic rock, consisting of an intermediate intrusive and felsic intrusive complex. These units typically consist of metagabbros, metadiorites, and mafic plutonic-volcanic complexes.



Author	Drawing	Layers	Date	Title Vicinity Map
Job No. 3106801	Revision	Figure 1-1	Scale 1" = 2000'	Project Porcelanite, Inc. Lexington, North Carolina

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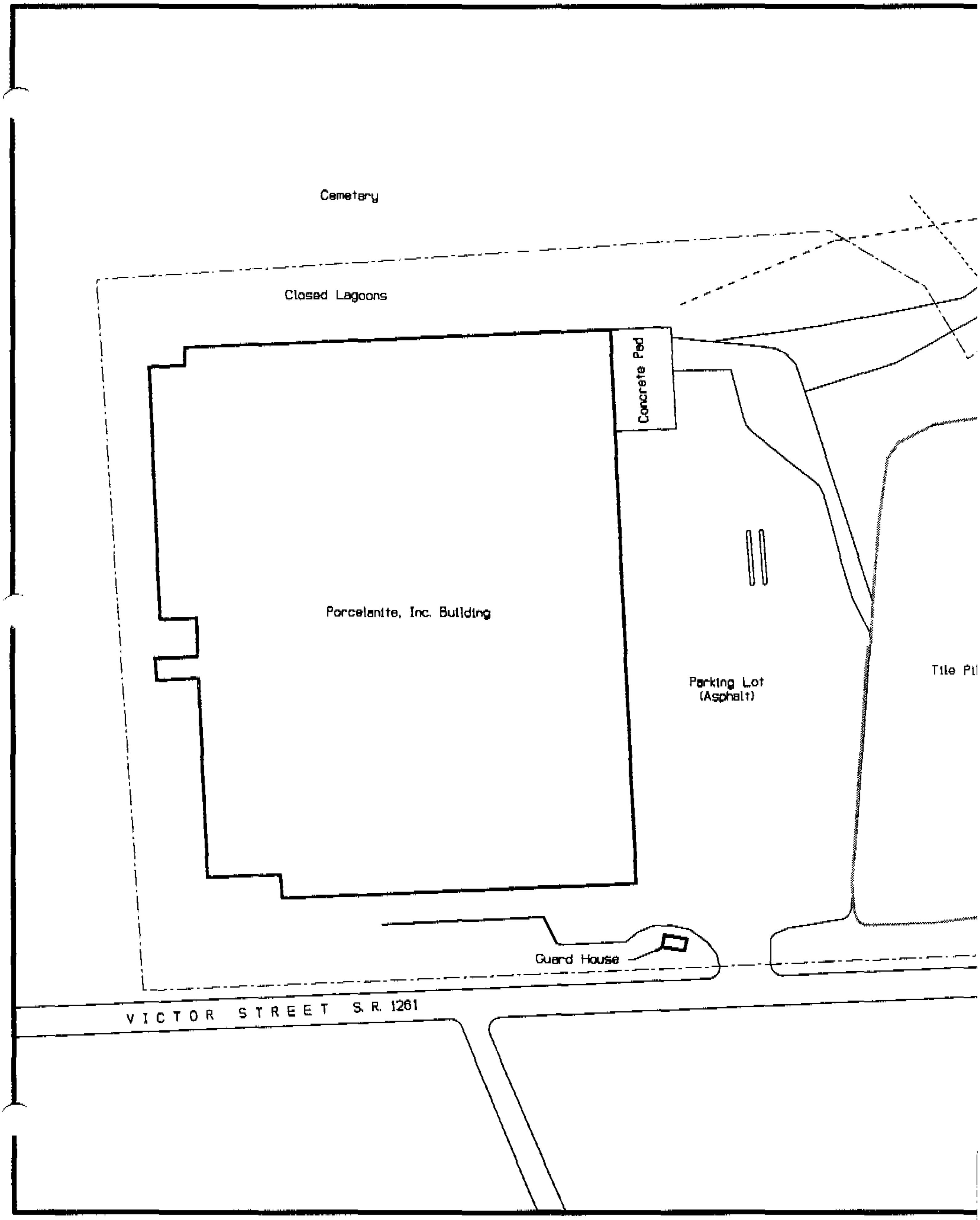
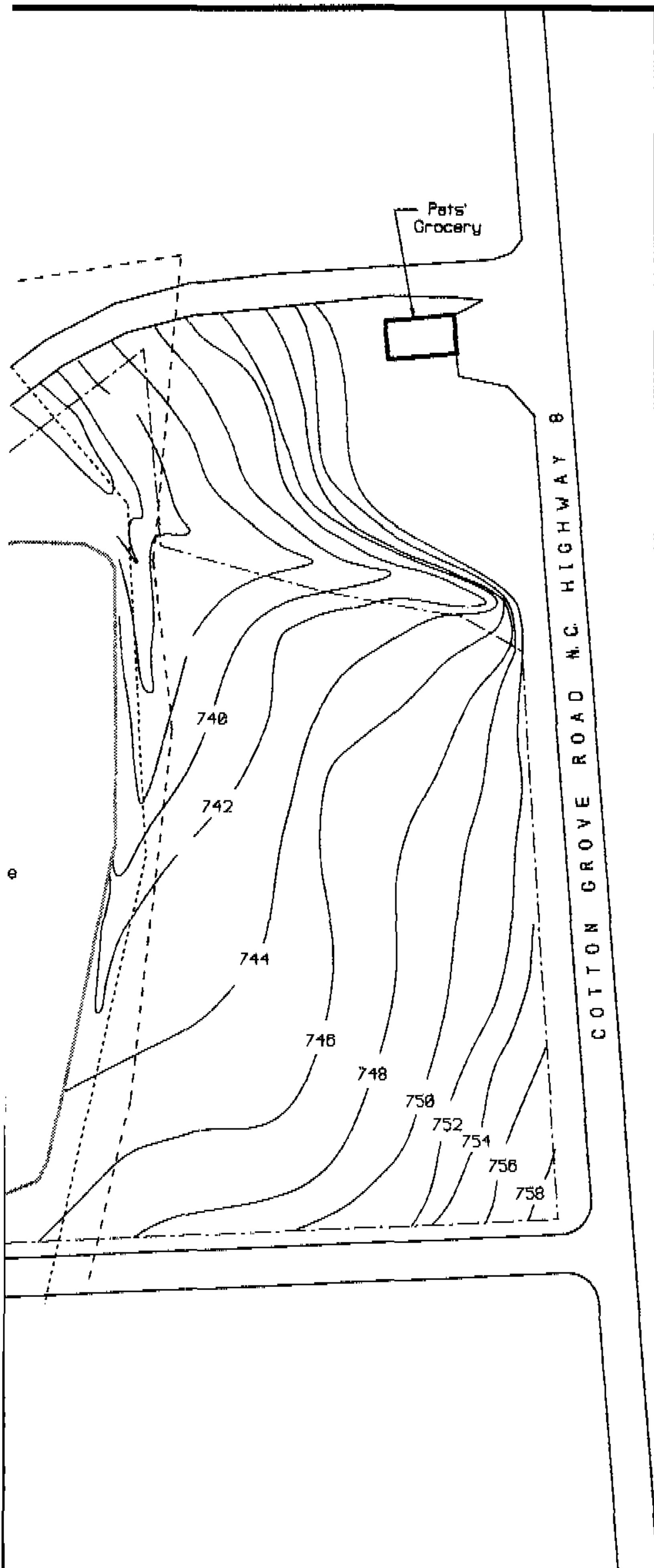

Cemetery
Closed Lagoons
Concrete Pad
Porcelanite, Inc. Building
Parking Lot
(Asphalt)
Tile Pi
Guard House
V I C T O R   S T R E E T   S. R. 1261

Tile Pile Closure
Ceramic Chip Tile Pile
Porcelanite, Inc.
611024.Dir



Legend

- - - 8" Sewer Line
------ Storm Drain
———— Tile Pile Boundary
~ Topo Line Location

Bar Scale
0 100 200

Title	Site Layout of Closed Tile Pile		
Project	Porcelanite, Inc. Lexington, North Carolina		
Author EVC	*Drawing* 31058-1	*Layers* 0,6,7,13	*Date* 1-14-97
Job No. 3105803	*Revision* 2-9-97	*Figure* 1-2	*Scale* 1" = 100'

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Thick saprolite sequences are common above bedrock in the Piedmont Physiographic Province. Saprolite grades from intensely weathered rock near the surface to slightly weathered rock with increasing depth. Soils typically have formed in the upper 5 to 6 feet of saprolite on uplands and slopes. Soils along stream floodplains have formed in alluvial material and are typically less developed.

According to the Davidson County Soil Survey Map (ENSCI, 1993), soils at the site have been mapped as the Chewacla series in the drainage at the east end of the facility, Vance series on the slopes above the drainage, and an Urban unit at the Porcelanite plant.

1.2.3 Hydrogeology

Previous site investigations at the Porcelanite facility have recognized two aquifer units. The uppermost unit is comprised of the residual soil (saprolite) as described above. The lower unit of the aquifer consists of slightly weathered bedrock and fractured bedrock.

The residual soil unit contains the vadose zone and the water table aquifer. Ground water saturated soils occur in this unit from a depth of about 5.5 to 24 feet below land surface and extend to the top of the partially weathered rock unit at a subsurface depth of between 27 and 50 feet. From previous investigations, ground water in the water table aquifer at the site was found to be flowing from the southwest toward the northeast under an average hydraulic gradient of about 0.028 foot/foot. The gradient generally steepens on the northeastern side of the property as ground water approaches the tributary stream known as Walltown Drain.

1.2.4 Surface Water and Wetlands

Runoff from the facility area discharges to Walltown Drain. Walltown Drain runs north approximately 0.5 miles to Rat Springs Branch, which flows to the southwest approximately 2 miles to Swearing Creek, a tributary of the Yadkin River. As indicated by Mr. Abner Brady of the Winston-Salem Regional Water Quality Office, Rat Springs Branch has a "C" surface water classification, based on classifications established by the North Carolina Environmental Management Commission (ENSCI, 1993).

Walltown Drain, located at the toe of the tile pile, was piped in 1992/1993. The construction was performed under a Nationwide 26 permit. In his letter dated July 23, 1992 (Appendix C of the ENSCI 1993 *Closure Plan for Scrap Tile Pile*), Mr. Wayne Wright, Regulatory Branch Chief, underground storage tanks United States Army Corps of Engineers indicated that a site visit was conducted by Mr. John Thomas on May 18, 1992. The purpose of the site visit was to review plans to construct a culvert, fill a section of Walltown Drain, and to inspect the site for wetlands subject to Department of the Army permitting authority.

Authorization was provided by the Army Corps of Engineers to proceed with piping the creek under a Nationwide 26 permit. The authorization was based on the determination that less than one acre of waters of the United States, located above the headwaters of Rat Springs Branch, would be impacted by the construction. (The impacted area is 0.11 acres.) No wetlands are present at this site.

1.3 Historical and Archaeological Sites/Critical Habitats/Recreational Areas

1.3.1 Historical and Archaeological Sites

The North Carolina Department of Cultural Resources, Division of Archives and History indicated in a letter dated July 29, 1993, (see Appendix O of the ENSCI 1993 *Closure Plan for Scrap Tile Pile*), that it had conducted a review of the project and concluded that there are no known properties of architectural, historic, or archaeological significance which would be affected by the proposed beneficial fill project. The search was conducted pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

1.3.2 Critical Habitat of Endangered or Threatened Species

According to Mr. Marshall Ellis, Resource Management Specialist for the North Carolina Division of Parks and Recreation, the Division of Parks and Recreation's Natural Heritage Program has no records of any rare or threatened species or critical habitats in the area downslope of the chip pile (see ENSCI 1993, Appendix O).

1.3.3 Recreational Areas

According to Mr. Marshall Ellis, Resource Management Specialist for the Division of Parks and Recreation, the proposed embankment for the closure of the chip pile will not adversely affect any state parks, state trails, registered natural heritage areas, or state recreational areas (see ENSCI 1993, Appendix O). Ms. Kathy Shoaf of the Lexington City Department of Parks and Recreation indicated that the closest recreational area was Washington Park and Pool located at Linwood Road and Booker Street (see ENSCI 1993, Appendix O). ENSCI identified a golf course approximately 3,200 feet east of the facility (ENSCI, 1993).

1.4 Closure Plan Development

Porcelanite and Mannington have contracted Aquaterra, Inc. (Aquaterra) to develop and implement the 1997 closure plan and post-closure care plan. The requirements of 40 CFR 265, Subpart L-Waste Piles and the general requirements of Subpart G-Closure and Post-Closure were used as requirements for closure and post-closure care.

The closure plan for the ceramic chip tile pile is presented in Chapter 3.0. The closure will be a "dirty" closure requiring post-closure care. The post-closure care plan is presented in Chapter 4.0.

1.5 Health and Safety Plan

Prior to any work at the site, a health and safety plan (HASP) will be developed for the tile pile as required under 29 CFR Part 1910. The HASP will address safety and standard operating procedures, anticipated hazards, exposure limits, levels of dermal and respiratory protection, emergency medical care of personnel, contingency plan for sudden releases of hazardous materials, emergency procedures, and ambient air monitoring.

All Aquaterra personnel and subcontractors having direct contact with the tile pile materials will be under an approved medical monitoring program including baseline and annual physicals. All personnel will have 32 to 40 hours of hazardous waste, health and safety training including negative pressure respirators and positive pressure breathing equipment. All personnel will be "fit tested" for respirators and be clean shaven and groomed in order to provide a good seal between face and respirator or breathing apparatus.

1.6 Maintenance of Plans

Porcelanite will maintain an on-site copy of the approved closure plan and post-closure care plan and all revisions. The closure plan will be maintained until the certificate of closure has been submitted and accepted by the North Carolina Department of Environment, Health, and Natural Resources, Division of Waste Management, Hazardous Waste Section (HWS). One copy of the plans and all revisions will be kept in the Environmental Health/Safety Engineer's office. The current EHS engineer's name and address is:

Mr. Tony Shaw
Porcelanite, Inc.
Post Office Box 1777
Lexington, North Carolina 27293-1777

Phone#	(910) 242-5636
Fax#	(910) 242-5601

Chapter 2
Waste Characterization

2.1 *Previous Investigations*

The chemical characteristics of the existing ceramic tile pile material have been developed from several previous investigations. These investigations include:

- A soil assessment conducted by Aquaterra in November and December of 1989. *Soil Boring Assessment, Mannington Ceramic Tile, Lexington, North Carolina,* Aquaterra report number R835-90, dated January 31, 1990.

- A tile pile material assessment conducted by Aquaterra in October 1991. *Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina,* Aquaterra report number R1547-92, dated January 7, 1992.

- An additional tile pile material assessment conducted by Aquaterra in March 1992. *Additional Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina.* Aquaterra report number R1646-92, dated April 1, 1992.

- Additional tile pile testing and treatability study conducted by ENSCI during September 1992. *Comprehensive Tile Pile Testing Program and Treatability Study, Mannington Ceramic Tile, Lexington, North Carolina,* ENSCI report dated October 20, 1992.

- A December 1996 soil assessment and tile pile material investigation by Aquaterra.

Figures showing the approximate location of all the previous sample locations are contained in Appendix A.

2.2 *Results of the Waste Characterization Investigations*

2.2.1 1989 Soil/Tile Material Assessment

The 1989 soil assessment consisted of 14 soil test borings in background native soils (B-1, B-2, and B-3), fill material (B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-13, and B-14), and tile material (B-5, B-8, and B-10). A photocopy of the data tables and a figure showing location of borings are contained in Appendix A. The samples were analyzed for the eight RCRA metals. The only sample to have detectable total metals was the tile material sample from B-8 which contained 0.2 mg/kg of cadmium and 74 mg/kg of lead.

2.2.2 October 1992 Tile Pile Material Assessment

The October 1991 tile pile assessment consisted of excavating four test pits approximately 16 to 18 feet deep. Samples were collected every 2 feet and composited into one composite sample per test pit (TP-1, TP-2, TP-3, and TP-4). The samples were analyzed for the following total metals:

aluminum	iron	sodium
antimony	lead	tin
barium	magnesium	titanium
boron	nickel	vanadium
calcium	potassium	zinc
chromium	praseodymium	zirconium
cobalt	silver	

The samples were also analyzed for the following additional inorganic parameters:

alkalinity	fluoride	pH units
bromide	phosphates	
chloride	sulfates	

Finally, the samples were analyzed for the TCLP metals and the following radionuclides:

gross alpha	radium 226	radium 228
gross beta		

The photocopies of the analytical results and figures showing the sample locations are shown in Appendix A. Only lead exceeded the regulatory levels for the TCLP extract. Lead ranged from 47 mg/L to 130 mg/L in the TCLP extract.

The radionuclide results in picocuries per gram (pCi/g) were

	TP-1	TP-2	TP-3	TP-4
Gross Alpha	16 ± 6.0	22 ± 7.0	21 ± 7.0	21 ± 7.0
Gross Beta	34 ± 3.0	30 ± 3.0	35 ± 3.0	39 ± 3.0
Radium 226	1.5 ± 0.2	1.4 ± 0.1	1.8 ± 0.2	1.9 ± 0.2
Radium 228	1.2 ± 0.2	1.2 ± 0.1	1.3 ± 0.2	1.3 ± 0.2

2.2.3 March 1992 Tile Pile Material Assessment

The March 1992 tile pile material assessment consisted of four soil borings (B-1, B-2, B-3, and B-4) to depths of approximately 22 to 24.5 feet. The samples were analyzed for SW-846 Method 8240 volatile organic compounds (VOCs), Method 8270 semivolatile organic compounds (SVOCs), and formaldehyde. Photocopies of the analytical data table and figure showing boring locations are contained in Appendix A.

The only VOC detected was ethylene chloride ranging from 820 µg/kg to 860 µg/kg. The only SVOC detected was bis(2-ethylhexyl) phthalate ranging from 1,900 µg/kg to 5,300 μg/kg. No formaldehyde was detected. It was suspected that the ethylene chloride was a laboratory artifact and that the bis(2-ethylhexyl) phthalate probably came from the vinyl gloves worn by the samplers and the analytical personnel.

2.2.4 *September 1992 Tile Pile Material Assessment*

The September 1992 tile pile material assessment consisted of four test pits (EX-1, EX-2, EX-3, and EX-4) placed as close as possible to the four test pits (TP-1, TP-2, TP-3, and TP-4) discussed in Section 2.2.2 *October 1991 Tile Pile Material Assessment*. The four test pits were excavated to 21 feet. Samples were collected in EX-1 at 18 feet, EX-2 at 20 feet, EX-3 at 16 feet, and EX-4 at 21 feet. The samples were analyzed for VOCs (Method 8240), SVOCs (Method 8270), formaldehyde by colormetric analysis, and the radionuclides gross alpha, gross beta, radium 226, radium 228, and uranium 238. Summary data tables and a figure showing test pit locations are contained in Appendix A.

No VOCs, SVOCs, or formaldehyde were detected in the samples.

The radionuclide results in pCi/g were:

	EX-1	EX-2	EX-3	EX-4
Gross Alpha	7.78 ± 3.90	11.17 ± 5.13	3.92 ± 2.55	2.77 ± 3.10
Gross Beta	5.47 ± 2.49	10.42 ± 3.17	10.04 ± 3.11	9.01 ± 2.89
Radium 226	1.222 ± 0.175	1.778 ± 0.174	1.565 ± 0.163	1.624 ± 0.134
Radium 228	1.303 ± 0.325	1.322 ± 0.268	1.280 ± 0.272	1.258 ± 0.223
Uranium 238	1.390 ± 0.537	1.390 ± 0.464	1.388 ± 0.488	1.097 ± 0.366

As reported by ENSCI (1992), the three naturally occurring radioisotopes (radium 226, radium 228, and uranium 238) were detected at levels near the levels commonly observed in native soils. Mr. Jim Watson of the University of North Carolina School of Public Health, reported to ENSCI (1992) that these naturally occurring radioisotopes occur in North Carolina soils in ranges of 1 to 3 pCi/g.

ENSCI (1992), as requested by the HWS, converted the concentrations of the radium 226, radium 228, and uranium 238 to units of millirems per year using the following formulas and assumptions.

"Beta particle energy (MeV/disintegration) x 0.037 (disintegrations/second/pCi) x isotope concentration (pCi/g) x 1.602 x 10^{-6} (ergs/MeV) x 1 rem (0.01 g/erg) = rem/sec beta radiation absorbed from the concentration of the isotope in 1 gram of the tile material by 1 gram of human tissue.

This conversion is true given the following assumptions:

1. The deposition rate is equal to the production rate, i.e., all beta particles are absorbed.
2. The beta particles are absorbed equally by all parts of the body.
3. The material is ingested so that the exposure rate is constant.
4. Absorbed dosage is cumulative."

Based on the above assumptions, the dosages in millirems per year that would be absorbed by a 180-pound man ingesting 1 gram/day of tile material for 1 year are:

Isotope	EX-1	EX-2	EX-3	EX-4
Uranium 238	0.001161	0.001162	0.001160	0.000917
Radium 226	0.000366	0.000534	0.000469	0.000487
Radium 228	0.001840	0.001868	0.001803	0.001778
Total	0.003367	0.003564	0.002967	0.002719

Based on this scenario, radiologic results indicate a total exposure of significantly less than 4 millirems per year, which is the EPA National Interim Primary Drinking Water Standard (ENSCI, 1992).

2.2.5 December 1996 Tile Pile Material Assessment

Four soil borings (SB-1, SB-2, SB-3, and SB-4) were installed on the tile pile from depths of 15 to 30 feet (see Figure 2-1). One sample from each boring was randomly chosen (SB-1-15′, SB-2-10′, SB-3-15′, and SB-4-5′) and then two samples from the four (SB-1-15′ and SB-4-5′) were submitted to the laboratory. The samples were analyzed for the total metals:

arsenic	chromium	mercury	silver
barium	cobalt	nickel	titanium
boron	lead	praseodymium	vanadium
cadmium	manganese	selenium	zinc

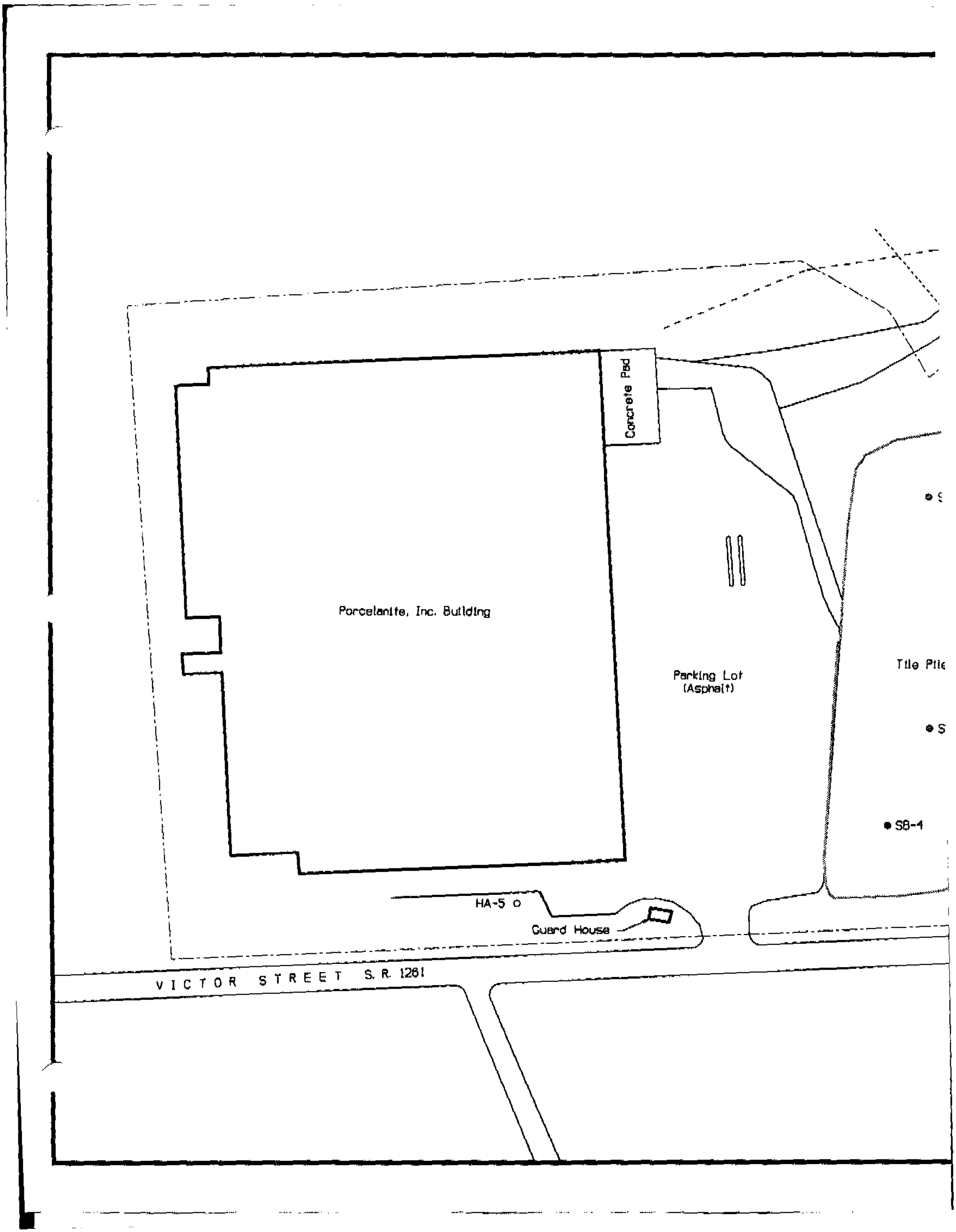
The inorganics bromide, nitrates, sulfates, phenols, and the radionuclides gross alpha and gross beta were also analyzed for each sample. One composite sample of the four random samples was analyzed for the TCLP metals.

The analytical results for SB-1-15′ and SB-4-5′ are summarized in Table 1 in Appendix B. The results show elevated levels of barium, boron, lead, and zinc above the background samples, HA-2, HA-3, HA-4, and HA-5 (see Table 2 in Apeendix B). The other metals and inorganic parameters were non-detect or at concentrations equal to or less than the background soil samples. The gross alpha and gross beta values were approximately the same as the background values for HA-4 and HA-5 (see Tables 1 and 2 in Appendix B). The TCLP results are summarized in Table 3 in Appendix B.

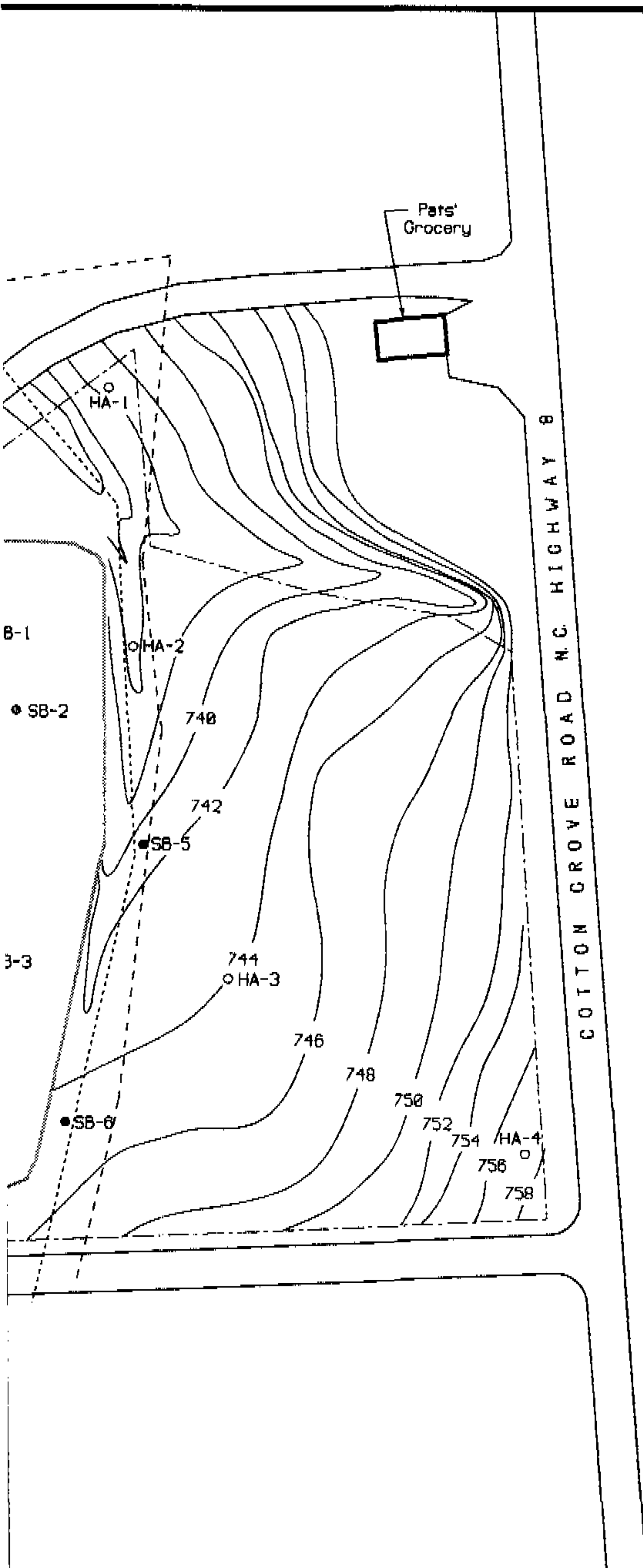
2.2.6 Conclusions from Tile Pile Material Assessments

As indicated by the TCLP results, the tile pile material is hazardous based on lead.

Based on the radionuclide data, the tile pile material does not appear to be hazardous. The values from the tile pile were approximately the same or less than the values for the background soil samples. In addition, the tile pile materials appear to contribute doses of radium 226, radium 228, and uranium 238 at concentrations significantly less than 4 millirems per year (average value of 0.003 millirems per year).


Concrete Pad
Porcelanite, Inc. Building
Parking Lot
(Asphalt)
Tile Pile
SB-4
HA-5
Guard House
VICTOR STREET S.R. 1261

Tile Pile Closure
Ceramic Chip Tile Pile
Porcelanite, Inc.
611024.Dir



Legend

- - -	8" Sewer Line
......	Storm Drain
——	Tile Pile Boundary
●	Soil Borings By Hollow Stem Auger Rig
○	Hand Auger Boring
~	Topo Line Location

Bar Scale

0 100 200

Title December 1996 Sample Locations			
Project Porcelanite, Inc. Lexington, North Carolina			
Author EVC	***Drawing*** 31058-1	***Layers*** 0,6,7,10	***Date*** 1-14-97
Job No. 3105803	***Revision*** 2-9-97	***Figure*** 2-1	***Scale*** 1" = 100'

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2.3 Soil Assessment Beneath/Downgradient of Tile Pile

2.3.1 September 1992 Tile Pile Soil Assessment

ENSCI (1992) installed four soil borings (SB-11, SB-12, SB-13, and SB-14) adjacent to the four test pits, EX-1 (SB-11), EX-2 (SB-12), EX-3 (SB-13), and EX-4 (SB-14). The borings were extended into native soil beneath the tile pile where a sample of the native soil was collected. The samples (SB-11 through SB-14) were analyzed for VOCs (Method 8240), SVOCs (Method 8270); and, in addition SB-13 and SB-14 were analyzed for the TCLP metals. Summary tables of analytical data and figure showing boring locations are contained in Appendix A.

Based on the TCLP analytical results, the native soils are not hazardous.

2.3.2 December 1996 Tile Pile Soil Assessment

Aquaterra personnel collected one upgradient native soil sample (HA-5) and seven native soil samples (SB-5-2.5′, SB-6-2.5′, HA-1, HA-2, HA-3, and HA-4) east of the tile pile on December 10-11, 1996. The sample locations are shown on Figure 2-1. The analytical results are summarized in Tables 1 and 2 located in Appendix B.

Soil borings SB-5-2.5′ and SB-6-2.5′ and hand auger boring HA-1 were placed parallel to the toe of the tile pile and adjacent to the now piped Walltown Drain. These samples were collected to evaluate if any metals had migrated from the tile pile into the downgradient native soils. Hand auger borings HA-2, HA-3, and HA-4 were placed east of the tile pile and topographically uphill from the toe of the tile pile. HA-5 was placed upgradient and west of the tile pile and approximately 250 feet east of MW-1. These soil samples represented undisturbed native background soil samples.

The concentrations for the four samples (HA-2, HA-3, HA-4, and HA-5) were compared as an average range of background values and then compared against samples SB-5-2.5′, SB-6-2.5′, and HA-1. HA-1 showed elevated levels of lead and zinc compared to the background samples. However, the concentrations were well below the levels of lead and zinc seen in the tile pile samples SB-1-16′ and SB-4-10′ (see Table 1 in Appendix B). It appears from these data that there has not been significant migration of constituents from the tile pile into the native soils.

Radionuclide samples were collected from SB-5-2.5′, HA-4, and HA-5 for developing a background value for gross alpha and gross beta. The background values for gross alpha and gross beta are higher than in sample SB-5-2.5′ (see Table 2 in Appendix B).

2.4 Ground Water Assessment Downgradient of Tile Pile

The ground water quality downgradient of the tile pile was reviewed based on historical data. The following Tetra Technologies Group, P.A. reports were evaluated:

> *1995 Annual Groundwater Assessment Update Report, Former Wastewater Holding Ponds and Waste Ceramic Tile Pile P & M Tile, Inc. Facility, Lexington, North Carolina,* dated March 14, 1996.

Second Quarter 1996 Groundwater Assessment Report, Porcelanite, Inc., Lexington, North Carolina, dated November 4, 1996.

Third Quarter 1996 Groundwater Assessment Report, Porcelanite, Inc., Lexington, North Carolina, dated November 4, 1996.

Based on the data presented in these reports, boron (MW-21, 22, and 23) and gross beta (MW-26A) were found in the downgradient monitoring wells to exceed North Carolina 2L standards and MW-1 background levels (for gross beta). Photocopies of these data tables and figures are contained in Appendix A.

Even though the tile pile is classified as hazardous based on lead, no ground water samples contained lead at values close to the 2L standards.

Porcelanite proposes to monitor the constituents in the tile pile that were elevated above background and that might potentially leach to the ground water. These constituents are boron and lead. Gross alpha and gross beta do not appear to have any more probability to show up in the ground water from the tile pile material than from the surrounding native soils. However, gross beta analysis will be conducted until sufficient data are available to verify if it is background or tile pile related.

Chapter 3
Closure Plan

3.1 Closure Plan Objectives

The following Closure Plan has been prepared for "dirty" closure conditions to comply with the closure requirements of Subpart G-Closure and Post-Closure (40 CFR 265.110 to 265.120) and, Subpart L-Waste Pile (40 CFR 265.250 to 265.258), Subpart N-Landfills (40 CFR 265.300 to 265.316) and to reflect the closure performance standards addressed in 40 CFR 265.111. Porcelanite will close the tile pile such that:

(a) There is minimal need for further maintenance;
(b) The closure protects human health and the environment and minimizes or eliminates the escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the atmosphere, ground water and surface water; and
(c) The Closure Plan complies with the closure requirements of this subpart (Subpart G-Closure and Post Closure) and Subpart L-Waste Pile and Subpart N-Landfills.

3.2 Maximum Inventory of Hazardous Waste

The total volume of tile pile waste was calculated by ENSCI (1993). The total volume of tile material calculated was approximately 107,000 cubic yards. Assuming a bulk unit weight (density) of 120.6 pounds per cubic foot, the weight of tile material was calculated at approximately 174,200 tons.

3.3 Closure of the Chip Pile

3.3.1 General Information and Objectives

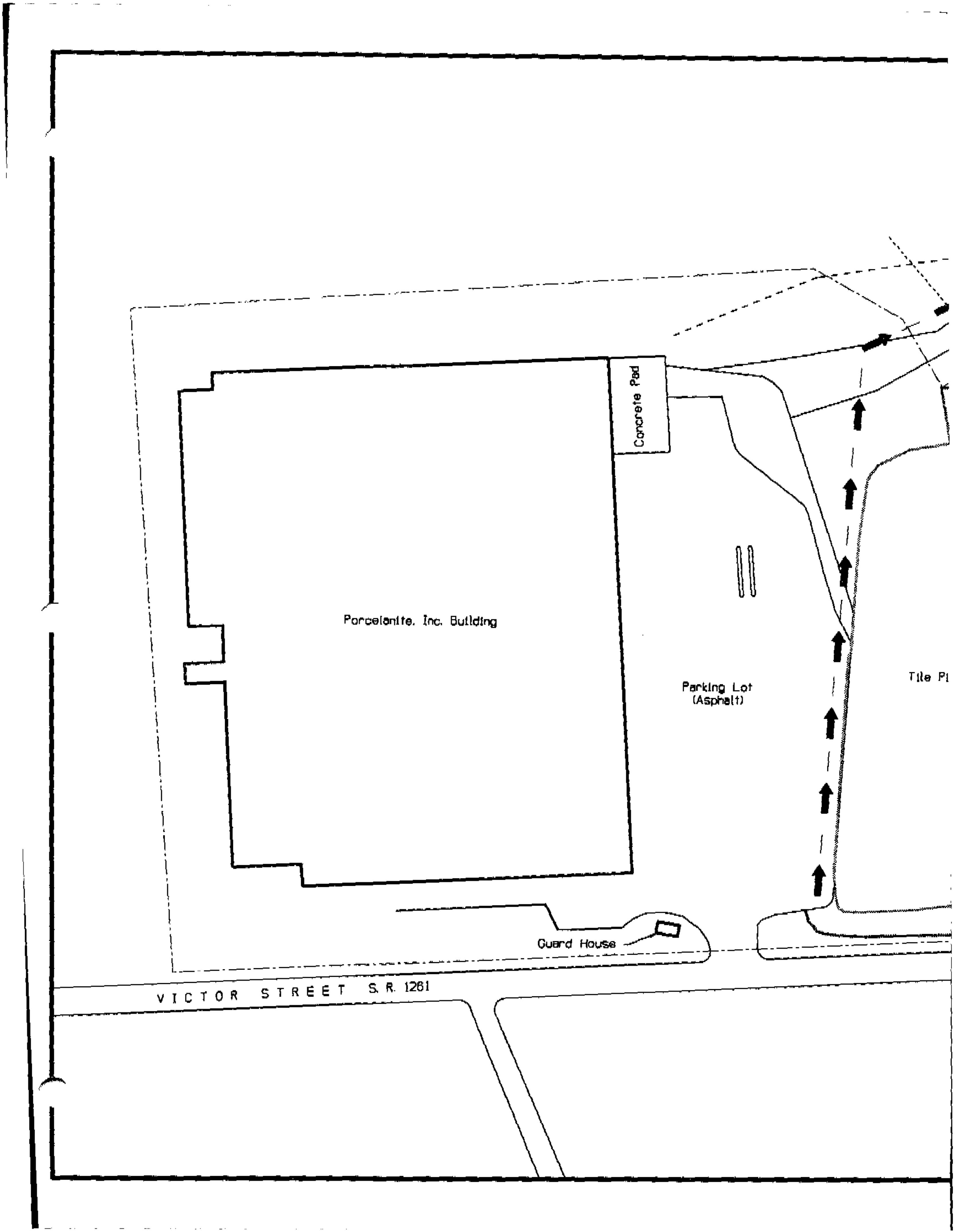
The chip pile cap system will consist of a flat top surface cap and a downgradient sloping cap. The upgradient portion of the chip pile is bordered (contained) by natural soils (saprolite). The cap system will be designed

- to have a hydraulic conductivity less than the chip pile material and equal to or less than the naturally occurring soils

- to require low maintenance even under future land use plans for the chip pile and cap.

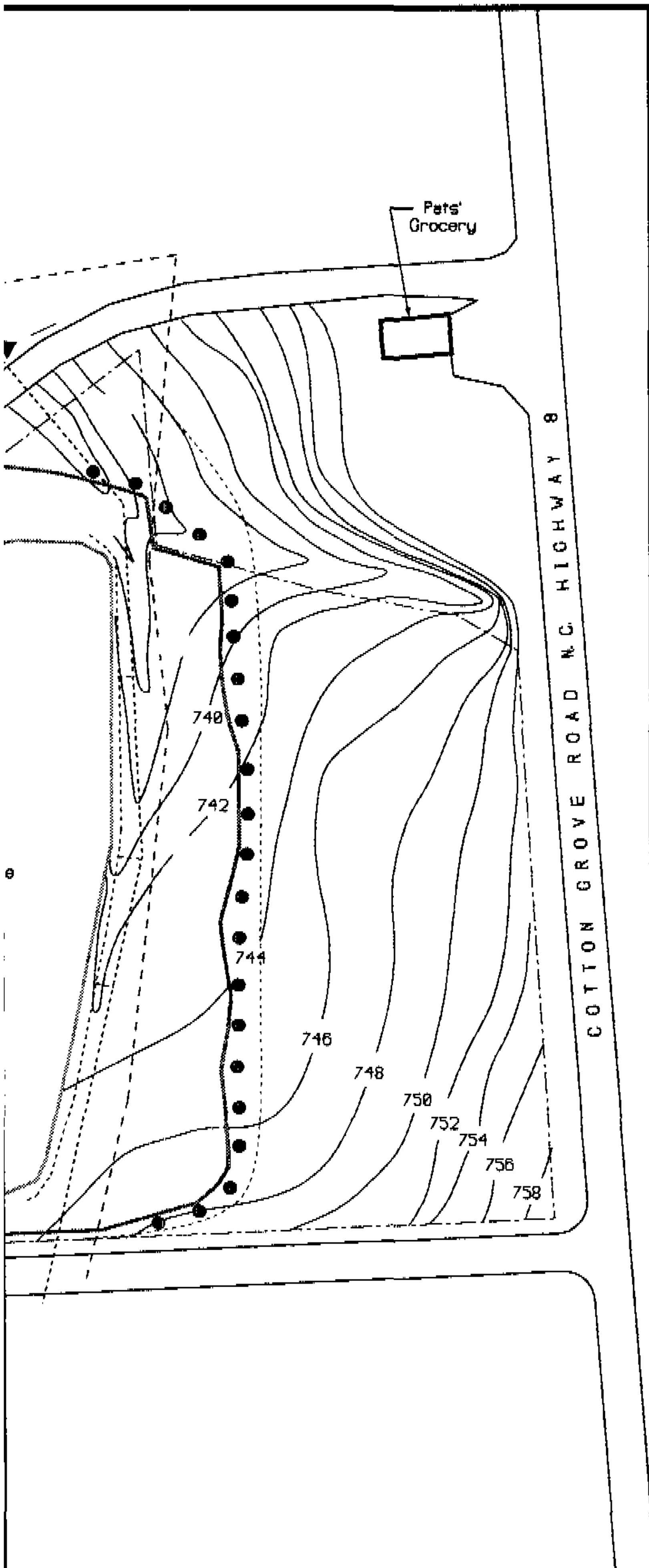
The flat surface of the cap will be used for employee parking and a truck turnaround. In the near future, a warehouse will be built on the flat surface of the cap. The slope of the cap will be used for a second drive way to the plant (see Figure 3-1).

The following sections describe the design details for the cap, geotechnical design testing of the site soils and borrow material (also includes analytical quality of



Concrete Pad
Porcelanite, Inc. Building
Parking Lot
(Asphalt)
Tile Pl
Guard House
VICTOR STREET S.R. 1261

Tile Pile Closure
Ceramic Chip Tile Pile
Porcelanite, Inc.
611024.Dir



Legend

- 8" Sewer Line
- Storm Drain
- Tile Pile Boundary
- Toe Embankment Drain
- Proposed Soil Embankment II
- Topo Line Location
- Proposed Relocated 8" Sewer Line
- Storm Water Runoff Division Ditch
- Storm Water Collection Drain From Parking Lots

Bar Scale
0 100 200

Title Plan View of Closed Tile Pile			
Project Porcelanite, Inc. Lexington, North Carolina			
Author EVC	*Drawing* 31058-1	*Layers* 0,6,7,11	*Date* 1-14-97
Job No. 3105803	*Revision* 2-9-97	*Figure* 3-1	*Scale* 1" = 100'

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borrow soils), the preparation of the chip pile, and the installation and quality control for the cap system.

3.3.2 Cap Design

The cap design consist of four parts (see Figure 3-2). These include:

- the flat top surface cap
- the slope surface cap
- storm water control
- ground water seepage control

3.3.2.1 Flat Top Surface Cap

The flat top surface cap will consist of 24-inches of compacted clayey silt to silty clay soils (see Figure 3-3). The upper tile pile surface will be graded and compacted to design grade to promote surface water drainage from the overlying cap.

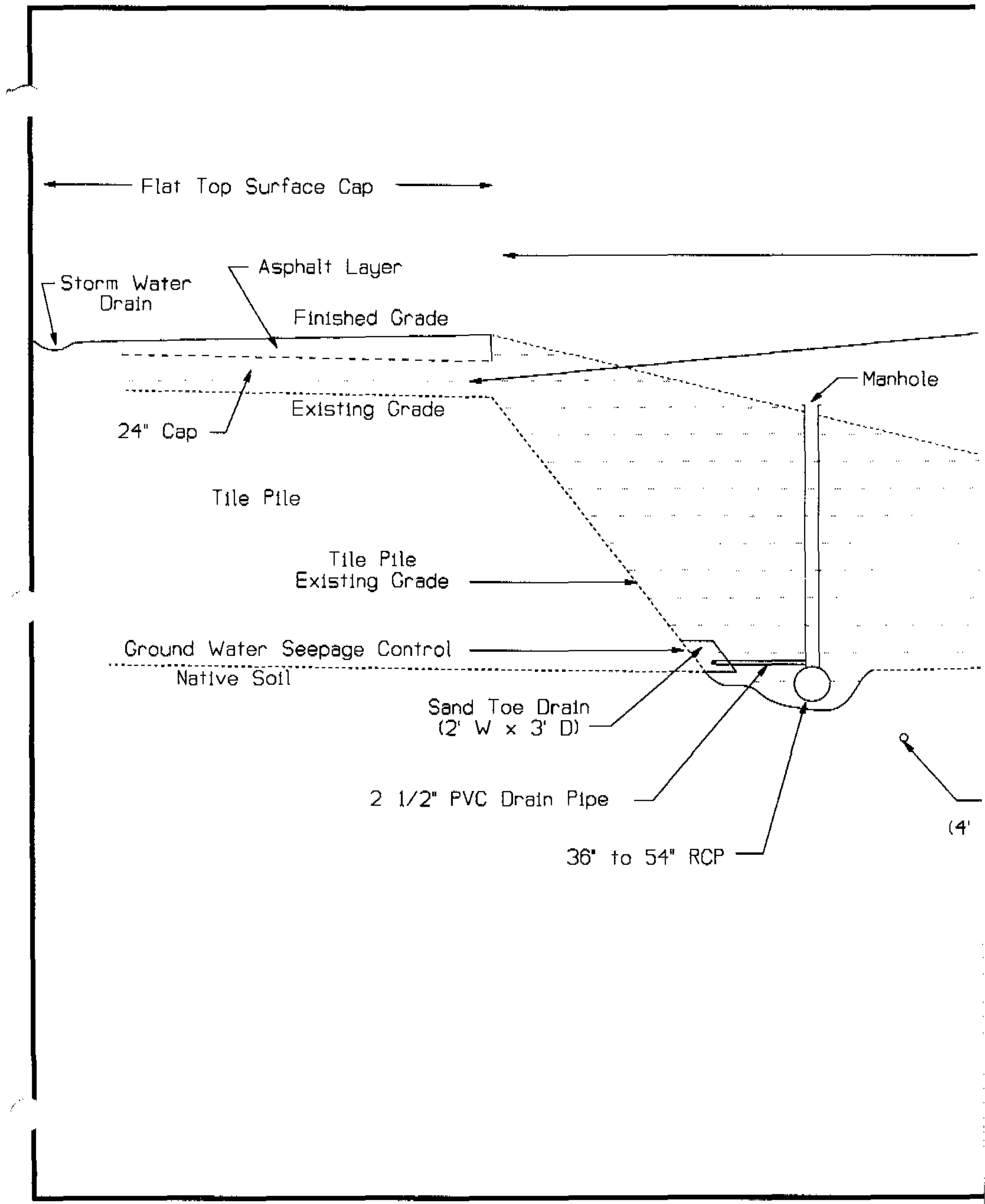
The 24-inches of compacted clayey silt material will be the same material proposed for the slope cap. The clayey silt will be compacted to airport runway densities (95 percent modified Proctor).

Overlying the 24-inches of compacted soil cap is a 12-inch asphalt cover to protect the cap from vehicles and to promote runoff. The asphalt cover will consist of three layers. The first layer will consist of a minimum of 6-inches of compacted base course (crush and run, North Carolina. Department of Transportation (NCDOT) *Standard Specification for Roads and Structures,* Section 520-*Aggregate Base Course*). The next layer consists of 4-inches of binder course. The third and top layer consists of 2-inches of compacted surface course. The base course will be wetted and compacted to 95 percent modified Proctor. The asphalt cover is suitable for Traffic Class IV (urban minor arterial and light industrial streets, rural major collectors and minor arterial highways) for an approximate range of heavy trucks of 700,000 to 1,500,000 during the design period (Asphalt Institue Traffic Classifications, Lindeburg, 1989).

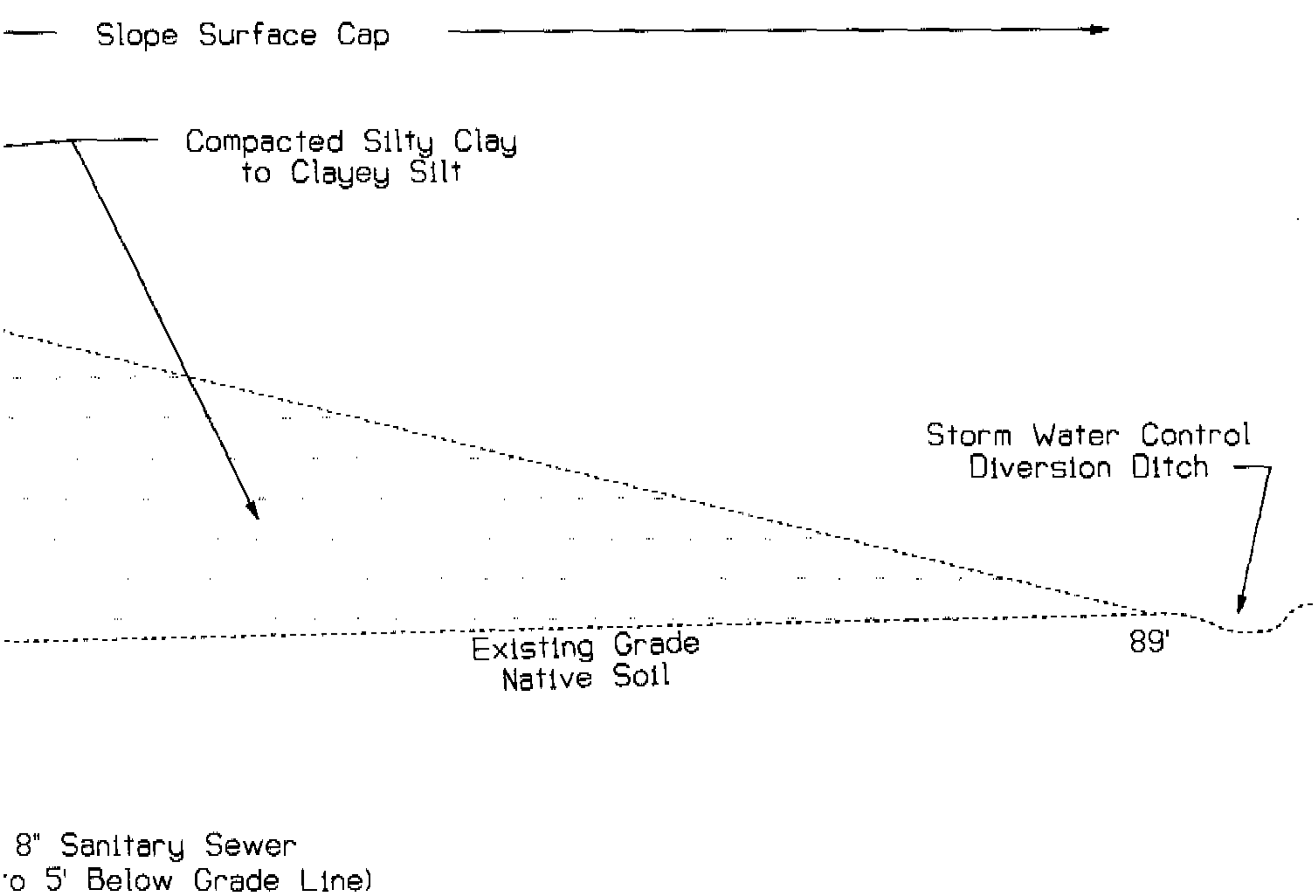
The compaction to 95 percent modified Proctor (ASTM D 1557 for the cap and asphalt base course will insure that the future warehouse and any vehicular traffic does not compromise the integrity of the cap. Where the utilities (power, gas, water, and sewer) run to the warehouse, the base course will be increased to a minimum thickness of 12-inches to allow the utilities to be installed without trenching into the cap.

The flat top surface cap and asphalt cover will be sloped to drain back to the intersection of the existing parking lot. The runoff will be collected in a drain running parallel to the existing parking lot. The runoff will then be directed north, eventually discharging into the Walltown Drain downgradient of the closed tile pile (see Figure 3-2). A curb will be installed along the eastern edge of the surface cap and asphalt cover to prevent any runoff from the asphalt surface running down the slope surface cap.

The flat top surface cap will merge into the slope surface cap to prevent seepage down along the contact of the tile pile slope and the slope surface cap.



Flat Top Surface Cap
Asphalt Layer
Storm Water Drain
Finished Grade
Manhole
Existing Grade
24" Cap
Tile Pile
Tile Pile Existing Grade
Ground Water Seepage Control
Native Soil
Sand Toe Drain (2' W x 3' D)
2 1/2" PVC Drain Pipe
36" to 54" RCP
(4'



Title Typical Cross-Section of Parts of Design			
Project Porcelanite, Inc. Lexington, North Carolina			
Author EVC	*Drawing* 31058-4a	*Layers* 0,1	*Date* 1-14-97
Job No. 3105803	*Revision* 1-28-97	*Figure* 3-2	*Scale* NTS

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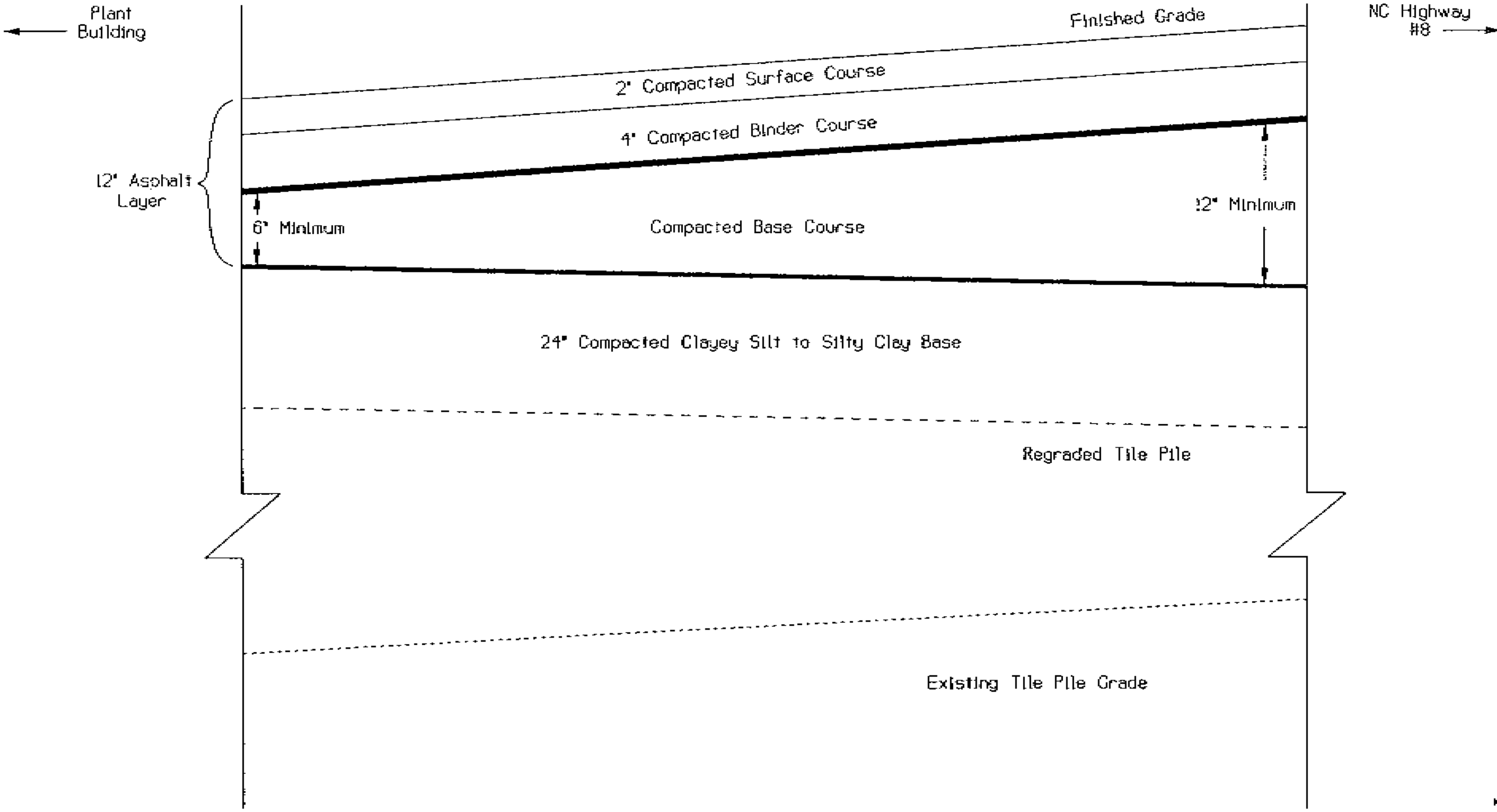

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Author	Drawing	Layers	Date	Title
EVC	31058-3	0,1	1-14-97	Cross-Section of Flat Top Surface Cap
Job No.	**Revision**	**Figure**	**Scale**	**Project**
3105803	2-11-97	3-3	NTS	Porcelanite, Inc. Lexington, North Carolina

3.3.2.2 Slope Surface Cap

General Design

The cap proposed for the chip pile slope is an earthen embankment of compacted clayey silt to silty clay soils on an average 4 horizontal to 1 vertical slope. The cap will consist of an interior drain along the toe of the existing tile pile to collect any seepage from the tile pile and native soils. The slope surface cap will then be placed against the drain and existing tile pile (see Figure 3-4). A surface runoff collection ditch will be placed along the toe of the slope surface cap.

Cap Placement

Cap material shall be clean clayey silt to silty clay soils that when compacted are less permeable than the underlying tile materials, fill, and native soils. Cap material shall be free of all organic materials, sod, peat, perishable, or other deleterious materials. No gravel or stones greater than two inches in any direction will be allowed in the cover soil.

Cap materials shall be placed in horizontal lifts not exceeding 12 inches in uncompacted thickness. Each lift shall be compacted to a minimum density of 90 percent of the maximum dry density as determined in accordance with ASTM D 1557 (modified Proctor).

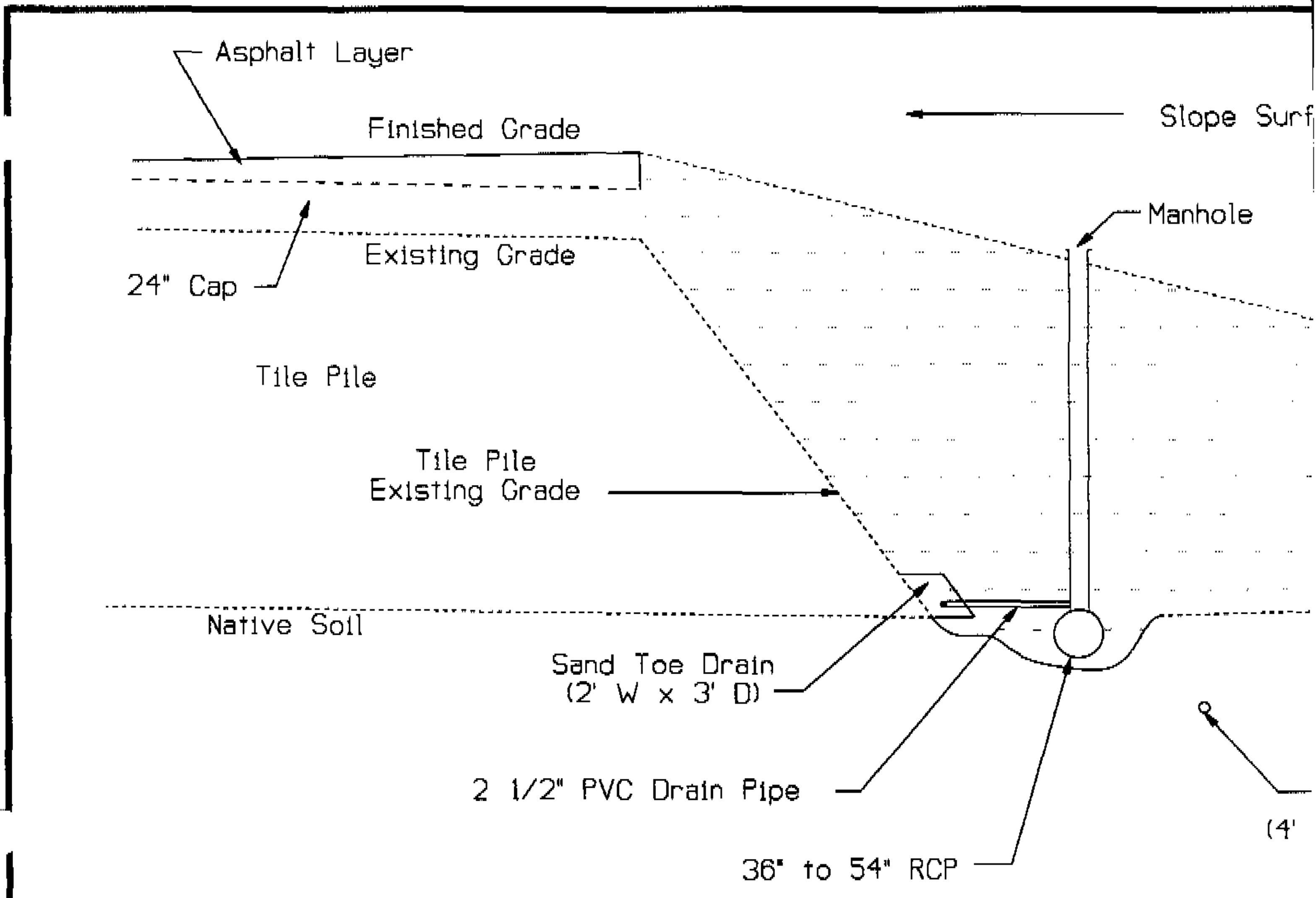
Upon completion of placement of the compacted clayey silt to silty clay, the upper surface shall be trimmed to a smooth surface and then compacted to provide a smooth, flat surface placed to the grade shown in Figure 3-4.

Placement of Topsoil Material

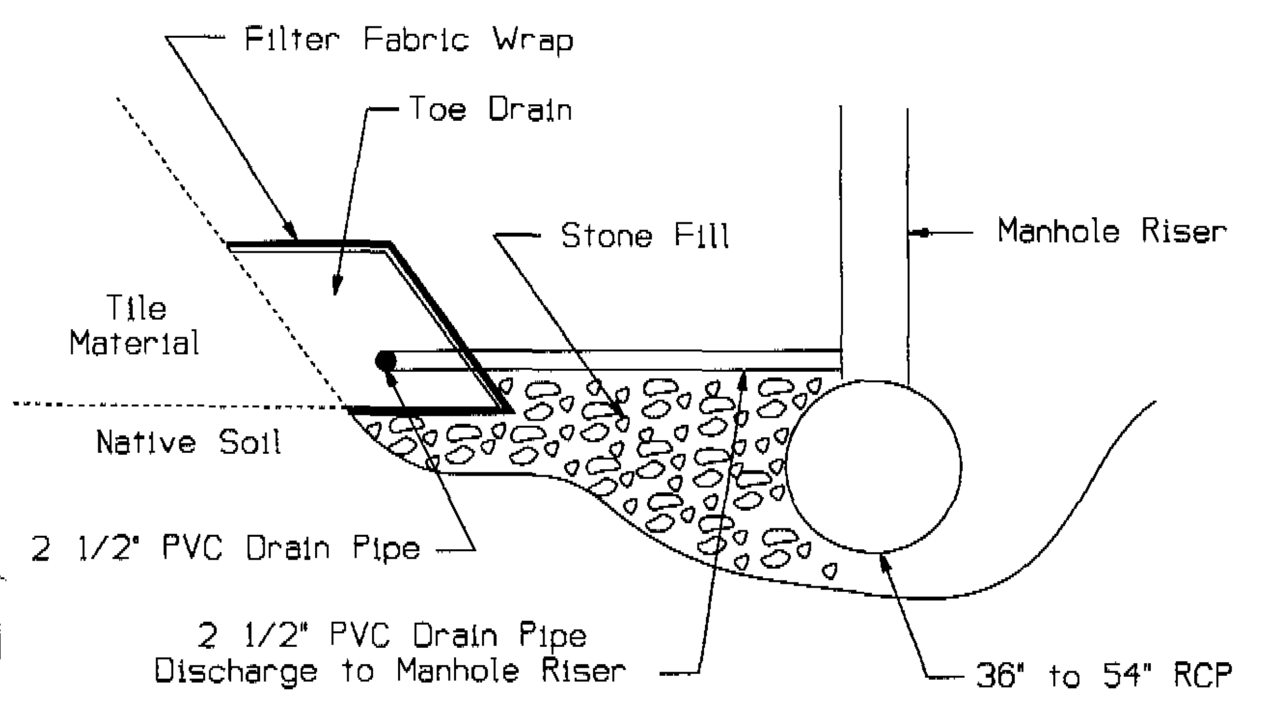
Topsoil material shall consist of clean off-site borrow materials. Topsoil shall be free of trash, perishable, or other deleterious materials. No cobbles, stones, or rock fragments greater than 3 inches in any direction will be allowed to be placed in the topsoil layer. Topsoil materials will be sufficiently compacted by placement activities, no further compaction of the topsoil will be required. No in-place density testing will be required on topsoil materials. The topsoil will be planted with shallow root plants to prevent the roots from penetrating the cap and reaching the tile material.

Mulching and seeding will occur after the topsoil is in place. The topsoil will be loosened to a depth of approximately 5 inches with the top 2 to 3 inches formed into a seedbed. Seedbed materials will meet NCDOT Division 10, Article 1060 requirements. Seeds will be distributed uniformly over the seedbed at the required rate of application, and immediately harrowed, dragged, raked, or worked to cover the seed. Immediately after the seedbed is covered, it will be lightly compacted. The following materials and application rates(in pounds per acre) will be applied:

- 40 pounds rye grain
- 70 pounds Kentucky tall fescue
- 1,000 pounds fertilizer (10-10-10)
- 2,000 pounds lime



Toe Drain Detail



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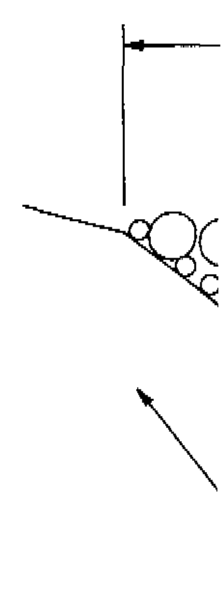
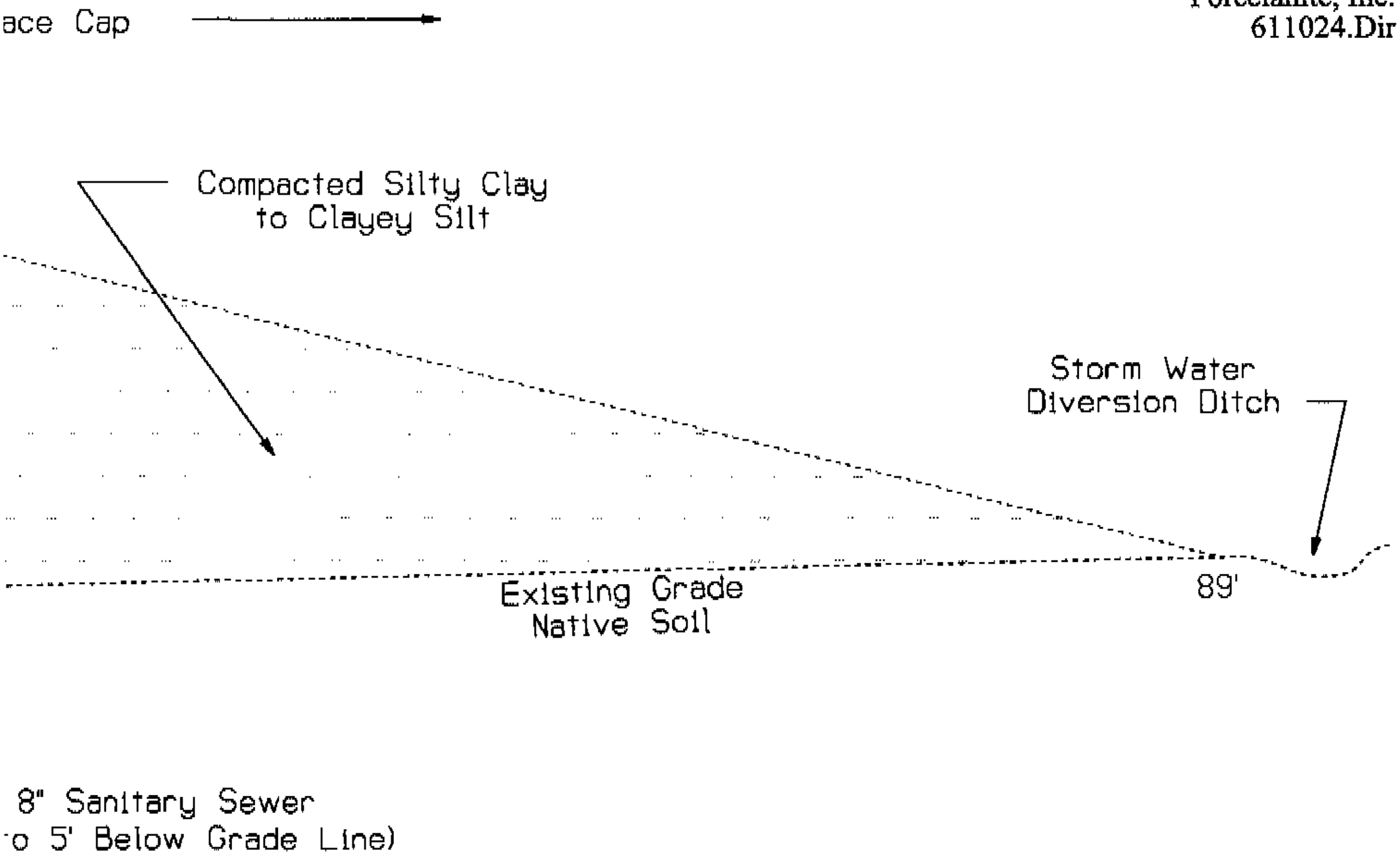
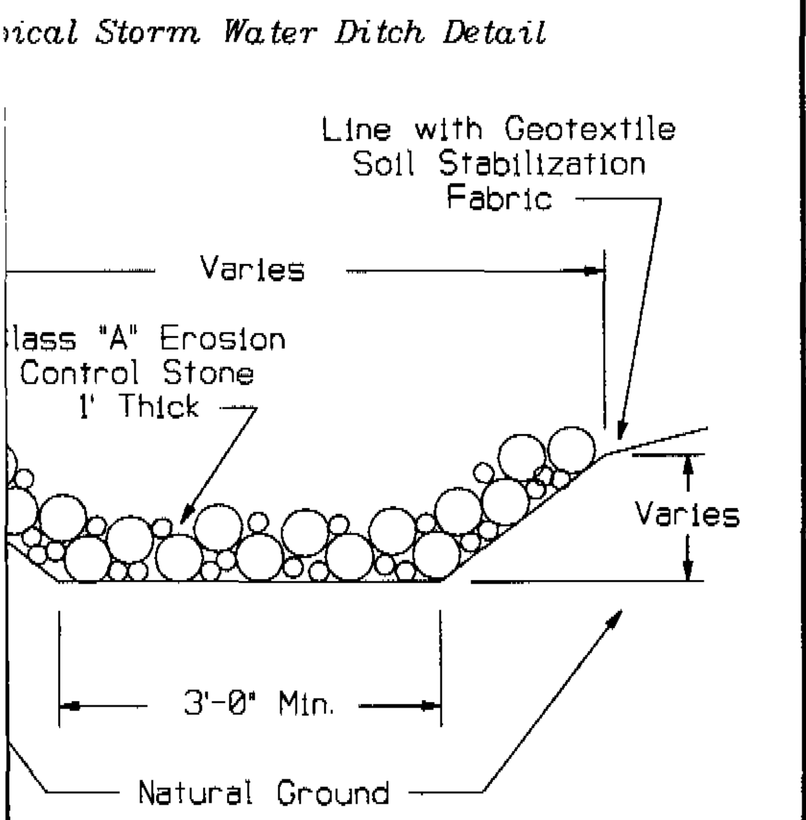


Tile Pile Closure
Ceramic Chip Tile Pile
Porcelanite, Inc.
611024.Dir





Title Cross-Section of Slope Surface Cap with Details			
Project Porcelanite, Inc. Lexington, North Carolina			
Author EVC	*Drawing* 31058-4	*Layers* 0,1	*Date* 1-14-97
Job No. 3105803	*Revision* 1-28-97	*Figure* 3-4	*Scale* NTS

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3.3.2.3 Toe Drain

The toe drain will consist of an interior drain along the toe of the existing tile pile to collect any seepage from the tile pile and native soils. The drain will consist of a base of gravel (no gravel larger than 3-inches in any direction) to bring the ground surface to the level of the surface water diversion pipe presently installed in the Walltown Drain. A geotextile fabric (Mirafi 500 or similar) will be placed over the top of the stone, up the slope of the tile pile, and up along a form parallel to the diversion pipe (see Figure 3-4). The geotextile fabric is placed over the sand layer to prevent clogging of the sand from the infiltration of the fines from the tile pile or compacted soils.

Six inches of compacted washed stone (North Carolina Aggregate Gradation Standard Size 78M, Section 1005 of NCDOT 1990 Specifications) will be placed to bed the drainpipe. A 2 1/2-inch PVC schedule 80 drainpipe will be placed over the compacted stone. The 2 1/2-inch drainpipe will be sloped to the north and will discharge into the surface water diversion pipe through the side of the manhole. Eight inches of compacted Standard Size 78M washed stone will be placed around and over the PVC pipeline. A minimum of 10-inches of compacted Standard Size 57 stone will then be placed over the Standard Size 78M stone. The geotextile will then be wrapped over the top of the toe drain from both the tile pile side and the diversion pipe side. The overlap shall be a minimum of 12 inches. Pins shall be used to hold the geotextile in place until the compacted cap soils are placed.

3.3.2.4 Surface Water Diversion Ditch

A surface water runoff ditch will be installed parallel to the toe of the cap to collect runoff from the cap and from the remainder of the site east to North Carolina Highway 8 (see Figures 3-3 and 3-4). The diversion ditch will carry the runoff to the north discharging to the Walltown Drain. The ditch will be constructed in the native soils and will consist of a finished trapezoidal ditch approximately 3 feet wide and 2 to 3 feet deep. The side slopes will be 2 feet horizontal to 1 foot vertical. A geotextile fabric (Mirafi 500 or similar) will be placed over the top of the excavated ditch prior to placing the stone lining for the ditch. The stone lining will be Class A erosion control stone 1-foot thick. The details of the ditch are shown in Figure 3-4.

3.3.3 Testing and Monitoring

3.3.3.1 Borrow Soil Testing

Chemical Quality of the Soils

All borrow sources for the fill soil, cap soil, and topsoil will be sampled and analyzed for SW-846 Methods 8240 (Purgeable Organic Compounds), 8270 (Base, Neutral, and Acid Extractable Compounds), and the priority pollutant metals plus the specific metals related to Porcelanite. No contaminated borrow material will be allowed on-site at Porcelanite.

Geotechnical Properties of Soil

The borrow sources for the cap soils will be drilled and sampled to determine the uniformity of the borrow soils. Samples will then be submitted to the soil laboratory and analyzed for the maximum dry density as determined in accordance with ASTM D 1557 (modified Proctor). Based on these results, quality control data will be generated for the different design densities. Soil samples at these different design densities will be analyzed for hydraulic conductivity properties to insure that the cap is less permeable than the tile materials or native soils.

Geotechnical quality control data for the stone and gravel will be supplied by the quarry where the stone and gravel are mined and screened. In general, NCDOT standards will be used.

3.3.3.2 Construction Soil Testing

All placement activities will be continuously monitored by a qualified person familiar with soil placement and testing techniques and procedures. On-site testing will consist of determining in-place density by the Sand Cone method in accordance with ASTM D 1556, the Rubber Balloon method in accordance with ASTM D 2167, or by the Nuclear method in accordance with ASTM D 3017.

Prior to placement activities, moisture/density tests will be performed on representative samples of each material to be placed. The results of these tests will be the basis for determining acceptable in-place density criteria. If there is any discrepancy between testing results between methods, the Sand Cone shall be the standard to which all results shall be compared.

Testing frequency shall be a minimum of one test per lift per 100 linear feet. Any in-pace materials not meeting the minimum density requirements shall be recompacted. Upon completion of the in-place test, the hole created for the test shall be cleaned of any remaining sand or other materials and shall be backfilled with commercially produced bentonite clay pellets, hand compacted in a maximum of two inch lifts, and hydrated.

3.3.4 Subsidence

The potential subsidence of this material will be negligible. The materials placed in accordance with the above procedures will exist in a compacted condition and will be over-consolidated due to the compactive effort during placement. Surcharge loads will be minimal consisting of vehicle parking and traffic and future warehousing. Since low surcharge load placed on the area by surface load and minimal seepage will be flowing downward through the placed material, there is no mechanism available to cause further compression of the cover, fill or subgrade materials.

3.3.5 Time for Closure

The closure activities will begin within 30 days of submittal of the closure plan to the HWS. Porcelanite will complete the closure activities within 180 days after start of closure.

3.3.6 Decontamination of Equipment

After closure of the tile pile area, equipment will be decontaminated on-site using dry decon procedures. Tires, compactors, and other pieces of equipment that come into contact with the tile materials will be brushed with heavy, stiff brooms to remove the tile pile materials. A temporary decontamination pad will be constructed and lined with an impermeable plastic material to collect tile materials. All dry solids in the lined decon pad will be removed by shovels and placed in drums which will be disposed of by the contractor. The impermeable plastic material used to line the decon pad along with any gravel will also be removed and disposed of by the contractor.

If dry decon is not adequate, equipment will be decontaminated on-site using high pressure stream and phosphate free soap. A temporary decontamination pad will be constructed and lined with an impermeable plastic material to collect washdown from the decontamination process. Equipment will be positioned during decontamination so that washdown is collected without runoff to any unlined portion of the soil. All washdown in the lined decon pad will be removed by a vacuum system and placed in drums which will be disposed of by the contractor. The impermeable plastic material used to line the decon pad along with any gravel will also be removed and disposed of by the contractor.

The dry solids and/or sludge and water from the washdown and the plastic and gravel will be sampled and analyzed for the hazardous waste constituents of concern identified in the Section 2.0 *Waste Characterization* and the resulting decon waste will be disposed of in accordance with the applicable requirements of 40 CFR 262. Completion of decontamination will be determined by visual inspection to ensure all tile materials have been removed from the equipment.

3.3.7 Inspection and Maintenance

Porcelanite will ensure that the closed tile pile is properly maintained by inspecting it regularly in the following areas:

1. Erosion damage
2. Vegetative cover
3. Run-on/run-off control system
4. Subsidence
5. Pavement wear and subsidence

The caps will be sloped to provide positive site drainage away from the tile pile as shown on the drawing. The sloped cap is designed so that the maximum drainage velocity leaving the cap is less than the velocity likely to cause erosion for the selected vegetation. The caps will be visually inspected annually to ensure that the positive drainage slopes are maintained. Should minor subsidence or spot irregularities be discovered, new topsoil will be placed on the slope cap, the area will be regraded, and the topsoil layer will be reseeded.

The sloped cap will also be protected from erosion by maintaining an appropriate vegetative cover. Maintenance activities for the vegetative cover will include mowing, seeding, and fertilizing during the year. The activities will be performed on an as-needed basis due to the seasonal nature of vegetation. The vegetation will be mowed as required to control volunteer growth of trees and shrubs.

The paved parking lot surface (flat top surface cap) will be inspected for wear and subsidence. Areas of subsidence or wear that allow ponding and possible infiltration of the ponded waters will be patched or replaced as necessary. As necessary, the entire asphalt surface will be seal coated.

As discussed in Section 3.3.4 *Subsidence,* subsidence of the tile pile and caps are not expected since: (1) the tile pile material has settled over the 16 years since the last disposal of the chips, (2) the cap materials will be compacted, (3) runon will be controlled, (4) infiltration through the cap will be minimized, and (5) only light surcharge loads will be placed on the cap. However, the topsoil layer will not be compacted and may settle. The topsoil layer will be visually inspected by a professional engineer or professional geologist. If subsidence is observed, topsoil will be added, the topsoil layer graded to promote runoff, and reseeded to minimize erosion.

3.3.8 Site Security

Site security is provided by perimeter fencing of the Porcelanite property which includes the present tile pile and all the proposed area affected by closure. Gates are locked at all times with the exception of the main gate at the plant on Victor Street. A guard is on duty at the main gate to prevent unauthorized access.

During the closure process, the contractor will provide personnel to control unauthorized access at any points in the fence that are open to allow truck traffic.

3.3.9 Closure Cost and Financial Assurance

3.3.9.1 Closure Cost Estimate

The closure cost information presented is submitted according to the requirements of 40 CFR 265.142, Cost Estimate for Closure. An estimated $491,340 will be needed to close the Porcelanite tile pile. This estimation includes the capping of the tile pile, waste characterization and confirmation sampling, surveying, inspections, and reporting. These costs are broken down in more detail and summarized in Table 3-1.

These closure estimates will be kept on file at the Porcelanite facility and will be revised whenever a change in the Closure Plan affects the cost of closure. It will be adjusted annually from the date of its original development to reflect changes in the closure cost brought about by inflation. The Department of Commerce's Annual implicit Price Deflater for Gross National Product (published by U.S. Department of Commerce in its monthly publication "Survey of Current Business") will be used to make this adjustment.

3.3.9.2 Financial Assurance Mechanism

Mannington, as the operator of the tile pile, has retained responsibility for the closure of the tile pile. Mannington, as the operator and submitter of the closure plan and post-closure care plan, will continue to maintain the financial assurance and liability requirements in compliance with 40 CFR 265 Subpart H-*Financial Requirements.*

Table 3-1 Cost Estimate[1] for Closure of Ceramic Chip Tile Pile, Porcelanite, Inc., Lexington, North Carolina

1. Grade and place surface cap (includes equipment, materials, and labor)		$ 69,660
2. Grade, install drain, and place sloped cap (includes equipment, materials, and labor)		$ 336,510
3. Environmental Consultant/Professional Engineer		
• Geotechnical QA/QC of cap construction		$ 19,000
• Install replacement monitoring well and sample		$ 18,000
• Professional engineer to certify closure		$ 3,500
	Subtotal	$ 446,670
4. Contingency (10 percent)		$ 44,670
	Total	$ 491,340

[1] *Costs are in 1997 dollars*
3105801

The financial assurance information is submitted according to the requirements of 40 CFR 265.143, Financial Assurance for Closure. Mannington has reviewed the five mechanisms for financial assurance and has chosen a mechanism for the Lexington facility.

3.3.9.2a Closure Trust Fund
Not applicable.

3.3.9.2b Surety Bond
Not applicable.

3.3.9.2c Closure Letter of Credit
Not applicable.

3.3.9.2d Closure Insurance
Not applicable.

3.3.9.2e Financial Test and Corporate Guarantee for Closure

Mannington meets the financial test criteria of 40 CFR 265.143. The following items have been submitted to the HWS for 1996 in accordance with Section 265.143. An updated financial assurance package will be submitted in 1997 by Mannington. The items that will be included are:

1. A copy of a letter signed by Mannington Chief Financial Officer that is worded as specified in Section 264.151(f).

2. A copy of the independent Certified Public Accountant's report on examination of Mannington's financial statement for the latest completed fiscal year.

3. A copy of the special report from Mannington's independent Certified Accountant to Mannington that:

   (a) He has compared the data which the letter from the Chief Financial Officer specified as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

   (b) In connection with that procedure, no matters came to his attention which have caused him to believe that the specified data should be adjusted.

3.3.10 Certificate of Closure

Within 60 days of completing closure, Mannington and Porcelanite will submit to the HWS a certification by both Mannington and Porcelanite and an independent Registered Professional Engineer in the State of North Carolina that the tile pile has been closed according to the Closure Plan. Documentation supporting the independent registered professional engineer's certification will be maintained until the HWS (Regional Administrator) releases Mannington from the financial assurance requirements for closure under Section 40 CFR 265.143(h).

3.3.11 Notice to Local Land Authority

Porcelanite within 60 days after closure is completed, will submit to the Davidson County Register of Deeds and to the HWS a survey plat indicating the location and dimensions of the tile pile with respect to permanently surveyed benchmarks. This plat will be prepared and certified by a registered professional land surveyor in the State of North Carolina. The plat will contain a note, prominently displayed , which states Porcelanite's obligation to restrict disturbances of the site in accordance with 40 CFR 264.117(c) if all the hazardous waste can not be cleaned up and the tile pile must begin post-closure care.

Chapter 4
Post-Closure Care Plan

4.1 Introduction

Since the tile pile cannot be clean closed, a post-closure care plan has been developed. The following items are included:

1. Ground Water Monitoring Plan - Since the monitoring wells placed in the earlier assessments showed ground water contamination, a ground water monitoring plan has been prepared by a qualified geologist and is submitted with the Post-Closure Care Plan.

   The ground water monitoring plan addresses:

   (i) the number, location and depth of wells;
   (ii) sampling and analytical methods for those hazardous wastes or hazardous waste constituents found present in the facility;
   (iii) evaluation procedures, including any use of previously gathered ground water quality information; and
   (iv) a schedule of implementation.

2. A description of the planned ground water monitoring activities and frequencies at which they will be performed.

3. A description of the planned maintenance activities and frequencies at which they will be performed for the cap, security fence and monitoring wells.

4. The name, address, and phone number of the person or office to contact about the hazardous waste disposal unit during the post-closure care period.

5. Recordkeeping and reporting during post-closure:
   - ground water monitoring data and evaluation of data;
   - annual report until closure is complete;
   - updates on costs of post-closure care; and
   - all records will be maintained for the post closure care period.

6. Copies of the Post-Closure Care Plan will be maintained at:

   Mr. Tony Shaw
   Porcelanite, Inc.
   Post Office Box 1777
   Lexington, North Carolina 27293-1777

   Phone# (910) 242-5636
   Fax# (910) 242-5601

The person responsible for updating the Post-Closure Care Plan will be the facility representative mentioned or his designee. As the Post-Closure Care Plan is updated or amended, the date and number of the revision will be noted on the plan's title page.

7. A Financial Assurance mechanism adopted by Mannington will be included.

4.2 Ground Water Monitoring Plan

4.2.1 Ground Water Assessment To Date

Ground water monitoring has determined that the ground water downgradient of the tile pile is contaminated. The ground water has been found to contain boron, nickel, vanadium, and gross beta that exceed North Carolina ground water standards.

4.2.2 Ground Water Assessment Plan

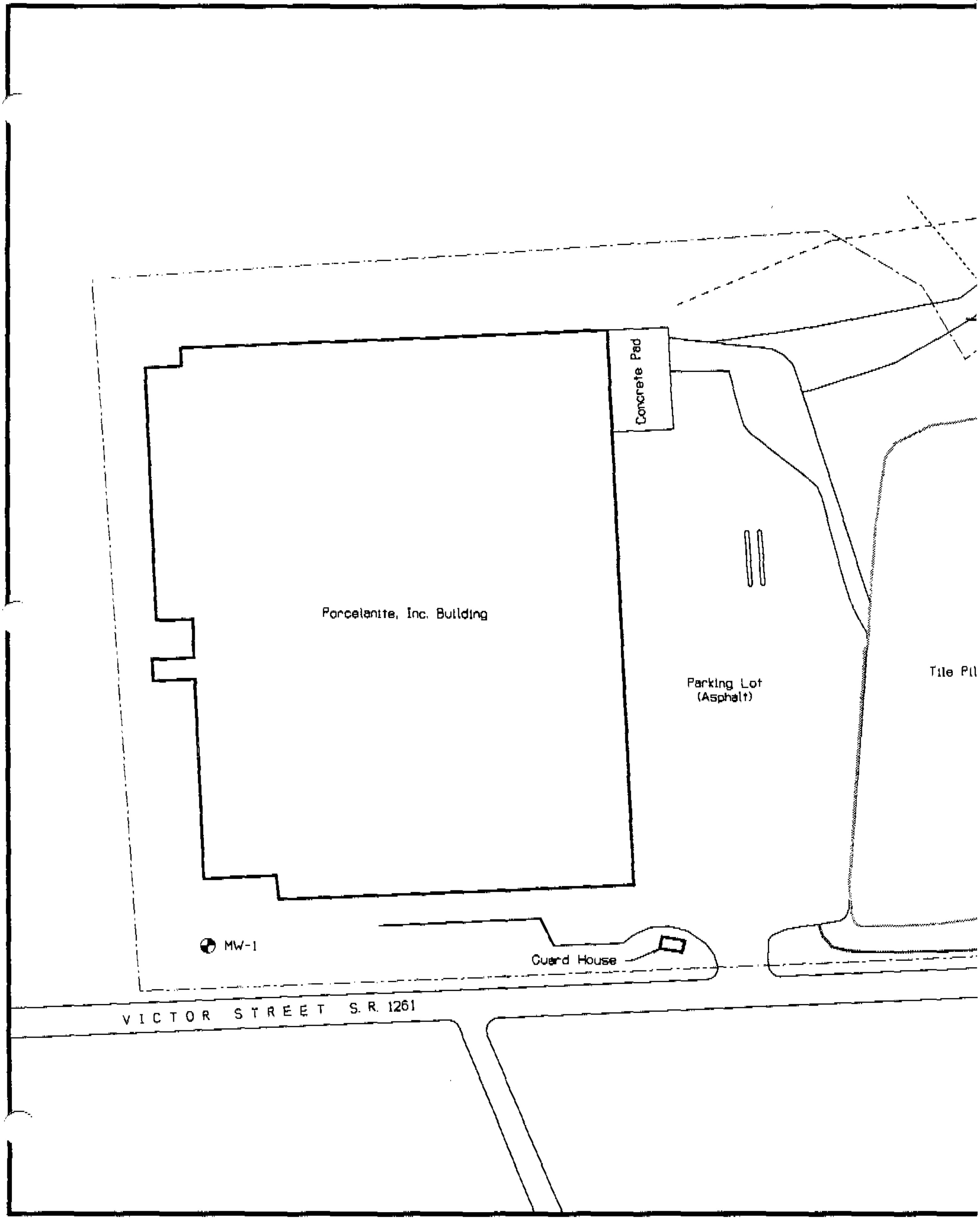
Since there is contaminated ground water associated with the tile pile, there is little need for a ground water monitoring program to detect if hazardous waste or hazardous waste constituents have entered the ground water. Porcelanite proposes to modify the ground water monitoring program discussed in 40 CFR 265.91 and 40 CFR 265.92 in accordance with 40 CFR 265.90(d).

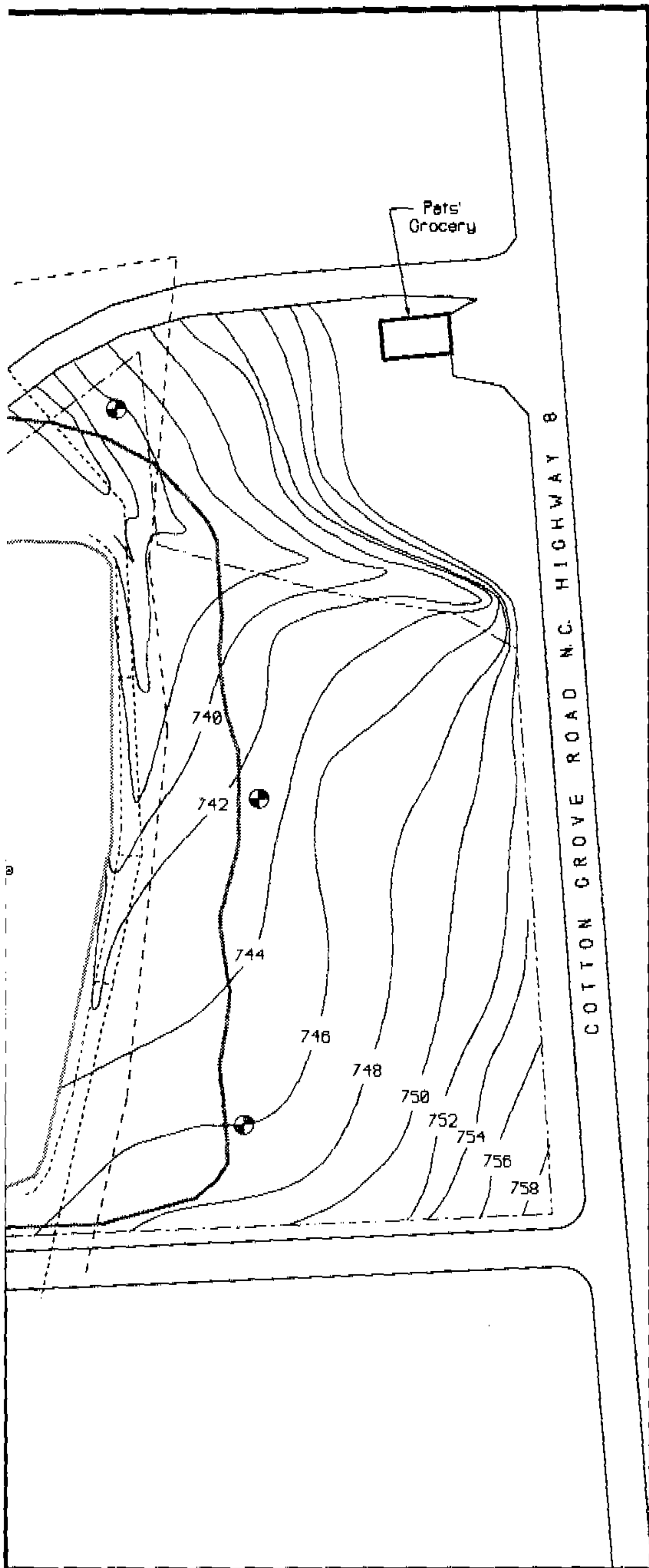
4.2.2.1 Number, Location, and Depth of Wells

Porcelanite has developed an alternate ground water monitoring system that addresses the requirements in 40 CFR 265.93(d)(3); that determines the rate and extent of migration and the concentration of the constituents in the ground water; that provides a written report per 40 CFR 265.93(d)(5); that monitors the plume extent, rate of migration, and concentration of the constituents; and that complies with the recordkeeping and reporting requirements in 40 CFR 265.94(b).

Porcelanite proposes to monitor one upgradient monitoring well (MW-1) and three downgradient monitoring wells. The downgradient monitoring wells will be new wells installed after the sloped cap installation is complete; and, they will replace monitoring wells MW-3, MW-7, MW-8, MW-21, MW-22, and MW-26A. The proposed locations are shown on Figure 4-1. The three new downgradient monitoring wells will be shallow wells.

Porcelanite proposes to sample the monitoring wells semiannually for the constituents determined to be present due to the tile pile (see Section 2.4 *Ground Water Assessment).*


Concrete Pad
Porcelanite, Inc. Building
Parking Lot
(Asphalt)
Tile Pil
MW-1
Guard House
VICTOR STREET S. R. 1261



Legend

- 8" Sewer Line
- Storm Drain
- Tile Pile Boundary
- Toe Embankment Drain
- Proposed Soil Embankment II
- Topo Line Location
- Post-closure Care Wells

Bar Scale

0 100 200

Title Location of Post-closure Care Monitoring Wells			
Project Porcelanite, Inc. Lexington, North Carolina			
Author EVC	*Drawing* 31058-1	*Layers* 0,6,7,9,12	*Date* 1-14-97
Job No. 3105803	*Revision* 2-9-97	*Figure* 4-1	*Scale* 1" = 100'

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The shallow wells (15 to 25 feet) will be constructed of schedule 40 two-inch PVC casing and screen. The PVC casing and screen will be connected by flush threaded connections. No PVC solvent or glue will be used to connect the pipe. Screens will consist of a 10-foot length of slotted or wire wrapped screen with screen openings of 0.010 inches.

The exact placement of the screen interval will depend on the water level encountered during the drilling.

4.2.2.2 Drilling and Well Installation

The drilling will be conducted with a rotary drill rig with hollow-stem augers. The hole will be drilled to a diameter of approximately 6 1/4 to 8 1/2 inches. Cuttings will be collected every five feet and logged by a geologist. The geologist will also record drilling rates, rod drops, etc. to help develop the geology of the boring.

Following the completion of the drilling, the monitoring well will be installed. All screens will have centralizers installed at their base and top to ensure that the screen will be centered within the boring. A sandpack consisting of clean washed sand and gravel containing less than five percent deleterious material by weight will be tremied around the screen and carried from two to four feet above the screen top. Deleterious materials are considered to be wood debris, other organic matter, heterogeneous material, and degradable materials.

Above the sandpack, bentonite clay will be placed to form a seal between the annular space and the well. After placement of the bentonite seal, a neat cement grout will be poured to ground surface. A lockable protective steel casing will be installed around the well. A concrete pad with dimensions of 3 feet by 3 feet by 6 inches thick will be poured as a base around the protective casing of the monitoring well.

Well locations to the nearest foot and vertical elevations to the nearest 0.01 foot will be surveyed by a registered surveyor in the State of North Carolina.

After the wells are installed, the wells will be cleaned of all clay, silt, or sand that may have accumulated in the well. The wells will be pumped or bailed for a sufficient length of time to settle the sandpack and remove any fines. The wells will be considered developed when the water removed from the well is reasonably free of sand, silt, and clay. All development water will be containerized and eventually discharged to the City of Lexington's waste water treatment plant.

No dispersing agents, acids, disinfectants, or other additives will be used during development or will at any other time be introduced to the well.

Each installed well shall be depicted in a well diagram. This diagram will graphically denote by depth from ground surface (unless otherwise specified):

- Screen location;
- bottom of boring;
- granular backfill;
- seals;
- grout;
- cave-in;
- height of casing stickup (above ground surface);
- protective casing details.

Upon completion of the monitoring wells, Aquaterra will submit Well Completion Form GW-1 for each well as required by North Carolina law. The originals will be submitted to the Division of Water Quality and copies will be submitted to the HWS.

4.2.2.3 Ground Water Sampling and Analytical Methods

Details of ground water sampling, including purging of the wells are contained in the latest ground water sampling and analysis plan (SAP) submitted on January 7, 1997, to the HWS *(Groundwater Sampling and Analysis Plan, Porcelanite, Inc. (Formerly P&M Tile, Inc.), NCD 986 181 451, Lexington, North Carolina,* dated January 7, 1997).

Porcelanite proposes to monitor the background well, MW-1, and the proposed three new downgradient replacement monitoring wells semiannually (see locations of monitoring wells on Figure 4-1). It is proposed to sample these wells in January and July of each year. The January sampling event and water level measurements will be used to develop the map of the ground water surface elevations, calculations of the rate of migration, extent of migration if any, concentration of analytes present, and discussion of the effectiveness of closure of the tile pile. This information will be presented in the semiannual post-closure care reports.

In the field, the samples will be analyzed for pH, specific conductance, and temperature in accordance with the January 7, 1997, SAP. The laboratory analysis will consist of total metals analysis of boron and lead and the radionuclied gross beta. The methods are reviewed in the SAP.

All data collected including copies of the semiannual reports will be maintained at the facility throughout the post-closure care period. The data will be maintained in the Environmental Health/Safety Engineer's office. The current EHS engineer's name and address:

Tony Shaw
Porcelanite, Inc.
Post Office Box 1777
Lexington, North Carolina 27293-1777

Phone # (910) 242-5636
Fax# (910) 242-5601

4.3 Inspection and Maintenance

Porcelanite will ensure that the closed tile pile is properly maintained by inspecting it regularly in the following areas:

1. Erosion damage
2. Vegetative cover
3. Run-on/run-off control system
4. Subsidence
5. Pavement wear and subsidence

The caps will be sloped to provide positive site drainage away from the tile pile as shown on the drawing. The sloped cap is designed so that the maximum drainage velocity leaving the cap is less than the velocity likely to cause erosion for the selected vegetation. The caps will be visually inspected annually to ensure that the positive drainage slopes are maintained. Should minor subsidence or spot irregularities be discovered, new topsoil will be placed on the slope cap, the area will be regraded, and the topsoil layer will be reseeded.

The sloped cap will also be protected from erosion by maintaining an appropriate vegetative cover. Maintenance activities for the vegetative cover will include mowing, seeding, and fertilizing during the year. The activities will be performed on an as-needed basis due to the seasonal nature of vegetation.

The paved parking lot surface (flat top surface cap) will be inspected for wear and subsidence. Areas of subsidence or wear that allow ponding and possible infiltration of the ponded waters will be patched or replaced as necessary. As necessary, the entire asphalt surface will be seal coated.

As discussed in Section 3.3.4 *Subsidence,* subsidence of the tile pile and caps are not expected since: (1) the tile pile material have settled over the 16 years since the last disposal of the chips, (2) the cap materials will be compacted, (3) runon will be controlled, (4) infiltration through the cap will be minimized, and (5) only light surcharge loads will be placed on the cap. However, the topsoil layer will not be compacted and may settle. The topsoil layer will be visually inspected by a professional engineer or professional geologist. If subsidence is observed, topsoil will be added, the topsoil layer graded to promote runoff, and reseeded to minimize erosion.

4.4 Site Security

Site security is provided by perimeter fencing of the Porcelanite property which includes the present tile pile and all the proposed area affected by closure. Gates are locked at all times with the exception of the main gate at the plant on Victor Street. A guard is on duty at the main gate to prevent unauthorized access.

During the closure process, the contractor will provide personnel to control unauthorized access at any points in the fence that are open to allow truck traffic.

4.5 Post-Closure Cost and Financial Assurance

4.5.1 Post-Closure Cost Estimate

The post-closure cost information presented is submitted according to the requirements of 40 CFR 265.144, *Cost Estimate for Post-Closure Care*. An estimated $226,800 will be needed to perform post-closure care of the Porcelanite tile pile. These costs are broken down in more detail and summarized in Table 4-1.

These post-closure care estimates will be kept on file at the Porcelanite facility and will be revised whenever a change in the Post-Closure Care Plan affects the cost of post-closure. It will be adjusted annually from the date of its original development to reflect changes in the post-closure cost brought about by inflation. The Department of Commerce's Annual implicit Price Deflater for Gross National Product (published by U.S. Department of Commerce in its monthly publication "Survey of Current Business") will be used to make this adjustment.

4.5.2 Financial Assurance Mechanism

Mannington, as the operator of the tile pile, has retained responsibility for the post-closure care of the tile pile. Mannington, as the operator and submitter of the post-closure care plan and post-closure care plan, will continue to maintain the financial assurance and liability requirements in compliance with 40 CFR 265 Subpart H-*Financial Requirements.*

The financial assurance information is submitted according to the requirements of 40 CFR 265.145, *Financial Assurance for Post-Closure Care*. Mannington has reviewed the five mechanisms for financial assurance and has chosen a mechanism for the Lexington facility.

4.5.2a Post-Closure Trust Fund
Not applicable.

4.5.2b Surety Bond
Not applicable.

4.5.2c Post-Closure Letter of Credit
Not applicable.

4.5.2d Post-Closure Insurance
Not applicable.

Table 4-1. Cost Estimate[1] for Post-Closure Care of Ceramic Chip Tile Pile, Porcelanite, Inc., Lexington, North Carolina.

1. Two Semiannual Sampling Events of Monitoring Wells (includes equipment, analysis, labor, and report)		**$ 2,600**
2. Maintain Grass Cover on Slope Surface Cap (includes mowing and fertilizing)		**$ 1,200**
3. Inspections and Maintenance of Cap System		
• Porcelanite inspections		$ 760
• Asphalt and drain maintenance		$ 1,900
• PE or PG to do annual inspection		$ 1,100
	Subtotal	**$ 3,760**
	Annual Total	$ 7,560
	Post-closure Care Period Multiplier	30 years
	TOTAL FOR 30 YEARS	$226,800

1 *Costs are in 1997 dollars*
3105801

4.5.2e Financial Test and Corporate Guarantee for Post-Closure Care

Mannington meets the financial test criteria of 40 CFR 265.145. The following items have been submitted to the HWS for 1996 in accordance with Section 265.145. An updated financial assurance package will be submitted to the HWS as required in 1997 by Mannington. The items that will be addressed are:

1. A copy of a letter signed by Mannington's Chief Financial Officer that is worded as specified in Section 264.151(f).

2. A copy of the independent Certified Public Accountant's report on examination of Mannington's financial statement for the latest completed fiscal year.

3. A copy of the special report from Mannington's independent Certified Accountant to Mannington that:

   (a) He has compared the data which the letter from the Chief Financial Officer specified as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

   (b) In connection with that procedure, no matters came to his attention which have caused him to believe that the specified data should be adjusted.

4.6 Certificate of Completion of Post-Closure Care

Within 60 days of completing the established post-closure care period for the tile pile Mannington and Porcelanite will submit to the HWS a certification by both Mannington and Porcelanite and an independent Registered Professional Engineer in the State of North Carolina that the tile pile post-closure care for the post-closure care period has been performed according to the Post-Closure Care Plan. Documentation supporting the independent registered professional engineer's certification will be furnished to the HWS (Regional Administrator) upon request.

4.7 Notice to Local Land Authority

Porcelanite, within 60 days after nonclean closure is completed, will submit to the Davidson County Register of Deeds and to the HWS a survey plat indicating the location and dimensions of the tile pile with respect to permanently surveyed benchmarks. This plat will be prepared and certified by a registered professional land surveyor in the State of North Carolina. The plat will contain a note, prominently displayed, which states Porcelanite's obligation to restrict disturbances of the site in accordance with 40 CFR 264.117(c) if all the hazardous waste can not be cleaned up and the tile pile area must begin post-closure care.

Chapter 5
References

Aquaterra, Inc., 1990, *Soil Boring Assessment, Mannington Ceramic Tile, Lexington, North Carolina:* Aquaterra, Inc. report number R835-90, Raleigh, North Carolina, January 31.

Aquaterra, Inc., 1992, *Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina:* Aquaterra report number R1547-92, Raleigh, North Carolina, January 7.

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Tetra Technologies Group, P.A., 1996, *Third Quarter 1996 Groundwater Assessment Report, Porcelanite, Inc., Lexington, North Carolina,* High Point, North Carolina, November 4.

Tetra Technologies Group, P.A., 1997, *Groundwater Sampling and Analysis Plan, Porcelanite, Inc., (Formerly P&M Tile, Inc.), NCD 986 181 451, Lexington, North Carolina:* High Point, North Carolina, January 7.

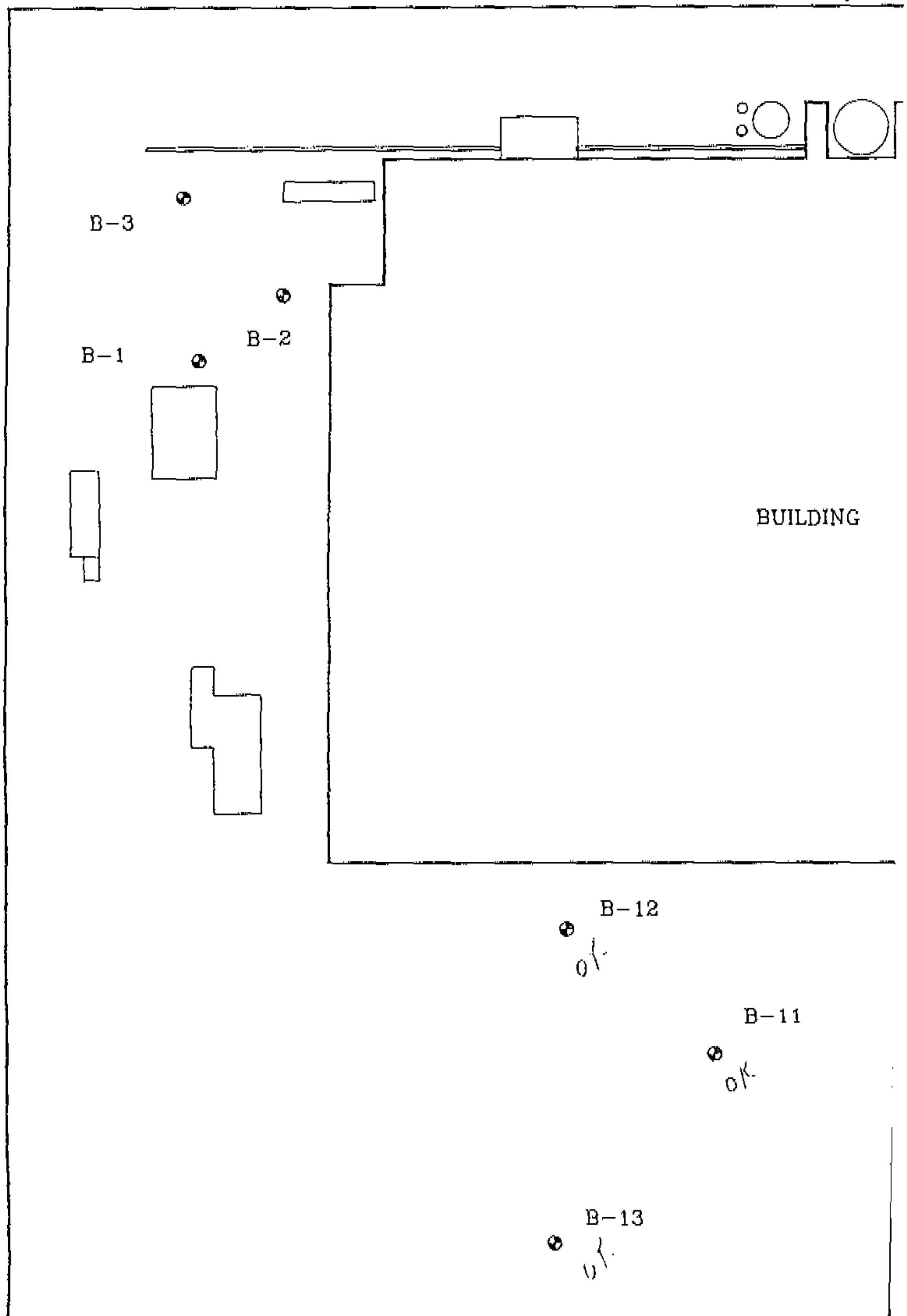
APPENDIX A

PREVIOUS INVESTIGATIONS

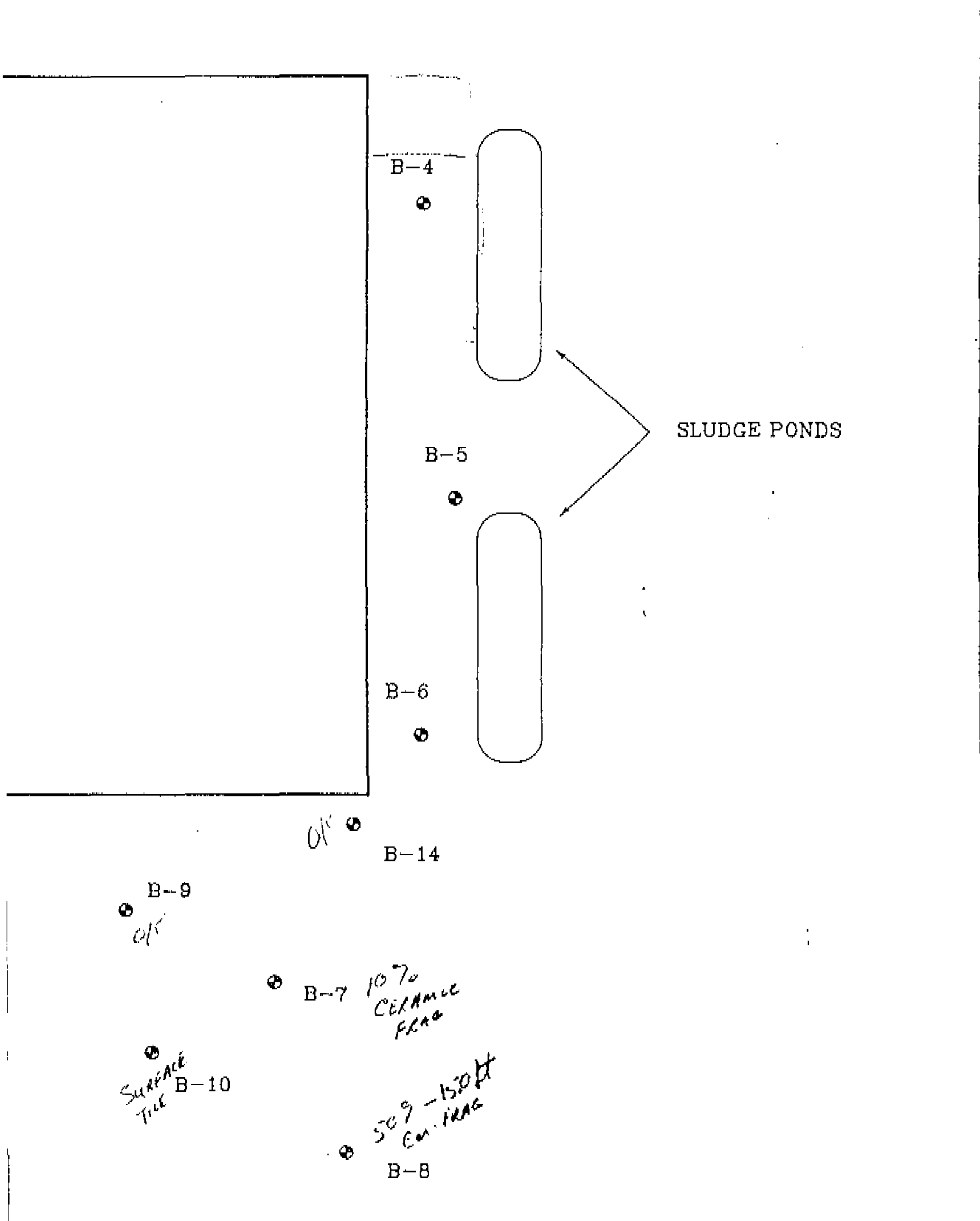
Appendix A

Aquaterra Report Number R835-90

Soil Boring Assessment
Mannington Ceramic Tile
Lexington, North Carolina
January 31, 1990



PROJECT:	TITLE:
MANNINGTON CERAMIC TILE LEXINGTON, NORTH CAROLINA	SOIL BO JOB: 27T · DRAW 27T



ING LOCATION MAP

:	FIGURE:	SCALE:
	2	1′ = 100′

AQUATERRA, INC.
RALEIGH, GREENSBORO, CHARLOTTE
NORTH CAROLINA

Table 1 Total Metals Analysis From Soil Boring Assessment, Mannington Ceramic Tile, Lexington, North Carolina

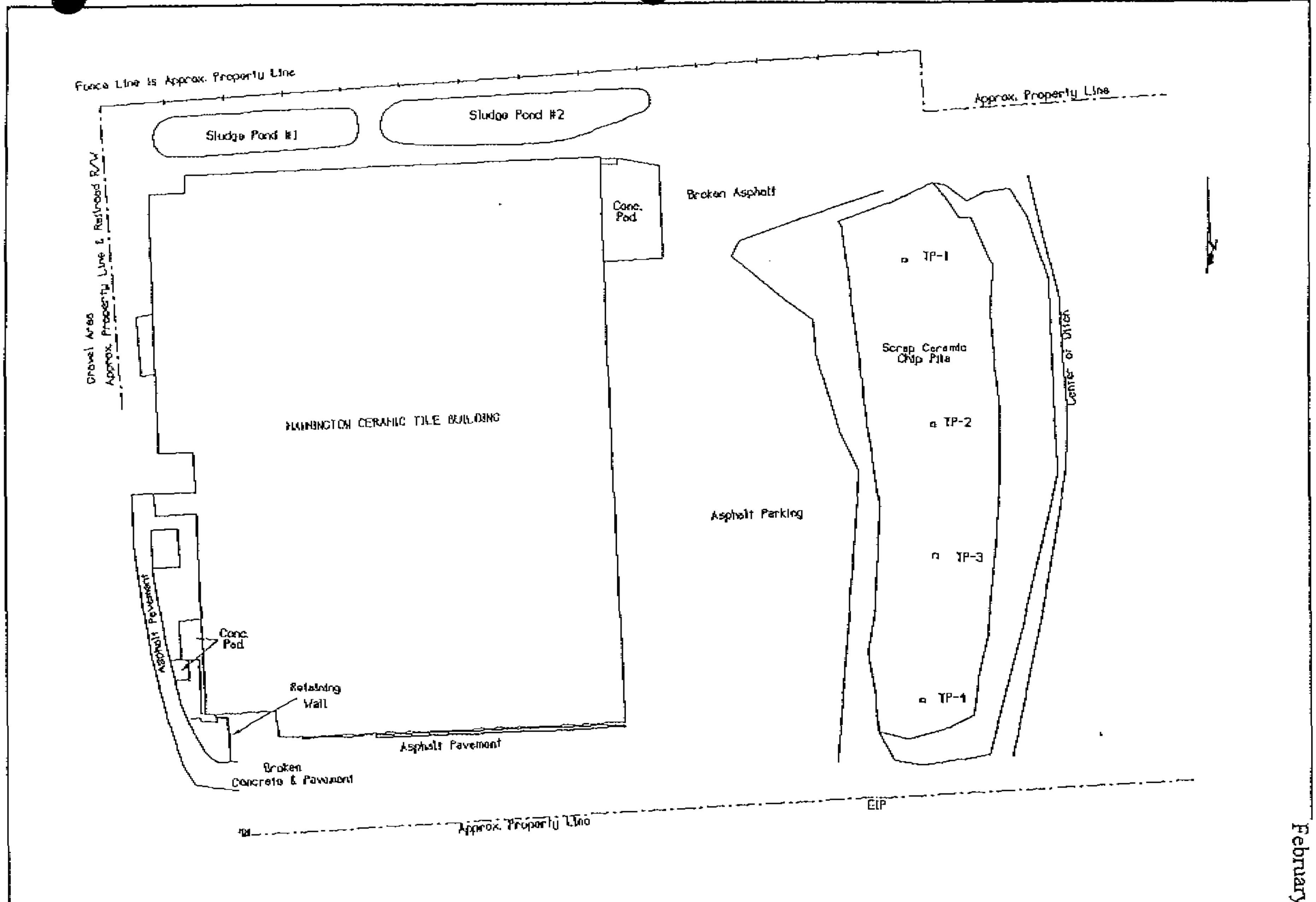
Location	Date	Depth	As	Ba	Cd	Cr	Hg	Pb	Ag	Se
B-1	11-29-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	<0.0005	< 0.50	< 0.50	< 0.10
		10.0' - 11.5'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-2	11-29-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-3	11-22-89	3.5' - 5.0'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
B-4	11-22-89	6.0' - 7.5'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
B-5	11-24-89	1' - 2.5'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
		6 - 7.5'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
B-6	11-24-89	2.5' - 4'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
		17.5' - 19'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
B-7	11-24-89	5' - 6.5'	< 1.0	< 10	< 0.50	< 1.0	< 0.2	< 1.0	< 1.0	< 0.50
B-8	11-27-89	7.5' - 9.0'	< 0.50	< 10	0.2	< 1.0	< 0.2	74	< 1.0	< 0.50
		20.0' - 21.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-9	11-27-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-10	1-28-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-11	11-28-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-12	11-28-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-13	11-28-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10
B-14	11-29-89	2.5' - 4.0'	< 0.50	< 10	< 0.10	< 0.50	< 0.0005	< 0.50	< 0.50	< 0.10

Analytical Laboratory: Industrial and Environmental Analysts, Cary, North Carolina
Results in mg/kg
from R835-90

Appendix A

Aquaterra Report Number R1547-92

**Sampling of Waste Ceramic Chip Tile
Mannington Ceramic Tile
Lexington, North Carolina
January 7, 1992**



AQUATERRA, INC. RALEIGH, GREENSBORO, CHARLOTTE NORTH CAROLINA	Author dlg/JJ	Drawing 354	Layers	Date 01-6-92	Title Test Pit Locations
	Job No. 354	Revision	Figure 2	Scale 1" ≈ 110'	Project Mannington Ceramic Tile Lexington, North Carolina

Tile Pile Closure
611024
February 11, 1997

Table 1 **TCLP Metal Results from Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina**

Parameters	TP-1	TP-2	TP-3	TP-4	Regulatory Level
Arsenic	< 0.52	< 0.52	< 0.52	< 0.52	5.0
Barium	6.7	3.4	2.2	4.6	100.0
Cadmium	< 0.11	< 0.11	< 0.11	0.15	1.0
Chromium	< 0.56	< 0.56	< 0.56	< 0.56	5.0
Lead	47	51	63	130	5.0
Mercury	< 0.017	< 0.017	< 0.017	< 0.017	0.2
Selenium	< 0.30	< 0.30	< 0.30	< 0.30	1.0
Silver	< 0.83	< 0.83	< 0.83	< 0.83	5.0

All Units are mg/L
Laboratory Analytical Laboratory: AnalytiKEM, Inc., Rock Hill, South Carolina

from R1547-92

Table 2 Summary of Analytical Data from Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina

Parameter	TP-1	TP-2	TP-3	TP-4	Average
Metals					
Aluminum	17000	19000	18000	22000	19000
Antimony	< 2	< 2	< 2	< 2	< 2
Barium	490	310	220	820	535
Boron	53.0	130	200	240	156
Calcium	22000	23000	24000	26000	23800
Chromium	4.9	6.4	5.9	4.2	5.4
Cobalt	12.0	26.0	13.0	23.0	18.5
Iron	3900	2000	1300	1200	2100
Lead	1600	3100	3900	4000	3150
Magnesium	3900	4600	4800	4400	4420
Nickel	8.3	18.0	< 4	12.0	10
Potassium	< 100	< 100	< 100	< 100	< 100
Praseodymium	< 10	< 10	< 10	< 10	< 10
Silver	< 4	< 4	< 4	14.0	5
Sodium	370	500	510	670	512
Tin	< 5	< 5	< 5	< 5	< 5
Titanium	100	110	110	100	105
Vanadium	10.0	7.3	8.5	9.7	8.9
Zinc	2400	2000	2700	6100	3300
Zirconium	65.0	67.0	100	150	95.5
Inorganic					
Alkalinity	3700	3200	4000	3700	3650
Bromide	4.4	4.2	3.2	4.1	4.0
Chloride	34.0	35.0	34.0	52.0	38.8
Fluoride	8.8	7.7	8.0	6.0	7.6
pH (units)	8.8	8.8	8.9	9.0	8.9
Phosphates	250	75.0	100	80	126
Sulfates	1,200	1,800	170	530	925
Radionuclides (pCi/g)*					
Gross Alpha	16 ± 6.0	22 ± 7.0	21 ± 7.0	21 ± 7.0	20 ± 6.7
Gross Beta	34 ± 3.0	30 ± 3.0	35 ± 3.0	39 ± 3.0	35 ± 3.5
Radium 226	1.5 ± 0.2	1.4 ± 0.1	1.8 ± 0.2	1.9 ± 0.2	1.5 ± 0.2
Radium 228	1.2 ± 0.2	1.2 ± 0.1	1.3 ± 0.2	1.3 ± 0.2	1.2 ± 0.2

All units are mg/kg, except as noted.
Laboratory: AnalytiKEM, Inc.
Rock Hill, South Carolina
** Teledyne Isotopes*
Westwood, New Jersey
from 354R1547-92

Appendix A

Aquaterra Report Number R1646-92

Additional Sampling of Waste Ceramic Chip Tile
Mannington Ceramic Tile
Lexington, North Carolina
April 1, 1992

Tile Pile Closure
611024
February 11, 1997

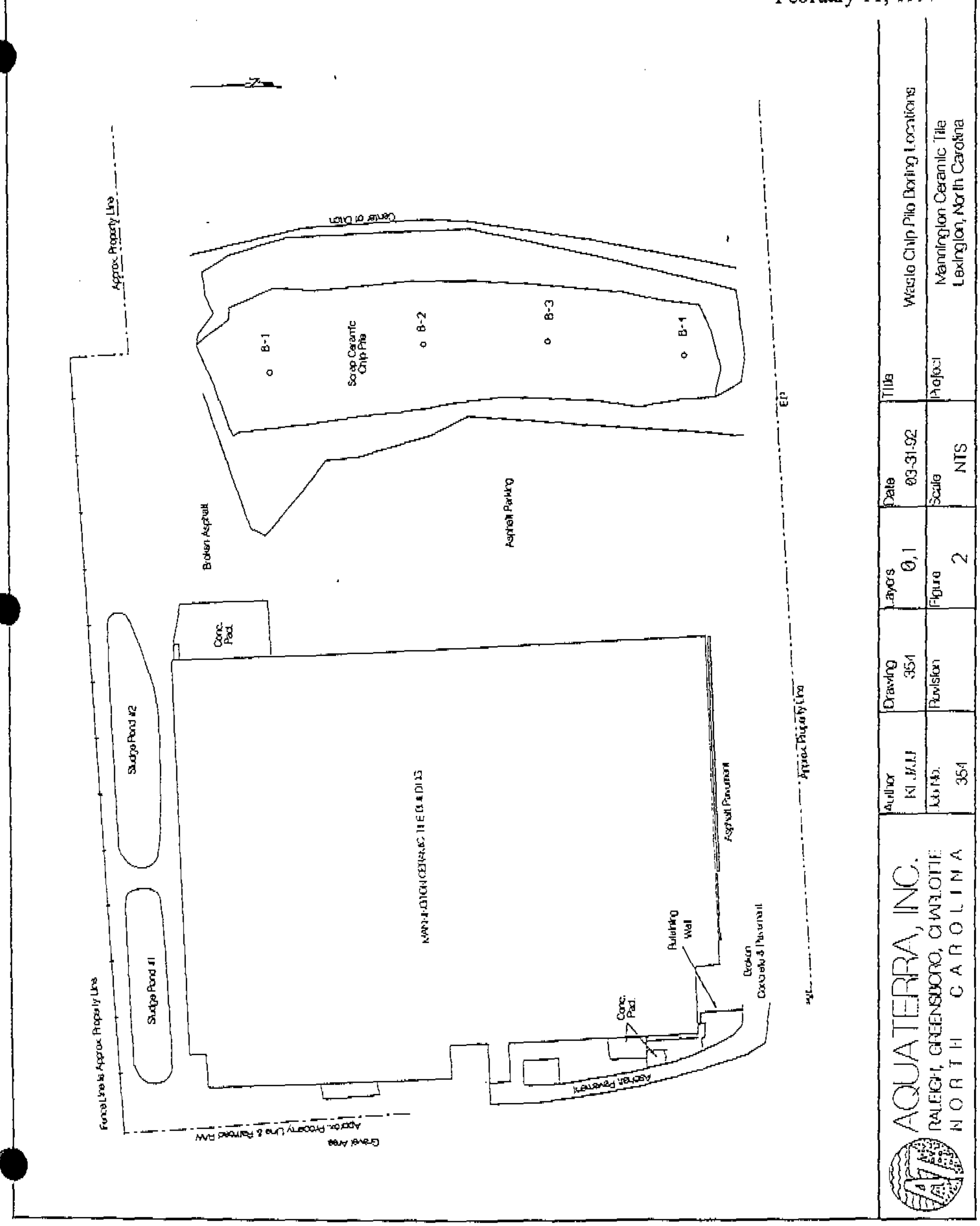


Table 1 **Summary of Waste Ceramic Chip Pile Analytical Data from Additional Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina**

Parameters	B-1	B-2	B-3	B-4
Volatile Organics				
Methylene Chloride	850	820	860	850
Semivolatile Organics				
Bis(2-ethylhexyl) phthalate	4600	1900	5300	3500
Formaldehyde	< 1100	< 1100	< 1100	< 1100

All units are μg/kg

Laboratory Analytical Laboratory: *AnalytiKEM, Inc.*
Rock Hill, South Carolina

from R1646-92

Appendix A

ENSCI Report

**Comprehensive Tile Pile Testing Program
And Treatability Study
Mannington Ceramic Tile
Lexington, North Carolina
October 20, 1992**

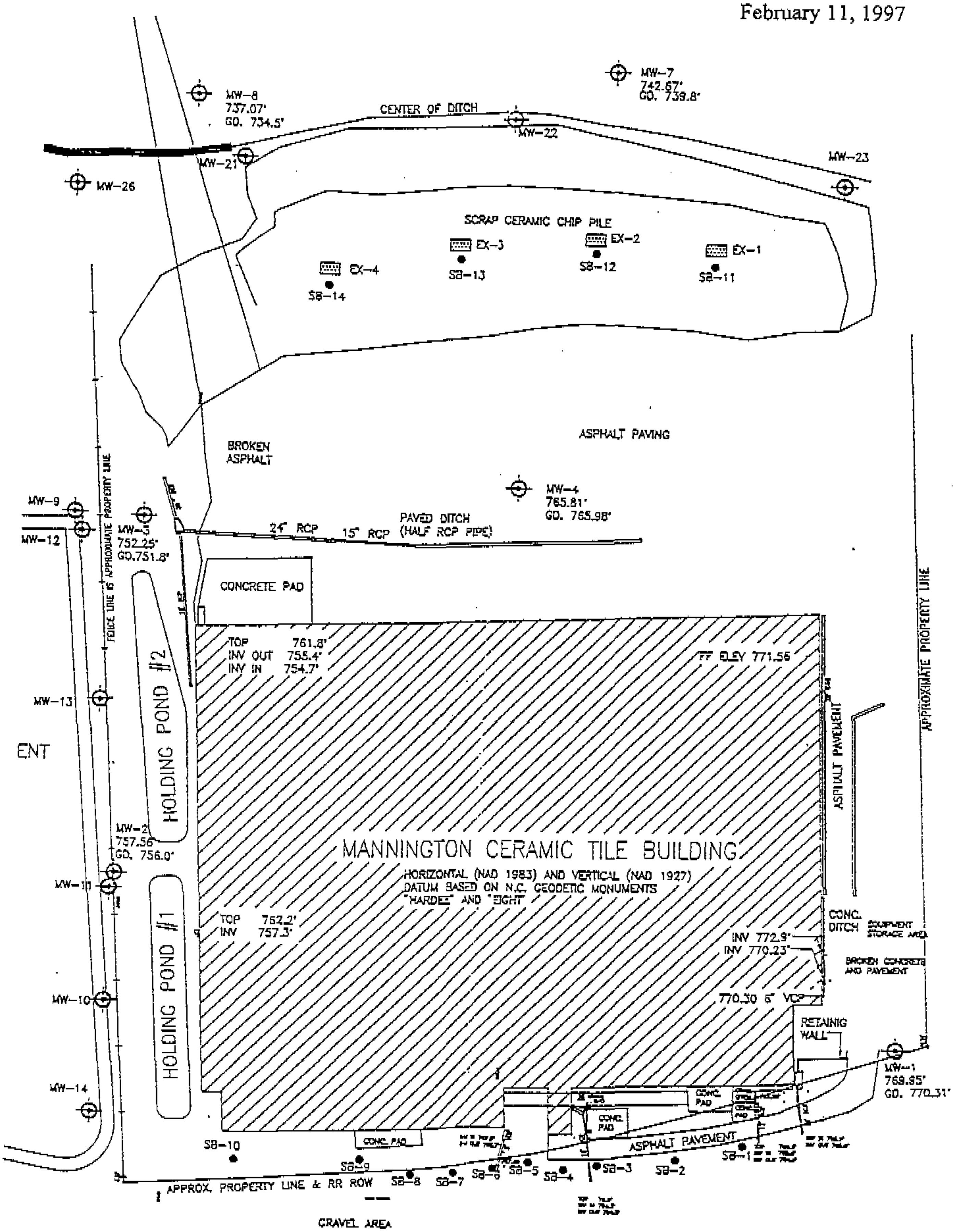

MW-7
742.67'
GD. 739.8'
MW-8
737.07'
GD. 734.5'
CENTER OF DITCH
MW-22
MW-21
MW-23
MW-26
SCRAP CERAMIC CHIP PILE
EX-3
EX-2
EX-1
EX-4
SB-13
SB-12
SB-11
SB-14
BROKEN ASPHALT
ASPHALT PAVING
MW-4
765.81'
GD. 765.98'
MW-9
MW-12
MW-3
752.25'
GD.751.8'
24" RCP
15" RCP
PAVED DITCH
(HALF RCP PIPE)
FENCE LINE 6' APPROXIMATE PROPERTY LINE
CONCRETE PAD
TOP 761.8'
INV OUT 755.4'
INV IN 754.7'
FF ELEV 771.56
HOLDING POND #2
MW-13
ENT
ASPHALT PAVEMENT
APPROXIMATE PROPERTY LINE
MW-2
757.56'
GD. 756.0'
MANNINGTON CERAMIC TILE BUILDING
HORIZONTAL (NAD 1983) AND VERTICAL (NAD 1927)
DATUM BASED ON N.C. GEODETIC MONUMENTS
"HARDEE" AND "EIGHT"
MW-11
HOLDING POND #1
TOP 762.2'
INV 757.3'
CONC. DITCH
EQUIPMENT STORAGE AREA
INV 772.9'
INV 770.23'
BROKEN CONCRETE AND PAVEMENT
MW-10
770.30 6" VCP
RETAINING WALL
MW-1
769.95'
GD. 770.31'
MW-14
CONC. PAD
ASPHALT PAVEMENT
SB-10
SB-9
SB-8
SB-7
SB-6
SB-5
SB-4
SB-3
SB-2
SB-1
APPROX. PROPERTY LINE & RR ROW
GRAVEL AREA

Table 1 **Results of Soil Analysis for Metals Using TCLP from Comprehensive Tile Pile Testing Program and Treatability Study, Mannington Ceramic Tile, Lexington, North Carolina**

Parameter	SB-13-40	SB-14-45
Arsenic	< 0.29	< 0.29*
Barium	< 5.2	< 5.2
Cadmium	< 0.050	< 0.050
Chromium	< 0.33	< 0.33
Lead	< 0.34	< 0.34
Mercury	< 0.018	< 0.018
Selenium	< 0.049	< 0.049
Silver	< 0.12	< 0.12

ENSCI October 20, 1992, Report

Appendix A

Terra Technologies Group Report

1995 Annual Groundwater Assessment Update Report
Former Wastewater Holding Ponds And Waste Ceramic Tile Pile
P & M Tile, Inc. Facility
Lexington, North Carolina
March 14, 1996

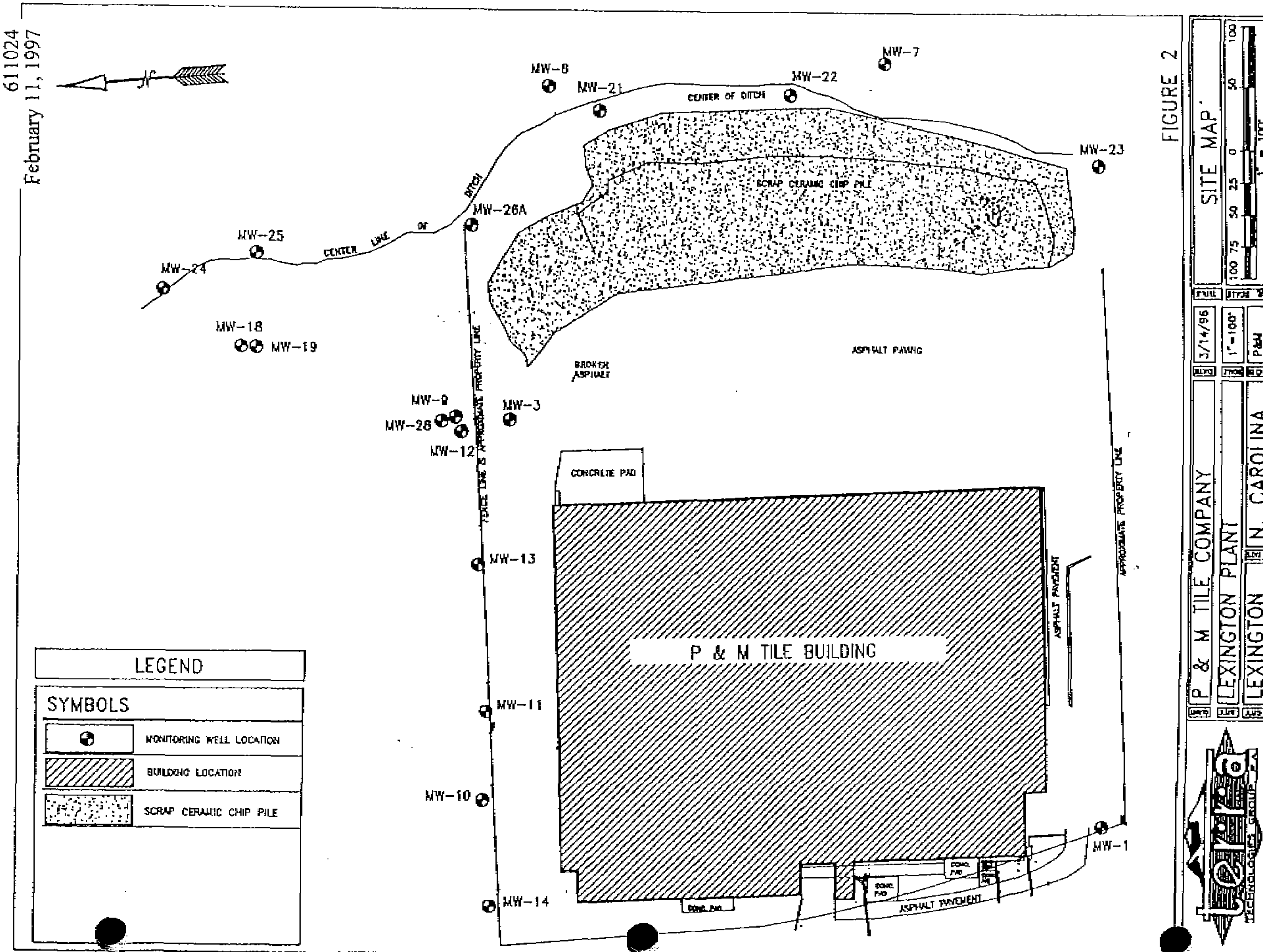

MW-7
MW-8
MW-21
MW-22
CENTER OF DITCH
MW-23
SCRAP CERAMIC CHIP PILE
CENTER LINE OF DITCH
MW-26A
MW-25
MW-24
MW-18
MW-19
BROKEN ASPHALT
ASPHALT PAVING
MW-9
MW-3
MW-28
MW-12
FENCE LINE IS APPROXIMATE PROPERTY LINE
CONCRETE PAD
APPROXIMATE PROPERTY LINE
ASPHALT PAVEMENT
MW-13
P & M TILE BUILDING
MW-11
MW-10
MW-1
MW-14
CONC. PAD
ASPHALT PAVEMENT
LEGEND
SYMBOLS
MONITORING WELL LOCATION
BUILDING LOCATION
SCRAP CERAMIC CHIP PILE
FIGURE 2
SITE MAP
100 75 50 25 0 50 100
1" = 100'
3/14/96
1"=100'
P&M
P & M TILE COMPANY
LEXINGTON PLANT
LEXINGTON N. CAROLINA

Table 4
1995 Year End Mean Values
Exceeding 15A NCAC 2L Standards

Group A Wells (4 testing events)

Parameter	Standards	MW-7	MW-21	MW-22	MW-23	MW-26A
Boron	0.32	NA	7.79	5.74	NA	47.73
Gross Beta	1.7*	NA	2.65	1.65	NA	19.48

Group B Wells (2 testing events)

Parameter	Standards	MW-9	MW-10	MW-12	MW-13	MW-25	MW-28
Cobalt	0.025	BDL	BDL	.164	.035	BDL	BDL
Nickel	0.01	0.086	BDL	.123	BDL	BDL	BDL

Group C Wells

No Exceedences

Group D Wells

No Testing Performed In 1995

Laboratory Did Not Meet Holding Times For December Samples

Group E Wells (4 testing events)

Parameter	Standards	MW-1	MW-21	MW-22	MW-26A
Boron	0.32	.296	7.79	5.74	47.73
Cobalt	0.005	.034**	BDL	BDL	BDL
Gross Beta	1.7*	3.28	3.48	1.65	19.48

*- 2L Standard is in pCi/L

**- Mean based on three sampling events in 1995

Table A-1

March 1995 Quarterly Sampling Event
Analytical Results Exceeding 15A NCAC 2L Ground Water Standards
Results Reported In mg/L

Parameter	Standards	MW-1	MW-21	MW-22	MW-23	MW-26A
Boron	0.32	.341	6.18	5.64	NA	80.8
NO3-N	10.0	NA	BDL	.875	11.0	BDL
Gross Beta	1.7*	3.7	3.2	1.4	NA	20.4

*2L Standard is in pCi/L
NA - No Analysis

Table A-2

June 1995 Quarterly Sampling Event
Analytical Results Exceeding 15A NCAC 2L Ground Water Standards
Results Reported In mg/L

Parameter	Standards	MW-1	MW-3	MW-7	MW-9	MW-10	MW-12	MW-12D
Boron	0.32	.202	NA	NA	NA	NA	NA	NA
Cadmium	0.005	BDL	BDL	BDL	BDL	BDL	**0.010**	**0.012**
Chromium	0.05	BDL	**0.066**	BDL	BDL	BDL	BDL	BDL
Cobalt	0.025	**.033**	BDL	BDL	BDL	BDL	0.210	0.244
Gross Beta	1.7*	**3.1**	NA	NA	NA	NA	NA	NA
Nickel	.01	BDL	BDL	BDL	**.078**	BDL	**0.162**	**0.194**
NO3-N	10.0	1.30	1.20	.5	2.80	4.10	2.90	5.30
Vanadium	0.02	BDL	BDL	**.024**	BDL	BDL	BDL	BDL

Table A-2 Continued

Parameter	Standards	MW-13	MW-21	MW-22	MW-23	MW-26A
Boron	0.32	NA	**9.72**	**6.20**	NA	**37.0**
Cadmium	0.005	BDL	BDL	BDL	**.010**	BDL
Chromium	0.05	BDL	BDL	BDL	BDL	BDL
Cobalt	0.025	**0.042**	BDL	BDL	BDL	BDL
Gross Beta	1.7*	NA	**3.3**	BDL	NA	**21.1**
Nickel	.01	BDL	BDL	BDL	BDL	BDL
NO3-N	10.0	2.00	BDL	0.600	6.40	0.120
Vanadium	0.02	BDL	BDL	BDL	BDL	BDL

*2L Standard is in pCi/L
NA - No Analysis

Table A-3

September 1995 Quarterly Sampling Event
Analytical Results Exceeding 15A NCAC 2L Ground Water Standards
Results Reported In mg/L

Parameter	Standards	MW-1	MW-7	MW-18	MW-21	MW-22	MW-23	MW-26A
Boron	0.32	0.31	NA	NA	11.2	4.89	NA	29.3
Cadmium	0.005	BDL	BDL	BDL	BDL	BDL	0.01	BDL
Gross Beta	1.7*	3.2	NA	NA	4.1	1.4	NA	21.8
Lead	0.015	0.0046	BDL	0.028	0.006	BDL	0.006	0.0034
Soluble Lead	0.015	NT	NT	BDL	NT	NT	NT	NT
Vanadium	0.02	BDL	0.024	BDL	BDL	BDL	BDL	BDL

*2L Standard is in pCi/L
NA - No Analysis

Table A-4

December 1995 Quarterly Sampling Event
Analytical Results Exceeding 15A NCAC 2L Ground Water Standards
Results Reported In mg/L

Parameter	Standards	MW-1	MW-9	MW-12	MW-21	MW-22	MW-25	MW-26A
Boron	0.32	.332	NA	NA	4.07	6.24	NA	43.8
Cadmium	0.005	BDL	.008	0.006	BDL	BDL	BDL	BDL
Cobalt	0.025	.036	BDL	0.117	BDL	BDL	BDL	BDL
Gross Alpha	15p Ci/L	1.9	7.0	16.5	BDL	3.5	1.9	5.6
Gross Beta	1.7*	3.1	NA	NA	BDL	3.8	NA	14.6
Sulfate	250	BDL	310	294	BDL	11.4	20.5	11.4
Titanium	0.1	BDL	BDL	BDL	BDL	BDL	0.178	BDL
Radium 226	5P Ci/L	1.0	1.0	1.0	.8	0.9	1.0	1.7
Radium 228	5P Ci/L	BDL	BDL	1.9	BDL	BDL	BDL	2.1

Table A-4 Continued

Parameter	Standards	MW-28
Boron	0.32	NA
Cadmium	0.005	BDL
Cobalt	0.025	BDL
Gross Alpha	15p Ci/L	4.3
Gross Beta	1.7*	NA
Sulfate	250	392
Titanium	0.1	BDL
Radium 226	5P Ci/L	3.4**
Radium 228	5P Ci/L	2.0**

*2L Standard is in pCi/L
** 2L Standard for radium 226 and radium 228 (combined): 5p Ci/L
NA - No Analysis

Appendix A

Terra Technologies Group Report

**Second Quarter 1996
Groundwater Assessment Report
Porcelanite, Inc.
Lexington, North Carolina
October 28, 1996**

Table 4
Groundwater Analytical Results

PARAMETER	15A NCAC 2L STD. (mg/L)	Monitoring Well Identification										
		MW#1	MW#3	MW#7	MW#8	MW#9	MW#10	MW#11	MW#12	MW#13	MW#14	MW#18
Boron	0.32	0.209	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Barium	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium	0.005	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.005	BDL	BDL	BDL
Chromium	0.05	BDL	BDL	0.028	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cobalt	0.025	0.037	BDL	BDL	BDL	BDL	BDL	BDL	0.099	0.032	BDL	BDL
Lead	0.015	BDL	0.003	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury	0.0011	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	0.10	BDL	BDL	BDL	BDL	0.037	BDL	BDL	0.070	BDL	BDL	BDL
Silver	0.018	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Praseodymium	0.050	BDL	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vanadium	0.020	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoride	2.0	BDL	BDL	BDL	BDL	0.430	2.60	BDL	0.380	0.10	0.100	BDL
Nitrate	10.0	1.10	1.73	0.925	0.060	3.20	1.88	1.78	2.45	1.35	5.88	1.60
Sulfate	250.0	BDL	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bromide	0.50	BDL	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gross Beta	0.5 pCi/L	3.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Note: Results are reported in mg/L; 15A NCAC 2L standards for each compound are as shown, if no standard has been codified then the method detection limit is considered the standard.

Table 4 (cont.)
Groundwater Analytical Results

PARAMETER	15A NCAC 2L STD (mg/L)	Monitoring Well Identification									
		MW#19	MW#21	MW#22	MW#23	MW#24	MW#25	MW#26A	MW#28	Travel Blank	Field Blank
Boron	0.32	NR	8.47	4.06	NR	NR	NR	52.2	NR	BDL	BDL
Barium	2.0	BDL	0.196	BDL	BDL	BDL	BDL	1.11	BDL	BDL	BDL
Cadmium	0.005	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	0.05	BDL	BDL	BDL	0.014	BDL	0.014	BDL	BDL	BDL	BDL
Cobalt	0.025	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	0.015	0.005	BDL	BDL	BDL	BDL	0.0045	BDL	0.003	BDL	BDL
Mercury	0.0011	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Silver	0.018	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Praseodymium	0.050	NR	BDL	BDL	NR	NR	NR	BDL	NR	BDL	BDL
Vanadium	0.020	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoride	2.0	BDL	BDL	BDL	BDL	BDL	BDL	0.17	0.10	BDL	BDL
Nitrate	10.0	1.67	BDL	1.18	0.100	1.63	1.33	0.140	0.760	1.67	0.160
Sulfate	250.0	NR	12.6	6.27	NR	NR	NR	BDL	NR	BDL	BDL
Bromide	0.50	NR	BDL	BDL	NR	NR	NR	BDL	NR	BDL	BDL
Gross Beta	0.5 pCi/L	NR	3.6	1.3	NR	NR	NR	14.6	NR	BDL	BDL

Note: Results are reported in mg/L; 15A NCAC 2L standards for each compound are as shown, if no standard has been codified then the method detection limit is considered the standard.

Appendix A

Terra Technologies Group Report

Third Quarter 1996
Groundwater Assessment Report
Porcelanite, Inc.
Lexington, North Carolina
November 4, 1996

Table 3
Groundwater Analytical Results
September 18, 1996

PARAMETER	15A NCAC 2L STDs (mg/L)	Monitoring Well Identification									
		MW#1	MW#7	MW#8	MW#18	MW#21	MW#22	MW#23	MW#26A	FIELD	TRIP
Boron	0.32	0.240	NR	NR	NR	6.34	BDL	NR	102.6	BDL	BDL
Barium	2.0	NR	BDL	0.131	BDL	0.200	BDL	BDL	0.973	BDL	BDL
Cadmium	0.005	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	0.05	NR	0.014	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cobalt	0.025	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	0.015	NR	0.0037	0.004	0.0032	0.0047	0.0034	0.005	0.0067	0.0041	BDL
Mercury	0.0011	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	0.10	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Silver	0.018	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Praseodymium	0.050	BDL	NR	NR	NR	BDL	BDL	NR	BDL	BDL	BDL
Vanadium	0.020	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoride	2.0	NR	0.190	0.140	BDL	0.120	0.140	BDL	1.80	BDL	BDL
Nitrate	10.0	NR	0.450	0.070	1.80	0.130	0.350	0.070	0.050	BDL	0.060
Sulfate	250.0	5.07	NR	NR	NR	10.8	BDL	NR	38.6	BDL	BDL
Bromide	0.50	BDL	NR	NR	NR	BDL	BDL	NR	BDL	BDL	BDL
Gross Beta	0.5 pCi/L	3.7	NR	NR	NR	2.3	1.1	NR	20.5	BDL	BDL

Note: Results are reported in mg/L; 15A NCAC 2L standards for each compound are as shown, If no standard has been codified then the method detection limit is considered the standard.

APPENDIX B

DECEMBER 1996 INVESTIGATION

Table 1 Analytical Results for Tile Pile Material Sampled on December 10, 1996, Porcelanite, Inc., Lexington, North Carolina

Parameter	SB-1-15′ (mg/kg)	SB-4-10′ (mg/kg)
Arsenic	< 1.03	< 1.10
Barium	659	401
Cadmium	0.905	1.84
Chromium	4.46	4.50
Lead	1090	17,400
Mercury	< 0.206	< 0.221
Selenium	< 1.03	< 1.10
Silver	< 1.03	< 1.10
Cobalt	14.5	9.84
Manganese	44.5	43.5
Nickel	14.3	2.10
Zinc	4900	3080
Titanium	120	77.2
Vanadium	15.8	11.2
Boron	426	90.8
Praseodymium	10.8	< 11.0
Bromide	< 10.0	< 10.0
Phenols	< 0.112	< 0.120
Sulfate	69.7	33.9
Nitrate	4.40	0.420
Gross alpha[2]	13.3	17.5
Gross beta[2]	14.9	16.7

1 = Less than or below detection limits
2 = Concentration in pCi/g (picocuries/gram)
< = All metals analyses are totals.

Aquaterra Job No. 3105801

611024.Dir

Table 2 Analytical Results for Native Soils Sampled on December 10, 1996, Porcelanite, Inc., Lexington, North Carolina

Parameter	SB-5-2.5 (mg/kg)	SB-6-2.5 (mg/kg)	HA-1 (mg/kg)	HA-2 (mg/kg)	HA-3 (mg/kg)	HA-4 (mg/kg)	HA-5 (mg/kg)
Arsenic	< 1.16	< 1.34	< 1.48	< 1.12	< 1.10	< 1.34	< 1.05
Barium	27.4	155	294	67.7	176	163	48.4
Cadmium	4.60	4.18	2.32	2.71	< 0.221	1.67	0.283
Chromium	20.8	29.0	31.2	55.1	9.12	122	1.08
Lead	20.1	19.7	501	55.0	7.54	12.1	18.8
Mercury	< 0.232	< 0.268	< 0.296	< 0.224	< 0.221	0.338	< 0.211
Selenium	< 1.16	< 1.34	< 1.48	< 1.12	< 1.10	< 1.34	< 1.05
Silver	< 1.16	< 1.34	< 1.48	< 1.12	< 1.10	< 1.34	< 1.05
Cobalt	7.90	1.88	17.7	17.1	5.50	8.60	4.22
Manganese	273	29.2	307	589	15.4	56.6	353
Nickel	6.14	2.95	7.98	5.94	2.64	12.0	3.27
Zinc	45.5	33.7	1,430	104	22.5	42.7	27.3
Titanium	418	19.1	312	232	33.8	738	67.7
Vanadium	131	736	59.3	79.5	29.7	187	7.03
Boron	127	104	60.8	59.4	< 11.0	51.5	< 10.5
Praseodymium	< 11.6	< 13.4	23.1	< 11.2	12.5	18.1	< 10.5
Bromide	< 10.0	< 10.0	NR	< 10.0	NR	NR	NR
Phenols	< 0.122	< 0.146	< 0.161	< 0.122	< 0.119	< 0.146	< 0.115
Sulfate	173	205	285	190	241	95.1	94.0
Nitrate	0.953	0.893	2.16	2.48	2.87	2.47	0.713
Gross alpha[2]	7.2	NR	NR	NR	NR	7.0	12.4
Gross beta[2]	8.5	NR	NR	NR	NR	4.1	48.5

1 = All metals analyses are totals
2 = Concentration in pCi/g (picocuries/gram)
< = Less than or below detection limits
NR = Not requested

Aquaterra Job No. 3105801 611024.Dir

Table 3 TCLP Analytical Results for Composite Tile Material Sampled on December 10, 1996, Porcelanite, Inc., Lexington, North Carolina

Parameter	Comp-1 Chip Pile
Arsenic	< 0.010
Barium	1.87
Cadmium	0.011
Chromium	0.025
Lead	187
Mercury	< 0.0004
Selenium	< 0.100
Silver	< 0.010

< = Less than or below detection limits
Results in mg/L

Aquaterra Job No. 3105801

611024.Dir

Boring /Well Construction Log

Well Construction Permit Number N/A

Aquaterra, Inc.

I. D. Number	*SB-1*	**Purpose**	*soil/tile samples*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*Engineering Tectonics*
Project No.	*3105801*	**Registration No.**	
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*Ronnie*
Start Date	*12/10/96* **Complete Date** *12/10/96*	**Equipment**	*Mobil B-50*

Drilling Method

Comments *6.25" Hollow stem augers*

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*6.25"*	*0-15'*	*white clay tile chips, dry*	*N/A*
Riser Type	*N/A*	*15-30'*	*white clay tile chips, dry / brown and tan*	*N/A*
Diameter	*N/A*		*sandy clay w/ green lenses, moist*	*N/A*
Screen Type	*N/A*		*tile ends ~ 30'*	*N/A*
Diameter	*N/A*			*N/A*
Riser Interval	*N/A*		*boring terminated @ 30'*	*N/A*
Screen Interval	*N/A*			
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*30'*			
R.P. Elevation				
Datum				
Water Level Information				
Date	**W.L. Below R.P.**			

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number *N/A* *Aquaterra, Inc.*

I. D. Number	*SB-2*	**Purpose**	*soil/tile samples*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*Engineering Tectonics*
Project No.	*3105801*	**Registration No.**	
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*Ronnie*
Start Date	*12/10/96* **Complete Date** *12/10/96*	**Equipment**	*Mobil B-50*

Drilling Method *6.25" Hollow Stem Auger*

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*6.25"*	*0-10'*	*white clay tile chips, dry*	
Riser Type	*N/A*	*10-15'*	*white clay tile chips, moist*	
Diameter	*N/A*	*15'*	*brown tan sandy clay moist*	
Screen Type	*N/A*			
Diameter	*N/A*		*boring terminated @ 15'*	
Riser Interval	*N/A*			
Screen Interval	*N/A*			
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*15'*			
R.P. Elevation				
Datum				
Water Level Information				
Date	**W.L. Below R.P.**			

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number N/A **Aquaterra, Inc.**

I. D. Number	SB-3	**Purpose**	soil/tile samples
Project Name	Porcelanite Tile Inc.	**Contractor**	Engineering Tectonics
Project No.	3105801	**Registration No.**	
Geologist	Cyrus F. Parker, Jr.	**Driller**	Ronnie
Start Date	12/10/96 **Complete Date** 12/10/96	**Equipment**	Mobil B-50

Drilling Method 6.25" Hollow Stem Auger

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	6.25"	0-5'	white clay tiles, dry	
Riser Type	N/A	5-10'	white clay tiles, moist	
Diameter	N/A	10-15'	clay tiles (chips and powder) w/ brown tan sandy	
Screen Type	N/A		clay	
Diameter	N/A	15-20'	wet clay powder w/ brown sandy clay	
Riser Interval	N/A	20-25'	white and tan clayey sand, mica (saprolite) moist	
Screen Interval	N/A			
Slot Size	N/A		boring terminated @ 25'	
Grout Type	N/A			
Interval	N/A			
Bentonite Type	N/A			
Interval	N/A			
Filter Pack	N/A			
Interval	N/A			
Total Depth	25'			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point W.L. = Water Level TBM = Temporary Benchmark MSL = Mean Sea Level

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number NA

Aquaterra, Inc.

I. D. Number	SB-4	**Purpose**	soil/tile samples
Project Name	Porcelanite Tile Inc.	**Contractor**	Engineering Tectonics
Project No.	3105801	**Registration No.**	
Geologist	Cyrus F. Parker, Jr.	**Driller**	Ronnie
Start Date	12/10/96 **Complete Date** 12/10/96	**Equipment**	Mobil B-50

Drilling Method 6.25" hollow stem auger

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	6.25"	0-5'	white to gray clay tile chips and powder, moist	
Riser Type	N/A	5-10'	white clay tile chips, cardboard joint @ 11'	
Diameter	N/A	10-18'	white clay tile chips, moist	
Screen Type	N/A	18-20'	brown/ tan clayey sand, wet	
Diameter	N/A			
Riser Interval	N/A		boring terminated @ 20'	
Screen Interval	N/A			
Slot Size	N/A			
Grout Type	N/A			
Interval	N/A			
Bentonite Type	N/A			
Interval	N/A			
Filter Pack	N/A			
Interval	N/A			
Total Depth	20'			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number NA *Aquaterra, Inc.*

I. D. Number	SB-5	**Purpose**	soil/tile samples
Project Name	Porcelanite Tile Inc.	**Contractor**	Engineering Tectonics
Project No.	3105801	**Registration No.**	
Geologist	Cyrus F. Parker, Jr.	**Driller**	Ronnie
Start Date	12/10/96 **Complete Date** 12/10/96	**Equipment**	Mobil B-50

Drilling Method 6.25" hollow stem auger

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	SPT blows per foot
Borehole Dia.	6.25"	0-2.5'	red & gray clay w/ dark green lenses, wet	1-2-8-13
Riser Type	N/A	2.5-5'	gray green clay w/ quartz pebbles & brown/red	9-5-7-9
Diameter	N/A		sand w/ mica (saprolite)	
Screen Type	N/A	5-10'	rust colored saprolite, high mica and quartz content	16-26-50/6
Diameter	N/A	10-15'	rock chips similar to gneiss, high mica and quartz	50/5
Riser Interval	N/A		content	
Screen Interval	N/A			
Slot Size	N/A		Auger Refusal @ 16.5'	
Grout Type	N/A			
Interval	N/A			
Bentonite Type	N/A			
Interval	N/A			
Filter Pack	N/A			
Interval	N/A			
Total Depth	16.5'			
R.P. Elevation				
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point W.L. = Water Level TBM = Temporary Benchmark MSL = Mean Sea Level

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*SB-5*	**Purpose**	*soil/tile samples*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*Engineering Tectonics*
Project No.	*3105801*	**Registration No.**	
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*Ronnie*
Start Date	*12/10/96* **Complete Date** *12/10/96*	**Equipment**	*Mobil B-50*

Drilling Method *6.25" hollow stem auger*

Comments

Well Construction Information		**Depth From - To**	**Soil / Rock Description / Comments**	**SPT blows per foot**
Borehole Dia.	*6.25"*	*0-2.5'*	*red clay w/ roots, moist*	*4-3-3-8*
Riser Type	*N/A*	*2.5-5'*	*red, tan, gray, & green clays w/ roots & small rocks*	*4-5-7-9*
Diameter	*N/A*	*5-10'*	*red clay w/ tan clay lenses, green micacious*	*5-8-11-14*
Screen Type	*N/A*		*saprolite w/ rust staining*	
Diameter	*N/A*	*10-15'*	*green micacious saprolite*	*50/4*
Riser Interval	*N/A*			
Screen Interval	*N/A*		*Auger Refusal @ 16'*	
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*16'*			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*HA-1*	**Purpose**	*soil sample*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*NA*
Project No.	*3105801*	**Registration No.**	*NA*
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*NA*
Start Date	*12/11/96* **Complete Date** *12/11/96*	**Equipment**	*Hand Auger*

Drilling Method *3.25" Hand Auger*

Comments

Well Construction Information		**Depth From - To**	**Soil / Rock Description / Comments**	**FID / PID (ppm) @ Depth (ft.)**
Borehole Dia.	*3.25"*	*0-1'*	*Red sandy clay moist*	
Riser Type	*N/A*		*augered down to 1.5' and water immediately entered*	
Diameter	*N/A*		*the hole*	
Screen Type	*N/A*			
Diameter	*N/A*		*boring terminated @ 1.5'*	
Riser Interval	*N/A*			
Screen Interval	*N/A*			
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*1.5'*			
R.P. Elevation				
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*HA-2*	**Purpose**	*soil sample*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*NA*
Project No.	*3105801*	**Registration No.**	*NA*
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*NA*
Start Date	*12/10/96* **Complete Date** *12/10/96*	**Equipment**	*Hand Auger*

Drilling Method *3.25" Hand Auger*

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	*3.25"*	*0-1'*	*red silty clay w/ roots*	
Riser Type	*N/A*	*1-4'*	*red silty clay, moist*	
Diameter	*N/A*			
Screen Type	*N/A*			
Diameter	*N/A*			
Riser Interval	*N/A*			
Screen Interval	*N/A*			
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*4'*			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number NA *Aquaterra, Inc.*

I. D. Number	*HA-3*	**Purpose**	*soil sample*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*NA*
Project No.	*3105801*	**Registration No.**	*NA*
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*NA*
Start Date	*12/11/96* **Complete Date** *12/11/96*	**Equipment**	*Hand Auger*

Drilling Method *3.25" Hand Auger*

Comments

Well Construction Information		**Depth From - To**	**Soil / Rock Description / Comments**	**FID / PID (ppm) @ Depth (ft.)**
Borehole Dia.	*3.25"*	*0-2'*	*Red brown sandy clay*	
Riser Type	*N/A*	*2-3'*	*tan sandy & silty clay*	
Diameter	*N/A*	*3-4'*	*tan clay w/ gray lenses*	
Screen Type	*N/A*	*4-5'*	*gray clay*	
Diameter	*N/A*			
Riser Interval	*N/A*		*boring terminated @ 5'*	
Screen Interval	*N/A*			
Slot Size	*N/A*			
Grout Type	*N/A*			
Interval	*N/A*			
Bentonite Type	*N/A*			
Interval	*N/A*			
Filter Pack	*N/A*			
Interval	*N/A*			
Total Depth	*5'*			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number NA **Aquaterra, Inc.**

I. D. Number	*HA-4*	**Purpose**	*soil sample*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*NA*
Project No.	*3105801*	**Registration No.**	*NA*
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*NA*
Start Date	*12/11/96* **Complete Date** *12/11/96*	**Equipment**	*Hand Auger*

Drilling Method *3.25" Hand Auger*

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	3.25"	0-4'	red clay, dry	
Riser Type	N/A	4-5'	red & tan clay w/ yellow sandy lenses dry	
Diameter	N/A	5-6'	gray clay, dry	
Screen Type	N/A	6-7'	tan & gray clay	
Diameter	N/A			
Riser Interval	N/A		boring terminated @ 7'	
Screen Interval	N/A			
Slot Size	N/A			
Grout Type	N/A			
Interval	N/A			
Bentonite Type	N/A			
Interval	N/A			
Filter Pack	N/A			
Interval	N/A			
Total Depth	7'			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	W.L. Below R.P.	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

Boring /Well Construction Log

Well Construction Permit Number *NA* *Aquaterra, Inc.*

I. D. Number	*HA-5*	**Purpose**	*soil sample*
Project Name	*Porcelanite Tile Inc.*	**Contractor**	*NA*
Project No.	*3105801*	**Registration No.**	*NA*
Geologist	*Cyrus F. Parker, Jr.*	**Driller**	*NA*
Start Date	*12/11/96* **Complete Date** *12/11/96*	**Equipment**	*Hand Auger*

Drilling Method *3.25" Hand Auger*

Comments

Well Construction Information		Depth From - To	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
Borehole Dia.	3.25"	0-2"	red clay	
Riser Type	N/A	2"-7'	red clayey sand, dry	
Diameter	N/A			
Screen Type	N/A		boring terminated @ 7'	
Diameter	N/A			
Riser Interval	N/A			
Screen Interval	N/A			
Slot Size	N/A			
Grout Type	N/A			
Interval	N/A			
Bentonite Type	N/A			
Interval	N/A			
Filter Pack	N/A			
Interval	N/A			
Total Depth	7'			
R.P. Elevation		-		
Datum		-		
Water Level Information		-		
Date	**W.L. Below R.P.**	-		
		-		
		-		
		-		

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Refer to Standard Well Construction Schematic Type II - Style 1.

RESEARCH & ANALYTICAL LABORATORIES, INC.

Analytical/Process Consultations

RESEARCH & ANALYTICAL LABS.
SIDNEY L. CHAMPION
NC #34
DIRECTOR
CERTIFIED ANALYSIS

Analytical Results for Selected Parameters & Sampling Locations for Project Identified as Porcelanite Tile, (An Aquaterra Project #3105801, 10-11 December 1996)

Parameter	SB-1-15 (mg/kg)	SB-4-10 (mg/kg)	SB-5-2.5 (mg/kg)	SB-6-2.5 (mg/kg)	HA-2 (mg/kg)	HA-1 (mg/kg)	HA-3 (mg/kg)	HA-4 (mk/kg)	HA-5 (mg/kg)
Arsenic, Tot.	<1.03	<1.10	<1.16	<1.34	<1.12	<1.48	<1.10	<1.34	<1.05
Barium, Tot.	659	401	27.4	155	67.7	294	176	163	48.4
Cadmium, Tot.	0.905	1.84	4.60	4.18	2.71	2.32	<0.221	1.67	0.283
Chromium, Tot.	4.46	4.50	20.8	29.0	55.1	31.2	9.12	122	1.08
Lead, Tot.	1090	17,400	20.1	19.7	55.0	501	7.54	12.1	18.8
Mercury, Tot.	<0.206	<0.221	<0.232	<0.268	<0.224	<0.296	<0.221	0.339	<0.211
Selenium, Tot.	<1.03	<1.10	<1.16	<1.34	<1.12	<1.48	<1.10	<1.34	<1.05
Silver, Tot.	<1.03	<1.10	<1.16	<1.34	<1.12	<1.48	<1.10	<1.34	<1.05
Cobalt, Tot.	14.5	9.84	7.90	1.88	17.1	17.7	5.50	8.60	4.22
Manganese, Tot.	44.5	43.5	273	29.2	589	307	15.4	56.6	353
Nickel, Tot.	14.3	2.10	6.14	2.95	5.94	7.98	2.64	12.0	3.27
Zinc, Tot.	4900	3080	45.5	33.7	104	1430	22.5	42.7	27.3
Titanium, Tot.	120	77.2	418	19.1	232	312	33.8	738	67.7
Vanadium, Tot.	15.8	11.2	131	736	79.5	59.3	29.7	197	7.03
Boron, Tot.	426	90.9	127	104	59.4	60.8	<11.0	51.5	<10.5
Praseodymium, Tot.	10.9	<11.0	<11.6	<13.4	<11.2	23.1	12.5	18.1	<10.5
Bromide	<10.0	<10.0	<10.0	<10.0	<10.0	NR	NR	NR	NR
Phenols	<0.112	<0.120	<0.122	<0.146	<0.122	<0.161	<0.119	<0.146	<0.115
Sulfate	59.7	33.9	173	205	190	265	241	95.1	94.0
Nitrate	4.40	0.420	0.953	0.893	2.48	2.16	2.87	2.47	0.713
Gross alpha	13.3	17.5	7.2	NR	NR	NR	NR	7.0	12.4
Gross beta	14.9	16.7	8.5	NR	NR	NR	NR	4.1	46.5
Sample Number	288731/32	288737/38	288739/40	288741/42	288743/44	288849	288850	288851/52	288853/54
Sample Date	12/10/96	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96	12/11/96	12/11/96
Sample Time	0830	1025	1115	1155	1320	1200	1235	1324	1404

mg/kg = milligram per kilogram = parts per million
< = less than or below detection limits
NR = Not Requested

RESEARCH & ANALYTICAL LABORATORIES, INC.

Analytical/Process Consultations

RESEARCH & ANALYTICAL LABS.
SIDNEY L. CHAMPION
NC #34
DIRECTOR
CERTIFIED ANALYSIS

21 January 1997

Aquaterra, Inc.
4901 Waters Edge Drive
Raleigh, North Carolina 27606

Attention: Mr. Bryson Trexler

Project Number: 3105801
Project Name: Porcelanite Tile

Parameter	Comp-1, Chip Pile(mg/l)
Arsenic, TCLP	<0.010
Barium, TCLP	1.87
Cadmium, TCLP	0.011
Chromium, TCLP	0.025
Lead, TCLP	187
Mercury, TCLP	<0.0004
Selenium, TCLP	<0.100
Silver, TCLP	<0.010
Sample Number	288745
Sample Date	12/10/96
Sample Time	1330

mg/l = milligrams per liter = parts per million
TCLP = Toxicity Characcteristic Leachate Procedure
< = less than or below detection limits

Aquamuc. J11 +

aquaterra

A GREAT LAKES CHEMICAL CORPORATION COMPANY

CHAIN-OF-CUSTODY RECORD
ANALYTICAL REQUEST

№ 4927

PROJECT NAME: Porcelanite Tile
REPORT TO: Bryson Trexler
TURNAROUND: ☐ NORMAL ☐ 5-DAY ☒ OTHER (SPECIFY): 48 hour Turnaround For Nitrates

ADDRESS: Lexington, North Carolina
AFFILIATION/LOCATION: Aquaterra Raleigh
REQUESTED DUE DATE:

JOB NUMBER: 3105801
PHONE: 919-859-9987
P.O. # / BILLING REFERENCE: RNC 10552

SAMPLED BY (PRINT): CYRUS F. PARKER, Jr.

SAMPLER'S SIGNATURE: Cyrus F. Parker, Jr.

SAMPLE ID	SAMPLE LOCATION	DATE	TIME	MATRIX WATER	MATRIX SOIL	MATRIX OTHER	TOTAL	UNPRESERVED	H_2SO_4	HNO_3	HCL	NaOH	pH < 2 OR > 12 Y	pH < 2 OR > 12 N	Arsenic, Barium, Cadmium	Chromium, Pb, Hg, Selenium	Silver, Cobalt, Manganese	Ni, Zinc, Titanium	Vanadium, Boron	Praseodymium, Bromide	Phenols, Sulfates, Nitrates	Gross Alpha	Gross Beta	TCLP Inorganics	REMARKS
SB-1-15	Chip Pile	12-10-96	830a			X	4	4		288731/732					X	X	X	X	X	X	X	X	X		
SB-2-10	Chip Pile	|	926a			X	4	4			733/734				X	X	X	X	X	X	X	X	X		
SB-3-5	Chip Pile	|	940a			X	4	4			735/736				X	X	X	X	X	X	X	X	X		~~Aquaterra~~ Canceled
SB-4-10	Chip Pile	|	1025a			X	4	4			737/738				X	X	X	X	X	X	X	X	X		~~Aquaterra~~
SB-5-2.5	Toe Chip Pile	|	1115a		X		4	4			739/740				X	X	X	X	X	X	X	X	X		
SB-6-2.5	Toe Chip Pile	|	1155a		X		4	4			741/742				X	X	X	X	X	X	X				
HA-2	Toe Chip Pile	|	120p		X		4	4			743/744				X	X	X	X	X	X	X				
Comp-1	Chip Pile	|	130p			X	4	4			745/746													X	

ADDITIONAL COMMENTS:
Samples Cooled w/ICE

CY ice

RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME	AIRBILL #
Cyrus Parker / Aquaterra	KW	4:10	12-10-96	

WHITE-LABORATORY REPORT COPY / PINK-LABORATORY COPY / CANARY-SAMPLER'S COPY

aquaterra
A GREAT LAKES CHEMICAL CORPORATION COMPANY

CHAIN-OF-CUSTODY RECORD
ANALYTICAL REQUEST
№ 4942

PROJECT NAME: Porcelanite Tile Inc.
REPORT TO: Bryson Trexler
TURNAROUND: [X] NORMAL [ ] 5-DAY [X] OTHER (SPECIFY): 48 hour Turnaround On Nitrates

ADDRESS: Lexington, NC
AFFILIATION/LOCATION: Aquaterra, Raleigh
REQUESTED DUE DATE:

JOB NUMBER: 3105801
PHONE: 919 859-9987
P.O. # / BILLING REFERENCE: RNC 10552

SAMPLED BY (PRINT): Cyrus F. Parker, Jr.

SAMPLER'S SIGNATURE: Cyrus F. Parker Jr.

	SAMPLE ID	SAMPLE LOCATION	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	NUMBER OF CONTAINERS: TOTAL	UNPRESERVED	H_2SO_4	HNO_3	HCL	NaOH	pH < 2 OR > 12: Y	N	Arsenic, Barium, Cadmium	Chromium, Pb, Hg, Selenium	Silver, Cobalt, Manganese	Ni, Zinc, [illegible] Titanium	Vanadium, Boron	Rascodymium	Phenols, Sulfates, Nitrates	Gross alpha	Gross Beta		REMARKS
78849	HA-1	NW E of Z6a	12-11-96	1200 P		X		4	4							X	X	X	X	X	X	X				
850	HA-3	NW E of #7		1235 P		X		4	4							X	X	X	X	X	X	X				
851/852	HA-4	Near Hwy 8		124 P		X		4	4							X	X	X	X	X	X	X	X	X		
853/854	HA-5	E of Building		204 P		X		4	4							X	X	X	X	X	X	X	X	X		

ADDITIONAL COMMENTS: Samples Cooled W/ ICE

RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME	AIRBILL #
Cyrus Parker / Aquaterra	[illegible signature]	12/11/96	428 P	

NCDENR
North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director | **Division of Waste Management** | Michael F. Easley, Governor
William G. Ross Jr., Secretary

March 14, 2005

Tony Shaw
Environmental/Safety Manager
Porcelanite, Inc.
1327 Lincoln Drive
High Point, North Carolina 27260-9945

Re: Ceramic Tile Pile Closure Certification
EPA ID # NCD 986 181 451

Dear Tony Shaw:

The Hazardous Waste Section received the closure certification from the independent professional engineer and the owner/operator on May 13, 2004 that closure activities for the Ceramic Tile Pile was completed according to the approved closure plan. Additionally, Mr. Ernest Lawrence of the Section conducted a closure inspection on August 30, 2004, and found the facility to be in compliance with the approved closure plan.

Your certification of partial closure for the facility is accepted. A copy of this letter will be forwarded to our Financial Unit. They will address details concerning financial assurance for closure under a separate letter.

If you have any questions, please contact Karim Pathan at (919) 733-4996 extension 228.

Sincerely,

Robert Glaser

Robert L. Glaser
Unit Supervisor
Facility Management Branch
Hazardous Waste Section

cc: Jon D. Johnston, US EPA, Region 4
Doug Holyfield
Jesse Wells
Jenny Lopp
Ernest Lawrence

Bud McCarty BMc
Robert Glaser RG
Karim Pathan KP

C:\mel\akp\porcelanite 6doc

ENSCI®
ENGINEERING GROUP, P.A.

CLOSURE REPORT FOR:

MANNINGTON CERAMIC TILE FACILITY

Closure Report For Settling Ponds

Mannington Ceramic Tile Facility
Lexington, North Carolina

Prepared for

Mannington Ceramic Tile

June 29, 1993

Augustus M. Mergenthaler, P.E.
President
ENSCI Engineering Group, P.A.

Al Cox
President and General Manager
Mannington Ceramic Tile

ENSCI Engineering Group, P.A.
1108 Old Thomasville Road
High Point, North Carolina 27260
(919) 883-7505

Table of Contents

Tables

Figures

Appendixes

1. Introduction

ENSCI Engineering Group, P.A. was contracted by Mannington Ceramic Tile to close two settling ponds at their Lexington, North Carolina facility (see **Figure 1**). The ponds were closed in place in accordance with ENSCI's May 1992 Revised Closure Plan for Settling Ponds and the provisions to the Closure Plan which were issued to Mannington by the North Carolina Department of Environment, Health & Natural Resources (DEHNR), Division of Solid Waste Management on August 13, 1992 (see Appendix A).

The two settling ponds were located at the northern part of the subject site (see **Figure 2**). They were oriented with the long dimension east-west, and they were bounded on the south side by the main building and on the north by the property line. The ponds consisted of residual sludge from process water, up to 21 feet thick.

2. Closure Methodology

Closure of the two settling ponds included the following activities:

- Stabilization of the settling pond sludge
- Installation of the cover system
- Decontamination of equipment

2.1 Sludge Stabilization

Sludge in the two settling ponds was stabilized between October 1992 and January 1993.

During all stabilization activities, a silt fence was in place on the downslope side of the ponds. Stabilization was performed by mechanically mixing the sludge with Type I portland cement in the ratio calculated during the treatability study (15 percent) such that long-term potential leachate generation is minimized. Sludge was first mixed with the portland cement using trackhoes. The sludge/portland mixture was then spread out within the settling ponds to a thickness of approximately 1 foot and mixed further with a tractor-mounted rototiller.

Prior to and during stabilization, soil samples were collected adjacent to the sludge (14 samples to assess the horizontal extent) and subadjacent to the sludge (6 samples to assess the vertical extent). The samples were analyzed using the methods indicated in the

DEHNR provisions (Appendix A). Based on the results of these samples, the areal and vertical extent of the sludge was determined (see **Figure 3**). All soil indicated to be contaminated was mixed with portland cement (and water, as necessary) to stabilize constituents as defined in the DEHNR provisions. Where possible, an additional 2 feet of "clean" soil on the periphery of contaminated soil was also mixed with portland cement and incorporated into the sludge ponds. Results of soil sample analyses are presented in **Table 1A-D**. Copies of the laboratory reports for these samples are included in Appendix B.

The sludge/portland mixture was tested periodically during stabilization for 16 metals (including the 8 primary RCRA metals) using the TCLP extraction method. Upon completion of stabilization 10 vertically composited samples (5 per pond) were collected and analyzed as specified in the DEHNR provisions. Results of analyses of the 10 vertically composited samples are presented in **Table 2A-C**. Copies of the original laboratory reports are included as Appendix C. An illustration of the extent of waste material is included as **Figure 4**.

2.2 Cover System

After stabilization was completed, the surface of the stabilized material was graded to a slope of 3 percent in preparation for the installation of the cover system. A survey was performed at this point and following placement of each layer of the cap to ensure that the slope remained constant at 3 percent at a minimum. Areas which did not meet this criterion were regraded following each survey event.

The cover system consisted of the following components:

- A layer of fill material
- CLAYMAX (geo-composite layer)
- A layer of fill material
- A flexible membrane liner
- A sand drainage layer
- Geotextile fabric
- Gravel base
- An asphalt roadway

Figure 3 presents a typical cross section of the cover and presents the areal extent of the cover system. The steps and procedures utilized to achieve the construction of the cover system are presented below.

2.2.1 Geo-Composite Layer (CLAYMAX)

Due to the increased elevation of the stabilized sludge caused by a greater sludge volume than previously estimated, and the limited availability of low hydraulic conductivity soil, the proposed system was modified. Instead, as provided for in the DEHNR provisions, CLAYMAX, a geo-composite layer with a hydraulic conductivity of 5 E-9 centimeters per second, was placed on top of the stabilized sludge (See Appendix D for Certifications).

2.2.2 Fill Material

A 6-inch lift of offsite borrow was placed above and below the Geo-Composite layer (CLAYMAX). The soil consisted of clay to clay loam textures. The soil was free of all organic materials, sod, peat, perishable, or other deleterious materials. No gravels or stones were allowed in the soil. The six-inch lift of soil was compacted by a minimum of six passes with sheeps foot and/or smooth roll compaction equipment and to a minimum density of 95 percent maximum dry density in accordance with DEHNR provisions. At no time was the minimum number of passes reduced. In accordance with ASTM D-698, the soil was compacted at no less than 2 percentage points below the optimum moisture content and no greater than 3 percentage points above the optimum moisture content. The results of density testing are summarized in Appendix E.

Upon completion of placement, the upper surface of the soil was compacted by three passes of a smooth drum roller to provide a smooth, flat surface for final grading. Grading was accomplished using a road motor grader. The soil was graded to a 3 percent slope in accordance with DEHNR provisions.

2.2.3 Flexible Membrane Liner

The flexible membrane liner (FML) consisted of a one piece of 30-mil very low density polyethylene (VLDPE) membrane material. The FML was placed in such a manner to provide a smooth, flat finished surface. All edges were anchored in a trench with minimum dimensions of 2 feet deep and 1 foot wide. Trench backfill materials consisted of fill materials mechanically tamped in place. The FML was placed as one piece, therefore there were no field seams. A copy of the Quality Control Certification is provided in Appendix F.

2.2.4 Sand Drainage Layer

A 12-inch layer of compacted sand was placed over the FML to provide drainage. The sand consisted of free-draining granular material with no more than 10 percent by weight passing the U.S. Standard No. 200 sieve. Results of a sieve analysis, presented in Appendix G, indicate that only 1.8 percent passed the #100 sieve. The sand was free of organic matter, sod, peat, perishable, or other deleterious materials. The hydraulic conductivity was calculated using the Hazen method to be between 4.1 X 10^{-2} to 8.2 X 10^{-2} centimeters per second. Sieve analysis and hydraulic conductivity calculations are included as Appendix G.

Placement of sand drain material was accomplished by end dumping at the edge of the excavation and pushing the sand over the membrane with a Caterpillar D-3 bulldozer. At no time was there less than 6 inches of material between the bottom of the tracks and the impervious membrane. No turning of equipment was allowed on the sand or fill material until there was a minimum depth of 1 foot of uncompacted sand over the membrane. No compaction equipment was allowed on the sand until there was a minimum of 14 inches of sand over the membrane. The sand layer was placed at a 3 percent slope minimum.

2.2.5 Geotextile

A geotextile fabric was placed over the drainage layer to prevent fines from the above layers from clogging the drainage layer. The geotextile was placed in such a manner to provide a smooth, flat finished surface. All field joints were overlapped a minimum of 1 foot. All edges were secured in an anchor trench with minimum dimensions of 1 foot deep and 6 inches wide. Trench backfill materials consisted of offsite materials mechanically tamped in place.

2.2.6 Gravel Base

A minimum of 6-inch aggregate base coarse was installed on the geotextile layer. Bags of sand were used to hold the geotextile in place prior to backfilling with gravel. Gravel was placed over the geotextile by end dumping and spreading over the fabric with a Caterpillar D-3 bulldozer. Following placement of the gravel, it was graded to a 3 percent slope. See Appendix H for Density Testing.

2.2.7 Asphalt Roadway

Asphalt was placed to a minimum thickness of 6 inches on the encapsulated material to allow for vehicular traffic. The elevations of the finished asphalt surface are presented in Figure 3. As illustrated, the asphalt layer was placed at the same minimum 3% or greater percent slope which was maintained throughout installation of the cover system. See Appendix I for Asphalt Density Testing.

2.2.8 Slopes

Erosion control Class A stone was used on all slopes. The slopes were placed a minimum of two horizontal to one vertical.

2.3 Decontamination of Closure Equipment

High-pressure steam and phosphate-free soap were used for onsite decontamination of equipment used for closure processes. A temporary decontamination pad was constructed on the parking area and lined with an impermeable plastic material to collect decontamination rinseate. This allowed rinseate to be collected without any runoff to unlined areas. The collected rinseate was pumped to drums and a tanker onsite. It was tested for the constituents specified in the DEHNR provisions to determine the appropriate means of disposal. Analytical results, included in Appendix J, indicated that the rinseate could be discharged to the Publicly Owned Treatment Works (POTW). Therefore, the water was discharged to the City of Lexington wastewater treatment system. The plastic liner on the decontamination pad was removed and disposed of at an offsite facility appropriately permitted to receive and dispose of these wastes. Two drums of debris containing Personal Protective Equipment (PPE) and plastic were disposed of at Laidlaw Environmental Services (see Appendix K for manifests).

3. Quality Assurance Testing

As specified in the May 1992 Closure Plan, several quality assurance tests were performed during sludge pond closure. These tests were performed to ensure the chemical quality, density, and hydraulic conductivity of borrow materials.

3.1 Chemical Quality

Borrow materials, which include fill soils were sampled and analyzed via SW-846 Methods 8240 and 8270 and the RCRA primary metals in TCLP extract. Results are presented in Appendix L. No contaminated borrow material was allowed onsite.

3.2 Density

All placement activities were continuously monitored by a qualified person familiar with soil placement and testing techniques and procedures. Onsite testing consisted of in-place density determination by the Nuclear Density Test method in accordance with ASTM D-3017.

Prior to placement activities, moisture/density tests were performed on representative samples of each material to be placed. The results of these tests were the basis for determining acceptable in-place density criteria.

Testing frequency was a minimum of one test per lift. Any in-place materials not meeting the minimum density requirements were recompacted. Upon completion of in-place testing, the hole created for the test were backfilled with commercially produced bentonite clay pellets, hydrated and hand compacted in a maximum of 2-inch lifts.

3.3 Hydraulic Conductivity

Due to the replacement of low hydraulic conductivity soils by the geotextile composite layer, no hydraulic conductivity testing was required. See Appendix D for certification of hydraulic conductivity of the geotextile composite layer.

4. Site Inspection

Site inspection by ENSCI Engineering Group, P.A. President Augustus M. Mergenthaler, a North Carolina Professional Engineer was performed at planned intervals during the project. **Table 3** illustrates the schedule of these inspections.

5. Certification of Closure

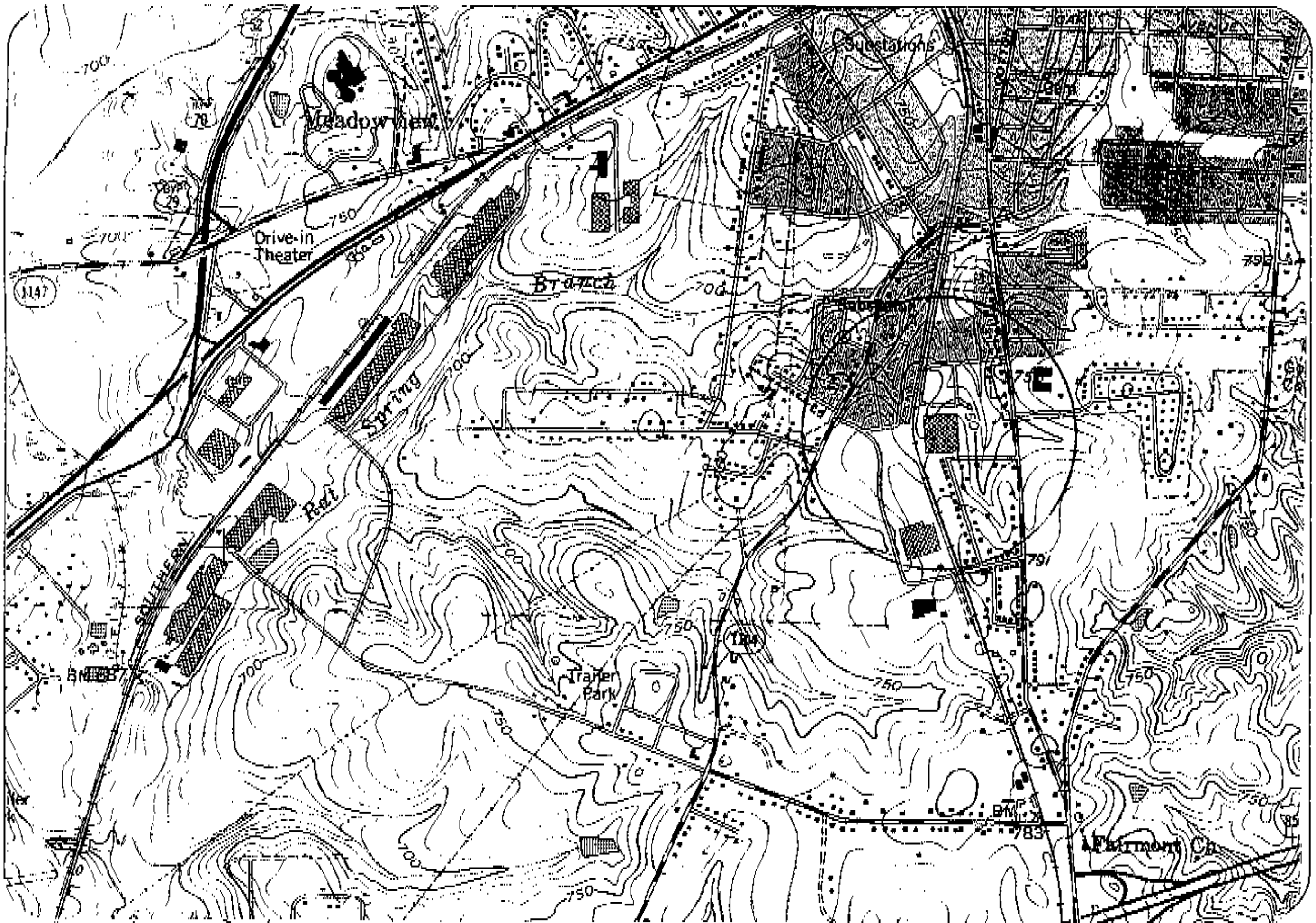
The Hazardous Waste Management Units (sludge ponds) have been closed in accordance with the specifications in the approved Closure Plan and The Provision To Mannington Ceramic Tile's Revised Closure Plan letter from Jerome H. Rhodes, Chief, Hazardous Waste Section dated August 13, 1992.

Augustus M. Mergenthaler, P.E.
President
ENSCI Engineering Group, P.A.

Al Cox
President & General Manager
Mannington Ceramic Tile

TOPOGRAPHICAL MAP

Mannington Ceramic Tile Company
Lexington, North Carolina



USGS LEXINGTON WEST 7.5 MINUTE QUADRANGLE

DATE OF MAP: 1950 PHOTOREVISION DATE: 1987

PHOTOREVISION DENOTED IN PURPLE (COLOR MAPS ONLY)

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET SCALE 1:24000

QUADRANGLE LOCATION

ROAD CLASSIFICATION

HEAVY-DUTY
MEDIUM-DUTY
LIGHT-DUTY
FOOT TRAIL
WGN & JEEP TRACK
UNIMPROVED ROAD

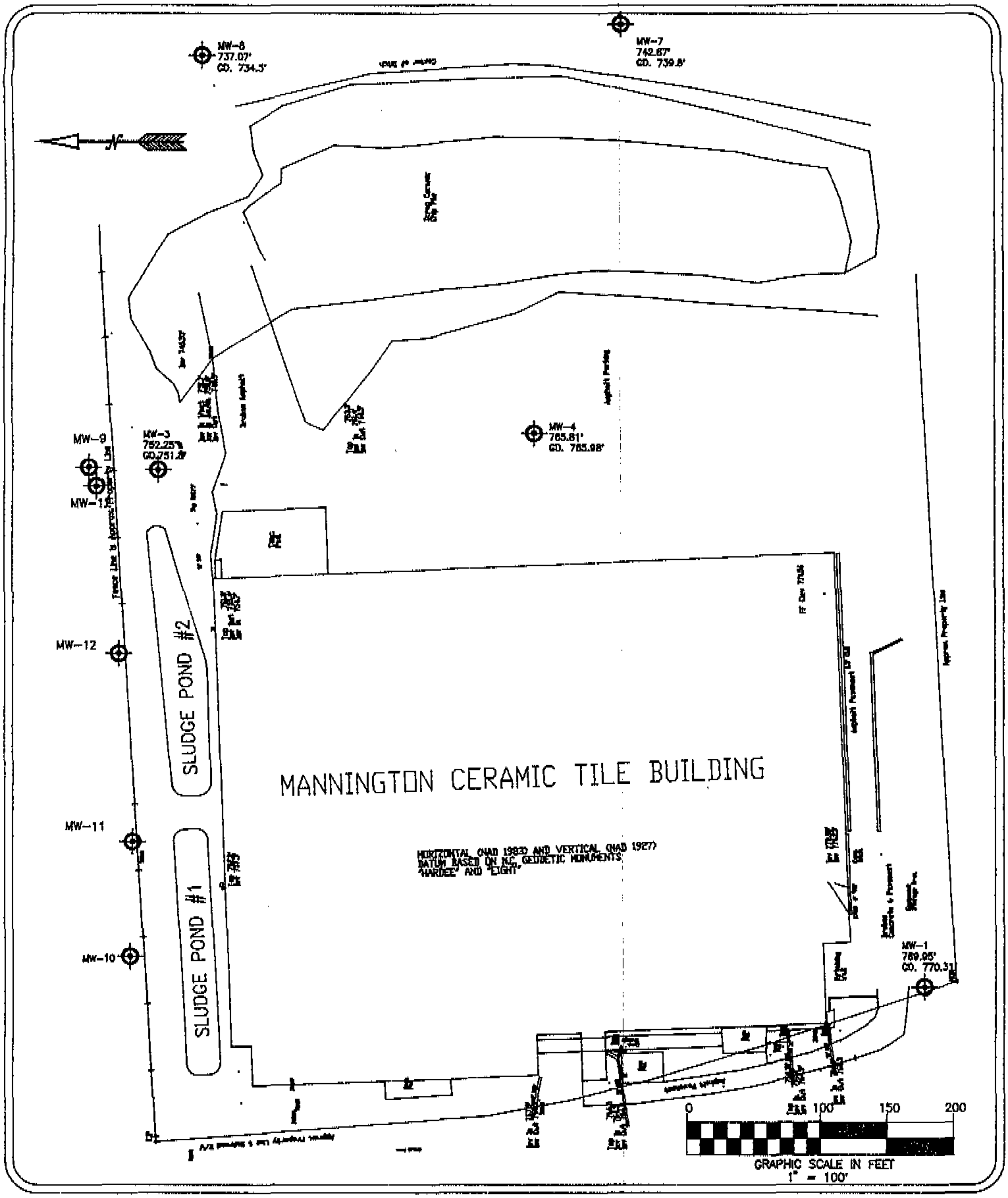
U.S. ROUTE
STATE ROUTE
INTERSTATE ROUTE

ENSCI® CORPORATION
HIGH POINT, NORTH CAROLINA

FOR: MANNINGTON CERAMIC TILE
CITY: LEXINGTON
STATE: NORTH CAROLINA

TITLE: TOPOGRAPHIC MAP

SCALE: 1"=2000'
DWN BY: DJ
DWG NAME: USGS-1
FIGURE: 1
DATE: 10/14/92
CK BY: CB
JOB #: 592032



ENCI® ENGINEERING GROUP, P.A.

MANNINGTON CERAMIC TILE COMPANY LEXINGTON, N.C.		FIGURE 2
DRAWN BY: DJ	DRAWG NM: MAN3	TITLE: FACILITY LAYOUT
CHECKED BY: AM	CB: AMM	

FIGURE 3

ES :

AP FOR THE STABILIZED WASTE MATERIAL IS
RUCTED AS FOLLOWS :

STE FILL CONSTRUCTED GENERALLY WITH 3% TOP SLOPE.

YMAX (JAMES CLEM CORP.) WITH HYDRAULIC CONDUCTIVITY
2x10(−9) cm/sec IS PLACED ABOVE THE WASTE. SOIL
N 6") IS PLACED ABOVE AND BELOW THE CLAYMAX.
SLOPE IS A MINIMUM 3%.

IDLINE @ VL(VLDPE), BY GUNDLE LINING SYSTEMS IS
MIL. FLEXIBLE MEMBRANE LINER (FML) CONSTRUCTED
A MINIMUM 3% SLOPE FOLLOWED BY:

ATER THAN OR EQUAL TO ONE (1) FOOT OF
MPACTED SAND FOR DRAINAGE WITH GREATER THAN
EQUAL TO 3% SLOPE AND A MINIMUM "K" OF 1.0 E−2
/sec, FOLLOWED BY:

VIRA GEOTEXTILE FABRIC IS LOCATED ABOVE THE
ND LAYER, FOLLOWED BY:

INIMUM OF 6" AND MAXIMUM 18" OF AGGREGATE BASE
URSE WAS PLACED IN 6" LIFTS UNDER THE ASPHALT.
A MINIMUM 3% SLOPE, FOLLOWED BY:

(6) INCHES OF ASPHALT WITH AT LEAST 3% SLOPE.

ENSCI®
ENGINEERING GROUP, P.A.

FIGURE 4

NAIL SET
ASPHALT
VER EIP

NOTE: NO KNOWN GRID TIE AVAILABLE WITHIN 2000'.

SURVEY FOR

MANNINGTON CERAMIC TILE COMPANY

N.C. HWY. 8

LEXINGTON

DAVIDSON COUNTY, N.C.

FEBRUARY 9, 1993

100 0 100 200 300

SCALE: 1" = 100'

MARK TERRY & Associates

REGISTERED LAND SURVEYOR

10705 N. Main St., Suite 300, Archdale, NC 27263

Phone: (919) 431-2114 FAX: (919) 431-2136

DRAWN BY: GAT

SURVEYED BY: LMT

JOB NO.: 3049-40-77

Tables

TABLE 1A: Results of TCLP Metals for 'X' Confirmatory Soil Samples (mg/l)

SAMPLE	As	B	Ba	Cd	Co	Cr	Hg	Mn	Ni	Pb	Pr	Se	Ti	Zn
S1		.42												7.7
S2		6.3												
S3		17					.0021						.086	
S4		3.2								.06			.037	
S5		.92						.61					.019	
S6		1.5						.45					.032	
S7		.66	1.5					3.7		.10			.015	
S8		4.2		.01										
S9		2.1												
S10		.58											.01	
S11		.42												
S12		.17											.028	
S13		.19								.088			.012	
S14		1.6		.007			.002							
NCAC 2L .0200	.05		1.0	.005		.05	.0011	.05	.15	.05		.01		5.0
Fed TCLP Limits	5		100	1		5	0.2		7	5		1		

NA = Not Analyzed.

Table 1B

TCLP Metal Results for 'O' Confirmatory Soil Samples (mg/l)

SAMPLE	As	B	Ba	Cd	Co	Cr	Hg	Mn	Ni	Pb	Pr	Se	SO_4	Ti	Zn
B1		.81													
B2		4.3						3.0							
B3		2.6													
B4		1.0													
B5		5.4													
B6		1.5													
10 x NCAC 2L .0200	0.5		10.0	.05		.5	.011	.5	1.5	.5		.1	2500		50
Fed TCLP Limits	5		100	1		5	0.2		7	5		1			

NA = Not Analyzed.

TABLE 1C

Results of 8240/8270 Analyses for Confirmatory Soil Samples (mg/kg)

SAMPLE	8240 (Volatiles)				8270 (Semi-Volatiles)
	Acetone	MEK	Methylene Chloride	Benzene	
CONFIRMATORY SOIL SAMPLES					
S1					
S2					
S3					
S4	.200		.011		
S5					
S6		.0069			
S7					
S8		.0063			
S9					
S10					
S11					
S12					
S13					
S14					
B1					
B2					
B3					
B4					
B5					
B6					
NCAC 2L .0200 Standard		0.005	.001		

* Indicates constituent was detected in the lab blank.

TABLE 1D

Results of Radiological Analyses on Confirmatory Soil Samples (PiC/g)

Sample	Gross Alpha	Gross B	Ra 226	Ra 228
S1	15	42	.81	1.7
S2	13	44	.72	.88
S3	45	91	5.9	2.6
S4	22	45	1.1	1.3
S5	27	73	1.0	3.2
S6	28	52	1.4	1.3
S7	13	51	.81	.71
S8	40	56	5.9	2.8
S9	36	83	.89	2.8
S10	42	67	2.1	3.5
S11	42	110	3.8	3.6
S12	36	75	1.1	2.1
S13	37	74	1.5	2.9
S14	20	26	1.6	1.7
B1	25	100	.99	1.9
B2	20	75	3.7	.91
B3	15	63	.67	1.0
B4	14	51	.69	.70
B5	9.4	14	1.1	.75
B6	40	72	4.7	2.4

Table 2A

Results of TCLP Metals for Stabilized Sludge (mg/l)

SAMPLE	As	B	Ba	Cd	Co	Cr	Hg	Mn	Ni	Pb	Pr	Se	V	Ti	Zn
1		13.11									.02		.01	.02	
2		19.30													
3		14.49													
4		22.65		.02											
5		1.53					.066								
6		1.24					.254								
7		14.68		.25											
8		17.75		.03											
9		15.83		.07											
10		9.82		.02											
10 X NCAC 2L .0200 Standard	.5		10	.05		.5	.011	.5	1.5	.5		.1			50

TABLE 2B

Results of 8240/8270 Analyses for Stabilized Sludge (mg/kg)

SAMPLE	8240 (Volatiles)				8270 (Semi-Volatiles)
	Acetone	MEK	Methylene Chloride	Benzene	
STABLIZED SLUDGE					
1	*.060				
2	*.099				
3	*.092				
4	*.160				
5	*.100				
6	*.048				
7	*.083				
8	*.190				
9	*.096				
10	*.110				

* Indicates constituent was detected in the lab blank.

TABLE 2C

Results of Radiological Analyses

on

Stabilized Sludge (PiC/g)

Sample	Gross Alpha	Gross B	Ra 226	Ra 228
1	50	30	4.59	.68
2	50	40	3.50	.82
3	50	30	4.43	.83
4	30	60	3.23	.84
5	40	30	3.56	.91
6	40	30	3.70	.92
7	40	30	3.30	1.02
8	70	40	3.15	1.22
9	60	40	2.87	1.15
10	50	30	1.78	1.19

Table 3: Schedule of Inspections

Project Stage	Month	Date(s)
Sludge Solidification	September 1992	17, 28
	October	7, 12, 15, 22, 28
	November	12, 16
	December	2, 29
	January 1993	6
Cap Construction	February	9, 15, 25
	March	2, 8, 11 (2 visits)
	April	1, 12
	May	11, 19

Appendix A

DEHNR Provisions for Closure

Send copies to:
Bob Cotten &
ENSCI &
George House -

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management

James G. Martin, Governor
William W. Cobey, Jr., Secretary

August 13, 1992

William L. Meyer
Director

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Albert R. Cox Jr., President
Mannington Ceramic Tile
P. O. Box 1777
Lexington, NC 27293-1777

Re: Closure Plan Approval
Mannington Ceramic Tile (MCT)
NCD986181451

Dear Mr. Cox:

This office has reviewed the May 1992 revised closure plan for your facility's sludge ponds.

This letter is to inform you that the public comment period for your revised closure plan dated May 1992 has ended and no comments were received. Your closure plan is hereby approved with the incorporation of the enclosed provisions. MCT can proceed with implementation of the plan. This letter and enclosure should be referenced in the professional engineer's closure certification acknowledging it as part of the approved closure plan.

Please be aware that you must still establish financial assurance for closure and post-closure care of the facility to satisfy the requirements of 40 CFR 265.143 and 265.145 referenced in 15A NCAC 13A .0010 or you will remain in violation of the Compliance Order with Administrative Penalty, Docket #90-164, dated June 11, 1990.

If you have any questions regarding the enclosed comments, please contact Rosemarie Sidorowicz at 919/733-2178.

Sincerely,

Jerome H. Rhodes

Jerome H. Rhodes, Chief
Hazardous Waste Section

JHR/RAS/mb
MCTSPNOD.doc

Enclosure

cc: William F. Hamner
James A. Carter
Robert Glaser
Gray Stevens
R. Douglas Holyfield
Linda Mann
Judy Bullock
Steve Phibbs
A. Karim Pathan
Rosemarie Sidorowicz

PROVISIONS TO
MANNINGTON CERAMIC TILE'S
REVISED CLOSURE PLAN

(This office has added these conditions in accordance with 265.112(d)(4))

1. Any piping that lead to the ponds, if present, must be properly removed. Porous piping containing hazardous constituents must be properly disposed of in accordance with applicable regulations. Non-porous piping must be properly decontaminated.

2. The area underneath any piping must not contain any contaminated or stabilized material that is left outside the cap. This must be shown by confirmatory samples.

3. The stabilized material, as stated in the revised closure plan, must be analyzed as follows:

Constituents^	Analytical Method*
purgeable organics	EPA Method 8240
base/neutral/acid extractable organics	EPA Method 8270
arsenic	206.2
barium	200.7
cadmium	200.7
chromium	200.7
lead	200.7
mercury	245.1
selenium	270.2
silver	200.7
cobalt	219.1
manganese	200.7
nickel	249.1
zinc	200.7
sulfate	EPA Approved Method
titanium	200.7 or EPA Approved Method
vanadium	200.8
boron	200.7
praseodymium	200.7
bromine	9022a (SW-846)
gross alpha	9310 (SW-846)
gross beta (as indicated, in millirem/yr)	9310 (SW-846)
radium 226 and 228	7500 (Standard Methods...)

^NOTE: All of the metals must first be extracted by the TCLP procedure, and then have the resulting extract analyzed by the methods as indicated.
*The 200 series methods above are from EPA's Methods for Chemical Analysis of Water and Waste, 1982.

4. All material in the sludge ponds must be stabilized such that no leachate exceeds 10x the current drinking water standards.

5. Prior to implementing closure, the horizontal and vertical boundaries of the material in the ponds to be stabilized, must be identified.

6. Therefore, prior to stabilization MCT must obtain at least three confirmatory samples from beneath the vertical extent of the sludge material in each pond to be stabilized. These sample locations are denoted by a "o" on Figure 2 (attached) and will represent the constituent concentrations remaining "in-place".

   The leachate from sample locations denoted by a "o" must not exceed 10x the current drinking water standards.

   In addition, MCT must obtain at least fourteen (14) confirmatory samples from outside the horizontal extent of the sludge material in both ponds to be stabilized. These sample locations are denoted by an "x" on Figure 2 (attached).

   If contamination+ is found in the "x" samples, this material must be removed or stabilized. No contaminated or stabilized material can be left outside the cap. Therefore, confirmatory soil samples, (x's), for metals must not exceed drinking water standards and for organics, concentrations over the applicable detection limits for the analytical methods stated in item 3 must not be exceeded.

   As a result, the area to be stabilized may have to be expanded and additional confirmatory samples obtained.

NOTE: contamination+ for the purpose of the "x" samples means concentrations over the current drinking water standards and for organics, concentrations over the applicable detection limits for the analytical methods stated in item 3.

7. Confirmatory samples (x's and o's) must be analyzed for the constituents listed in item 3 on the previous page of this letter.

   In addition, the sampling and analysis of the stabilized waste as proposed on page 6 of the May 1992 closure plan, must also include the constituents listed in item 3 on the previous page of this letter.

8. As part of closure certification, the areal and vertical extent of the stabilized material must be shown in relation to the confirmatory samples obtained. In addition, a diagram indicating the area of the cap must also be provided.

9. The cap over the compacted*, stabilized material shall be constructed as follows:

1. Fill as necessary for grade (greater than or equal to 3%)

2. Greater than or equal to two (2) feet of compacted* soil to be placed in four equal lifts, that has an in place saturated hydraulic conductivity of less than or equal to 1.0×10^{-7} cm/sec or a geo-composite layer (e.g. claymax) and greater than or equal to 3% slope followed by;

3. 30 mil FML (flexible membrane liner) with greater than or equal to 3% slope followed by;

4. Greater than or equal to one (1) foot of compacted* sand for drainage with greater than or equal to 3% slope and a minimum K of 1.0 E-2 cm/sec, followed by;

5. Geotextile fabric to prevent the sand drain from clogging, followed by;

6. As proposed, 6" of aggregate base coarse with at least a 3% slope, followed by;

7. Six (6) inches of asphalt with at least a 3% slope.

NOTE: compacted* for the purpose of this closure means 95% maximum proctor density. This is necessary due to the use of the cap as a road base.

10. If the final grade for the cap exceeds 5%, erosion control such as rip-rap must be used on any unpaved portion.

11. Fill material must only consist of non-hazardous borrow material.

12. Trench backfill materials must consist of non-hazardous excavated materials.

13. The sand drainage layer must slope to an exit drain.

14. Rinsate from the decontamination process should be collected such that there is no run-off to any unlined portion of the soil or parking area.

15. Before routing any decontamination rinsate to the POTW, a waste determination must be completed on the washdown. The rinsate must be sampled and analyzed for the list of constituents previously identified as being required for the confirmatory samples. If hazardous waste, it must be managed as such and not be sent directly to the POTW.

16. If rinsate is found to contain hazardous constituents, the impermeable plastic material used to line the decontamination pad must be properly removed and disposed of.

17. During mixing, it is suggested that steps are taken to avoid contamination of the area outside the ponds (e.g. use of plastic sheeting, silt fence, etc.).

18. The sludge pond closure cost estimate in Attachment D should be revised to include cost estimates for decontamination and proper disposal of materials used during closure. Cost estimates for sampling and analysis should be adjusted to reflect the additional confirmatory sampling.

19. The closure cost estimate will be revised no later then 30 days after a revision of the closure plan has been made that will increase the cost of closure.

20. In addition to the independent, registered, professional engineers signature, the closure certification must also be signed by the owner or operator of the facility.

21. Within 60 days of certification of closure, MCT must submit to the Davidson County Register of Deeds and to this office, a survey plat indicating the location and dimensions of the units with respect to the permanently surveyed benchmarks.

22. The notation in the deed to the facility property, or on some other instrument which is normally examined during a title search that is required by 40 CFR 265.119(b) must be recorded within 60 days of closure certification.

23. No later than 60 days after certification of closure, MCT must submit to the local zoning authority and this office a record of the type, location, and quantity of hazardous wastes disposed of within the sludge ponds.

24. Within 60 days of certification of closure, MCT must submit to this office a certification signed by the owner or operator, that the information required by 40 CFR 265.119(b) was recorded. A copy of the document in which the notations were placed must be provided to this office.

25. If any material besides asphalt will be the top layer for the cap, a revised diagram must be submitted to this office indicating where these components are to be placed prior to installation.

26. MCT must submit a separate plan to this office for post-closure care within 30 days of the date of this approval letter.

27. Page 12 of the closure plan states that MCT will monthly inspect the vegetative cover of the closed sludge ponds. All components of the cap (i.e. asphalt, vegetative cover, rip-rap must be inspected.

28. Page 12 of the closure plan also states that MCT will monthly inspect the run-on/run-off control systems for the closed sludge ponds. MCT must obtain approval from this office prior to closure completion of the location and construction designs of any type of run-on/run-off control systems.

29. MCT must maintain an on-site copy of the most current post-closure care plan and all revisions until certification of closure has been submitted and accepted by this office. One copy of the post-closure care plan and all revisions must be kept in the general manager's office and the plant engineer's office.

[40 CFR 265.118(b)]

30. Any hazardous material including rinsate, must be properly disposed of within ninety (90) days of generation. Closure must be completed within 180 days after the date of this approval letter.

[40 CFR 265.113]

31. A detailed schedule of the date of completion for each closure activity must be submitted to this office within 30 days of the date of this approval letter.

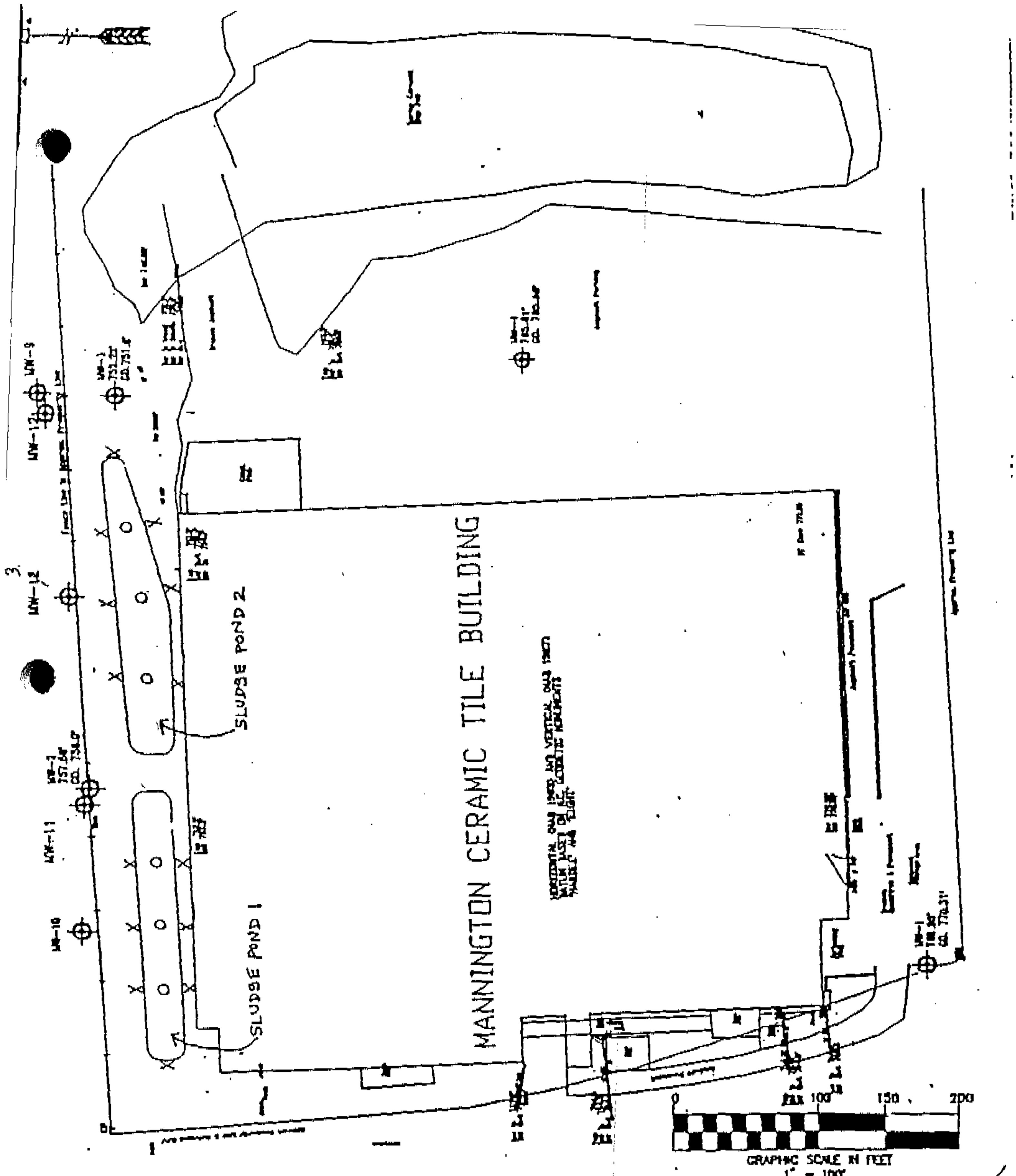
[40 CFR 265.112(b)(6) and (7)]

32. Employees and contract workers managing hazardous waste must have 40 hours of OSHA training and 8 hours of annual update. Personnel training records must be maintained on-site until closure of the facility.

[40 CFR 262.34 and 40 CFR 265.16]

33. Contaminated material must not be stockpiled outside of the waste management unit. Treatment must be done within the boundaries of the waste management unit.

34. Test ten (10) seam locations for seam integrity in the FML.



MANNINGTON CERAMIC TILE COMPANY
LEXINGTON, N.C.

FIGURE 2

TITLE:
FACILITY LAYOUT

Appendix B

Analytical Reports for Soil Samples

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A82791-1

March 17, 1993

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile

Table

2

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82791-2	S1	Nonaqueous	10/12/92
A82791-3	S2	Nonaqueous	10/12/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	10/12/92	
Receipt/Refrigeration	10/13/92	
TCLP Extractions		
TC Extraction	1/14/93	
Sample Preparations		
Metals:		
General	1/15/93	
Mercury	1/15/93	
Furnace	1/15/93	
Analyses		
Metals:		
General	1/17/93	
Mercury	1/15/93	
Furnace	1/17/93	

Laboratory Manager Review & Approval
(Signature) ____________
(Printed Name) Edward J. Palmer, Jr.
(Date) 3-17-93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82791-2	50	1	1,000
A82791-3	50	1	1,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82791-2 S1
A82791-3 S2

VIII. Analytical Results

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A82791-2

Client Designation: S1

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	0.05
D005	Barium	< 1.0	< 1.0	1.0
D006	Cadmium	< 0.005	< 0.005	0.005
D007	Chromium	< 0.050	< 0.050	0.05
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.0011	< 0.0011	0.0011
D010	Selenium	< 0.010	< 0.010	0.01
D011	Silver	< 0.050	< 0.050	0.05
----	Vanadium	< 0.050	< 0.050	---
----	Cobalt	< 0.050	< 0.050	---
----	Titanium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.43	---
----	Praseodymium	< 0.10	< 0.10	---
Units		(mg/l)	(mg/l)	(mg/l)

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A82791-3

Client Designation: S2

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	0.05
D005	Barium	< 1.0	< 1.0	1.0
D006	Cadmium	< 0.005	< 0.005	0.005
D007	Chromium	< 0.050	< 0.050	0.05
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.0011	< 0.0011	0.0011
D010	Selenium	< 0.010	< 0.010	0.01
D011	Silver	< 0.050	< 0.050	0.05
----	Vanadium	< 0.050	< 0.050	---
----	Cobalt	< 0.050	< 0.050	---
----	Titanium	< 0.050	< 0.050	---
----	Boron	< 0.10	6.3	---
----	Praseodymium	< 0.10	< 0.10	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A60651-11

Parameter	Amount of Spike	Recovery MS
Arsenic	300	108
Barium	300	99
Boron	300	97
Cadmium	300	100
Chromium	300	100
Cobalt	300	96
Lead	300	98
Mercury	20	81
Selenium	300	74
Silver	300	95
Vanadium	300	97
Titanium	300	95
Praseodymium	300	82
Units	(ug)	(%)

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A82824-1

March 17, 1993

Prepared for:

ENSCI
1108 Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

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Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

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AnalytiKEM

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ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82824-1	S3	Nonaqueous	10/20/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	10/20/92	
Receipt/Refrigeration	10/21/92	
TCLP Extractions		
TC Extraction	1/14/93	
Sample Preparations		
Metals:		
General	1/15/93	
Mercury	1/15/93	
Furnace	1/15/93	
Analyses		
Metals:		
General	1/17/93	
Mercury	1/15/93	
Furnace	1/17/93	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Edward J. Palmer, Jr.
(Date) 3-17-93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82824-1	50	1	1,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

AnalytiKEM Designation: A82824-1

Client Designation: S3

EPA HW Number	Contaminant	Level Found in TCLP Extract (mg/l)	Regulatory Level (mg/l)
D009	Mercury	0.0021	0.0011

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82824-1

Client Designation: S3

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.50	< 0.54	0.05
D005	Barium	< 1.0	< 1.0	1.0
D006	Cadmium	< 0.005	< 0.005	0.005
D007	Chromium	< 0.050	< 0.050	0.05
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.0011	0.0021	0.0011
D010	Selenium	< 0.010	< 0.010	0.01
D011	Silver	< 0.050	< 0.050	0.05
D012	Cobalt	< 0.050	< 0.050	---
D016	Titanium	< 0.050	0.086	---
D017	Vanadium	< 0.050	< 0.050	---
D018	Boron	< 0.10	17	---
D019	Praseodymium	< 0.10	< 0.10	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A60651-11

Parameter	Amount of Spike	Recovery MS
Arsenic	300	108
Barium	300	99
Boron	300	97
Cadmium	300	100
Chromium	300	100
Cobalt	300	96
Lead	300	98
Mercury	20	81
Selenium	300	74
Silver	300	95
Vanadium	300	97
Titanium	300	95
Praseodymium	300	82
Units	(ug)	(%)

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651

January 19, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ______________________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A60651-1	B5	Nonaqueous	12/28/92
A60651-2	S7	Nonaqueous	12/29/92
A60651-3	S6	Nonaqueous	12/29/92
A60651-4	S5	Nonaqueous	12/29/92
A60651-5	S8	Nonaqueous	12/29/92
A60651-6	S9	Nonaqueous	12/29/92
A60651-7	S10	Nonaqueous	12/29/92
A60651-8	S4	Nonaqueous	12/29/92
A60651-9	S14	Nonaqueous	12/30/92
A60651-10	S12	Nonaqueous	12/30/92
A60651-11	S13	Nonaqueous	12/30/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

V. Laboratory Chronicle

AnalytiKEM

	DATE I	DATE II
Date Sampled	12/28 - 12/30/92	
Receipt/Refrigeration	1/04/93	
TCLP Extractions		
TC Extraction	1/06/93	
Sample Preparations		
Metals:		
General	1/14/93	
Mercury	1/14/93	
Furnace	1/14/93	
Analyses		
Metals:		
General	1/14/93	
Mercury	1/15/93	
Furnace	1/15/93	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Edward J. Palmer, Jr.
(Date) 1-19-93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A60651-1	500	1	1,000
A60651-2	500	1	1,000
A60651-3	500	1	1,000
A60651-4	500	1	1,000
A60651-5	500	1	1,000
A60651-6	500	1	1,000
A60651-7	500	1	1,000
A60651-8	500	1	1,000
A60651-9	500	1	1,000
A60651-10	500	1	1,000
A60651-11	500	1	1,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A60651-1	B5
A60651-2	S7
A60651-3	S6
A60651-4	S5
A60651-5	S8
A60651-6	S9
A60651-7	S10
A60651-8	S4
A60651-9	S14
A60651-10	S12
A60651-11	S13

VIII. Analytical Results

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-1

Client Designation: B5

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	5.4	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.021	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-2

Client Designation: S7

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	1.5	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.10	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.66	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.015	---
Units		(mg/l)	(mg/l)	(mg/l)

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-3

Client Designation: S6

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	1.5	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.032	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-4

Client Designation: S5

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.92	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.019	---
Units		(mg/l)	(mg/l)	(mg/l)

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-5

Client Designation: S8

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	0.010	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	4.2	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	< 0.010	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-6

Client Designation: S9

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	2.1	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	< 0.010	---
Units		(mg/l)	(mg/l)	(mg/l)

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-7

Client Designation: S10

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.34	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	1.5	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	< 0.010	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-8

Client Designation: S4

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.10	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	3.2	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.037	---
Units		(mg/l)	(mg/l)	(mg/l)

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-9

Client Designation: S14

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	0.007	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	1.6	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	< 0.010	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-10

Client Designation: S12

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.17	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.028	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

VIII. Analytical Results (Cont'd)

TCLP Metals

AnalytiKEM Designation: A60651-11

Client Designation: S13

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.088	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.19	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.012	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-11 (Duplicate)

Client Designation: S13

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.077	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.18	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.016	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A60651-11

Parameter	Amount of Spike	Recovery MS
Arsenic	100	108
Barium	300	99
Boron	300	97
Cadmium	300	100
Chromium	300	100
Cobalt	300	96
Lead	300	98
Mercury	20	81
Selenium	100	74
Silver	300	95
Vanadium	300	97
Titanium	100	95
Praseodymium	100	82
Units	(ug)	(%)

60651 552

AnalytiKEM An American NuKEM Company

03282

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI

Sample Collector: Steve Stadelman

Project: 592032

AnalytiKEM Contact: Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	520 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml Sept.	950 ml unpres.		PARAMETERS
1.	B5	12-28 92	1430	Soil	G			2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
2	S7	12-29 92	1030	"	G			2					1	3		
3	S6	12-29 92	1215	"	G			2					1	3		
4	S5	12-29 92	1300	"	G			2					1	3		
5	S8	12-29 92	1415	"	G			2					1	3		
6	S9	12-29 92	1445	"	G			2					1	3		
7	S10	12-29 92	1515	"	G			2					1	3		
8	S4	12-29 92	1600	"	G			2					1	3		
9	S14	12-30 92	1100	"	G			2					1	3		
10	S12	12-30 92	1130	"	G			2					1	3		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Grady Lane	12-30 92	1400
2	1-10	Grady Lane	Janet Winters	12-30 92	1605
3	1-10	J. Winters	[illegible]	1/4/93	1800
4					

REMARKS

Rush turnaround

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

AnalytiKEM ...EM C...

...ustody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Ha... ...ous Waste

Client: ENSCI

Sample Collector: Steve Stadelman

Project: 592032

AnalytiKEM Contact: Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
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Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	__ ml HNO_3	__ ml H_2SO_4	__ ml NaOH	__ ml HCL	250 ml sept.	950 ml unpres.		PARAMETERS
1	513	12-30-92	1215	Soil	G			2					1	3		8240, 8270 TCLP metals, gross α, gross β, Ra 226-228; $BaSO_4$. Analyze per attached sheet
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Lane	12-30-92	1410
2	1	Grady Lane	Janet Winkles	12-30-92	1605
3	1	Janet Winkles	[illegible]	1/4/93	1000
4					

REMARKS

Rush turnaround.

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651, Supplemental

February 4, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A60651-1	B5	Nonaqueous	12/28/92
A60651-2	S7	Nonaqueous	12/29/92
A60651-3	S6	Nonaqueous	12/29/92
A60651-4	S5	Nonaqueous	12/29/92
A60651-5	S8	Nonaqueous	12/29/92
A60651-6	S9	Nonaqueous	12/29/92
A60651-7	S10	Nonaqueous	12/29/92
A60651-8	S4	Nonaqueous	12/29/92
A60651-9	S14	Nonaqueous	12/29/92
A60651-10	S12	Nonaqueous	12/29/92
A60651-11	S13	Nonaqueous	12/30/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	12/28 - 12/30/92	
Receipt/Refrigeration	1/04/93	
TCLP Extractions		
TC Extraction	1/06/93	
Sample Preparations		
Metals: General	1/14/93	
Analyses		
Metals: General	1/25/93	

Laboratory Manager (Signature) ____________
Review & Approval (Printed Name) Edward J. Palmer, Jr.
(Date) 2/4/93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A60651-1	50	1	1,000
A60651-2	50	1	1,000
A60651-3	50	1	1,000
A60651-4	50	1	1,000
A60651-5	50	1	1,000
A60651-6	50	1	1,000
A60651-7	50	1	1,000
A60651-8	50	1	1,000
A60651-9	50	1	1,000
A60651-10	50	1	1,000
A60651-11	50	1	1,000

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A60651-1	B5
A60651-2	S7
A60651-3	S6
A60651-4	S5
A60651-5	S8
A60651-6	S9
A60651-7	S10
A60651-8	S4
A60651-9	S14
A60651-10	S12
A60651-11	S13

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A60651-1

Client Designation: B5

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	0.46	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	3.2	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-2

Client Designation: S7

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	3.7	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	0.60	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-3

Client Designation: S6

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	0.45	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	0.43	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

VIII. Analytical Results (Cont'd)

TCLP Metals

AnalytiKEM Designation: A60651-4

Client Designation: S5

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	0.61	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	2.5	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-5

Client Designation: S8

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	3.6	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-6

Client Designation: S9

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	2.4	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

VIII. Analytical Results (Cont'd)

TCLP Metals

AnalytiKEM Designation: A60651-7

Client Designation: S10

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	0.81	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-8

Client Designation: S4

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	0.44	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-9

Client Designation: S14

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	1.7	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

VIII. Analytical Results (Cont'd)

TCLP Metals

AnalytiKEM Designation: A60651-10

Client Designation: S12

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	0.70	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-11

Client Designation: S13

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	< 0.20	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-11 (Duplicate)

Client Designation: S13

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
----	Manganese	< 0.15	< 0.15	---
----	Nickel	< 0.40	< 0.40	---
----	Zinc	< 0.20	< 0.20	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A60651-11

Parameter	Amount of Spike	Recovery MS
Manganese	300	102
Nickel	300	97
Zinc	300	100
Units	(ug)	(%)

research analyses consultation
EFEH & ASSOCIATES
10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 996-5031

RECEIVED
FEB 23 1993

February 17, 1993

Mr. Steve Stadelman
~~ENSCI Corporation~~
1108 Old Thomasville Road
High Point, North Carolina 27260

Dear Mr. Stadelman:

Following are the results of the soil samples submitted to our laboratory for analyses on January 26, 1993:

P.O. #: 31998

SAMPLE I.D.	S4R 1/23/93 09:00	S10R 1/23/93 09:00
LAB NO.	G-2710	G-2711
TCLP INORGANIC (Leachate)		
Lead, mg/l	0.06	<0.01

METHOD: EPA 1311/6010

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr.

Edwin B. Smith, Jr. PhD

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A82929-1

March 17, 1993

Prepared for:

ENSCI
1108 Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ______

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

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Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82929-1	S-11	Nonaqueous	11/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

IV. Methodology

AnalytiKEM

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

V. Laboratory Chronicle

AnalytiKEM

	DATE I	DATE II
Date Sampled	11/16/92	
Receipt/Refrigeration	11/17/92	
TCLP Extractions		
TC Extraction	1/14/93	
Sample Preparations		
Metals:		
General	1/15/93	
Mercury	1/15/93	
Furnace	1/15/93	
Analyses		
Metals:		
General	1/17/93	
Mercury	1/15/93	
Furnace	1/17/93	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Edward J. Palmer, Jr.
(Date) 3-17-93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82929-1	50	1	1,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82929-1 S-11

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82929-1

Client Designation: S-11

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.50	0.05
D005	Barium	< 1.0	< 1.0	1.0
D006	Cadmium	< 0.005	< 0.005	0.005
D007	Chromium	< 0.050	< 0.050	0.05
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.0011	< 0.0011	0.0011
D010	Selenium	< 0.010	< 0.010	0.01
D011	Silver	< 0.050	< 0.050	0.05
----	Cobalt	< 0.050	< 0.050	---
----	Titanium	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.42	---
----	Praseodymium	< 0.10	< 0.10	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A60651-11

Parameter	Amount of Spike	Recovery MS
Arsenic	300	108
Barium	300	99
Boron	300	97
Cadmium	300	100
Chromium	300	100
Cobalt	300	96
Lead	300	98
Mercury	20	81
Selenium	300	74
Silver	300	95
Vanadium	300	97
Titanium	300	95
Praseodymium	300	82
Units	(ug)	(%)

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82791, Supplemental

November 19, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile

Reviewed & Approved by: Michael Schmidt, Ph.D. for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

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Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
DI	Deionized Water
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RPD	Relative Percent Difference
RSD	Relative Standard Deviation
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mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82791-1	B1	Nonaqueous	10/12/92
A82791-2	S1	Nonaqueous	10/12/92
A82791-3	S2	Nonaqueous	10/12/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	10/12/92	
Receipt/Refrigeration	10/13/92	
TCLP Extractions		
TC Extraction	10/13/92	
Sample Preparations		
Metals:		
General	11/16/92	
Mercury	11/16/92	
Furnace	11/14/92	
Analyses		
Metals:		
General	11/17/92	
Mercury	11/16/92	
Furnace	11/16/92	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Gregory A. Pruna
(Date) 11/19/92

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82791-1	100	1	2,000
A82791-2	100	1	2,000
A82791-3	100	1	2,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82791-1 B1
A82791-2 S1
A82791-3 S2

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82791-1

Client Designation: B1

EPA Number	Parameter	Method Blank		Sample Result		Regulatory Level
D004	Arsenic	0.54	U	0.54	U	5.0
D005	Barium	2.4	U	0.89	J	100
D006	Cadmium	0.11	U	0.11	U	1.0
D007	Chromium	0.57	U	0.57	U	5.0
D008	Lead	0.57	U	0.44	J	5.0
D009	Mercury	0.025	U	0.025	U	0.2
D010	Selenium	0.33	U	0.33	U	1.0
D011	Silver	1.0	U	1.0	U	5.0
D012	Cobalt	0.056	U	0.056	U	---
D013	Manganese	0.019	U	0.024		---
D014	Nickel	0.046	U	0.046	U	---
D015	Zinc	0.020	U	0.64		---
D016	Titanium	0.055	U	0.055	U	---
D017	Vanadium	0.054	U	0.054	U	---
D018	Boron	0.028		0.81		---
D019	Praseodymium	1.2	U	1.2	U	---
Units		(mg/l)		(mg/l)		(mg/l)

Note: All results are corrected for spike recoveries.

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A82791-2

Client Designation: S1

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	0.28 U	0.28 U	5.0
D005	Barium	4.8 U	2.2 J	100
D006	Cadmium	0.051 U	0.051 U	1.0
D007	Chromium	0.30 U	0.30 U	5.0
D008	Lead	0.30 U	0.30 U	5.0
D009	Mercury	0.018 U	0.018 U	0.2
D010	Selenium	0.051 U	0.051 U	1.0
D011	Silver	0.15 U	0.15 U	5.0
----	Cobalt	0.052 U	0.052 U	---
----	Manganese	0.016 U	0.045	---
----	Nickel	0.040 U	0.040 U	---
----	Zinc	0.017 J	7.7	---
----	Titanium	0.051 U	0.051 U	---
----	Vanadium	0.050 U	0.050 U	---
----	Praseodymium	0.59 U	0.59 U	---
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

VIII. Analytical Results (Cont'd)

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A82791-3

Client Designation: S2

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	0.28 U	0.28 U	5.0
D005	Barium	4.8 U	0.89 J	100
D006	Cadmium	0.051 U	0.012 J	1.0
D007	Chromium	0.30 U	0.30 U	5.0
D008	Lead	0.30 U	0.30 U	5.0
D009	Mercury	0.018 U	0.018 U	0.2
D010	Selenium	0.051 U	0.051 U	1.0
D011	Silver	0.15 U	0.15 U	5.0
----	Cobalt	0.052 U	0.052 U	---
----	Manganese	0.016 U	0.015	---
----	Nickel	0.040 U	0.040 U	---
----	Zinc	0.017 J	2.5	---
----	Titanium	0.051 U	0.051 U	---
----	Vanadium	0.050 U	0.050 U	---
----	Praseodymium	0.59 U	0.59 U	---
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A82832-1-1

Parameter	Amount of Spike	Recovery MS
Arsenic	300	106
Barium	300	104
Cadmium	300	99
Chromium	300	100
Cobalt	300	97
Lead	300	100
Manganese	300	92
Mercury	20	113
Nickel	300	101
Selenium	300	99
Silver	300	46
Vanadium	300	101
Zinc	300	100
Titanium	300	99
Praseodymium	300	101
Units	(ppb)	(%)

53

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A82824

November 5, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82824-1	S3	Nonaqueous	10/20/92
A82824-2	B2	Nonaqueous	10/20/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	10/20/92	
Receipt/Refrigeration	10/21/92	
TCLP Extractions		
TC Extraction	10/22/92	
Sample Preparations		
Metals:		
General	10/23/92	
Mercury	10/23/92	
Analyses		
Metals:		
General	10/23, 24, 26/92	
Mercury	10/23/92	

Laboratory Manager Review & Approval
(Signature) Albert E. [signature] for
(Printed Name) Gregory A. Pruns
(Date) 11-9-92

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82824-1	100	1	2,000
A82824-2	100	1	2,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82824-1 S3
A82824-2 B2

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82824-1

Client Designation: S3

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.54	< 0.54	5.0
D005	Barium	< 2.4	2.7	100
D006	Cadmium	< 0.11	< 0.11	1.0
D007	Chromium	< 0.57	< 0.57	5.0
D008	Lead	< 0.57	< 0.57	5.0
D009	Mercury	< 0.019	< 0.019	0.2
D010	Selenium	< 0.33	< 0.33	1.0
D011	Silver	< 1.0	< 1.0	5.0
D012	Cobalt	< 0.056	0.074	---
D013	Manganese	< 0.019	5.3	---
D014	Nickel	< 0.46	< 0.46	---
D015	Zinc	< 0.20	31	---
D016	Titanium	< 0.055	< 0.055	---
D017	Vanadium	< 0.054	< 0.054	---
D018	Boron	< 0.020	13	---
D019	Praseodymium	< 0.71	< 0.71	---
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82824-2

Client Designation: B2

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.54	< 0.54	5.0
D005	Barium	< 2.4	< 2.4	100
D006	Cadmium	< 0.11	< 0.11	1.0
D007	Chromium	< 0.57	< 0.57	5.0
D008	Lead	< 0.57	< 0.57	5.0
D009	Mercury	< 0.019	< 0.019	0.2
D010	Selenium	< 0.33	< 0.33	1.0
D011	Silver	< 1.0	< 1.0	5.0
D012	Cobalt	< 0.056	< 0.056	---
D013	Manganese	< 0.019	3.0	---
D014	Nickel	< 0.46	< 0.46	---
D015	Zinc	< 0.20	0.35	---
D016	Titanium	< 0.055	< 0.055	---
D017	Vanadium	< 0.054	< 0.054	---
D018	Boron	< 0.020	4.3	---
D019	Praseodymium	< 0.71	< 0.71	---
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A82791-3

Parameter	Amount of Spike	Recovery MS
Arsenic	300	92
Barium	300	85
Boron	300	98
Cadmium	300	89
Chromium	300	87
Cobalt	300	90
Lead	300	87
Manganese	300	79
Mercury	20	107
Nickel	300	87
Selenium	300	92
Silver	300	50
Vanadium	300	92
Zinc	300	34
Titanium	300	91
Praseodymium ϕ	300	84
Units	(ppb)	(%)

ϕ Spike performed on sample A82791-2.

AnalytiKEM An American NuKEM Company

03237

Chain-of-Custody Record

82874

Program Area: Drinking Water   Wastewater   Groundwater   Solid and Hazardous Waste

Client: ENSCI   **Sample Collector:** Stadelman

Project: 592032   **AnalytiKEM Contact:** Holly

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	950 ml Unpres.	___ ml HNO_3	___ ml H_2SO4	___ ml NaOH	___ ml HCL	500 ml unpreserved	250 unpreserved		PARAMETERS
1	S3	10-20-92	11:45	Soil	G			3					2	1		Gross α, gross β, radium 226, radium 228, 8240, 8270, metals by TCLP, sulfate & bromide by IC
2	B2	10-20-92	10:30	Soil	G			3					2	1		" " "
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-2	Steve Stadelman	Grady Lane	10-21-92	1250
2	1-2	Grady Lane	Janet Winters	10-21-92	1450
3					
4					

REMARKS
P.O. # 31682

Steve Stadelman
SAMPLER'S SIGNATURE

AKEM #1 12/

Reorder: PJ Associates 803-329-2300   White Laboratory Copy   Yellow Client Copy

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: Mannington Tile Soil

Laboratory Number: 82824

1.		Shipped	Notes:
	✓	Hand Delivered	
2.	✓	COC Present on Receipt	Notes:
		No COC	
3.		COC Tape on Shipping Container	Notes:
	✓	No COC Tape on Shipping Container	Notes:
4.		Samples Broken/Leaking	Notes:
	✓	Sample Intact on Receipt	
		Other (See Notes)	
5.	✓	Ambient on Receipt	Notes:
		Chilled on Receipt	
6.		Samples Preserved Correctly	Notes:
		Improper Preservatives	
	✓	N/A (None Recommended)	
		Other (See Notes)	
7.	✓	Received Within Holding Time	Notes:
		Not Received Within Holding Time	
		N/A (None Recommended)	
		Other (See Notes)	
8.		COC Tapes on Samples	Notes:
	✓	No COC Tapes on Samples	
9.		Discrepancies Between COC and Sample Labels	Notes:
	✓	No Discrepancies Noted	
		N/A (No COC Received)	

Additional Comments:

Inspected and Logged in by: Greg Barrett

Date/Time: 10/21/92 6:45 pm

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A83007

December 28, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

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Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A83007-1	B3	Nonaqueous	12/04/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

IV. Methodology

AnalytiKEM

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	12/04/92	
Receipt/Refrigeration	12/08/92	
TCLP Extractions		
TC Extraction	12/09/92	12/11/92
Sample Preparations		
Metals:		
General		12/15, 12/17/92
Mercury	12/10/92	
Furnace	12/10/92	
Analyses		
Metals:		
General		12/14-12/16/92
Mercury	12/10/92	
Furnace	12/10/92	

Laboratory Manager Review & Approval
(Signature) Michael Schmoller for
(Printed Name) Gregory A. Pruna
(Date) 1/4/93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A83007-1	100	1	2,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A83007-1 B3

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A83007-1

Client Designation: B3

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	0.05
D005	Barium	< 2.0	< 2.0	1.0
D006	Cadmium	< 0.050	< 0.050	1.0
D007	Chromium	< 0.30	< 0.30	5.0
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.020	< 0.020	0.2
D010	Selenium	< 0.050	< 0.050	1.0
D011	Silver	< 0.070	< 0.070	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Manganese	< 0.015	0.032	---
----	Nickel	< 0.080	< 0.080	0.15
----	Zinc	< 0.020	0.23 *	5.0
----	Titanium	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.020	2.6	---
----	Praseodymium	< 0.60	< 0.60	---
Units		(mg/l)	(mg/l)	(mg/l)

* Analyzed by MSA.

AnalytiKEM

VIII. Analytical Results (Cont'd)

TCLP Metals

AnalytiKEM Designation: A83007-1 (Duplicate)

Client Designation: B3

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 2.0	< 2.0	100
D006	Cadmium	< 0.050	< 0.050	1.0
D007	Chromium	< 0.30	< 0.30	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.020	< 0.020	0.2
D010	Selenium	< 0.050	< 0.050	1.0
D011	Silver	< 0.070	< 0.070	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Manganese	< 0.015	0.027	---
----	Nickel	< 0.080	< 0.080	---
----	Zinc	< 0.020	0.20 *	---
----	Titanium	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.020	2.7	---
----	Praseodymium	< 0.60	< 0.60	---
Units		(mg/l)	(mg/l)	(mg/l)

* Analyzed by MSA.

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A83007-1

Parameter	Amount of Spike	Recovery MS
Arsenic	300	105
Barium	300	119
Cadmium	300	112
Cadmium ϕ	300	104
Chromium	300	111
Chromium ϕ	300	104
Cobalt	300	98
Cobalt ϕ	300	96
Lead	300	122
Lead ϕ	300	97
Manganese	300	107
Mercury	20	102
Nickel	300	109
Selenium	300	108
Silver	300	27
Vanadium	300	95
Zinc	300	115
Zinc ϕ	300	102
Titanium	300	94
Praseodymium	300	101
Units	(ppb)	(%)

ϕ Spike performed on DI Water.

03214

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytiKEM Contact:** Holly

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	950 ml Unpres.	ml HNO$_3$	ml H$_2$SO4	ml NaOH	ml HCL	500 ml unpres.	250 ml unpres.		PARAMETERS
1	B3	12-7-92	1600	SOIL	G			3					2	1		Analyses per attached sheet 8240, 8270, metals by ICP, gross α, gross β, Ra 226/228, B,[illegible]
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Love	12-7-92	1215
2	1	Grady Love	S. Sawyer	12-7-92	1730
3					
4					

REMARKS

P.O. # 31833
Rush turnaround on metals.

Steve Stadelman

SAMPLER'S SIGNATURE

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: 592032

Laboratory Number: 83007

1. ____ Shipped
   ✓ Hand Delivered
   Notes: ____
2. ✓ COC Present on Receipt
   ____ No COC
   Notes: ____
3. ____ COC Tape on Shipping Container
   Notes: ____
   ✓ No COC Tape on Shipping Container
   Notes: ____
4. ____ Samples Broken/Leaking
   ✓ Sample Intact on Receipt
   ____ Other (See Notes)
   Notes: ____
5. ____ Ambient on Receipt
   ✓ Chilled on Receipt
   Notes: ____
6. ____ Samples Preserved Correctly
   ____ Improper Preservatives
   ✓ N/A (None Recommended)
   ____ Other (See Notes)
   Notes: ____
7. ✓ Received Within Holding Time
   ____ Not Received Within Holding Time
   ____ N/A (None Recommended)
   ____ Other (See Notes)
   Notes: ____
8. ____ COC Tapes on Samples
   ✓ No COC Tapes on Samples
   Notes: ____
9. ____ Discrepancies Between COC and Sample Labels
   ✓ No Discrepancies Noted
   ____ N/A (No COC Received)
   Notes: ____

Additional Comments: ____

Inspected and Logged in by: S Sawyer

Date/Time: 12-8-92 11:20 A.M.

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60646

January 16, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A60646-1	B4	Nonaqueous	12/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	12/16/92	
Receipt/Refrigeration	12/18/92	
TCLP Extractions		
TC Extraction	12/21/92	
Sample Preparations		
Metals:		
General	12/23/92 & 1/5/93	
Mercury	1/5/93	
Furnace	12/26/92	
Analyses		
Metals:		
General	1/4 - 1/6/93 & 12/28/92	
Mercury	12/26/92	
Furnace	1/5/93	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Edward J. Palmer, Jr.
(Date) 1/15/93

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A60646-1	100	1	2,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A60646-1 B4

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A60646-1

Client Designation: B4

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	0.05
D005	Barium	< 1.0	< 1.0	1.0
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	0.05
D009	Mercury	< 0.0011	< 0.0011; < 0.0011*	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.025	< 0.025	---
----	Manganese	< 0.050	< 0.050	---
----	Nickel	< 0.15	< 0.15	0.15
----	Zinc	< 5.0	< 5.0	5.0
----	Titanium	< 0.010	< 0.010	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	1.0	---
----	Praseodymium	< 0.10	< 0.10	---
Units		(mg/l)	(mg/l)	(mg/l)

* Duplicate analysis.

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Parameter	Sample Spiked	Amount of Spike	Recovery MS
Arsenic	A60646-1	300	108
Barium	A60645-1	300	110
Boron	A60645-1	300	116
Boron	DI Water	300	100
Cadmium	A60645-1	300	97
Chromium	A60645-1	300	99
Cobalt	A60645-1	300	85
Lead	A60645-1	300	93
Manganese	A60644-1	300	102
Mercury	A60646-1	20	99
Nickel	A60645-1	300	96
Selenium	A60646-1	300	81
Silver	A60645-1	300	104
Silver	DI Water	300	95
Vanadium	A60645-1	300	93
Zinc	A60645-1	300	96
Titanium	A60645-1	300	93
Praseodymium	A60645-1	300	104
Units		(ug)	(%)

60646 03239

alytiKEM An American NuKEM Company

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: S92032 **AnalytiKEM Contact:** Holly

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	4 oz ml Unpres. 500	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml plastic	950 ml unpres.	PARAMETERS
1	B4	12-16-92	1600	Soil	G		2					1	3		analyses per attached sheet
2															
3															
4															RESULTS DUE BY
5															12-30-92
6															
7															
8															
9															
10															

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Dennis Williams	12-17-92	1330
2	1	Dennis Williams	S. Sawyer	12-17-92	1530
3	1	S. Sawyer	FED EX	12-17-92	5:30 P.M.
4	1	FED EX	[illegible]	12/18	1000

REMARKS

P.O. # 31868

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

ANALYTIKEM
SAMPLE RECEIPT CHECKLIST

AnalytiKEM

CLIENT NAME: Enco ANALYTIKEM NO. 60646

PROJECT NAME ______

COMMENTS

1. ______ SHIPPED
   5213684 855 AIR BILL #
   ______ HAND-DELIVERED

2. ✓ COC PRESENT ON RECEIPT
   ______ NO COC ON RECEIPT
   ______ COC TAPE ON CONTAINERS/COOLERS
   ✓ NO COC TAPE ON CONTAINERS/COOLERS

3. ✓ SAMPLE(S) INTACT ON RECEIPT
   ______ SAMPLE(S) BROKEN/LEAKING
   ______ OTHER (SEE COMMENTS)

4. ✓ PROPER TEMPERATURE
   ______ IMPROPER TEMPERATURE

5. ✓ PROPERLY PRESERVED
   ______ IMPROPERLY PRESERVED
   ✓ NA

6. ✓ RECEIVED WITHIN HOLDING TIME
   ______ NOT RECEIVED WITHIN HOLDING TIME
   ______ NA

7. ______ DISCREPANCIES BETWEEN COC AND SAMPLE LABELS

8. ✓ NO DISCREPANCIES NOTED

SAMPLES INSPECTED AND LOGGED BY: [signature]

DATE/TIME: 12/18/92 1001

VIII. Analytical Results

AnalytiKEM

TCLP Metals

AnalytiKEM Designation: A60651-1

Client Designation: B5

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	< 1.0	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	< 0.050	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	5.4	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.021	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM Designation: A60651-2

Client Designation: S7

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.050	< 0.050	5.0
D005	Barium	< 1.0	1.5	100
D006	Cadmium	< 0.005	< 0.005	1.0
D007	Chromium	< 0.050	< 0.050	5.0
D008	Lead	< 0.050	0.10	5.0
D009	Mercury	< 0.0011	< 0.0011	0.2
D010	Selenium	< 0.010	< 0.010	1.0
D011	Silver	< 0.050	< 0.050	5.0
----	Cobalt	< 0.050	< 0.050	---
----	Vanadium	< 0.050	< 0.050	---
----	Boron	< 0.10	0.66	---
----	Praseodymium	< 0.10	< 0.10	---
----	Titanium	< 0.010	0.015	---
Units		(mg/l)	(mg/l)	(mg/l)

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82918

November 23, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: S92032

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

III. Sample Designations

AnalytiKEM

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82918-1	B6-R2	Nonaqueous	11/09/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

AnalytiKEM

V. Laboratory Chronicle

	DATE I	DATE II
Date Sampled	11/09/92	
Receipt/Refrigeration	11/13/92	
TCLP Extractions		
TC Extraction	11/16/92	
Sample Preparations		
Metals:		
General	11/18/92	
Mercury	11/19/92	
Furnace	11/18/92	
Analyses		
Metals:		
General	11/18/92	
Mercury	11/19/92	
Furnace	11/18/92	

Laboratory Manager Review & Approval
(Signature) [signature]
(Printed Name) Gregory A. Pruna
(Date) 11/25/92

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

AnalytiKEM

VI. Extraction Log

Sample Designation	TCLP Extraction, (g)	Extraction Fluid Type	Extraction Fluid Volume (ml)
A82918-1	100	1	2,000

AnalytiKEM

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82918-1 B6-R2

AnalytiKEM

VIII. Analytical Results

TCLP Metals

AnalytiKEM Designation: A82918-1

Client Designation: B6-R2

EPA Number	Parameter	Method Blank	Sample Result	Regulatory Level
D004	Arsenic	< 0.28	< 0.28	0.50
D005	Barium	< 4.8	< 4.8	10
D006	Cadmium	< 0.051	< 0.051	0.10
D007	Chromium	< 0.30	< 0.30	0.50
----	Cobalt	< 0.052	< 0.052	--
D008	Lead	< 0.30	< 0.30	0.50
----	Manganese	< 0.016	0.041	--
D009	Mercury	< 0.018	< 0.018	0.020
----	Nickel	< 0.040	< 0.040	--
D010	Selenium	< 0.051	< 0.051	0.10
D011	Silver	< 0.15	< 0.15	0.50
----	Vanadium	< 0.050	< 0.050	--
----	Zinc	< 0.020	2.2	--
----	Titanium	< 0.051	< 0.051	--
----	Praseodynium	< 0.59	< 0.59	--
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

AnalytiKEM

IX. Quality Control Data

TCLP Procedure

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A82832-1

Parameter	Amount of Spike	Recovery MS
Arsenic	300	106
Barium	300	104
Cadmium	300	99
Chromium	300	100
Cobalt	300	97
Lead	300	100
Manganese	300	92
Mercury	200	113
Nickel	300	101
Selenium	300	99
Silver	300	46
Vanadium	300	101
Zinc	300	100
Titanium	300	99
Praseodynium	300	101
Units	(ppb)	(%)

AnalytiKEM An American NuKEM Company

03272

Chain-of-Custody Record 82918

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI Sample Collector: Steve Stadelman

Project: 592032 AnalytiKEM Contact: Jean Neil

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	_ ml Unpres.	_ ml HNO_3	_ ml H_2SO4	_ ml NaOH	_ ml HCL			PARAMETERS
1	B6-R2	11-9-92	1330	soil	G										metals per attached sheet
2															
3															
4															
5															
6															
7															
8															
9															
10															

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Skip Sawyer	11-12-92	1610
2					
3					
4					

REMARKS 3-day TAT.
P.O. # 31767

Steve Stadelman
SAMPLER'S SIGNATURE

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: 31767

Laboratory Number: 82918

1. ✓ Shipped — Notes:
   ___ Hand Delivered
2. ✓ COC Present on Receipt — Notes:
   ___ No COC
3. ___ COC Tape on Shipping Container — Notes:
   ✓ No COC Tape on Shipping Container — Notes:
4. ___ Samples Broken/Leaking — Notes:
   ✓ Sample Intact on Receipt
   ___ Other (See Notes)
5. ___ Ambient on Receipt — Notes:
   ✓ Chilled on Receipt
6. ___ Samples Preserved Correctly — Notes:
   ___ Improper Preservatives
   ✓ N/A (None Recommended)
   ___ Other (See Notes)
7. ___ Received Within Holding Time — Notes:
   ___ Not Received Within Holding Time
   ✓ N/A (None Recommended)
   ___ Other (See Notes)
8. ___ COC Tapes on Samples — Notes:
   ✓ No COC Tapes on Samples
9. ___ Discrepancies Between COC and Sample Labels — Notes:
   ✓ No Discrepancies Noted
   ___ N/A (No COC Received)

Additional Comments:

Inspected and Logged in by: S. Sawyer
Date/Time: 11-13-92 11:20 A.M.

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: 31767 Laboratory Number: 82918

1. ✓ Shipped Notes:
   ___ Hand Delivered
2. ✓ COC Present on Receipt Notes:
   ___ No COC
3. ___ COC Tape on Shipping Container Notes:
   ✓ No COC Tape on Shipping Container Notes:
4. ___ Samples Broken/Leaking Notes:
   ✓ Sample Intact on Receipt
   ___ Other (See Notes)
5. ___ Ambient on Receipt Notes:
   ✓ Chilled on Receipt
6. ___ Samples Preserved Correctly Notes:
   ___ Improper Preservatives
   ✓ N/A (None Recommended)
   ___ Other (See Notes)
7. ___ Received Within Holding Time Notes:
   ___ Not Received Within Holding Time
   ✓ N/A (None Recommended)
   ___ Other (See Notes)
8. ___ COC Tapes on Samples Notes:
   ✓ No COC Tapes on Samples
9. ___ Discrepancies Between COC and Sample Labels Notes:
   ✓ No Discrepancies Noted
   ___ N/A (No COC Received)

Additional Comments:

Inspected and Logged in by: S. Sawyer
Date/Time: 11-13-92 11:20 A.M.

research analyses consultation

EFEH & ASSOCIATES

10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 996-5031

November 6, 1992

Mr. Steve Stadelman
ENSCI Corporation
1108 Old Thomasville Road
High Point, North Carolina 27260

Dear Mr. Stadelman:

Following are the results of the solid sample submitted to our laboratory for analyses on November 3, 1992:

P.O. #: 31728

SAMPLE I.D.	B6-R2 11/1/92 11:30
LAB NO.	F-9747
TCLP INORGANICS (Leachate)	
Arsenic, mg/l	<0.01
Barium, mg/l	0.08
Boron, mg/l	1.50
Cadmium, mg/l	<0.005
Chromium, mg/l	<0.01
Cobalt, mg/l	<0.01
Lead, mg/l	0.02
Manganese, mg/l	0.07
Mercury, mg/l	<0.002
Nickel, mg/l	<0.01
Praseodymium, mg/l	0.01
Selenium, mg/l	<0.01
Silver, mg/l	<0.01
Titanium, mg/l	<0.01
Vanadium, mg/l	<0.06
Zinc, mg/l	<0.01

METHOD: EPA 1311/6010/7471

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr.

Edwin B. Smith, Jr. PhD.

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651, Revision

February 2, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission *	
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated bA60646k as well as the sample. It indicates possible/probable bA60646k contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A60651-1	B5	Nonaqueous	12/28/92
A60651-2	S7	Nonaqueous	12/29/92
A60651-3	S6	Nonaqueous	12/29/92
A60651-4	S5	Nonaqueous	12/29/92
A60651-5	S8	Nonaqueous	12/29/92
A60651-6	S9	Nonaqueous	12/29/92
A60651-7	S10	Nonaqueous	12/29/92
A60651-8	S4	Nonaqueous	12/29/92
A60651-9	S14	Nonaqueous	12/30/92
A60651-10	S12	Nonaqueous	12/30/92
A60651-11	S13	Nonaqueous	12/30/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

	Sample Designation		
Parameter	Method Blank 1	A60651-1 B5	A60651-2 S7
Chloromethane	< 10	< 10	< 10
Bromomethane	< 10	< 10	< 10
Vinyl Chloride	< 10	< 10	< 10
Chloroethane	< 10	< 10	< 10
Methylene Chloride	10	6.8	< 5.0
2-Propanone (Acetone)	< 100	< 100	< 100
Carbon Disulfide	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0	< 5.0
Benzene	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10	< 10
Bromoform	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0	< 5.0
Toluene	< 5.0	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0	< 5.0
Styrene	< 5.0	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Volatile Organics

Parameter	Method Blank 2	A60651-3 S6	A60651-7 S10
	Sample Designation		
Chloromethane	< 10	< 10	< 10
Bromomethane	< 10	< 10	< 10
Vinyl Chloride	< 10	< 10	< 10
Chloroethane	< 10	< 10	< 10
Methylene Chloride	< 5.0	6.9	< 5.0
2-Propanone (Acetone)	< 100	< 100	< 100
Carbon Disulfide	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50	< 5.0
Bromodichloromethane	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0	< 5.0
Benzene	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10	< 10
Bromoform	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0	< 5.0
Toluene	< 5.0	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0	< 5.0
Styrene	< 5.0	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Volatile Organics

Sample Designation

Parameter	Method Blank 3	A60651-4 S5	A60651-6 S9
Chloromethane	< 10	< 10	< 10
Bromomethane	< 10	< 10	< 10
Vinyl Chloride	< 10	< 10	< 10
Chloroethane	< 10	< 10	< 10
Methylene Chloride	< 5.0	< 5.0	< 5.0
2-Propanone (Acetone)	< 100	< 100	< 100
1,1-Dichloroethene	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0	< 5.0
Benzene	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10	< 10
Bromoform	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0	< 5.0
Toluene	< 5.0	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0	< 5.0
Styrene	< 5.0	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Volatile Organics

Parameter	Method Blank 3	A60651-10 S12	A60651-11 S13
	Sample Designation		
Chloromethane	< 10	< 10	< 10
Bromomethane	< 10	< 10	< 10
Vinyl Chloride	< 10	< 10	< 10
Chloroethane	< 10	< 10	< 10
Methylene Chloride	< 5.0	< 5.0	< 5.0
2-Propanone (Acetone)	< 100	< 100	< 100
1,1-Dichloroethene	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0	< 5.0
Benzene	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10	< 10
Bromoform	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0	< 5.0
Toluene	< 5.0	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0	< 5.0
Styrene	< 5.0	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Volatile Organics

Parameter	Method Blank 4	A60651-5 S8	A60651-8 S4
		Sample Designation	
Chloromethane	< 10	< 10	< 10
Bromomethane	< 10	< 10	< 10
Vinyl Chloride	< 10	< 10	< 10
Chloroethane	< 10	< 10	< 10
Methylene Chloride	< 5.0	6.3	< 5.0
2-Propanone (Acetone)	< 100	< 100	200
1,1-Dichloroethene	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100	160
1,1,1-Trichloroethane	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0	< 5.0
Benzene	< 5.0	< 5.0	11
trans-1,3-Dichloropropene	< 5.0	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10	< 10
Bromoform	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0	< 5.0
Toluene	< 5.0	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0	< 5.0
Styrene	< 5.0	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0	< 5.0
Units	(ug/1)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Volatile Organics

Parameter	Method Blank 4	A60651-9 S14
	Sample Designation	
Chloromethane	< 10	< 10
Bromomethane	< 10	< 10
Vinyl Chloride	< 10	< 10
Chloroethane	< 10	< 10
Methylene Chloride	< 5.0	< 5.0
2-Propanone (Acetone)	< 100	< 100
1,1-Dichloroethene	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0
Benzene	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10
Bromoform	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50
2-Hexanone	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0
Toluene	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0
Styrene	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)

V. Analytical Results (Cont'd)

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Semivolatile Organics (Page 1 of 2)

		Sample Designation	
Parameter	Method Blank	A60651-1 B5	A60651-2 S7
N-Nitrosodimethylamine	< 330	< 330	< 330
Phenol	< 330	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330	< 330
2-Chlorophenol	< 330	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330	< 330
Benzyl Alcohol	< 330	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330	< 330
2-Methylphenol	< 330	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330	< 330
4-Methylphenol	< 330	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330	< 330
Hexachloroethane	< 330	< 330	< 330
Nitrobenzene	< 330	< 330	< 330
Isophorone	< 330	< 330	< 330
2-Nitrophenol	< 330	< 330	< 330
2,4-Dimethylphenol	< 330	< 330	< 330
Benzoic Acid	< 1,600	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330	< 330
2,4-Dichlorophenol	< 330	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330	< 330
Naphthalene	< 330	< 330	< 330
4-Chloroaniline	< 330	< 330	< 330
Hexachlorobutadiene	< 330	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330	< 330
2-Methylnaphthalene	< 330	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330	< 330
Acenaphthylene	< 330	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600	< 1,600
Acenaphthene	< 330	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 2 of 2)

Parameter	Method Blank	A60651-1 B5	A60651-2 S7
		Sample Designation	
4-Nitrophenol	< 1,600	< 1,600	< 1,600
Dibenzofuran	< 330	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330	< 330
Diethyl Phthalate	< 330	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330	< 330
Fluorene	< 330	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330	< 330
Hexachlorobenzene	< 330	< 330	< 330
Pentachlorophenol	< 1,600	< 330	< 330
Phenanthrene	< 330	< 330	< 330
Anthracene	< 330	< 330	< 330
Dibutyl Phthalate	< 330	< 330	< 330
Fluoranthene	< 330	< 330	< 330
Benzidine	< 3,300	< 3,300	< 3,300
Pyrene	< 330	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660	< 660
Benzo(a)anthracene	< 330	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330	< 330
Chrysene	< 330	< 330	< 330
Dioctyl Phthalate	< 330	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330	< 330
Benzo(a)pyrene	< 330	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330	< 330
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

		Sample Designation	
Parameter	Method Blank	A60651-3 S6	A60651-4 S5
N-Nitrosodimethylamine	< 330	< 330	< 330
Phenol	< 330	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330	< 330
2-Chlorophenol	< 330	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330	< 330
Benzyl Alcohol	< 330	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330	< 330
2-Methylphenol	< 330	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330	< 330
4-Methylphenol	< 330	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330	< 330
Hexachloroethane	< 330	< 330	< 330
Nitrobenzene	< 330	< 330	< 330
Isophorone	< 330	< 330	< 330
2-Nitrophenol	< 330	< 330	< 330
2,4-Dimethylphenol	< 330	< 330	< 330
Benzoic Acid	< 1,600	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330	< 330
2,4-Dichlorophenol	< 330	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330	< 330
Naphthalene	< 330	< 330	< 330
4-Chloroaniline	< 330	< 330	< 330
Hexachlorobutadiene	< 330	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330	< 330
2-Methylnaphthalene	< 330	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330	< 330
Acenaphthylene	< 330	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600	< 1,600
Acenaphthene	< 330	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

Parameter	Method Blank	A60651-3 S6	A60651-4 S5
4-Nitrophenol	< 1,600	< 1,600	< 1,600
Dibenzofuran	< 330	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330	< 330
Diethyl Phthalate	< 330	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330	< 330
Fluorene	< 330	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330	< 330
Hexachlorobenzene	< 330	< 330	< 330
Pentachlorophenol	< 1,600	< 1,600	< 1,600
Phenanthrene	< 330	< 330	< 330
Anthracene	< 330	< 330	< 330
Dibutyl Phthalate	< 330	< 330	< 330
Fluoranthene	< 330	< 330	< 330
Benzidine	< 3,300	< 3,300	< 3,300
Pyrene	< 330	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660	< 660
Benzo(a)anthracene	< 330	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330	< 330
Chrysene	< 330	< 330	< 330
Dioctyl Phthalate	< 330	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330	< 330
Benzo(a)pyrene	< 330	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330	< 330
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

Parameter	Method Blank	A60651-5 S8	A60651-6 S9
		Sample Designation	
N-Nitrosodimethylamine	< 330	< 330	< 330
Phenol	< 330	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330	< 330
2-Chlorophenol	< 330	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330	< 330
Benyzyl Alcohol	< 330	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330	< 330
2-Methylphenol	< 330	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330	< 330
4-Methylphenol	< 330	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330	< 330
Hexachloroethane	< 330	< 330	< 330
Nitrobenzene	< 330	< 330	< 330
Isophorone	< 330	< 330	< 330
2-Nitrophenol	< 330	< 330	< 330
2,4-Dimethylphenol	< 330	< 330	< 330
Benzoic Acid	< 1,600	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330	< 330
2,4-Dichlorophenol	< 330	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330	< 330
Naphthalene	< 330	< 330	< 330
4-Chloroaniline	< 330	< 330	< 330
Hexachlorobutadiene	< 330	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330	< 330
2-Methylnaphthalene	< 330	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330	< 330
Acenaphthylene	< 330	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600	< 1,600
Acenaphthene	< 330	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

	Sample Designation		
Parameter	Method Blank	A60651-5 S8	A60651-6 S9
4-Nitrophenol	< 1,600	< 1,600	< 1,600
Dibenzofuran	< 330	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330	< 330
Diethyl Phthalate	< 330	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330	< 330
Fluorene	< 330	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330	< 330
Hexachlorobenzene	< 330	< 330	< 330
Pentachlorophenol	< 1,600	< 330	< 330
Phenanthrene	< 330	< 330	< 330
Anthracene	< 330	< 330	< 330
Dibutyl Phthalate	< 330	< 330	< 330
Fluoranthene	< 330	< 330	< 330
Benzidine	< 3,300	< 3,300	< 3,300
Pyrene	< 330	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660	< 660
Benzo(a)anthracene	< 330	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330	< 330
Chrysene	< 330	< 330	< 330
Dioctyl Phthalate	< 330	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330	< 330
Benzo(a)pyrene	< 330	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330	< 330
Units	(ug/kg)	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 1 of 2)

	Sample Designation		
Parameter	Method Blank	A60651-7 S10	A60651-8 S4
N-Nitrosodimethylamine	< 330	< 330	< 330
Phenol	< 330	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330	< 330
2-Chlorophenol	< 330	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330	< 330
Benzyl Alcohol	< 330	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330	< 330
2-Methylphenol	< 330	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330	< 330
4-Methylphenol	< 330	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330	< 330
Hexachloroethane	< 330	< 330	< 330
Nitrobenzene	< 330	< 330	< 330
Isophorone	< 330	< 330	< 330
2-Nitrophenol	< 330	< 330	< 330
2,4-Dimethylphenol	< 330	< 330	< 330
Benzoic Acid	< 1,600	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330	< 330
2,4-Dichlorophenol	< 330	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330	< 330
Naphthalene	< 330	< 330	< 330
4-Chloroaniline	< 330	< 330	< 330
Hexachlorobutadiene	< 330	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330	< 330
2-Methylnaphthalene	< 330	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330	< 330
Acenaphthylene	< 330	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600	< 1,600
Acenaphthene	< 330	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

Parameter	Method Blank	A60651-7 S10	A60651-8 S4
4-Nitrophenol	< 1,600	< 1,600	< 1,600
Dibenzofuran	< 330	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330	< 330
Diethyl Phthalate	< 330	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330	< 330
Fluorene	< 330	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330	< 330
Hexachlorobenzene	< 330	< 330	< 330
Pentachlorophenol	< 1,600	< 1,600	< 1,600
Phenanthrene	< 330	< 330	< 330
Anthracene	< 330	< 330	< 330
Dibutyl Phthalate	< 330	< 330	< 330
Fluoranthene	< 330	< 330	< 330
Benzidine	< 3,300	< 3,300	< 3,300
Pyrene	< 330	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660	< 660
Benzo(a)anthracene	< 330	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330	< 330
Chrysene	< 330	< 330	< 330
Dioctyl Phthalate	< 330	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330	< 330
Benzo(a)pyrene	< 330	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330	< 330
Units	(ug/kg)	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 1 of 2)

Parameter	Method Blank	A60651-9 S14	A60651-10 S12
		Sample Designation	
N-Nitrosodimethylamine	< 330	< 330	< 330
Phenol	< 330	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330	< 330
2-Chlorophenol	< 330	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330	< 330
Benzyl Alcohol	< 330	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330	< 330
2-Methylphenol	< 330	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330	< 330
4-Methylphenol	< 330	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330	< 330
Hexachloroethane	< 330	< 330	< 330
Nitrobenzene	< 330	< 330	< 330
Isophorone	< 330	< 330	< 330
2-Nitrophenol	< 330	< 330	< 330
2,4-Dimethylphenol	< 330	< 330	< 330
Benzoic Acid	< 1,600	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330	< 330
2,4-Dichlorophenol	< 330	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330	< 330
Naphthalene	< 330	< 330	< 330
4-Chloroaniline	< 330	< 330	< 330
Hexachlorobutadiene	< 330	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330	< 330
2-Methylnaphthalene	< 330	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330	< 330
Acenaphthylene	< 330	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600	< 1,600
Acenaphthene	< 330	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 2 of 2)

Parameter	Method Blank	A60651-9 S14	A60651-10 S12
	Sample Designation		
4-Nitrophenol	< 1,600	< 1,600	< 1,600
Dibenzofuran	< 330	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330	< 330
Diethyl Phthalate	< 330	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330	< 330
Fluorene	< 330	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330	< 330
Hexachlorobenzene	< 330	< 330	< 330
Pentachlorophenol	< 1,600	< 1,600	< 1,600
Phenanthrene	< 330	< 330	< 330
Anthracene	< 330	< 330	< 330
Dibutyl Phthalate	< 330	< 330	< 330
Fluoranthene	< 330	< 330	< 330
Benzidine	< 3,300	< 3,300	< 3,300
Pyrene	< 330	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660	< 660
Benzo(a)anthracene	< 330	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330	< 330
Chrysene	< 330	< 330	< 330
Dioctyl Phthalate	< 330	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330	< 330
Benzo(a)pyrene	< 330	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330	< 330
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

	Sample Designation	
Parameter	Method Blank	A60651-11 S13
N-Nitrosodimethylamine	< 330	< 330
Phenol	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330
2-Chlorophenol	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330
Benzyl Alcohol	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330
2-Methylphenol	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330
4-Methylphenol	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330
Hexachloroethane	< 330	< 330
Nitrobenzene	< 330	< 330
Isophorone	< 330	< 330
2-Nitrophenol	< 330	< 330
2,4-Dimethylphenol	< 330	< 330
Benzoic Acid	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330
2,4-Dichlorophenol	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330
Naphthalene	< 330	< 330
4-Chloroaniline	< 330	< 330
Hexachlorobutadiene	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330
2-Methylnaphthalene	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330
Acenaphthylene	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600
Acenaphthene	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

	Sample Designation	
Parameter	Method Blank	A60651-11 S13
4-Nitrophenol	< 1,600	< 1,600
Dibenzofuran	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330
Diethyl Phthalate	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330
Fluorene	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330
Hexachlorobenzene	< 330	< 330
Pentachlorophenol	< 1,600	< 1,600
Phenanthrene	< 330	< 330
Anthracene	< 330	< 330
Dibutyl Phthalate	< 330	< 330
Fluoranthene	< 330	< 330
Benzidine	< 3,300	< 3,300
Pyrene	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660
Benzo(a)anthracene	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330
Chrysene	< 330	< 330
Dioctyl Phthalate	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330
Benzo(a)pyrene	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

	Parameter	
Sample Designation	Bromide, by IC	Sulfate, by IC
Method Blank	< 1,000	< 1,000
A60651-1 B5	< 1,000	110,000
A60651-2 S7	< 1,000	600,000
A60651-3 S6	< 1,000	110,000
A60651-4 S5	1,000	2,000
A60651-5 S8	< 1,000	110,000
A60651-6 S9	< 1,000	42,000
A60651-7 S10	< 1,000	83,000
A60651-8 S4	< 1,000	120,000
A60651-9 S14	< 1,000	67,000
A60651-10 S12	< 1,000	23,000
A60651-11 S13	< 1,000	11,000
Units	(ug/kg)	(ug/kg)

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A60651-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,1-Dichloroethene	0.25	89	93	5	59-172	22
Trichloroethene (TCE)	0.25	106	108	2	62-137	24
Chlorobenzene	0.25	102	108	6	60-133	21
Toluene	0.25	102	106	4	59-139	21
Benzene	0.25	111	100	10	66-142	21
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

RPD: 0 out of 5 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Volatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	Surrogate Recovery 1,2-Dichloroethane-d_4 (0.25 ug Added)	Toluene-d_8 (0.25 ug Added)	4-Bromofluorobenzene (0.25 ug Added)
Method Blank 1	96	100	94
Method Blank 2	99	100	105
Method Blank 3	97	101	117
Method Blank 4	100	102	89
A60651-1 Spike	99	98	109
A60651-1 Spike Dup.	103	98	108
A60651-1	99	98	94
A60651-2	96	100	101
A60651-3	97	98	110
A60651-4	97	102	108
A60651-5	101	107	83
A60651-6	97	99	110
A60651-7	101	98	109
A60651-8	111	110	91
A60651-9	102	109	94
A60651-10	99	101	103
A60651-11	100	100	114
Units	(%)	(%)	(%)
Control Limits	70-121	81-117	74-121

0 out of 51 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A60651-2

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	100	59	56	5	28-104	27
N-Nitrosodipropylamine	100	58	52	11	41-126	38
1,2,4-Trichlorobenzene	100	68	63	8	38-107	23
Acenaphthene	100	94	83	12	31-137	19
2,4-Dinitrotoluene	100	75	75	0	28-89	47
Pyrene	100	129	123	5	35-142	36
Phenol	200	61	57	7	26-90	35
2-Chlorophenol	200	67	70	4	25-102	50
4-Chloro-3-methylphenol	200	58	53	9	26-103	33
4-Nitrophenol	200	49	46	6	11-114	50
Pentachlorophenol	200	95	92	3	17-109	47
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 22 outside control limits

RPD: 0 out of 11 outside control limits

VI. Quality Control Data (Cont'd)

AnalytiKEM

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

	Surrogate Recovery		
Sample Designation	2-Fluorophenol (200 ug Added)	Phenol-d_5 (200 ug Added)	2,4,6-Tribromophenol (200 ug Added)
Method Blank	27	31	67
A60651-2 Spike	75	64	105
A60651-2 Spike Dup.	71	58	93
A60651-1	28	36	57
A60651-2	77	69	77
A60651-3	28	42	54
A60651-4	29	33	53
A60651-5	27	30	37
A60651-6	28	35	52
A60651-7	32	40	54
A60651-8	26	37	46
A60651-9	26	26	51
A60651-10	25	27	48
A60651-11	32	48	49
Units	(%)	(%)	(%)
Control Limits	25-121	24-113	19-122

	Surrogate Recovery		
Sample Designation	Nitrobenzene-d_5 (100 ug Added)	2-Fluorobiphenyl (100 ug Added)	Terphenyl-d_{14} (100 ug Added)
Method Blank	34	67	82
A60651-2 Spike	71	74	122
A60651-2 Spike Dup.	62	70	120
A60651-1	41	65	79
A60651-2	76	75	122
A60651-3	42	47	96
A60651-4	45	43	103
A60651-5	24	34	43
A60651-6	42	64	74
A60651-7	46	60	76
A60651-8	45	44	87
A60651-9	33	46	90
A60651-10	35	41	86
A60651-11	38	42	79
Units	(%)	(%)	(%)
Control Limits	23-120	30-115	18-137

0 out of 84 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A60651-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Sulfate	100	97	98	1	75-125	20
Bromide	75	99	99	0	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

60651 552
03282

AnalytiKEM An American NuKEM Company

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytiKEM Contact:** Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO4	ml NaOH	ml HCL	250 ml Sert.	950 ml unpres.		PARAMETERS
1	B5	12-28 92	1430	Soil	G			2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
2	S7	12-29 92	1030	"	G			2					1	3		
3	S6	12-29 92	1215	"	G			2					1	3		
4	S5	12-29 92	1300	"	G			2					1	3		
5	S8	12-29 92	1415	"	G			2					1	3		
6	S9	12-29 92	1445	"	G			2					1	3		
7	S10	12-29 92	1515	"	G			2					1	3		
8	S4	12-29 92	1600	"	G			2					1	3		
9	S14	12-30 92	1100	"	G			2					1	3		
10	S12	12-30 92	1130	"	G			2					1	3		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Grady Lane	12-30 92	1400
2	1-10	Grady Lane	Janet L. Winters	12-30 92	1605
3	1-10	J. Winters	[illegible]	1/4/93	1800
4					

REMARKS
Rush turnaround
P.O. # 31844

Steve Stadelman
SAMPLER'S SIGNATURE

AnalytiKEM ... EM C... 03284

...ustody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Ha... ...ous Waste

Client: ENSCI Sample Collector: Steve Stadelman

Project: 592032 AnalytiKEM Contact: Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml ...	950 ml unpres	PARAMETERS
1	S13	12-30-92	1215	Soil	G		2						1	3	8240, 8270 TCLP metals, gross α, gross β, Ra 226-228, $BaSO_4$. Analyze ...
2															
3															
4															
5															
6															
7															
8															
9															
10															

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Lane	12-30-92	1410
2	1	Grady Lane	Janet Winkles	12-30-92	1605
3	1	Janet Winkles	[illegible]	1/4/93	1000
4					

REMARKS

Rush turnaround.

P.O. # 31894

Steve Stadelman
SAMPLER'S SIGNATURE

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60646, Revision

February 2, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by:

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated bA60646k as well as the sample. It indicates possible/probable bA60646k contamination.

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A60646-1	B4	Nonaqueous	12/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

Parameter	Sample Designation: Method Blank	Sample Designation: A60646-1 B4
Chloromethane	< 10	< 10
Bromomethane	< 10	< 10
Vinyl Chloride	< 10	< 10
Chloroethane	< 10	< 10
Methylene Chloride	< 5.0	< 5.0
2-Propanone (Acetone)	< 100	< 100
Carbon Disulfide	< 5.0	< 5.0
1,1-Dichloroethene	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0
Benzene	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10
Bromoform	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50
2-Hexanone	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0
Toluene	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0
Styrene	< 5.0	< 5.0
m-Xylene	< 5.0	< 5.0
o,p-Xylene	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

Parameter	Sample Designation: Method Blank	A60646-1 B4
N-Nitrosodimethylamine	< 330	< 330
Phenol	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330
2-Chlorophenol	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330
Benzyl Alcohol	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330
2-Methylphenol	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330
4-Methylphenol	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330
Hexachloroethane	< 330	< 330
Nitrobenzene	< 330	< 330
Isophorone	< 330	< 330
2-Nitrophenol	< 330	< 330
2,4-Dimethylphenol	< 330	< 330
Benzoic Acid	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330
2,4-Dichlorophenol	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330
Naphthalene	< 330	< 330
4-Chloroaniline	< 330	< 330
Hexachlorobutadiene	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330
2-Methylnaphthalene	< 330	
Hexachlorocyclopentadiene	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330
Acenaphthylene	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600
Acenaphthene	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

Parameter	Sample Designation: Method Blank	A60646-1 B4
4-Nitrophenol	< 1,600	< 1,600
Dibenzofuran	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330
Diethyl Phthalate	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330
Fluorene	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330
Hexachlorobenzene	< 330	< 330
Pentachlorophenol	< 1,600	< 1,600
Phenanthrene	< 330	< 330
Anthracene	< 330	< 330
Dibutyl Phthalate	< 330	< 330
Fluoranthene	< 330	< 330
Benzidine	< 3,300	< 3,300
Pyrene	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660
Benzo(a)anthracene	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330
Chrysene	< 330	< 330
Dioctyl Phthalate	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330
Benzo(a)pyrene	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

Parameter	Method Blank	A60646-1 B4
	Sample Designation	
Bromide, by IC	< 1,000	< 1,000
Sulfate, by IC	< 1,000	30,000
Units	(ug/kg)	(ug/kg)

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A29123-2

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,1-Dichloroethene	0.25	98	94	5	59-172	22
Trichloroethene (TCE)	0.25	97	94	3	62-137	24
Benzene	0.25	92	94	2	60-133	21
Toluene	0.25	89	89	0	59-139	21
Chlorobenzene	0.25	100	96	3	66-142	21
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

RPD: 0 out of 5 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Volatile Organics

Nonaqueous Surrogate Recovery Data

	Surrogate Recovery		
Sample Designation	1,2-Dichloroethane-d_4 (0.25 ug Added)	Toluene-d_8 (0.25 ug Added)	4-Bromofluorobenzene (0.25 ug Added)
Method Blank	114	97	98
A29123-2 Spike	99	98	109
A29123-2 Spike Dup.	103	98	108
A60646-1	113	94	94
Units	(%)	(%)	(%)
Control Limits	70-121	81-117	74-121

0 out of 12 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A9434-2

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	100	55	62	12	28-104	27
N-Nitrosodipropylamine	100	68	67	1	41-126	38
1,2,4-Trichlorobenzene	100	52	62	18	38-107	23
Acenaphthene	100	87	89	2	31-137	19
2,4-Dinitrotoluene	100	81	77	13	28-89	47
Pyrene	100	103	121	16	35-142	36
Phenol	200	59	59	0	26-90	35
2-Chlorophenol	200	53	54	2	25-102	50
4-Chloro-3-methylphenol	200	57	56	2	26-103	33
4-Nitrophenol	200	75	65	14	11-114	50
Pentachlorophenol	200	58	58	0	17-109	47
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 22 outside control limits

RPD: 0 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	Surrogate Recovery: 2-Fluorophenol (200 ug Added)	Phenol-d_5 (200 ug Added)	2,4,6-Tribromophenol (200 ug Added)
Method Blank	88	52	73
A9434-2 Spike	76	79	90
A9434-2 Spike Dup.	82	82	82
A60646-1	112	112	57
Units	(%)	(%)	(%)
Control Limits	25-121	24-113	19-122

Sample Designation	Surrogate Recovery: Nitrobenzene-d_5 (100 ug Added)	2-Fluorobiphenyl (100 ug Added)	Terphenyl-d_{14} (100 ug Added)
Method Blank	114	43	86
A9434-2 Spike	85	86	84
A9434-2 Spike Dup.	100	93	125
A60646-1	83	75	103
Units	(%)	(%)	(%)
Control Limits	23-120	30-115	18-137

0 out of 24 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A60646-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Sulfate, by IC	100	91	95	4	75-125	20
Bromide, by IC	75	95	94	1	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

AnalytiKEM An American NuKEM Company

28 Springdale Road
Cherry Hill, New Jersey 08003
(609) 751-1122 • (215) 923-2068
Fax: (609) 751-0824

Chain-of-Custody

454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

Client AnalytiKEM Project: 60646 AnalytiKEM Contact Michelle Levin

SAMPLE DESIGNATION	DATE	MATRIX	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml Unpres.	ml HNO_3	ml H_2SO_4	ml H_2SO_4	ml NaOH			PARAMETERS
60646-1	12/16/92	solid			1								Radium 226, Radium 228, Gross Alpha & Beta

I. Field Measurements:

Data Sheets: Y N

Filtered: Y Not Required

II. Field Conditions/Comments:

III. Special Instructions:
(Detection Limits, Data Package, etc.)

Relinquished By:	Time/Date:	Received By:	Time/Date:
[signature]	1710 12/23/92	Airborne Express	
		[signature]	12-24-92 1200

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A82824

November 5, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by:

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission *	
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units,
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82824-1	S3	Nonaqueous	10/20/92
A82824-2	B2	Nonaqueous	10/20/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

Parameter	Method Blank	A82824-1 S3	A82824-2 B2
	Sample Designation		
Chloromethane	< 1,000	< 1,000	< 1,000
Bromomethane	< 1,000	< 1,000	< 1,000
Vinyl Chloride	< 1,000	< 1,000	< 1,000
Chloroethane	< 1,000	< 1,000	< 1,000
Methylene Chloride	< 500	< 500	< 500
2-Propanone (Acetone)	<10,000	< 10,000	< 10,000
Carbon Disulfide	< 500	< 500	< 500
1,1-Dichloroethene	< 500	< 500	< 500
1,1-Dichloroethane	< 500	< 500	< 500
trans-1,2-Dichloroethene	< 500	< 500	< 500
Chloroform	< 500	< 500	< 500
1,2-Dichloroethane	< 500	< 500	< 500
2-Butanone (MEK)	<10,000	< 10,000	< 10,000
1,1,1-Trichloroethane	< 500	< 500	< 500
Carbon Tetrachloride	< 500	< 500	< 500
Vinyl Acetate	< 5,000	< 5,000	< 5,000
Bromodichloromethane	< 500	< 500	< 500
1,2-Dichloropropane	< 500	< 500	< 500
trans-1,3-Dichloropropene	< 500	< 500	< 500
Trichloroethene	< 500	< 500	< 500
Dibromochloromethane	< 500	< 500	< 500
1,1,2-Trichloroethane	< 500	< 500	< 500
Benzene	< 500	< 500	< 500
cis-1,3-Dichloropropene	< 500	< 500	< 500
2-Chloroethyl Vinyl Ether	< 1,000	< 1,000	< 1,000
Bromoform	< 500	< 500	< 500
4-Methyl-2-Pentanone (MIBK)	< 5,000	< 5,000	< 5,000
2-Hexanone	< 5,000	< 5,000	< 5,000
Tetrachloroethene	< 500	< 500	< 500
1,1,2,2-Tetrachloroethane	< 500	< 500	< 500
Toluene	< 500	< 500	< 500
Chlorobenzene	< 500	< 500	< 500
Ethylbenzene	< 500	< 500	< 500
Styrene	< 500	< 500	< 500
m,p-Xylene	< 500	< 500	< 500
o-Xylene	< 500	< 500	< 500
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

Parameter	Method Blank	A82824-1 S3	A82824-2 B2
	Sample Designation		
N-Nitrosodimethylamine	< 500	< 500	< 500
Phenol	< 500	< 500	< 500
Bis(2-chloroethyl) Ether	< 500	< 500	< 500
2-Chlorophenol	< 500	< 500	< 500
1,3-Dichlorobenzene	< 500	< 500	< 500
1,4-Dichlorobenzene	< 500	< 500	< 500
Benzyl Alcohol	< 500	< 500	< 500
1,2-Dichlorobenzene	< 500	< 500	< 500
2-Methylphenol	< 500	< 500	< 500
Bis(2-chloroisopropyl) Ether	< 500	< 500	< 500
4-Methylphenol	< 500	< 500	< 500
N-Nitrosodipropylamine	< 500	< 500	< 500
Hexachloroethane	< 500	< 500	< 500
Nitrobenzene	< 500	< 500	< 500
Isophorone	< 500	< 500	< 500
2-Nitrophenol	< 500	< 500	< 500
2,4-Dimethylphenol	< 500	< 500	< 500
Benzoic Acid	< 2,500	< 2,500	< 2,500
Bis(2-chloroethoxy)methane	< 500	< 500	< 500
2,4-Dichlorophenol	< 500	< 500	< 500
1,2,4-Trichlorobenzene	< 500	< 500	< 500
Naphthalene	< 500	< 500	< 500
4-Chloroaniline	< 500	< 500	< 500
Hexachlorobutadiene	< 500	< 500	< 500
4-Chloro-3-methylphenol	< 500	< 500	< 500
2-Methylnaphthalene	< 500	< 500	< 500
Hexachlorocyclopentadiene	< 500	< 500	< 500
2,4,6-Trichlorophenol	< 500	< 500	< 500
2,4,5-Trichlorophenol	< 2,500	< 2,500	< 2,500
2-Chloronaphthalene	< 500	< 500	< 500
2-Nitroaniline	< 2,500	< 2,500	< 2,500
Dimethyl Phthalate	< 500	< 500	< 500
Acenaphthylene	< 500	< 500	< 500
3-Nitroaniline	< 2,500	< 2,500	< 2,500
Acenaphthene	< 500	< 500	< 500
2,4-Dinitrophenol	< 2,500	< 2,500	< 2,500
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

Parameter	Method Blank	A82824-1 S3	A82824-2 B2
	Sample Designation		
4-Nitrophenol	< 2,500	< 2,500	< 2,500
Dibenzofuran	< 500	< 500	< 500
2,4-Dinitrotoluene	< 500	< 500	< 500
2,6-Dinitrotoluene	< 500	< 500	< 500
Diethyl Phthalate	< 500	< 500	< 500
4-Chlorophenyl Phenyl Ether	< 500	< 500	< 500
Fluorene	< 500	< 500	< 500
4-Nitroaniline	< 2,500	< 2,500	< 2,500
4,6-Dinitro-2-methylphenol	< 2,500	< 2,500	< 2,500
N-Nitrosodiphenylamine	< 500	< 500	< 500
4-Bromophenyl Phenyl Ether	< 500	< 500	< 500
Hexachlorobenzene	< 500	< 500	< 500
Pentachlorophenol	< 500	< 500	< 500
Phenanthrene	< 500	< 500	< 500
Anthracene	< 500	< 500	< 500
Dibutyl Phthalate	< 500	< 500	< 500
Fluoranthene	< 500	< 500	< 500
Benzidine	< 2,500	< 2,500	< 2,500
Pyrene	< 500	< 500	< 500
Butylbenzyl Phthalate	< 500	< 500	< 500
3,3'-Dichlorobenzidine	< 1,000	< 1,000	< 1,000
Benzo(a)anthracene	< 500	< 500	< 500
Bis(2-ethylhexyl) Phthalate	< 500	< 500	< 500
Chrysene	< 500	< 500	< 500
Dioctyl Phthalate	< 500	< 500	< 500
Benzo(b)fluoranthene	< 500	< 500	< 500
Benzo(k)fluoranthene	< 500	< 500	< 500
Benzo(a)pyrene	< 500	< 500	< 500
Indeno(1,2,3-cd)pyrene	< 500	< 500	< 500
Dibenzo(a,h)anthracene	< 500	< 500	< 500
Benzo(g,h,i)perylene	< 500	< 500	< 500
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

		Sample Designation	
Parameter	Method Blank	A82824-1 S3	A82824-2 B2
Sulfate, by IC	< 1,000	100,000	21,000
Bromide, by IC	< 1,000	< 1,000	< 1,000
Units	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82824-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery
1,1-Dichloroethene	0.25	98	85	14	D-234
Trichloroethene (TCE)	0.25	103	106	3	71-157
Chlorobenzene	0.25	106	111	5	37-160
Toluene	0.25	108	115	6	47-150
Benzene	0.25	110	118	7	37-151
Units	(ug)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Volatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	Surrogate Recovery: 1,2-Dichloroethane-d_4 (50 ppb Added)	Toluene-d_8 (50 ppb Added)	4-Bromofluorobenzene (50 ppb Added)
Method Blank	102	104	113
A82824-1 Spike	94	99	102
A82824-1 Spike Dup.	99	104	108
A82824-1	90	91	105
A82824-2	92	94	102
Units	(%)	(%)	(%)
Control Limits	62-152	57-159	62-148

0 out of 15 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82824-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	50	71	71	0	18-120	43
N-Nitrosodipropylamine	50	104	103	1	10-156	31
1,2,4-Trichlorobenzene	50	73	73	0	24-161	17
Acenaphthene	50	84	82	2	10-151	16
2,4-Dinitrotoluene	50	64	61	5	10-197	33
Pyrene	50	106	106	0	10-167	31
Phenol	100	67	66	1	10-141	41
2-Chlorophenol	100	58	57	2	33-101	19
4-Chloro-3-methylphenol	100	63	53	17	26-117	25
4-Nitrophenol	100	34	18	61	10-221	36
4-Nitrophenol ϕ	100	95	--	--	10-221	36
Pentachlorophenol	100	61	59	3	10-179	16
Units	(ppb)	(%)	(%)	(%)	(%)	(%)

ϕ Spike performed on DI Water.

Recovery: 0 out of 23 outside control limits

RPD: 1 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	Surrogate Recovery 2-Fluorophenol (200 ppb Added)	Phenol-d_5 (200 ppb Added)	2,4,6-Tribromophenol (200 ppb Added)
Method Blank	68	76	91
A82824-1 Spike	68	72	78
A82824-1 Spike Dup.	68	72	47
A82824-1	79	88	61
A82824-2	89	102	63
Units	(%)	(%)	(%)
Control Limits	27-106	30-88	42-89

Sample Designation	Surrogate Recovery Nitrobenzene-d_5 (100 ppb Added)	2-Fluorobiphenyl (100 ppb Added)	Terphenyl-d_{14} (100 ppb Added)
Method Blank	72	81	130
A82824-1 Spike	75	83	100
A82824-1 Spike Dup.	71	79	100
A82824-1	95	72	96
A82824-2	101	76	102
Units	(%)	(%)	(%)
Control Limits	34-107	10-157	10-175

0 out of 30 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A28611-65

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Sulfate	100	98	97	1	75-125	20
Bromide	75	98	100	2	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

AnalytiKEM An American NuKEM Company

03237

Chain-of-Custody Record

828 24

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI

Sample Collector: Stadelman

Project: 592032

AnalytiKEM Contact: Holly

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	250ml Unpres.	ml HNO_3	ml H_2SO4	ml NaOH	ml HCL	500 ml unpreserved	250 unpreserved		PARAMETERS
1	S3	10-20-92	11:45	soil	G			3.					2	1		Gross α, gross β, radium 226, radium 228, 8240, 8270, metals by TCLP, sulfate & bromide by IC
2	B2	10-20-92	10:30	soil	G			3					2	1		" " "
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-2	Steve Stadelman	Grady Lane	10-21-92	1250
2	1-2	Grady Lane	Janet Winters	10-21-92	1450
3					
4					

REMARKS

P.O. # 31682

Steve Stadelman

SAMPLER'S SIGNATURE

AKEM #1 12

Reorder: PJ Associates 803-329-2300

White Laboratory Copy Yellow Client Copy

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: Mannington Tile Soil Laboratory Number: 82824

1. ____ Shipped Notes: ____
   ✓ Hand Delivered
2. ✓ COC Present on Receipt Notes: ____
   ____ No COC
3. ____ COC Tape on Shipping Container Notes: ____
   ✓ No COC Tape on Shipping Container Notes: ____
4. ____ Samples Broken/Leaking Notes: ____
   ✓ Sample Intact on Receipt
   ____ Other (See Notes)
5. ✓ Ambient on Receipt Notes: ____
   ____ Chilled on Receipt
6. ____ Samples Preserved Correctly Notes: ____
   ____ Improper Preservatives
   ✓ N/A (None Recommended)
   ____ Other (See Notes)
7. ✓ Received Within Holding Time Notes: ____
   ____ Not Received Within Holding Time
   ____ N/A (None Recommended)
   ____ Other (See Notes)
8. ____ COC Tapes on Samples Notes: ____
   ✓ No COC Tapes on Samples
9. ____ Discrepancies Between COC and Sample Labels Notes: ____
   ✓ No Discrepancies Noted
   ____ N/A (No COC Received)

Additional Comments: ____

Inspected and Logged in by: Greg Barrett
Date/Time: 10/21/92 6:45 pm

524-1KE10

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82791

October 22, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, Tx	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission *	
Massachusetts	NJ117			Louisiana *	
New Jersey	04012				
New York	10815				
N. Carolina	258				
N. Dakota	R-038				
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				

* No certification numbers are issued for these states.

II. Definition of Terms

AnalytiKEM

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
TON	Threshold Odor Number
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82791-1	B1	Nonaqueous	10/12/92
A82791-2	S1	Nonaqueous	10/12/92
A82791-3	S2	Nonaqueous	10/12/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

Parameter	Method Blank	A82791-1 B1	A82791-2 S1	A82791-3 S2
		Sample Designation		
Chloromethane	1,000 U	1,000 U	1,000 U	1,000 U
Bromomethane	1,000 U	1,000 U	1,000 U	1,000 U
Vinyl Chloride	1,000 U	1,000 U	1,000 U	1,000 U
Chloroethane	1,000 U	1,000 U	1,000 U	1,000 U
Methylene Chloride	500 U	190 J	200 J	220 J
2-Propanone (Acetone)	10,000 U	10,000 U	10,000 U	10,000 U
Carbon Disulfide	500 U	500 U	500 U	500 U
1,1-Dichloroethene	500 U	500 U	500 U	500 U
1,1-Dichloroethane	500 U	500 U	500 U	500 U
trans-1,2-Dichloroethene	500 U	500 U	500 U	500 U
Chloroform	500 U	500 U	500 U	500 U
1,2-Dichloroethane	500 U	500 U	500 U	500 U
2-Butanone (MEK)	10,000 U	10,000 U	10,000 U	10,000 U
1,1,1-Trichloroethane	500 U	500 U	500 U	500 U
Carbon Tetrachloride	500 U	500 U	500 U	500 U
Vinyl Acetate	5,000 U	5,000 U	5,000 U	5,000 U
Bromodichloromethane	500 U	500 U	500 U	500 U
1,2-Dichloropropane	500 U	500 U	500 U	500 U
trans-1,3-Dichloropropene	500 U	500 U	500 U	500 U
Trichloroethene	500 U	500 U	500 U	500 U
Dibromochloromethane	500 U	500 U	500 U	500 U
1,1,2-Trichloroethane	500 U	500 U	500 U	500 U
Benzene	500 U	500 U	500 U	500 U
cis-1,3-Dichloropropene	500 U	500 U	500 U	500 U
2-Chloroethyl Vinyl Ether	1,000 U	1,000 U	1,000 U	1,000 U
Bromoform	4.7 J	500 U	500 U	500 U
4-Methyl-2-Pentanone (MIBK)	5,000 U	5,000 U	5,000 U	5,000 U
2-Hexanone	5,000 U	5,000 U	5,000 U	5,000 U
Tetrachloroethene	500 U	500 U	500 U	500 U
1,1,2,2-Tetrachloroethane	500 U	500 U	500 U	500 U
Toluene	500 U	500 U	500 U	500 U
Chlorobenzene	500 U	500 U	500 U	500 U
Ethylbenzene	500 U	500 U	500 U	500 U
Styrene	500 U	500 U	500 U	500 U
m,p-Xylene	500 U	500 U	500 U	500 U
o-Xylene	500 U	500 U	500 U	500 U
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

		Sample Designation		
Parameter	Method Blank	A82791-1 B1	A82791-2 S1	A82791-3 S2
N-Nitrosodimethylamine	500 U	500 U	500 U	500 U
Phenol	500 U	500 U	500 U	500 U
Bis(2-chloroethyl) Ether	500 U	500 U	500 U	500 U
2-Chlorophenol	500 U	500 U	500 U	500 U
1,3-Dichlorobenzene	500 U	500 U	500 U	500 U
1,4-Dichlorobenzene	500 U	500 U	500 U	500 U
Benzyl Alcohol	500 U	500 U	500 U	500 U
1,2-Dichlorobenzene	500 U	500 U	500 U	500 U
2-Methylphenol	500 U	500 U	500 U	500 U
Bis(2-chloroisopropyl) Ether	500 U	500 U	500 U	500 U
4-Methylphenol	500 U	500 U	500 U	500 U
N-Nitrosodipropylamine	500 U	500 U	500 U	500 U
Hexachloroethane	500 U	500 U	500 U	500 U
Nitrobenzene	500 U	500 U	500 U	500 U
Isophorone	500 U	500 U	500 U	500 U
2-Nitrophenol	500 U	500 U	500 U	500 U
2,4-Dimethylphenol	500 U	500 U	500 U	500 U
Benzoic Acid	2,500 U	220 J	92 J	2,500 U
Bis(2-chloroethoxy)methane	500 U	500 U	500 U	500 U
2,4-Dichlorophenol	500 U	500 U	500 U	500 U
1,2,4-Trichlorobenzene	500 U	500 U	500 U	500 U
Naphthalene	500 U	500 U	500 U	500 U
4-Chloroaniline	500 U	500 U	500 U	500 U
Hexachlorobutadiene	500 U	500 U	500 U	500 U
4-Chloro-3-methylphenol	500 U	500 U	500 U	500 U
2-Methylnaphthalene	500 U	500 U	500 U	500 U
Hexachlorocyclopentadiene	500 U	500 U	500 U	500 U
2,4,6-Trichlorophenol	500 U	500 U	500 U	500 U
2,4,5-Trichlorophenol	2,500 U	2,500 U	2,500 U	2,500 U
2-Chloronaphthalene	500 U	500 U	500 U	500 U
2-Nitroaniline	2,500 U	2,500 U	2,500 U	2,500 U
Dimethyl Phthalate	500 U	500 U	500 U	500 U
Acenaphthylene	500 U	500 U	500 U	500 U
3-Nitroaniline	2,500 U	2,500 U	2,500 U	2,500 U
Acenaphthene	500 U	500 U	500 U	500 U
2,4-Dinitrophenol	2,500 U	2,500 U	2,500 U	2,500 U
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 2 of 2)

		Sample Designation		
Parameter	Method Blank	A82791-1 B1	A82791-2 S1	A82791-3 S2
4-Nitrophenol	2,500 U	2,500 U	2,500 U	2,500 U
Dibenzofuran	500 U	500 U	500 U	500 U
2,4-Dinitrotoluene	500 U	500 U	500 U	500 U
2,6-Dinitrotoluene	500 U	500 U	500 U	500 U
Diethyl Phthalate	500 U	500 U	500 U	500 U
4-Chlorophenyl Phenyl Ether	500 U	500 U	500 U	500 U
Fluorene	500 U	500 U	500 U	500 U
4-Nitroaniline	2,500 U	2,500 U	2,500 U	2,500 U
4,6-Dinitro-2-methylphenol	2,500 U	2,500 U	2,500 U	2,500 U
N-Nitrosodiphenylamine	500 U	500 U	500 U	500 U
4-Bromophenyl Phenyl Ether	500 U	500 U	500 U	500 U
Hexachlorobenzene	500 U	500 U	500 U	500 U
Pentachlorophenol	500 U	500 U	500 U	500 U
Phenanthrene	500 U	500 U	500 U	500 U
Anthracene	500 U	500 U	500 U	500 U
Dibutyl Phthalate	240 J	180 J	210 J	180 J
Fluoranthene	500 U	500 U	500 U	500 U
Benzidine	2,500 U	2,500 U	2,500 U	2,500 U
Pyrene	500 U	500 U	500 U	500 U
Butylbenzyl Phthalate	500 U	500 U	500 U	500 U
3,3'-Dichlorobenzidine	1,000 U	1,000 U	1,000 U	1,000 U
Benzo(a)anthracene	500 U	500 U	500 U	500 U
Bis(2-ethylhexyl) Phthalate	77 J	74 J	83 J	70 J
Chrysene	500 U	500 U	500 U	500 U
Dioctyl Phthalate	500 U	500 U	500 U	500 U
Benzo(b)fluoranthene	500 U	500 U	500 U	500 U
Benzo(k)fluoranthene	500 U	500 U	500 U	500 U
Benzo(a)pyrene	500 U	500 U	500 U	500 U
Indeno(1,2,3-cd)pyrene	500 U	500 U	500 U	500 U
Dibenzo(a,h)anthracene	500 U	500 U	500 U	500 U
Benzo(g,h,i)perylene	500 U	500 U	500 U	500 U
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

		Sample Designation		
Parameter	Method Blank	A82791-1 B1	A82791-2 S1	A82791-3 S2
Bromide, by IC	1,000 U	1,000 U	1,000 U	1,000 U
Sulfate, by IC	1,000 U	27,000	24,000	150,000
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

Note: The Bromide and Sulfate analyses were performed at our Cherry Hill, NJ facility.

Note: The radioactivity analyses were subcontracted to Teledyne Isotopes. Please see the attached copy of their report.

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82714-6

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery
1,1-Dichloroethene	0.25	90	91	1	D-234
Trichloroethene (TCE)	0.25	97	100	3	71-157
Benzene	0.25	94	96	2	37-151
Toluene	0.25	96	95	1	47-150
Chlorobenzene	0.25	97	96	1	37-160
Units	(ug)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Volatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	1,2-Dichloroethane-d_4 (50 ppb Added)	Toluene-d_8 (50 ppb Added)	4-Bromofluorobenzene (50 ppb Added)
	Surrogate Recovery		
Method Blank	73	71	80
A82714-6 Spike	96	94	98
A82714-6 Spike Dup.	92	93	98
A82791-1	96	93	97
A82791-2	98	94	99
A82791-3	97	91	98
Units	(%)	(%)	(%)
Control Limits	70-121	81-117	74-121

0 out of 18 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82682-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	50	74	66	11	18-120	43
N-Nitrosodipropylamine	50	44	65	38	10-156	31
1,2,4-Trichlorobenzene	50	82	72	13	24-161	17
Acenaphthene	50	97	90	7	10-151	16
2,4-Dinitrotoluene	50	70	71	1	10-197	33
Pyrene	50	109	104	5	10-167	31
Phenol	100	71	66	7	10-141	41
2-Chlorophenol	100	72	65	10	33-101	19
4-Chloro-3-methylphenol	100	74	64	14	26-117	25
4-Nitrophenol	100	60	58	5	10-221	36
Pentachlorophenol	100	82	83	1	10-179	16
Units	(ppb)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 22 outside control limits

RPD: 1 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	2-Fluorophenol (200 ppb Added)	Phenol-d_5 (200 ppb Added)	2,4,6-Tribromophenol (200 ppb Added)
	Surrogate Recovery		
Method Blank	50	51	53
A82682-1 Spike	61	68	67
A82682-1 Spike Dup.	59	67	46
A82791-1	53	53	60
A82791-2	41	42	51
A82791-3	39	39	52
Units	(%)	(%)	(%)
Control Limits	27-106	30-88	42-89

Sample Designation	Nitrobenzene-d_5 (100 ppb Added)	2-Fluorobiphenyl (100 ppb Added)	Terphenyl-d_{14} (100 ppb Added)
	Surrogate Recovery		
Method Blank	38	44	68
A82682-1 Spike	75	89	100
A82682-1 Spike Dup.	69	84	96
A82791-1	46	52	93
A82791-2	34	39	84
A82791-3	32	39	82
Units	(%)	(%)	(%)
Control Limits	34-107	10-157	10-175

__1__ out of __36__ surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A60624-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Bromide	75	97	97	0	75-125	20
Sulfate	100	93	92	1	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

AnalytiKEM An American NuKEM Company 82791 04241

3-day turnaround

Chain-of-Custody Record

P.O. 31652

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Stadelman

Project: Mannington Tile **AnalytiKEM Contact:** Jean Neil

Laboratory	**Sales Office**
2324 Vernsdale Road Rock Hill, South Carolina 29731 (803) 324-5310 Fax: (803) 324-8378	454 South Anderson Road BTC 532 Rock Hill, South Carolina 29730 (803) 329-9690 Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	250 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	500 ml	950 ml		PARAMETERS
1	B1	10-12-92	16:25	Soil				1								8240
2	B1		16:28				2									8270
3	B1		16:35										1			metals by TCLP
4	B1		16:40											1		sulfate and bromide by IC scan
5	B1		16:40										1			gross alpha, gross beta, radium 226 + 228
6	S1		17:25					1								8240
7	S1		17:30				2									8270
8	S1		17:36										1			metals by TCLP
9	S1		17:42											1		sulfate & bromide by IC scan
10	S1		17:42										1			gross alpha, gross beta, radium 226 + 228

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Denise Williams	10-13-92	1:55 pm
2		Denise Williams	Janet Winters	10-13-92	4:35 pm
3					
4					

REMARKS

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM An American NuKEM Company   82791   04249

3-day turnaround

Chain-of-Custody Record

P.O. 31652

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI   Sample Collector: Stadelman

Project: Mannington Tile   AnalytiKEM Contact: Jean N.

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	250 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	500 ml	950 ml	PARAMETERS
1	52	10-12-92	16:54				1								8240
2	52		17:00			2									8270
3	52		17:03									1			metals by TCLP
4	52		17:08										1		sulfite & bromine by IC-Scan
5	52		17:48									1			gross alpha, gross beta, radium 226 & 228
6															
7															
8															
9															
10															

3

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-5	Steve Stadelman	Dennis Williams	10-13-92	1:55 pm
2		Dennis Williams	Janet Winters	10-13-92	4:30 pm
3					
4					

REMARKS

Steve Stadelman
SAMPLER'S SIGNATURE

SAMPLE RECEIPT CHECKLIST

Client: 82791

Project Number: Mannington Tile

Laboratory Number: 82791

1.		Shipped	Notes:
	✓	Hand Delivered	
2.	✓	COC Present on Receipt	Notes:
		No COC	
3.		COC Tape on Shipping Container	Notes:
	✓	No COC Tape on Shipping Container	Notes:
4.		Samples Broken/Leaking	Notes:
	✓	Sample Intact on Receipt	
		Other (See Notes)	
5.		Ambient on Receipt	Notes:
	✓	Chilled on Receipt	
6.	✓	Samples Preserved Correctly	Notes:
		Improper Preservatives	
		N/A (None Recommended)	
		Other (See Notes)	
7.	✓	Received Within Holding Time	Notes:
		Not Received Within Holding Time	
		N/A (None Recommended)	
		Other (See Notes)	
8.		COC Tapes on Samples	Notes:
	✓	No COC Tapes on Samples	
9.		Discrepancies Between COC and Sample Labels	Notes:
	✓	No Discrepancies Noted	
		N/A (No COC Received)	

Additional Comments:

Inspected and Logged in by: [signature]

Date/Time: 10/13 5:30p

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60646, Supplemental

January 24, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses were subcontracted to Teledyne Isotopes. Please see the attached copy of their report.

Reviewed &
Approved by:

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

20 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/19/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5557		12/24/92	01/27/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/N *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
99486	60646-1		12/16				GR-A	1.4 +-0.5 E 01		01/06			3
							GR-B	5.1 +-0.4 E 01		01/06			3
							RA-226	6.9 +-0.7 E-01		01/08			4
							RA-228	7.0 +-1.3 E-01		01/08			4

LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 01/19/93

SEND 1 COPIES TO AN133S ATTN: Q A DEPT

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60646, Supplemental

January 24, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses were subcontracted to Teledyne Isotopes. Please see the attached copy of their report.

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

20 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/19/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5557		12/24/92	01/27/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
99486	60646-1		12/16				GR-A	1.4 +-0.5 E 01		01/06			3
							GR-B	5.1 +-0.4 E 01		01/06			3
							RA-226	6.9 +-0.7 E-01		01/08			4
							RA-228	7.0 +-1.3 E-01		01/08			4

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AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82824, Supplemental

November 18, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile

The Radioactivity analyses were subcontracted to Teledyne Isotopes, Laboratories. Please see attached copy of their report.

Reviewed &
Approved by: Michael Shmatula Ph.D for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

11 NOVEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/10/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4534		10/23/92	11/25/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
93817	82824-0 NO 1		10/20				GR-A	4.5 +-1.0 E 01		11/02			3
							GR-B	9.1 +-0.5 E 01		11/02			3
							RA-226	5.9 +-0.9 E 00		11/05			4
							RA-228	2.6 +-0.3 E 00		11/05			4
93818	82824-0 NO 2		10/20				GR-A	2.0 +-0.7 E 01		11/02			3
							GR-B	7.5 +-0.5 E 01		11/02			3
							RA-226	3.7 +-0.6 E 00		11/05			4
							RA-228	9.1 +-1.5 E-01		11/05			4

LAST PAGE OF REPORT

JG Martin

APPROVED BY J. GUENTHER 11/10/92

SEND 1 COPIES TO AN133T PATTI DE ANDINO

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82824, Supplemental

November 18, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile

The Radioactivity analyses were subcontracted to Teledyne Isotopes, Laboratories. Please see attached copy of their report.

Reviewed &
Approved by: Michael Shmatl, Ph.D. for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

11 NOVEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/10/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4534		10/23/92	11/25/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/X *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
93817	82824-0 NO 1		10/20				GR-A	4.5 +-1.0 E 01		11/02			3
							GR-B	9.1 +-0.5 E 01		11/02			3
							RA-226	5.9 +-0.9 E 00		11/05			4
							RA-228	2.6 +-0.3 E 00		11/05			4
93818	82824-0 NO 2		10/20				GR-A	2.0 +-0.7 E 01		11/02			3
							GR-B	7.5 +-0.5 E 01		11/02			3
							RA-226	3.7 +-0.6 E 00		11/05			4
							RA-228	9.1 +-1.5 E-01		11/05			4

JGMartin

LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 11/10/92

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AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82929, Supplemental

December 16, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Note: The Radioactivity analyses were subcontracted to Teledyne Isotopes. Please the attached copy of their report.

Reviewed &
Approved by: Gerald J Miller PhD for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

I. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82929-1	S-11	Nonaqueous	11/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

REPORT OF ANALYSIS

2 DECEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/01/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4954		11/18/92	12/21/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
96143	82929-1		11/16				GR-A	4.2 +-1.0 E 01		11/23			3
							GR-B	1.1 +-0.1 E 02		11/23			3
							RA-226	3.8 +-0.4 E 00		11/24			4
							RA-228	3.6 +-0.4 E 00		11/24			4

LAST PAGE OF REPORT

DMartin

APPROVED BY D. GUENTHER 12/01/92

SEND 1 COPIES TO AN133T PATTI DE ANDINO

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM *An American NuKEM Company*

AnalytIKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82929, Supplemental

December 16, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Note: The Radioactivity analyses were subcontracted to Teledyne Isotopes. Please the attached copy of their report.

Reviewed &
Approved by: Gerald A. Miller, Ph.D. for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

I. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82929-1	S-11	Nonaqueous	11/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

REPORT OF ANALYSIS

2 DECEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/01/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4954		11/18/92	12/21/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

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96143	82929-1		11/16				GR-A	4.2 +-1.0 E 01		11/23			3
							GR-B	1.1 +-0.1 E 02		11/23			3
							RA-226	3.8 +-0.4 E 00		11/24			4
							RA-228	3.6 +-0.4 E 00		11/24			4

LAST PAGE OF REPORT

DMartin
APPROVED BY D. GUENTHER 12/01/92

SEND 1 COPIES TO AN133T PATTI DE ANDINO

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A83007

December 28, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

TABLE OF CONTENTS

AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission *	
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A83007-1	B3	Nonaqueous	12/04/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

	Sample Designation	
Parameter	Method Blank	A83007-1 B3
Chloromethane	< 10	< 10
Bromomethane	< 10	< 10
Vinyl Chloride	< 10	< 10
Chloroethane	< 10	< 10
Methylene Chloride	< 5.0	< 5.0
2-Propanone (Acetone)	< 100	< 100
Carbon Disulfide	< 5.0	6.3
1,1-Dichloroethene	< 5.0	< 5.0
1,1-Dichloroethane	< 5.0	< 5.0
trans-1,2-Dichloroethene	< 5.0	< 5.0
Chloroform	< 5.0	< 5.0
1,2-Dichloroethane	< 5.0	< 5.0
2-Butanone (MEK)	< 100	< 100
1,1,1-Trichloroethane	< 5.0	< 5.0
Carbon Tetrachloride	< 5.0	< 5.0
Vinyl Acetate	< 50	< 50
Bromodichloromethane	< 5.0	< 5.0
1,2-Dichloropropane	< 5.0	< 5.0
trans-1,3-Dichloropropene	< 5.0	< 5.0
Trichloroethene	< 5.0	< 5.0
Dibromochloromethane	< 5.0	< 5.0
1,1,2-Trichloroethane	< 5.0	< 5.0
Benzene	< 5.0	< 5.0
cis-1,3-Dichloropropene	< 5.0	< 5.0
2-Chloroethyl Vinyl Ether	< 10	< 10
Bromoform	< 5.0	< 5.0
4-Methyl-2-Pentanone (MIBK)	< 50	< 50
2-Hexanone	< 50	< 50
Tetrachloroethene	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	< 5.0	< 5.0
Toluene	< 5.0	< 5.0
Chlorobenzene	< 5.0	< 5.0
Ethylbenzene	< 5.0	< 5.0
Styrene	< 5.0	< 5.0
m,p-Xylene	< 5.0	< 5.0
o-Xylene	< 5.0	< 5.0
Units	(ug/l)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

	Sample Designation	
Parameter	Method Blank	A83007-1 B3
N-Nitrosodimethylamine	< 330	< 330
Phenol	< 330	< 330
Bis(2-chloroethyl) Ether	< 330	< 330
2-Chlorophenol	< 330	< 330
1,3-Dichlorobenzene	< 330	< 330
1,4-Dichlorobenzene	< 330	< 330
Benzyl Alcohol	< 330	< 330
1,2-Dichlorobenzene	< 330	< 330
2-Methylphenol	< 330	< 330
Bis(2-chloroisopropyl) Ether	< 330	< 330
4-Methylphenol	< 330	< 330
N-Nitrosodipropylamine	< 330	< 330
Hexachloroethane	< 330	< 330
Nitrobenzene	< 330	< 330
Isophorone	< 330	< 330
2-Nitrophenol	< 330	< 330
2,4-Dimethylphenol	< 330	< 330
Benzoic Acid	< 1,600	< 1,600
Bis(2-chloroethoxy)methane	< 330	< 330
2,4-Dichlorophenol	< 330	< 330
1,2,4-Trichlorobenzene	< 330	< 330
Naphthalene	< 330	< 330
4-Chloroaniline	< 330	< 330
Hexachlorobutadiene	< 330	< 330
4-Chloro-3-methylphenol	< 330	< 330
2-Methylnaphthalene	< 330	< 330
Hexachlorocyclopentadiene	< 330	< 330
2,4,6-Trichlorophenol	< 330	< 330
2,4,5-Trichlorophenol	< 1,600	< 1,600
2-Chloronaphthalene	< 330	< 330
2-Nitroaniline	< 1,600	< 1,600
Dimethyl Phthalate	< 330	< 330
Acenaphthylene	< 330	< 330
3-Nitroaniline	< 1,600	< 1,600
Acenaphthene	< 330	< 330
2,4-Dinitrophenol	< 1,600	< 1,600
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

	Sample Designation	
Parameter	Method Blank	A83007-1 B3
4-Nitrophenol	< 1,600	< 1,600
Dibenzofuran	< 330	< 330
2,4-Dinitrotoluene	< 330	< 330
2,6-Dinitrotoluene	< 330	< 330
Diethyl Phthalate	< 330	< 330
4-Chlorophenyl Phenyl Ether	< 330	< 330
Fluorene	< 330	< 330
4-Nitroaniline	< 1,600	< 1,600
4,6-Dinitro-2-methylphenol	< 1,600	< 1,600
N-Nitrosodiphenylamine	< 330	< 330
4-Bromophenyl Phenyl Ether	< 330	< 330
Hexachlorobenzene	< 330	< 330
Pentachlorophenol	< 330	< 330
Phenanthrene	< 330	< 330
Anthracene	< 330	< 330
Dibutyl Phthalate	< 330	< 330
Fluoranthene	< 330	< 330
Benzidine	< 1,600	< 1,600
Pyrene	< 330	< 330
Butylbenzyl Phthalate	< 330	< 330
3,3'-Dichlorobenzidine	< 660	< 660
Benzo(a)anthracene	< 330	< 330
Bis(2-ethylhexyl) Phthalate	< 330	< 330
Chrysene	< 330	< 330
Dioctyl Phthalate	< 330	< 330
Benzo(b)fluoranthene	< 330	< 330
Benzo(k)fluoranthene	< 330	< 330
Benzo(a)pyrene	< 330	< 330
Indeno(1,2,3-cd)pyrene	< 330	< 330
Dibenzo(a,h)anthracene	< 330	< 330
Benzo(g,h,i)perylene	< 330	< 330
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

	Sample Designation	
Parameter	Method Blank	A83007-1 B3
Bromide, by IC	< 1,000	< 1,000
Sulfate, by IC	< 1,000	61,000
Units	(ug/kg)	(ug/kg)

VI. Quality Control Data (Cont'd)

AnalytiKEM

Volatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	Surrogate Recovery: 1,2-Dichloroethane-d_4 (100 ppb Added)	Toluene-d_8 (100 ppb Added)	4-Bromofluorobenzene (100 ppb Added)
Method Blank	103	110	100
A83020-5 Spike	114	106	102
A83020-5 Spike Dup.	117	108	104
A83007-1	104	106	101
Units	(%)	(%)	(%)
Control Limits	70-121	81-117	74-121

0 out of 12 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A83027-2

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	50	67	62	8	18-120	43
N-Nitrosodipropylamine	50	88	79	11	10-156	31
1,2,4-Trichlorobenzene	50	81	76	6	24-161	17
Acenaphthene	50	86	78	10	10-151	16
2,4-Dinitrotoluene	50	79	72	9	10-197	33
Pyrene	50	79	74	6	10-167	31
Phenol	100	70	68	3	10-141	41
2-Chlorophenol	100	64	62	3	33-101	19
4-Chloro-3-methylphenol	100	82	72	13	26-117	25
4-Nitrophenol	100	52	40	12	10-221	36
Pentachlorophenol	100	53	34	44	10-179	16
Pentachlorophenol ϕ	100	90	--	--	10-179	16
Units	(ppb)	(%)	(%)	(%)	(%)	(%)

ϕ Spike performed on DI Water.

Recovery: 0 out of 23 outside control limits

RPD: 1 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	2-Fluorophenol (200 ppb Added)	Phenol-d_5 (200 ppb Added)	2,4,6-Tribromophenol (200 ppb Added)
	Surrogate Recovery		
Method Blank	56	72	46
A83027-2 Spike	67	75	74
A83027-2 Spike Dup.	64	69	70
A83007-1	67	68	64
Units	(%)	(%)	(%)
Control Limits	27-106	30-88	42-89

Sample Designation	Nitrobenzene-d_5 (100 ppb Added)	2-Fluorobiphenyl (100 ppb Added)	Terphenyl-d_{14} (100 ppb Added)
	Surrogate Recovery		
Method Blank	70	82	102
A83027-2 Spike	74	70	72
A83027-2 Spike Dup.	73	69	69
A83007-1	64	75	92
Units	(%)	(%)	(%)
Control Limits	34-107	10-157	10-175

0 out of 24 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A83007-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Sulfate, by IC	100	97	99	2	75-125	20
Bromide, by IC	75	99	99	0	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

S2910 S220

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690

TEST REPORT NO. A82929

November 28, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

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AnalytiKEM

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

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Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

II. Definition of Terms

Term	Definition
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82929-1	S-11	Nonaqueous	11/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

AnalytiKEM

IV. Methodology

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

Parameter	Method Blank	A82929-1 S-11
	Sample Designation	
Chloromethane	< 1,000	< 1,000
Bromomethane	< 1,000	< 1,000
Vinyl Chloride	< 1,000	< 1,000
Chloroethane	< 1,000	< 1,000
Methylene Chloride	< 500	< 500
2-Propanone (Acetone)	< 10,000	< 10,000
Carbon Disulfide	< 500	< 500
1,1-Dichloroethene	< 500	< 500
1,1-Dichloroethane	< 500	< 500
trans-1,2-Dichloroethene	< 500	< 500
Chloroform	< 500	< 500
1,2-Dichloroethane	< 500	< 500
2-Butanone (MEK)	< 10,000	< 10,000
1,1,1-Trichloroethane	< 500	< 500
Carbon Tetrachloride	< 500	< 500
Vinyl Acetate	< 5,000	< 5,000
Bromodichloromethane	< 500	< 500
1,2-Dichloropropane	< 500	< 500
trans-1,3-Dichloropropene	< 500	< 500
Trichloroethene	< 500	< 500
Dibromochloromethane	< 500	< 500
1,1,2-Trichloroethane	< 500	< 500
Benzene	< 500	< 500
cis-1,3-Dichloropropene	< 500	< 500
2-Chloroethyl Vinyl Ether	< 1,000	< 1,000
Bromoform	< 500	< 500
4-Methyl-2-Pentanone (MIBK)	< 5,000	< 5,000
2-Hexanone	< 5,000	< 5,000
Tetrachloroethene	< 500	< 500
1,1,2,2-Tetrachloroethane	< 500	< 500
Toluene	< 500	< 500
Chlorobenzene	< 500	< 500
Ethylbenzene	< 500	< 500
Styrene	< 500	< 500
m,p-Xylene	< 500	< 500
o-Xylene	< 500	< 500
Units	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

Semivolatile Organics (Page 1 of 2)

	Sample Designation	
Parameter	Method Blank	A82929-1 S-11
N-Nitrosodimethylamine	< 500	< 500
Phenol	< 500	< 500
Bis(2-chloroethyl) Ether	< 500	< 500
2-Chlorophenol	< 500	< 500
1,3-Dichlorobenzene	< 500	< 500
1,4-Dichlorobenzene	< 500	< 500
Benzyl Alcohol	< 500	< 500
1,2-Dichlorobenzene	< 500	< 500
2-Methylphenol	< 500	< 500
Bis(2-chloroisopropyl) Ether	< 500	< 500
4-Methylphenol	< 500	< 500
N-Nitrosodipropylamine	< 500	< 500
Hexachloroethane	< 500	< 500
Nitrobenzene	< 500	< 500
Isophorone	< 500	< 500
2-Nitrophenol	< 500	< 500
2,4-Dimethylphenol	< 500	< 500
Benzoic Acid	< 2,500	< 2,500
Bis(2-chloroethoxy)methane	< 500	< 500
2,4-Dichlorophenol	< 500	< 500
1,2,4-Trichlorobenzene	< 500	< 500
Naphthalene	< 500	< 500
4-Chloroaniline	< 500	< 500
Hexachlorobutadiene	< 500	< 500
4-Chloro-3-methylphenol	< 500	< 500
2-Methylnaphthalene	< 500	< 500
Hexachlorocyclopentadiene	< 500	< 500
2,4,6-Trichlorophenol	< 500	< 500
2,4,5-Trichlorophenol	< 2,500	< 2,500
2-Chloronaphthalene	< 500	< 500
2-Nitroaniline	< 2,500	< 2,500
Dimethyl Phthalate	< 500	< 500
Acenaphthylene	< 500	< 500
3-Nitroaniline	< 2,500	< 2,500
Acenaphthene	< 500	< 500
2,4-Dinitrophenol	< 2,500	< 2,500
Units	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd) **AnalytiKEM**

Semivolatile Organics (Page 2 of 2)

	Sample Designation	
Parameter	Method Blank	A82929-1 S-11
4-Nitrophenol	< 2,500	< 2,500
Dibenzofuran	< 500	< 500
2,4-Dinitrotoluene	< 500	< 500
2,6-Dinitrotoluene	< 500	< 500
Diethyl Phthalate	< 500	< 500
4-Chlorophenyl Phenyl Ether	< 500	< 500
Fluorene	< 500	< 500
4-Nitroaniline	< 2,500	< 2,500
4,6-Dinitro-2-methylphenol	< 2,500	< 2,500
N-Nitrosodiphenylamine	< 500	< 500
4-Bromophenyl Phenyl Ether	< 500	< 500
Hexachlorobenzene	< 500	< 500
Pentachlorophenol	< 500	< 500
Phenanthrene	< 500	< 500
Anthracene	< 500	< 500
Dibutyl Phthalate	< 500	< 500
Fluoranthene	< 500	< 500
Benzidine	< 2,500	< 2,500
Pyrene	< 500	< 500
Butylbenzyl Phthalate	< 500	< 500
3,3'-Dichlorobenzidine	< 1,000	< 1,000
Benzo(a)anthracene	< 500	< 500
Bis(2-ethylhexyl) Phthalate	< 500	< 500
Chrysene	< 500	< 500
Dioctyl Phthalate	< 500	< 500
Benzo(b)fluoranthene	< 500	< 500
Benzo(k)fluoranthene	< 500	< 500
Benzo(a)pyrene	< 500	< 500
Indeno(1,2,3-cd)pyrene	< 500	< 500
Dibenzo(a,h)anthracene	< 500	< 500
Benzo(g,h,i)perylene	< 500	< 500
Units	(ug/kg)	(ug/kg)

V. Analytical Results (Cont'd)

AnalytiKEM

General Chemistry

Sample Designation

Parameter	Method Blank	A82929-1 S-11
Fluoride	< 500	< 500
Chloride	< 500	49,000
Nitrite	< 500	< 500
Bromide	< 1,000	< 1,000
Nitrate	< 500	< 500
Phosphate	< 1,000	< 1,000
Sulfate	< 1,000	14,000
Units	(ug/kg)	(ug/kg)

Note: The IC Scan analysis was performed at our Cherry Hill, NJ facility.

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82927-6

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery
1,1-Dichloroethene	0.25	96	97	1	D-234
Trichloroethene (TCE)	0.25	98	99	1	71-157
Benzene	0.25	94	97	3	37-160
Toluene	0.25	96	98	2	47-150
Chlorobenzene	0.25	91	92	1	37-151
Units	(ppb)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

VI. Quality Control Data (Cont'd)

AnalytiKEM

Volatile Organics

Nonaqueous Surrogate Recovery Data

	Surrogate Recovery		
Sample Designation	1,2-Dichloroethane-d_4 (50 ppb Added)	Toluene-d_8 (50 ppb Added)	4-Bromofluorobenzene (50 ppb Added)
Method Blank	87	93	91
A82927-6 Spike	93	87	81
A82927-6 Spike Dup.	94	88	82
A82929-1	89	97	97
Units	(%)	(%)	(%)
Control Limits	62-152	57-159	62-148

0 out of 12 surrogate recoveries are outside control limits.

VI. Quality Control Data (Cont'd)

AnalytiKEM

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82899-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	50	53	65	20	18-120	43
N-Nitrosodipropylamine	50	74	85	14	10-156	31
1,2,4-Trichlorobenzene	50	51	60	16	24-161	17
Acenaphthene	50	67	75	11	10-151	16
2,4-Dinitrotoluene	50	54	61	12	10-197	33
Pyrene	50	74	80	8	10-167	31
Phenol	100	56	65	15	10-141	41
2-Chlorophenol	100	48	57	17	33-101	19
4-Chloro-3-methylphenol	100	59	64	8	26-117	25
4-Nitrophenol	100	40	34	16	10-221	36
Pentachlorophenol	100	44	49	11	10-179	16
Units	(ppb)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 22 outside control limits

RPD: 0 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	2-Fluorophenol (200 ppb Added)	Phenol-d_5 (200 ppb Added)	2,4,6-Tribromophenol (200 ppb Added)
	Surrogate Recovery		
Method Blank	86	87	90
A82899-1 Spike	52	58	59
A82899-1 Spike Dup.	64	69	63
A82929-1	80	80	74
Units	(%)	(%)	(%)
Control Limits	27-106	30-88	42-89

Sample Designation	Nitrobenzene-d_5 (100 ppb Added)	2-Fluorobiphenyl (100 ppb Added)	Terphenyl-d_{14} (100 ppb Added)
	Surrogate Recovery		
Method Blank	87	88	101
A82899-1 Spike	62	57	71
A82899-1 Spike Dup.	69	64	79
A82929-1	78	74	101
Units	(%)	(%)	(%)
Control Limits	34-107	10-157	10-175

0 out of 24 surrogate recoveries are outside control limits.

VI. Quality Control Data (Cont'd)

AnalytiKEM

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A28551-3

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Fluoride	10	122	116	5	75-125	20
Chloride	15	93	93	0	75-125	20
Nitrite	10	99	99	0	75-125	20
Bromide	75	98	98	0	75-125	20
Nitrate	20	94	94	0	75-125	20
Phosphate	50	108	107	1	75-125	20
Sulfate	100	117	112	4	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 14 outside control limits

RPD: 0 out of 7 outside control limits

AnalytiKEM An American NuKEM Company

03278

Chain-of-Custody Record #82929

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: SCI ENSCI

Sample Collector: Steve Stadelman

Project: 592032

AnalytiKEM Contact: Becky

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	__ ml Unpres.	__ ml HNO_3	__ ml H_2SO_4	__ ml NaOH	__ ml HCL	250 ml w/septa	500 ml unpres.	950 ml unpres.	PARAMETERS
1	S-11	11-16-92	0950	soil	G								1	2	3	Analyses per attached sheet 8240, 8270, metals by TCLP, gross α+β, Radium 226/228
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Scott Long	11/17/92	10:40 am
2	1	Scott Long	S. Sawyer	11/17/92	1:30 P.M.
3					
4					

REMARKS
P.O. # 31781
3-day TAT

Steve Stadelman
SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

SAMPLE RECEIPT CHECKLIST

Client: ENSCI

Project Number: 592032

Laboratory Number: 82929

1. ____ Shipped — Notes: ____
   ✓ Hand Delivered
2. ✓ COC Present on Receipt — Notes: ____
   ____ No COC
3. ____ COC Tape on Shipping Container — Notes: ____
   ✓ No COC Tape on Shipping Container — Notes: ____
4. ____ Samples Broken/Leaking — Notes: ____
   ✓ Sample Intact on Receipt
   ____ Other (See Notes)
5. ____ Ambient on Receipt — Notes: ____
   ✓ Chilled on Receipt
6. ____ Samples Preserved Correctly — Notes: ____
   ____ Improper Preservatives
   ✓ N/A (None Recommended)
   ____ Other (See Notes)
7. ✓ Received Within Holding Time — Notes: ____
   ____ Not Received Within Holding Time
   ____ N/A (None Recommended)
   ____ Other (See Notes)
8. ____ COC Tapes on Samples — Notes: ____
   ✓ No COC Tapes on Samples
9. ____ Discrepancies Between COC and Sample Labels — Notes: ____
   ✓ No Discrepancies Noted
   ____ N/A (No COC Received)

Additional Comments: ____

Inspected and Logged in by: S. Sawyer

Date/Time: 11-17-92 1360

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A82832

November 4, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stackman

Project: Mannington

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

AnalytiKEM

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State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

AnalytiKEM

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ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

AnalytiKEM

III. Sample Designations

AnalytiKEM Designation	Client Designation	Matrix	Date Sampled
A82832-1	B-6	Nonaqueous	10/23/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

IV. Methodology

AnalytiKEM

Volatiles

Method 5030, Purge and Trap, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Semivolatiles

Method 3550, Sonication Extraction, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics: Capillary Column Technique, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

General Chemistry

Method 9056, Anion Chromatography Method, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Third Edition, USEPA, 1986, with all promulgated revisions.

AnalytiKEM

V. Analytical Results

Volatile Organics

Parameter	Method Blank	A82832-1 B-6
	Sample Designation	
Chloromethane	< 1,000	< 1,000
Bromomethane	< 1,000	< 1,000
Vinyl Chloride	< 1,000	< 1,000
Chloroethane	< 1,000	< 1,000
Methylene Chloride	< 500	660
2-Propanone (Acetone)	<10,000	< 10,000
Carbon Disulfide	< 500	< 500
1,1-Dichloroethene	< 500	< 500
1,1-Dichloroethane	< 500	< 500
trans-1,2-Dichloroethene	< 500	< 500
Chloroform	< 500	< 500
1,2-Dichloroethane	< 500	< 500
2-Butanone (MEK)	<10,000	< 10,000
1,1,1-Trichloroethane	< 500	< 500
Carbon Tetrachloride	< 500	< 500
Vinyl Acetate	< 5,000	< 5,000
Bromodichloromethane	< 500	< 500
1,2-Dichloropropane	< 500	< 500
trans-1,3-Dichloropropene	< 500	< 500
Trichloroethene	< 500	< 500
Dibromochloromethane	< 500	< 500
1,1,2-Trichloroethane	< 500	< 500
Benzene	< 500	< 500
cis-1,3-Dichloropropene	< 500	< 500
2-Chloroethyl Vinyl Ether	< 1,000	< 1,000
Bromoform	< 500	< 500
4-Methyl-2-Pentanone (MIBK)	< 5,000	< 5,000
2-Hexanone	< 5,000	< 5,000
Tetrachloroethene	< 500	< 500
1,1,2,2-Tetrachloroethane	< 500	< 500
Toluene	< 500	< 500
Chlorobenzene	< 500	< 500
Ethylbenzene	< 500	< 500
Styrene	< 500	< 500
m-Xylene	< 500	< 500
o,p-Xylene	< 500	< 500
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 1 of 2)

	Sample Designation	
Parameter	Method Blank	A82832-1 B-6
N-Nitrosodimethylamine	< 500	< 500
Phenol	< 500	< 500
Bis(2-chloroethyl) Ether	< 500	< 500
2-Chlorophenol	< 500	< 500
1,3-Dichlorobenzene	< 500	< 500
1,4-Dichlorobenzene	< 500	< 500
Benzyl Alcohol	< 500	< 500
1,2-Dichlorobenzene	< 500	< 500
2-Methylphenol	< 500	< 500
Bis(2-chloroisopropyl) Ether	< 500	< 500
4-Methylphenol	< 500	< 500
N-Nitrosodipropylamine	< 500	< 500
Hexachloroethane	< 500	< 500
Nitrobenzene	< 500	< 500
Isophorone	< 500	< 500
2-Nitrophenol	< 500	< 500
2,4-Dimethylphenol	< 500	< 500
Benzoic Acid	< 2,500	< 2,500
Bis(2-chloroethoxy)methane	< 500	< 500
2,4-Dichlorophenol	< 500	< 500
1,2,4-Trichlorobenzene	< 500	< 500
Naphthalene	< 500	< 500
4-Chloroaniline	< 500	< 500
Hexachlorobutadiene	< 500	< 500
4-Chloro-3-methylphenol	< 500	< 500
2-Methylnaphthalene	< 500	< 500
Hexachlorocyclopentadiene	< 500	< 500
2,4,6-Trichlorophenol	< 500	< 500
2,4,5-Trichlorophenol	< 2,500	< 2,500
2-Chloronaphthalene	< 500	< 500
2-Nitroaniline	< 2,500	< 2,500
Dimethyl Phthalate	< 500	< 500
Acenaphthylene	< 500	< 500
3-Nitroaniline	< 2,500	< 2,500
Acenaphthene	< 500	< 500
2,4-Dinitrophenol	< 2,500	< 2,500
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

Semivolatile Organics (Page 2 of 2)

	Sample Designation	
Parameter	Method Blank	A82832-1 B-6
4-Nitrophenol	< 2,500	< 2,500
Dibenzofuran	< 500	< 500
2,4-Dinitrotoluene	< 500	< 500
2,6-Dinitrotoluene	< 500	< 500
Diethyl Phthalate	< 500	< 500
4-Chlorophenyl Phenyl Ether	< 500	< 500
Fluorene	< 500	< 500
4-Nitroaniline	< 2,500	< 2,500
4,6-Dinitro-2-methylphenol	< 2,500	< 2,500
N-Nitrosodiphenylamine	< 500	< 500
4-Bromophenyl Phenyl Ether	< 500	< 500
Hexachlorobenzene	< 500	< 500
Pentachlorophenol	< 500	< 500
Phenanthrene	< 500	< 500
Anthracene	< 500	< 500
Dibutyl Phthalate	< 500	< 500
Fluoranthene	< 500	< 500
Benzidine	< 2,500	< 2,500
Pyrene	< 500	< 500
Butylbenzyl Phthalate	< 500	< 500
3,3'-Dichlorobenzidine	< 1,000	< 1,000
Benzo(a)anthracene	< 500	< 500
Bis(2-ethylhexyl) Phthalate	< 500	< 500
Chrysene	< 500	< 500
Dioctyl Phthalate	< 500	< 500
Benzo(b)fluoranthene	< 500	< 500
Benzo(k)fluoranthene	< 500	< 500
Benzo(a)pyrene	< 500	< 500
Indeno(1,2,3-cd)pyrene	< 500	< 500
Dibenzo(a,h)anthracene	< 500	< 500
Benzo(g,h,i)perylene	< 500	< 500
Units	(ug/kg)	(ug/kg)

AnalytiKEM

V. Analytical Results (Cont'd)

General Chemistry

Sample Designation

Parameter	Method Blank	A82832-1 B-6
Sulfate, by IC	< 1,000	120,000
Bromide, by IC	< 1,000	< 1,000
Units	(ug/kg)	(ug/kg)

Note: The IC scan was performed at our Cherry Hill, NJ facility.

AnalytiKEM

VI. Quality Control Data

Volatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A74241-REC

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery
1,1-Dichloroethene	0.25	84	101	18	D-234
Trichloroethene (TCE)	0.25	98	100	2	71-157
Chlorobenzene	0.25	97	102	5	37-160
Toluene	0.25	98	102	4	47-150
Benzene	0.25	99	102	3	37-151
Units	(ug)	(%)	(%)	(%)	(%)

Recovery: 0 out of 10 outside control limits

VI. Quality Control Data (Cont'd)

AnalytiKEM

Volatile Organics

Nonaqueous Surrogate Recovery Data

	Surrogate Recovery		
Sample Designation	1,2-Dichloroethane-d_4 (50 ppb Added)	Toluene-d_8 (50 ppb Added)	4-Bromofluorobenzene (50 ppb Added)
Method Blank	102	104	113
A74241-REC Spike	87	87	91
A74241-REC Spike Dup.	86	89	94
A82832-1	94	97	108
Units	(%)	(%)	(%)
Control Limits	62-152	57-159	62-148

0 out of 12 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A82824-1

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
1,4-Dichlorobenzene	50	71	71	0	18-120	43
N-Nitrosodipropylamine	50	104	103	1	10-156	31
1,2,4-Trichlorobenzene	50	73	73	0	24-161	17
Acenaphthene	50	84	82	2	10-151	16
2,4-Dinitrotoluene	50	64	61	5	10-197	33
Pyrene	50	106	106	0	10-167	31
Phenol	100	67	66	1	10-141	41
2-Chlorophenol	100	58	57	2	33-101	19
4-Chloro-3-methylphenol	100	63	53	17	26-117	25
4-Nitrophenol	100	34	18	61	10-221	36
4-Nitrophenol ϕ	100	95	--	--	10-221	36
Pentachlorophenol	100	61	59	3	10-179	16
Units	(ug)	(%)	(%)	(%)	(%)	(%)

ϕ Spike performed on DI Water.

Recovery: 0 out of 23 outside control limits

RPD: 1 out of 11 outside control limits

AnalytiKEM

VI. Quality Control Data (Cont'd)

Semivolatile Organics

Nonaqueous Surrogate Recovery Data

Sample Designation	2-Fluorophenol (200 ppb Added)	Phenol-d_5 (200 ppb Added)	2,4,6-Tribromophenol (200 ppb Added)
	Surrogate Recovery		
Method Blank	75	75	79
A82824-1 Spike	68	72	78
A82824-1 Spike Dup.	68	72	47
A82832-1	63	65	53
Units	(%)	(%)	(%)
Control Limits	27-106	30-88	42-89

Sample Designation	Nitrobenzene-d_5 (100 ppb Added)	2-Fluorobiphenyl (100 ppb Added)	Terphenyl-d_{14} (100 ppb Added)
	Surrogate Recovery		
Method Blank	74	80	103
A82824-1 Spike	75	83	100
A82824-1 Spike Dup.	71	79	100
A82832-1	62	68	82
Units	(%)	(%)	(%)
Control Limits	34-107	10-157	10-175

0 out of 24 surrogate recoveries are outside control limits.

AnalytiKEM

VI. Quality Control Data (Cont'd)

General Chemistry

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

Sample Spiked A28611-361

Parameter	Amount of Spike	Recovery MS	Recovery MSD	RPD	Control Limits Recovery	Control Limits Max. RPD
Sulfate	100	99	97	2	75-125	20
Bromide	75	101	99	3	75-125	20
Units	(ug)	(%)	(%)	(%)	(%)	(%)

Recovery: 0 out of 4 outside control limits

RPD: 0 out of 2 outside control limits

AnalytiKEM An American NuKEM Company

04253

Chain-of-Custody Record

82832

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI Sample Collector: Boggs

Project: Mannington AnalytIKEM Contact: Jean

Laboratory	Sales Office
2324 Vernsdale Road Rock Hill, South Carolina 29731 (803) 324-5310 Fax: (803) 324-8378	454 South Anderson Road BTC 532 Rock Hill, South Carolina 29730 (803) 329-9690 Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	950 ml Unpres.	__ ml HNO_3	__ ml H_2SO4	__ ml NaOH	__ ml HCL	500 Unpres	250 Unpres	PARAMETERS
1	B-6	10/23	0950	Solid	G		3					2	1		Analyses Per
2															Attached Sheet
3															
4															
5															
6															
7															
8															
9															
10															

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Alvin Boggs	Scott Long	10/23/92	5:15 pm
2	1	Scott Long	C. Hudson	10/23/92	2:30
3					
4					

REMARKS

PO# 31682

3 Day TAT

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A82832, Supplemental

November 18, 1992

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil

The Gross Alpha, Gross Beta and Radium 226,228 analyses were subcontracted to Teledyne Isotopes, Laboratories. Please see attached copy of their report.

Reviewed &
Approved by: Michael Shmookler M.D. for

Name: Carmine M. Fioriglio

Title: QA/QC Manager

SAMPLE RECEIPT CHECKLIST

Client: Ensci

Project Number: Marrington Site   Laboratory Number: 82832

1. ✓ Shipped — Notes:
   ___ Hand Delivered
2. ✓ COC Present on Receipt — Notes:
   ___ No COC
3. ___ COC Tape on Shipping Container — Notes:
   ✓ No COC Tape on Shipping Container — Notes:
4. ___ Samples Broken/Leaking — Notes:
   ✓ Sample Intact on Receipt
   ___ Other (See Notes)
5. ___ Ambient on Receipt — Notes:
   ✓ Chilled on Receipt
6. ___ Samples Preserved Correctly — Notes:
   ___ Improper Preservatives
   ✓ N/A (None Recommended)
   ___ Other (See Notes)
7. ✓ Received Within Holding Time — Notes:
   ___ Not Received Within Holding Time
   ___ N/A (None Recommended)
   ___ Other (See Notes)
8. ___ COC Tapes on Samples — Notes:
   ✓ No COC Tapes on Samples
9. ___ Discrepancies Between COC and Sample Labels — Notes:
   ✓ No Discrepancies Noted
   ___ N/A (No COC Received)

Additional Comments:

Inspected and Logged in by: C. Hercher
Date/Time: 10/25/92 ~~10:~~ 2:00

REPORT OF ANALYSIS

13 NOVEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/12/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4562		10/27/92	11/29/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE TIME	STOP DATE TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
94012	82832-1		10/23 0950		GR-A	4.0 +-1.0 E 01		11/09		3
					GR-B	7.2 +-0.4 E 01		11/09		3
					RA-226	4.7 +-0.7 E 00		11/05		4
					RA-228	2.4 +-0.2 E 00		11/05		4

LAST PAGE OF REPORT

DMartin

APPROVED BY J. GUENTHER 11/12/92

SEND 1 COPIES TO AN133T PATTI DE ANDINO

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

REPORT OF ANALYSIS

4 NOVEMBER 1992

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/04/92

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-4379		10/15/92	10/28/92	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
93051	82791-1 B1		10/12				GR-A	2.5 +-0.8 E 01		10/22			3
							GR-B	1.0 +-0.1 E 02		10/22			3
							RA-226	9.9 +-1.0 E-01		10/30			4
							RA-228	1.9 +-0.2 E 00		10/30			4
93052	82791-2 S1		10/12				GR-A	1.5 +-0.6 E 01		10/22			3
							GR-B	4.2 +-0.4 E 01		10/22			3
							RA-226	8.1 +-0.9 E-01		10/30			4
							RA-228	1.7 +-0.2 E 00		10/30			4
93053	82791-3 S2		10/12				GR-A	1.3 +-0.6 E 01		10/22			3
							GR-B	4.4 +-0.4 E 01		10/22			3
							RA-226	7.2 +-0.8 E-01		10/30			4
							RA-228	8.8 +-1.5 E-01		10/30			4

LAST PAGE OF REPORT

J Guenther
APPROVED BY J. GUENTHER 11/04/92

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AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651, Supplemental

February 1, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses was subcontracted to Teledyne Isotopes. Please see attached copy of their report.

Reviewed &
Approved by: ____________

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

27 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5807	.	01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

SOIL

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION		STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00665	60651-01	55		12/28				GR-A	9.4 +-5.3 E 00		01/15			3
								GR-B	1.4 +-0.3 E 01		01/15			3
								RA-226	1.1 +-0.1 E 00		01/21			4
								RA-228	7.5 +-1.6 E-01		01/21			4
00666	60651-02	57		12/29				GR-A	1.3 +-0.6 E 01		01/15			3
								GR-B	5.1 +-0.4 E 01		01/15			3
								RA-226	8.1 +-0.8 E-01		01/21			4
								RA-228	7.1 +-1.1 E-01		01/21			4
00667	60651-03	56		12/29				GR-A	2.8 +-0.8 E 01		01/15			3
								GR-B	5.2 +-0.4 E 01		01/15			3
								RA-226	1.4 +-0.1 E 00		01/21			4
								RA-228	1.3 +-0.2 E 00		01/21			4
00668	60651-04	55		12/29				GR-A	2.7 +-0.8 E 01		01/15			3
								GR-B	7.3 +-0.5 E 01		01/15			3
								RA-226	1.0 +-0.1 E 00		01/21			4
								RA-228	3.2 +-0.3 E 00		01/21			4
00669	60651-05	58		12/29				GR-A	4.0 +-1.0 E 01		01/15			3
								GR-B	5.6 +-0.4 E 01		01/15			3
								RA-226	5.9 +-0.6 E 00		01/21			4
								RA-228	2.8 +-0.3 E 00		01/21			4
00670	60651-06	59		12/29				GR-A	3.6 +-0.9 E 01		01/15			3
								GR-B	8.3 +-0.5 E 01		01/15			3
								RA-226	8.9 +-1.0 E-01		01/21			4
								RA-228	2.8 +-0.3 E 00		01/21			4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
3-5807		01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION		STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00671	60651-07	S10		12/29				GR-A	4.2 +-1.0 E 01		01/15			3
								GR-B	6.7 +-0.4 E 01		01/15			3
								RA-226	2.1 +-0.2 E 00		01/21			4
								RA-228	3.5 +-0.4 E 00		01/21			4
00672	60651-08	S4		12/29				GR-A	2.2 +-0.7 E 01		01/15			3
								GR-B	4.5 +-0.4 E 01		01/15			3
								RA-226	1.1 +-0.1 E 00		01/21			4
								RA-228	1.3 +-0.1 E 00		01/21			4
00673	60651-09	S14		12/30				GR-A	2.0 +-0.7 E 01		01/15			3
								GR-B	2.6 +-0.3 E 01		01/15			3
								RA-226	1.6 +-0.2 E 00		01/21			4
								RA-228	1.7 +-0.2 E 00		01/21			4
00674	60651-10	S12		12/30				GR-A	3.6 +-0.9 E 01		01/15			3
								GR-B	7.5 +-0.5 E 01		01/15			3
								RA-226	1.1 +-0.1 E 00		01/21			4
								RA-228	2.1 +-0.2 E 00		01/21			4
00675	60651-11	S13		12/30				GR-A	3.7 +-0.9 E 01		01/15			3
								GR-B	7.4 +-0.5 E 01		01/15			3
								RA-226	1.5 +-0.2 E 00		01/21			4
								RA-228	2.9 +-0.3 E 00		01/21			4

LAST PAGE OF REPORT

APPROVED BY D. GUENTHER 01/27/93

SEND 1 COPIES TO AN133S ATTN: Q A DEPT

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

03282

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI

Project: 592032

Sample Collector: Steve Stadelman

AnalytIKEM Contact: Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml Sclt.	950 ml unpres.		PARAMETERS
1	B5	12-28 92	1430	Soil	G			2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
2	S7	12-29 92	1030	"	G			2					1	3		
3	S6	12-29 92	1215	"	G			2					1	3		
4	S5	12-29 92	1300	"	G			2					1	3		
5	S8	12-29 92	1415	"	G			2					1	3		
6	S9	12-29 92	1445	"	G			2					1	3		
7	S10	12-29 92	1515	"	G			2					1	3		
8	S4	12-29 92	1600	"	G			2					1	3		
9	S14	12-30 92	1100	"	G			2					1	3		
10	S12	12-30 92	1130	"	G			2					1	3		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Grady Lare	12-30 92	1400
2	1-10	Grady Lare	Janet Winders	12-30 92	1605
3	1-10	J. Winders	[illegible]	1/4/93	1100
4					

REMARKS

Rush turnaround

P.O. # 31844

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

KEM Company 03282

Chain-of-Custody Record

Solid and Hazardous Waste

Sample Collector: Steve Stadelman

AnalytiKEM Contact: Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml sept.	950 ml unpres.	PARAMETERS
G		2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		
G		2					1	3		

TRANSFERS ACCEPTED BY	DATE	TIME
Grady Lane	12-30-92	1400
Janet McWirter	12-30-92	1605
[signature]	1/4/93	1600

REMARKS

Rush turnaround

P.O. # 31844

Steve Stadelman

SAMPLER'S SIGNATURE

White Laboratory Copy Yellow Client Copy

AKEM #1 12/89

AnalytiKEM [illegible] ...EM C[illegible]

03384

...ustody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Ha[illegible]ous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytiKEM Contact:** Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO4	ml NaOH	ml HCL	250 ml sept.	950 ml unpres.		PARAMETERS
1	513	12-30-92	1215	Soil	G			2					1	3		8240, 8270 TCLP metals, gross α, gross β, Ra 226-228, $BaSO_4$. Analyze per attached sheet
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Lane	12-30-92	1400
2	1	Grady Lane	Janet Winkles	12-30-92	1605
3	1	Janet Winkles	[illegible]	1/4/93	1000
4					

REMARKS

Rush turnaround.

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651, Supplemental

February 1, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses was subcontracted to Teledyne Isotopes. Please see attached copy of their report.

Reviewed &
Approved by: ______

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

27 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5807	.	01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00665	60651-01		12/28				GR-A	9.4 +-5.3 E 00		01/15			3
							GR-B	1.4 +-0.3 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	7.5 +-1.6 E-01		01/21			4
00666	60651-02		12/29				GR-A	1.3 +-0.6 E 01		01/15			3
							GR-B	5.1 +-0.4 E 01		01/15			3
							RA-226	8.1 +-0.8 E-01		01/21			4
							RA-228	7.1 +-1.1 E-01		01/21			4
00667	60651-03		12/29				GR-A	2.8 +-0.8 E 01		01/15			3
							GR-B	5.2 +-0.4 E 01		01/15			3
							RA-226	1.4 +-0.1 E 00		01/21			4
							RA-228	1.3 +-0.2 E 00		01/21			4
00668	60651-04		12/29				GR-A	2.7 +-0.8 E 01		01/15			3
							GR-B	7.3 +-0.5 E 01		01/15			3
							RA-226	1.0 +-0.1 E 00		01/21			4
							RA-228	3.2 +-0.3 E 00		01/21			4
00669	60651-05		12/29				GR-A	4.0 +-1.0 E 01		01/15			3
							GR-B	5.6 +-0.4 E 01		01/15			3
							RA-226	5.9 +-0.6 E 00		01/21			4
							RA-228	2.8 +-0.3 E 00		01/21			4
00670	60651-06		12/29				GR-A	3.6 +-0.9 E 01		01/15			3
							GR-B	8.3 +-0.5 E 01		01/15			3
							RA-226	8.9 +-1.0 E-01		01/21			4
							RA-228	2.8 +-0.3 E 00		01/21			4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
3-5807		01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00671	60651-07		12/29				GR-A	4.2 +-1.0 E 01		01/15			3
							GR-B	6.7 +-0.4 E 01		01/15			3
							RA-226	2.1 +-0.2 E 00		01/21			4
							RA-228	3.5 +-0.4 E 00		01/21			4
00672	60651-08		12/29				GR-A	2.2 +-0.7 E 01		01/15			3
							GR-B	4.5 +-0.4 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	1.3 +-0.1 E 00		01/21			4
00673	60651-09		12/30				GR-A	2.0 +-0.7 E 01		01/15			3
							GR-B	2.6 +-0.3 E 01		01/15			3
							RA-226	1.6 +-0.2 E 00		01/21			4
							RA-228	1.7 +-0.2 E 00		01/21			4
00674	60651-10		12/30				GR-A	3.6 +-0.9 E 01		01/15			3
							GR-B	7.5 +-0.5 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	2.1 +-0.2 E 00		01/21			4
00675	60651-11		12/30				GR-A	3.7 +-0.9 E 01		01/15			3
							GR-B	7.4 +-0.5 E 01		01/15			3
							RA-226	1.5 +-0.2 E 00		01/21			4
							RA-228	2.9 +-0.3 E 00		01/21			4

LAST PAGE OF REPORT

D Martin

APPROVED BY D. GUENTHER 01/27/93

SEND 1 COPIES TO AN133S ATTN: Q A DEPT

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

02282

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytiKEM Contact:** Holley

Laboratory	**Sales Office**
2324 Vernsdale Road Rock Hill, South Carolina 29731 (803) 324-5310 Fax: (803) 324-8378	454 South Anderson Road BTC 532 Rock Hill, South Carolina 29730 (803) 329-9690 Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	520 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml Sept.	150 ml unpres.		PARAMETERS
1	B5	12-28 92	1430	Soil	G			2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
2	S7	12-29 92	1030	"	G			2					1	3		
3	S6	12-29 92	1215	"	G			2					1	3		
4	S5	12-29 92	1300	"	G			2					1	3		
5	S8	12-29 92	1415	"	G			2					1	3		
6	S9	12-29 92	1445	"	G			2					1	3		
7	S10	12-29 92	1515	"	G			2					1	3		
8	S4	12-29 92	1600	"	G			2					1	3		
9	S14	12-30 92	1100	"	G			2					1	3		
10	S12	12-30 92	1130	"	G			2					1	3		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Grady Lane	12-30 92	1400
2	1-10	Grady Lane	Jane H. Winters	12-30 92	1605
3	1-10	J. Winters	[illegible]	1/4/93	1600
4					

REMARKS

Rush turnaround

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM American ... EM Co. 03284

...ustody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Ha...ous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytIKEM Contact:** Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO4	ml NaOH	ml HCL	250 ml Unpr.	950 ml unpres		PARAMETERS
1	513	12-30 92	1215	Soil	G			2					1	3		8240, 8270 TCLP metals, gross α, gross β, Ra 226-228; BaSO4. Analyses per attached sheet
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Lane	12-30 92	1400
2	1	Grady Lane	Janet Winkles	12-30 92	1605
3	1	Janet Winkles	[illegible]	1/4/92	1000
4					

REMARKS

Rush turnaround.

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60651, Supplemental

February 1, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses was subcontracted to Teledyne Isotopes. Please see attached copy of their report.

Reviewed &
Approved by:

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

27 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5807	.	01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00665	60651-01		12/28				GR-A	9.4 +-5.3 E 00		01/15			3
							GR-B	1.4 +-0.3 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	7.5 +-1.6 E-01		01/21			4
00666	60651-02		12/29				GR-A	1.3 +-0.6 E 01		01/15			3
							GR-B	5.1 +-0.4 E 01		01/15			3
							RA-226	8.1 +-0.8 E-01		01/21			4
							RA-228	7.1 +-1.1 E-01		01/21			4
00667	60651-03		12/29				GR-A	2.8 +-0.8 E 01		01/15			3
							GR-B	5.2 +-0.4 E 01		01/15			3
							RA-226	1.4 +-0.1 E 00		01/21			4
							RA-228	1.3 +-0.2 E 00		01/21			4
00668	60651-04		12/29				GR-A	2.7 +-0.8 E 01		01/15			3
							GR-B	7.3 +-0.5 E 01		01/15			3
							RA-226	1.0 +-0.1 E 00		01/21			4
							RA-228	3.2 +-0.3 E 00		01/21			4
00669	60651-05		12/29				GR-A	4.0 +-1.0 E 01		01/15			3
							GR-B	5.6 +-0.4 E 01		01/15			3
							RA-226	5.9 +-0.6 E 00		01/21			4
							RA-228	2.8 +-0.3 E 00		01/21			4
00670	60651-06		12/29				GR-A	3.6 +-0.9 E 01		01/15			3
							GR-B	8.3 +-0.5 E 01		01/15			3
							RA-226	8.9 +-1.0 E-01		01/21			4
							RA-228	2.8 +-0.3 E 00		01/21			4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/27/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
3-5807		01/07/93	02/09/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
00671	60651-07		12/29				GR-A	4.2 +-1.0 E 01		01/15			3
							GR-B	6.7 +-0.4 E 01		01/15			3
							RA-226	2.1 +-0.2 E 00		01/21			4
							RA-228	3.5 +-0.4 E 00		01/21			4
00672	60651-08		12/29				GR-A	2.2 +-0.7 E 01		01/15			3
							GR-B	4.5 +-0.4 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	1.3 +-0.1 E 00		01/21			4
00673	60651-09		12/30				GR-A	2.0 +-0.7 E 01		01/15			3
							GR-B	2.6 +-0.3 E 01		01/15			3
							RA-226	1.6 +-0.2 E 00		01/21			4
							RA-228	1.7 +-0.2 E 00		01/21			4
00674	60651-10		12/30				GR-A	3.6 +-0.9 E 01		01/15			3
							GR-B	7.5 +-0.5 E 01		01/15			3
							RA-226	1.1 +-0.1 E 00		01/21			4
							RA-228	2.1 +-0.2 E 00		01/21			4
00675	60651-11		12/30				GR-A	3.7 +-0.9 E 01		01/15			3
							GR-B	7.4 +-0.5 E 01		01/15			3
							RA-226	1.5 +-0.2 E 00		01/21			4
							RA-228	2.9 +-0.3 E 00		01/21			4

LAST PAGE OF REPORT

APPROVED BY D. GUENTHER 01/27/93

SEND 1 COPIES TO AN1335 ATTN: Q A DEPT

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM An American NuKEM Company

03282

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: S92032 **AnalytiKEM Contact:** Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	950 ml Unpres.	ml HNO3	ml H2SO4	ml NaOH	ml HCL	250 ml Sect.	250 ml unpres.	PARAMETERS
1	B5	12-28 92	1430	Soil	G		2					1	3		8240, 8270, TCLP metals, gross α, gross β, Ra 226-228, Br, SO_4. Analyses per attached sheet
2	S7	12-29 92	1030	"	G		2					1	3		
3	S6	12-29 92	1215	"	G		2					1	3		
4	S5	12-29 92	1300	"	G		2					1	3		
5	S8	12-29 92	1415	"	G		2					1	3		
6	S9	12-29 92	1445	"	G		2					1	3		
7	S10	12-29 92	1515	"	G		2					1	3		
8	S4	12-29 92	1600	"	G		2					1	3		
9	S14	12-30 92	1100	"	G		2					1	3		
10	S12	12-30 92	1150	"	G		2					1	3		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Grady Lane	12-30 92	1400
2	1-10	Grady Lane	Janet Winter	12-30 92	1605
3	1-10	J. Winter	[illegible]	1/4/93	1800
4					

REMARKS
Rush turnaround
P.O. # 31894

Steve Stadelman
SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM ...EM Co... 03284

ustody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Ha... ...ous Waste

Client: ENSCI **Sample Collector:** Steve Stadelman

Project: 592032 **AnalytIKEM Contact:** Holley

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 532
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	500 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml sept.	950 ml unpres.		PARAMETERS
1	S13	12-30-92	1215	Soil	G			2					1	3		8240, 8270 TCLP metals, gross α, gross β, Ra 226-228, Bq 504. Analyses per attached sheet
2																
3																
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	Steve Stadelman	Grady Lane	12-30-92	1410
2	1	Grady Lane	Janet Winkes	12-30-92	1605
3	1	Janet Winkes	[illegible]	1/4/93	1000
4					

REMARKS

Rush turnaround.

P.O. # 31894

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1 12/89

AnalytiKEM Inc.
454 S. Anderson Road, BTC 532
Rock Hill, SC 29730
803/329-9690
Fax: 803/324-3982

TEST REPORT NO. A83007, Supplemental

January 12, 1993

Prepared for:

ENSCI
1108 Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

Note: The Radiological analyses were subcontracted to Teledyne Isotopes. Please see the attached copy of their report.

Reviewed & Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

8 JANUARY 1993

JAN 11 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/07/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5322		12/10/92	01/13/93	

PATTI DE ANDINO
ANALYTIKEM INC
2324 VERNSDALE ROAD
ROCK HILL SC 29731

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
98106	83007-1		12/04				GR-A	1.5 +-0.6 E 01		12/16			3
							GR-B	6.3 +-0.4 E 01		12/16			3
							RA-226	6.7 +-0.9 E-01		12/24			4
							RA-228	1.0 +-0.2 E 00		12/24			4

LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 01/07/93

SEND 1 COPIES TO AN133T PATTI DE ANDINO

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

AnalytiKEM *An American NuKEM Company*

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
1-800-TRY-LAB1
Fax: 609/751-0824

TEST REPORT NO. A60646, Supplemental B4

January 24, 1993

Prepared for:

ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Attention: Steven Stadelman

Project: Mannington Tile Soil (S92032)

The Radiological analyses were subcontracted to Teledyne Isotopes. Please see the attached copy of their report.

Reviewed &
Approved by: [signature]

Name: Carmine M. Fioriglio

Title: QA/QC Manager

REPORT OF ANALYSIS

20 JANUARY 1993

TELEDYNE ISOTOPES
50 Van Buren Ave., P.O. Box 1235
Westwood, N.J. 07675-1235
Phone: 201/664-7070
FAX: 201/664-5586

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 01/19/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
3-5557		12/24/92	01/27/93	

ATTN: Q A DEPT
ANALYTIKEM INC
28 SPRINGDALE ROAD
CHERRY HILL NJ 08003

S O L I D S

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
99486	60646-1		12/16				GR-A	1.4 +-0.5 E 01		01/06			3
							GR-B	5.1 +-0.4 E 01		01/06			3
							RA-226	6.9 +-0.7 E-01		01/08			4
							RA-228	7.0 +-1.3 E-01		01/08			4

LAST PAGE OF REPORT

APPROVED BY J. GUENTHER 01/19/93

SEND 1 COPIES TO AN1335 ATTN: Q A DEPT

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

Appendix C

Analytical Reports for Stabilized Sludge Samples

Rocky Mountain
Analytical Laboratory

Enseco
A Corning Company

February 18, 1993

Mr. Steve Stadelman
ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Dear Mr. Stadelman:

Enclosed is the report for ten soil samples received at Enseco-Rocky Mountain Analytical Laboratory on January 6, 1993.

Included with the report is a quality control summary.

Please call if you have any questions.

Sincerely,

Nancy Voiland-Dow

Nancy Voiland-Dow
Project Administrator

NVD/nvd
Enclosures

RMAL #027566

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

ENSCI Corporation

ENSECO-RMAL NO. 027566

FEBRUARY 18, 1993

Reviewed by: Nancy Voiland-Dow

Nancy Voiland-Dow

ENSCI Corporation Job #S92032

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On January 6, 1993, Enseco-Rocky Mountain Analytical Laboratory received ten soil samples from ENSCI Corporation.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

I. Overview
II. Sample Description Information/Analytical Test Requests
III. Analytical Results
IV. Quality Control Report

DISCUSSION

The samples for this project were originally received at the laboratory on January 6, 1993 and were logged in on RMAL project 027019. With permission from Steve Stadelman at ENSCI Corporation, these samples were relogged under RMAL project 027566 for the Radium 226 analysis only. All other requested analyses have been reported under RMAL project 027019.

A reagent blank is analyzed with all radiochemistry parameters and must be within established control limits. The results for Radium 226 are calculated by subtracting the reagent blank.

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION
for
ENSCI Corporation

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
027566-0001-SA	1	SOIL	02 JAN 93	09:30	06 JAN 93
027566-0002-SA	2	SOIL	02 JAN 93	10:00	06 JAN 93
027566-0003-SA	3	SOIL	02 JAN 93	10:30	06 JAN 93
027566-0004-SA	10	SOIL	03 JAN 93	09:30	06 JAN 93
027566-0005-SA	9	SOIL	03 JAN 93	10:00	06 JAN 93
027566-0006-SA	8	SOIL	03 JAN 93	10:30	06 JAN 93
027566-0007-SA	7	SOIL	03 JAN 93	10:45	06 JAN 93
027566-0008-SA	6	SOIL	03 JAN 93	11:00	06 JAN 93
027566-0009-SA	5	SOIL	03 JAN 93	11:15	06 JAN 93
027566-0010-SA	4	SOIL	03 JAN 93	11:45	06 JAN 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
ENSCI Corporation

Lab ID: 027566	Group Code	Analysis Description	Custom Test?
0001 - 0010	A	Radium-226 in soil/ Radon De-emanation	N
		Prep - Radium-226 in soil/ Radon De-emanation	N

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.5, May, 1992.

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027566-0001-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	4.59E+0	+/-5.3E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027566-0002-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.50E+0	+/-4.8E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027566-0003-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	4.43E+0	+/-4.9E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027566-0004-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	1.78E+0	+/-3.0E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027566-0005-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	2.87E+0	+/-3.6E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027566-0006-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.15E+0	+/-3.6E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027566-0007-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.30E+0	+/-4.0E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027566-0008-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.70E+0	+/-4.4E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027566-0009-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.56E+0	+/-3.7E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027566-0010-SA
Matrix: SOIL
Authorized: 10 FEB 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Radium-226	3.23E+0	+/-3.6E-1	pCi/g	EPA Ra-01	12 FEB 93

Reported By: Mark Stella Approved By: Grant Wilton

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\%\ \text{Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\,\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}\,|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Radiochemistry

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027566-0001-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0002-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0003-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0004-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0005-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0006-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0007-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0008-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0009-SA	SOLID	RA226-S	05 FEB 93-9A	-
027566-0010-SA	SOLID	RA226-S	05 FEB 93-9A	-

RADIOCHEMISTRY QUALITY CONTROL REPORT

Parameter: Radium 226
QC Lot # 05-Feb-93 -9A
Units: pCi/g
Matrix: SOIL

DUPLICATE CONTROL SAMPLE REPORT

SAMPLE	Activity +/- 2 s	units	Spike Activity +/- 2 s	units
DCS1	4.9E+02 +/- 2E+01	pCi/g	5.00E+02 +/- 6E+01	pCi/g
DCS2	4.7E+02 +/- 2E+01	pCi/g	5.00E+02 +/- 6E+01	pCi/g

	Duplicate Control Sample # 1			Duplicate Control Sample # 2			Duplicate Control Sample Statistics			
Analyte	Activity +/- 2 sigma	Spike Activity	Accuracy (%)	Activity +/- 2 sigma	Spike Activity	Accuracy (%)	Mean %	Accuracy Limits	DCS Precision (RPD) RPD	DCS Precision (RPD) Limits
Radium 226	4.9E+02 +/- 2E+01 pCi/g	5.0E+02 pCi/g	98%	4.7E+02 +/- 2E+01 pCi/g	5.0E+02 pCi/g	95%	97%	70-130	4%	20%

Enseco
A Corning Company

AnalytiKEM An American NuKEM Company

10958

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI

Project: 592032

Sample Collector: Steve Stadelman, Greg Russell

AnalytiKEM Contact: Don McDowell

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BTC 5
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	1150 ml Unpres.	__ ml HNO_3	__ ml H_2SO_4	__ ml NaOH	__ ml HCL	250 ml Glass	[illegible] ml		PARAMETERS
1	1	1-2-93	0930	soil				3					1	2		8240, 8270, metals by TCLP, Cl, SO_4, Rate ANALYSES PER ATTACHED SHEET
2	2	1-2-93	1000	|				3					1	2		
3	3	1-2-93	1030	|				2					1	4		
4	~~14~~ 10	1-3-93	0930	|				4					1			
5	9	1-3-93	1000	|				4					1			
6	8	1-3-93	1030	|				4					1			
7	7	1-3-93	1045	|				4					1			
8	6	1-3-93	1100	|				4					1			
9	5	1-3-93	1115	|				4					1			
10	4	1-3-93	1145	|				4					1			

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Kenneth F. [illegible] Jr.	1-4-93	1600
2				1-6-93	0900
3					
4					

REMARKS

P.O. # 31904

Rush turnaround on metals

Steve Stadelman

SAMPLER'S SIGNATURE

Reorder: PJ Associates 803-329-2300 White Laboratory Copy Yellow Client Copy AKEM #1

Enseco
A Corning Company

February 11, 1993

Mr. Steve Stadelman
ENSCI Corporation
1108 Old Thomasville Road
High Point, NC 27260

Dear Mr. Stadelman:

Enclosed is the report for ten soil samples received at Enseco-Rocky Mountain Analytical Laboratory on January 6, 1993.

Included with the report is a quality control summary.

Please call if you have any questions.

Sincerely,

Nancy Voiland-Dow

Nancy Voiland-Dow
Project Administrator

NVD/nvd
Enclosures

RMAL #027019

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

ENSCI Corporation

ENSECO-RMAL NO. 027019

FEBRUARY 11, 1993

Reviewed by: Nancy Voiland-Dow

ENSCI Corporation Job #S92032

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On January 6, 1993, Enseco-Rocky Mountain Analytical Laboratory received ten soil samples from ENSCI Corporation.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

I. Overview
II. Sample Description Information/Analytical Test Requests
III. Analytical Results
IV. Quality Control Report

DISCUSSION

The percent recovery of one or more acid surrogates was outside the Enseco advisory acceptance criteria for the Method 8270 analysis of RMAL samples 027019-0001 through -0010. These sample surrogate recoveries suggest a matrix interference. As discussed with Steve Stadelman and Henry Havener of ENSCI Corporation on January 15, 1993, these samples were not reprepped and the original sample data were reported.

A matrix spike was performed for the TCLP-Praseodymium (141) analysis of RMAL sample 027019-0005.

As discussed with Steve Stadelman on February 10, 1993, the Radium 226 analyses of RMAL samples 027019-0001 through -0010 were cancelled. These samples were relogged under RMAL project 027566. The Radium 226 analytical data will be reported under this new project.

Samples within this project have been analyzed for TCLP as in 40 CFR Part 261, Appendix II, and corrected in the Federal Register, November 24, 1992 (57 FR 55114.) TCLP leachates are prepared using Method 1311 and analyzed using Methods 6010, 7470, and 7740 for metals, 8240 for volatiles, 8270 for semivolatiles, 8080 for pesticides, and 8150 for herbicides. Every effort was made to achieve reporting limits below the regulated limit on each sample. However, as with all environmental analyses, matrix interferences or target compounds may be present in some samples which limit the effectiveness of the analytical method to achieve these limits.

The final TCLP rule of November 24, 1992, contains a requirement that a matrix spike be analyzed for each analytical batch; however, bias correction using the matrix spike recoveries, is not required by the US EPA. In accordance with this rule, all data reported have not been corrected for bias. The results from the QC sample analyses (surrogates, lab controls and matrix spikes) are contained in the report, should these data be of interest in adjusting reported values. As stated in Method 1311, use of alternate methods may be needed when the recovery of the matrix spike is below the expected analytical performance.

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION
for
ENSCI Corporation

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
027019-0001-SA	1	SOIL	02 JAN 93	09:30	06 JAN 93
027019-0002-SA	2	SOIL	02 JAN 93	10:00	06 JAN 93
027019-0003-SA	3	SOIL	02 JAN 93	10:30	06 JAN 93
027019-0004-SA	10	SOIL	03 JAN 93	09:30	06 JAN 93
027019-0005-SA	9	SOIL	03 JAN 93	10:00	06 JAN 93
027019-0005-MS	9	SOIL	03 JAN 93	10:00	06 JAN 93
027019-0006-SA	8	SOIL	03 JAN 93	10:30	06 JAN 93
027019-0007-SA	7	SOIL	03 JAN 93	10:45	06 JAN 93
027019-0008-SA	6	SOIL	03 JAN 93	11:00	06 JAN 93
027019-0009-SA	5	SOIL	03 JAN 93	11:15	06 JAN 93
027019-0010-SA	4	SOIL	03 JAN 93	11:45	06 JAN 93

ANALYTICAL TEST REQUESTS
for
ENSCI Corporation

Lab ID: 027019	Group Code	Analysis Description	Custom Test?
0001 - 0010	A	Digestion for Metals from a TCLP leachate	N
		TCLP Extraction / Extractable Organics & Metals	N
		Volatile Organics	N
		Target Compound List (TCL)	N
		GC Screen For Low Level Soils	N
		TCL Semivolatile Organics	N
		Prep - Semivolatile Organics by GC/MS	N
		Sulfate, Ion Chromatography	N
		Deionized Water Leach	N
		Bromide by IC	N
		Gross Alpha/Beta-Gas Proportional Counter	N
		Prep- Gross Alpha/Beta-Gas Proportional Counter	N
		Radium-226 in soil/ Radon De-emanation	N
		Prep - Radium-226 in soil/ Radon De-emanation	N
		Radium-228 in soil/ Gamma Spec	N
		Prep - Radium-228 in soil/ Gamma Spec	N
		Metals, ICP/MS-Bromine	N
		ICP/MS DI Leach	N
		ICP/MS Metals (TCLP Leachate)- Praseodymium (141)	Y

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.5, May, 1992.

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

The analytical data reported are subject to the following limitations of the analytical methodology:

GC/MS

Volatile Organics

a) The cis- and trans-isomers of 1,2-dichloroethene cannot be distinguished using EPA Method 624 or 8240. All dichloroethene present is reported as 1,2-dichloroethene (total).

Semivolatile Organics

a) Benzo(b) and benzo(k) fluoranthene cannot be differentiated based on their mass spectra; retention times are almost identical. The isomer which is the closest in retention time to the sample is reported.

b) 1,2-diphenylhydrazine is measured as azobenzene.

c) Diphenylamine cannot be distinguished from N-nitrosodiphenylamine.

d) 3-Methyl phenol and 4-methyl phenol cannot be differentiated based on their mass spectra and retention times are almost identical. Results are reported as 3/4-methyl phenol (or m&p-cresols).

e) Several Appendix IX and Refinery List compounds are not consistently recovered using Method 8270, and reporting limits cannot be established. These compounds include: dimethoate, famphur, hexachlorophene, 4-nitroquinoline-1-oxide, 4-phenylenedianine, and benzenethiol.

f) Two Refinery List compounds, pyridine and quinoline, are not recovered after alumina column cleanup.

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL — Sampled: 02 JAN 93 — Received: 06 JAN 93
Authorized: 06 JAN 93 — Prepared: 08 JAN 93 — Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	60	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	99	%
4-Bromofluorobenzene	95	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle — Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 08 JAN 93
Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	99	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	10	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	102	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	92	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	93	%
4-Bromofluorobenzene	102	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	92	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	110	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	12	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	101	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	100	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL   Sampled: 03 JAN 93   Received: 06 JAN 93
Authorized: 06 JAN 93   Prepared: 08 JAN 93   Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	96	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	11	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	100	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle   Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL
Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 08 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	190	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	22	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	101	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 12 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	98	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 13 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	83	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	101	%
4-Bromofluorobenzene	100	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 13 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 13 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	48	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	93	%
4-Bromofluorobenzene	105	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 13 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	93	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 08 JAN 93
Analyzed: 13 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	100	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	99	%
4-Bromofluorobenzene	102	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle Approved By: Shawn Kassner

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL — Sampled: 03 JAN 93 — Received: 06 JAN 93
Authorized: 06 JAN 93 — Prepared: 08 JAN 93 — Analyzed: 13 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	101	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle — Approved By: Shawn Kassner

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 08 JAN 93
Analyzed: 13 JAN 93

Parameter	Result	Wet wt. Units	Reporting Limit
Acetone	160	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	16	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

Surrogate	Recovery	
Toluene-d8	98	%
4-Bromofluorobenzene	103	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 08 JAN 93

Received: 06 JAN 93
Analyzed: 13 JAN 93

Surrogate	Recovery	
1,2-Dichloroethane-d4	97	%

ND = Not detected
NA = Not applicable

Reported By: Debbie Coyle

Approved By: Shawn Kassner

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Authorized: 06 JAN 93
Sampled: 02 JAN 93
Prepared: 12 JAN 93
Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico
Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 12 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	76	%
2-Fluorobiphenyl	74	%
Terphenyl-d14	84	%
Phenol-d5	22	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	14	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico   Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 12 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico
Approved By: Richard Murphy

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 12 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	80	%
2-Fluorobiphenyl	75	%
Terphenyl-d14	64	%
Phenol-d5	42	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	32	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	76	%
2-Fluorobiphenyl	75	%
Terphenyl-d14	66	%
Phenol-d5	41	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	43	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL — Sampled: 03 JAN 93 — Received: 06 JAN 93
Authorized: 06 JAN 93 — Prepared: 12 JAN 93 — Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico — Approved By: Richard Murphy

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL   Sampled: 03 JAN 93   Received: 06 JAN 93
Authorized: 06 JAN 93   Prepared: 12 JAN 93   Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	86	%
2-Fluorobiphenyl	82	%
Terphenyl-d14	70	%
Phenol-d5	47	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	31	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico   Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL Sampled: 03 JAN 93 Received: 06 JAN 93
Authorized: 06 JAN 93 Prepared: 12 JAN 93 Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	65	%
2-Fluorobiphenyl	68	%
Terphenyl-d14	64	%
Phenol-d5	51	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	40	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL   Sampled: 03 JAN 93   Received: 06 JAN 93
Authorized: 06 JAN 93   Prepared: 12 JAN 93   Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico   Approved By: Richard Murphy

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL — Sampled: 03 JAN 93 — Received: 06 JAN 93
Authorized: 06 JAN 93 — Prepared: 12 JAN 93 — Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	82	%
2-Fluorobiphenyl	78	%
Terphenyl-d14	68	%
Phenol-d5	44	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	24	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico — Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93
Sampled: 03 JAN 93
Prepared: 12 JAN 93
Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

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ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico   Approved By: Richard Murphy

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL   Sampled: 03 JAN 93   Received: 06 JAN 93
Authorized: 06 JAN 93   Prepared: 12 JAN 93   Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	77	%
2-Fluorobiphenyl	76	%
Terphenyl-d14	61	%
Phenol-d5	32	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	16	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico   Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 12 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico
Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	74	%
2-Fluorobiphenyl	70	%
Terphenyl-d14	65	%
Phenol-d5	36	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	32	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93
Prepared: 12 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico
Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	75	%
2-Fluorobiphenyl	70	%
Terphenyl-d14	63	%
Phenol-d5	34	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	20	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics

Method 8270

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: 12 JAN 93

Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Richard Murphy

Enseco
A Corning Company

TCL Semivolatile Organics (CONT.)

Method 8270

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93
Sampled: 03 JAN 93
Prepared: 12 JAN 93
Received: 06 JAN 93
Analyzed: 14 JAN 93

Parameter	Result	Units	Reporting Limit
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330

Surrogate	Recovery	
Nitrobenzene-d5	70	%
2-Fluorobiphenyl	67	%
Terphenyl-d14	71	%
Phenol-d5	34	%
2-Fluorophenol	ND	%
2,4,6-Tribromophenol	21	%

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico
Approved By: Richard Murphy

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.063	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.11	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.098	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.10	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.090	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.10	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.11	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.090	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.090	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

Total Metals

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromine (81)	0.11	mg/kg	0.025	RMAL	12 JAN 93	12 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: I
Lab ID: 027019-0001-SA
Matrix: SOIL

Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL

Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL

Sampled: 02 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

Enseco
A Corning Company

ICP/MS Metals

TCLP Leachate

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL

Sampled: 03 JAN 93
Received: 06 JAN 93
Authorized: 06 JAN 93

Leached: 12 JAN 93
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Praseodymium (141)	ND	mg/L	0.00050	6020	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Heideman

Approved By: Richard Persichitte

General Inorganics

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Enseco
A Corning Company

General Inorganics

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

General Inorganics

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 02 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Enseco
A Corning Company

General Inorganics

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

General Inorganics

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

General Inorganics

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Ensco
A Corning Company

General Inorganics

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

General Inorganics

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Enseco
A Corning Company

General Inorganics

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Enseco
A Corning Company

General Inorganics

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93
Prepared: See Below

Received: 06 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Bromide	ND	mg/kg	1.0	300.0 Mod.	12 JAN 93	13 JAN 93
Sulfate	ND	mg/kg	25.0	300.0 Mod.	12 JAN 93	14 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Kirsten Meier

Approved By: Julie Martinez

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 1
Lab ID: 027019-0001-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	5E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 3E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	6.8E-1	+/-1.3E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison

Approved By: Robert Shannon

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 2
Lab ID: 027019-0002-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	5E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	8.2E-1	+/-1.2E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 3
Lab ID: 027019-0003-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 02 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	5E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	8.3E-1	+/-1.0E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison

Approved By: Robert Shannon

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 10
Lab ID: 027019-0004-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	5E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 3E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	1.19E+0	+/-1.7E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 9
Lab ID: 027019-0005-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	6E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	1.15E+0	+/-1.0E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 8
Lab ID: 027019-0006-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	7E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	1.22E+0	+/-1.6E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Enseco
A Corning Company

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 7
Lab ID: 027019-0007-SA
Matrix: SOIL
Authorized: 06 JAN 93

Sampled: 03 JAN 93

Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	1.02E+0	+/-1.2E-1	pCi/g	GAMMA SPEC	18 JAN 93

Reported By: Brett Allison

Approved By: Robert Shannon

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 6
Lab ID: 027019-0008-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 3E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	9.2E-1	+/-1.1E-1	pCi/g	GAMMA SPEC	19 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 5
Lab ID: 027019-0009-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	4E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	3E+01	+/- 3E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	9.1E-1	+/-1.0E-1	pCi/g	GAMMA SPEC	19 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

Radiochemistry

Client Name: ENSCI Corporation
Client ID: 4
Lab ID: 027019-0010-SA
Matrix: SOIL
Authorized: 06 JAN 93 Sampled: 03 JAN 93 Received: 06 JAN 93

Parameter	Result	+/- 2 Sigma Uncertainty	Units	Analytical Method	Analyzed Date
Gross Alpha	3E+01	+/- 2E+01	pCi/g	DIRECT COUNT	12 JAN 93
Gross Beta	6E+01	+/- 3E+01	pCi/g	DIRECT COUNT	12 JAN 93
Radium-228(Actinium -228)	8.4E-1	+/-1.0E-1	pCi/g	GAMMA SPEC	19 JAN 93

Reported By: Brett Allison Approved By: Robert Shannon

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\%\ \text{Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027019-0001-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0002-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0003-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0004-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0005-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0006-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0007-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0008-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0009-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D
027019-0010-SA	SOIL	8240-SL	11 JAN 93-D	12 JAN 93-D

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Category: 8240-SL
Matrix: SOIL
QC Lot: 11 JAN 93-D
Concentration Units: ug/kg

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
1,1-Dichloroethene	50	39.9	39.3	39.6	79	75-121	1.5	18
Trichloroethene	50	44.9	45.1	45.0	90	75-108	0.4	11
Benzene	50	43.9	44.2	44.0	88	81-118	0.7	15
Toluene	50	44.8	46.2	45.5	91	83-115	3.1	14
Chlorobenzene	50	43.5	45.1	44.3	89	81-115	3.6	14

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CPL-TCL-S
Matrix: SOIL
QC Lot: 11 JAN 93-D QC Run: 12 JAN 93-D

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/kg	10
Benzene	ND	ug/kg	5.0
Bromodichloromethane	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
2-Butanone (MEK)	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Chloroethane	ND	ug/kg	10
Chloroform	ND	ug/kg	5.0
Chloromethane	ND	ug/kg	10
Dibromochloromethane	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,2-Dichloroethene (total)	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
2-Hexanone	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10
Styrene	ND	ug/kg	5.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Vinyl acetate	ND	ug/kg	10
Vinyl chloride	ND	ug/kg	10
Xylenes (total)	ND	ug/kg	5.0

QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027019-0001-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0002-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0003-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0004-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0005-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0006-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0007-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0008-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0009-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A
027019-0010-SA	SOIL	8270-S	12 JAN 93-8A	12 JAN 93-8A

DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Category: 8270-S
Matrix: SOIL
QC Lot: 12 JAN 93-8A
Concentration Units: ug/kg

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision (RPD) Limit
Phenol	6670	4970	5840	5400	81	40-116	16	20
2-Chlorophenol	6670	5080	5860	5470	82	42-114	14	14
1,4-Dichlorobenzene	3330	2510	2860	2680	81	52-108	13	16
N-Nitroso-di-n-propylamine	3330	2280	2590	2440	73	55-108	13	15
1,2,4-Trichlorobenzene	3330	2520	2950	2740	82	54-102	16	16
4-Chloro-3-methylphenol	6670	5000	5880	5440	82	49-121	16	19
Acenaphthene	3330	2680	3040	2860	86	60-103	13	17
4-Nitrophenol	6670	6090	6800	6440	97	33-120	11	24
2,4-Dinitrotoluene	3330	2580	2810	2700	81	61-106	8.5	15
Pentachlorophenol	6670	5230	6440	5840	87	21-139	21	31
Pyrene	3330	3020	3360	3190	96	51-126	11	16

Calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Inorganic-CLP

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027019-0001-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0001-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0002-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0002-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0003-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0003-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0004-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0004-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0005-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0005-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0005-MS	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0006-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0006-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0007-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0007-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0008-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0008-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0009-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0009-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M
027019-0010-SA	SOLID	ICPMSGLP-S	12 JAN 93-9A	12 JAN 93-9A
027019-0010-SA	AQUEOUS	ICPMSMI-AT	12 JAN 93-9M	12 JAN 93-9M

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DUPLICATE CONTROL SAMPLE REPORT
Inorganic-CLP

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: ICPMSGLP-S								
Matrix: SOLID								
QC Lot: 12 JAN 93-9A								
Concentration Units: mg/kg								
Bromine (81)	2.5	2.4	2.3	2.4	94	85-115	2.4	20
Category: ICPMSMI-AT								
Matrix: AQUEOUS								
QC Lot: 12 JAN 93-9M								
Concentration Units: mg/L								
Arsenic	0.0474	NA	NA	NC	NC	75-125	NC	20
Barium	2.04	NA	NA	NC	NC	75-125	NC	20
Cadmium	0.498	NA	NA	NC	NC	75-125	NC	20
Chromium	0.510	NA	NA	NC	NC	75-125	NC	20
Copper	0.519	NA	NA	NC	NC	75-125	NC	20
Lead	0.50	0.493	0.488	0.491	98	75-125	0.9	20
Nickel	0.497	NA	NA	NC	NC	75-125	NC	20
Selenium	0.0526	NA	NA	NC	NC	75-125	NC	20
Silver	0.498	NA	NA	NC	NC	75-125	NC	20
Zinc	3.32	NA	NA	NC	NC	75-125	NC	20
Praseodymium (141)	0.10	0.0890	0.0861	0.0876	88	75-125	3.3	20

ND = Not detected
NC = Not calculated, calculation not applicable
NA = Not applicable

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Inorganic-CLP

Analyte	Result	Units	Reporting Limit
Test: ICPMS-BR-GLP-S Matrix: SOIL QC Lot: 12 JAN 93-9A QC Run: 12 JAN 93-9A			
Bromine (81)	ND	mg/kg	0.025
Test: ICPMS-MICH-TCLP-L Matrix: SOIL QC Lot: 12 JAN 93-9M QC Run: 12 JAN 93-9M			
Praseodymium (141)	ND	mg/L	0.00050
Test: ICPMS-MICH-TCLP-L Matrix: SOIL QC Lot: 12 JAN 93-9M QC Run: 12 JAN 93-9M			
Praseodymium (141)	ND	mg/L	0.00050

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Inorganic-CLP

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE	ICPMS-MICH-TCLP-L	027019-0005-MS	12 JAN 93-9M

MATRIX SPIKE REPORT
Inorganic-CLP

Analyte	Sample	Concentration Matrix Spike	Concentration Amount Spiked	% Rec
Test: ICPMS-MICH-TCLP-L Matrix SOIL Sample: 027019-0005 Units: mg/L				
Praseodymium (141)	ND	0.096	0.10	96

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027019-0001-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0001-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0002-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0002-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0003-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0003-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0004-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0004-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0005-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0005-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0006-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0006-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0007-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0007-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0008-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0008-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0009-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0009-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A
027019-0010-SA	SOLID	SO4-IC-S	14 JAN 93-9A	11 JAN 93-9A
027019-0010-SA	AQUEOUS	BR-IC-A	13 JAN 93-9A	11 JAN 93-9A

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Concentration Measured DCS1	Concentration Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: S04-IC-S Matrix: SOLID QC Lot: 14 JAN 93-9A Concentration Units: mg/kg								
Sulfate	100	98.9	98.8	98.8	99	75-125	0.1	15
Category: BR-IC-A Matrix: AQUEOUS QC Lot: 13 JAN 93-9A Concentration Units: mg/L								
Bromide	10	9.94	9.96	9.95	100	90-110	0.1	2[illegible]

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: SO4-IC-S Matrix: SOIL QC Lot: 14 JAN 93-9A QC Run: 11 JAN 93-9A			
Sulfate	ND	mg/kg	25.0
Test: BR-IC-S Matrix: SOIL QC Lot: 13 JAN 93-9A QC Run: 11 JAN 93-9A			
Bromide	ND	mg/kg	1.0

QC LOT ASSIGNMENT REPORT
Radiochemistry

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027019-0001-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0001-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0002-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0002-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0003-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0003-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0004-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0004-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0005-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0005-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0006-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0006-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0007-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0007-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0008-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0008-SA	SOLID	RA228-S	19 JAN 93-9A	-
027019-0009-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0009-SA	SOLID	RA228-S	18 JAN 93-9A	-
027019-0010-SA	SOLID	GAB-S	12 JAN 93-9A	-
027019-0010-SA	SOLID	RA228-S	18 JAN 93-9A	-

Radiochemistry Quality Control Report

Parameter: Gross Alpha and Beta
QC Lot # 12-Jan-93 -9A
Matrix: SOIL

Control Sample Report

Test	Observed Activity +/-	2s	units	Spike Activity +/-	2s	units
Am-241	144 +/-	3	pCi / std	135 +/-	4	pCi / std
Sr-90	86 +/-	2	pCi / std	92 +/-	3	pCi / std

Control Sample Statistics

Test	Accuracy Mean %	Limits
Gross Alpha	106%	70% - 130%
Gross Beta	93%	70% - 130%

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RADIOCHEMISTRY QUALITY CONTROL REPORT FOR GAMMA SPECTRAL ANALYSIS

Analyst: BA
Units: Bq
Standard: Analytics SRNS # 43563-288

DUPLICATE COUNT REPORT

QC LOT # 18-Jan-93 -9A

COUNT DATA / STANDARD DATA

			COUNT				1173.24 keV		SRNS # 43563-288		
COUNT #	RADIONUCLIDE	COUNT DATE	START	Activity	+/- 2 σ	Bq	Centroid	Δ keV	Activity	+/- 2 σ	Bq
Count 1	Cobalt 60	18-Jan-93	07:44	1.66E+03 +/-	6E+01	Bq	1173.12	-0.12 keV	1.63E+03 +/-	7E+01	Bq
Count 2	Cobalt 60	18-Jan-93	16:27	1.62E+03 +/-	4E+01	Bq	1173.20	-0.04 keV	1.63E+03 +/-	7E+01	Bq

ACCURACY		MEAN ACCURACY	REL. % DIFFERENCE
Count 1	101.8%	100.6%	2.4%
Count 2	99.4%		

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RADIOCHEMISTRY QUALITY CONTROL REPORT FOR GAMMA SPECTRAL ANALYSIS

Analyst: BA
Units: Bq
Standard: Analytics SRNS # 43563-288

DUPLICATE COUNT REPORT

QC LOT # 19-Jan-93 -9A

COUNT DATA									STANDARD DATA			
			COUNT				1173.24 keV		SRNS # 43563-288			
COUNT #	RADIONUCLIDE	COUNT DATE	START	Activity +/-	2 σ	Bq	Centroid	Δ keV	Activity	+/-	2 σ	Bq
Count 1	Cobalt 60	19-Jan-93	09:12	1.63E+03 +/-	4E+01	Bq	1173.43	0.19 keV	1.63E+03	+/-	7E+01	Bq
Count 2	Cobalt 60	19-Jan-93	15:41	1.59E+03 +/-	4E+01	Bq	1173.57	0.33 keV	1.63E+03	+/-	7E+01	Bq

ACCURACY		MEAN ACCURACY	REL. % DIFFERENCE
Count 1	100.4%	99.1%	2.5%
Count 2	97.9%		

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10958

Chain-of-Custody Record

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: ENSCI
Sample Collector: Steve Stadelman, Greg Russell
Project: 592032
~~AnalytiKEM~~ Contact: Don McDowell

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Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

	ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	950 ml Org. Pres.	452 ml Unpres.	ml HNO_3	ml H_2SO_4	ml NaOH	ml HCL	250 ml glass	500 ml		PARAMETERS
01	1	1	1-2-93	0930	soil				3					1	2		8240, 8270, metals by TCLP, Cl, SO4, Ra 226/228, Gross αβ ANALYSES PER ATTACHED SHEET
02	2	2	1-2-93	1000					3					1	2		
03	3	3	1-2-93	1030					2					1	4		
04	4	~~4~~ 10	1-3-93	0930					4					1			
05	5	9	1-3-93	1000					4					1			
06	6	8	1-3-93	1030					4					1			
07	7	7	1-3-93	1045					4					1			
08	8	6	1-3-93	1100					4					1			
09	9	5	1-3-93	1115					4					1			
10	10	4	1-3-93	1145					4					1			

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1-10	Steve Stadelman	Kenneth T. Lawson Jr.	1-4-93	1600
2				1-6-93	09:00
3					
4					

REMARKS

P.O. # 31904
Rush turnaround on metals

Steve Stadelman
SAMPLER'S SIGNATURE

research analyses consultation

EFEH & ASSOCIATES

10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 996-5031

January 22, 1993

Mr. Steve Stadelman
ENSCI Corporation
1108 Old Thomasville Road
High Point, North Carolina 27260

Dear Mr. Stadelman:

Following are the results of the soil samples submitted to our laboratory for analyses on January 19, 1993:

P.O. #: 31965

SAMPLE I.D.	#1 1/18/93 08:45	#2 1/18/93 09:00	#3 1/18/93 09:15
LAB NO.	G-2476	G-2477	G-2478
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	<0.01	<0.01	<0.01
Barium, mg/l	2.80	2.58	2.77
Boron, mg/l	13.11	19.30	14.49
Cadmium, mg/l	<0.01	<0.01	<0.01
Chromium, mg/l	0.04	<0.01	0.01
Cobalt, mg/l	<0.01	<0.01	<0.01
Lead, mg/l	<0.01	<0.01	<0.01
Manganese, mg/l	<0.01	0.04	<0.01
Mercury, mg/l	<0.002	<0.002	<0.002
Nickel, mg/l	<0.01	<0.01	<0.01
Praseodymium, mg/l	0.02	<0.01	<0.01
Selenium, mg/l	<0.01	<0.01	<0.01
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	0.02	<0.01	<0.01
Vanadium, mg/l	0.01	<0.01	<0.01
Zinc, mg/l	0.02	0.02	0.01

EFEH & ASSOCIATES

SAMPLE I.D.	#4 1/18/93 09:30	#5 1/18/93 09:45	#6 1/18/93 10:00
LAB NO.	G-2479	G-2480	G-2481
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	<0.01	0.04	0.04
Barium, mg/l	2.28	4.92	4.68
Boron, mg/l	22.65	29.34	20.03
Cadmium, mg/l	<0.01	0.08	0.05
Chromium, mg/l	<0.01	<0.01	<0.01
Cobalt, mg/l	0.02	0.30	0.23
Lead, mg/l	<0.01	11.11	7.08
Manganese, mg/l	0.11	0.75	0.54
Mercury, mg/l	<0.002	<0.002	<0.002
Nickel, mg/l	0.01	0.04	0.04
Praseodymium, mg/l	<0.01	<0.01	<0.01
Selenium, mg/l	<0.01	<0.01	<0.01
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	<0.01	<0.01	<0.01
Vanadium, mg/l	<0.01	<0.01	<0.01
Zinc, mg/l	0.06	364.27	70.75

SAMPLE I.D.	#7 1/18/93 10:15	#8 1/18/93 10:30	#9 1/18/93
LAB NO.	G-2482	G-2483	G-2484
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	0.05	<0.01	<0.01
Barium, mg/l	2.69	2.46	3.00
Boron, mg/l	14.68	17.75	15.83
Cadmium, mg/l	<0.01	<0.01	0.01
Chromium, mg/l	<0.01	<0.01	<0.01
Cobalt, mg/l	0.25	0.03	0.07
Lead, mg/l	<0.01	<0.01	0.14
Manganese, mg/l	0.29	0.12	0.27
Mercury, mg/l	<0.002	<0.002	<0.002
Nickel, mg/l	0.01	<0.01	0.03
Praseodymium, mg/l	<0.01	<0.01	<0.01
Selenium, mg/l	<0.01	<0.01	<0.01
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	<0.01	<0.01	<0.01
Vanadium, mg/l	<0.01	<0.01	<0.01
Zinc, mg/l	0.78	0.07	4.62

SAMPLE I.D.	#10 1/18/93 11:00
LAB NO.	G-2485

TCLP INORGANICS (Leachate)

Arsenic, mg/l	0.06
Barium, mg/l	1.81
Boron, mg/l	9.82
Cadmium, mg/l	<0.01
Chromium, mg/l	0.02
Cobalt, mg/l	0.02
Lead, mg/l	<0.01
Manganese, mg/l	<0.01
Mercury, mg/l	<0.002
Nickel, mg/l	0.01
Praseodymium, mg/l	<0.01
Selenium, mg/l	<0.01
Silver, mg/l	<0.01
Titanium, mg/l	<0.01
Vanadium, mg/l	<0.01
Zinc, mg/l	<0.01

METHODS: EPA 1311/6010/7471

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr.

Edwin B. Smith, Jr. PhD

P. 01

research · analyses · consultation

EFEH & ASSOCIATES

Shipping Address:
EFEH & Ass.
3319 Industrial Dr
Pearland, TX. 77581
Att. David Barnette
phone (713) 996-5031

CHAIN OF CUSTODY RECORD

Company Name & Address
ENSCI Corporation
1108 Old Thomasville Rd.
High Point, NC 27260

Sta. #	Date	Time	comp	Grab	Station Location / Sample #	# of Containers	500ml inorganic						Remarks & Analysis Requested: TCLP metals per attached list (No Radium)
	1-18-93	0845			G-2476 1	1	1						
	1-18-93	0900			G-2477 2	1	1						" "
	1-18-93	0915			G-2478 3	1	1						" "
	1-18-93	0930			G-2479 4	1	1						" "
	1-18-93	0945			G-2480 5	1	1						" "
	1-18-93	1000			G-2481 6	1	1						" "
	1-18-93	1015			G-2482 7	1	1						" "
	1-18-93	1030			G-2483 8	1	1						" "
	1-18-93				G-2484 9	1	1						" "
	1-18-93	1100			G-2485 10	1	1						" "

Relinquished by:	Date:	Time:	Recieved by:	Relinquished by:	Date:	Time:
Steve Stadelman	1-18-93	1600				
Relinquished by:	Date:	Time:	Recieved by:	Relinquished by:	Date:	Time:
Relinquished by:	Date:	Time:	Recieved for Laboratory by:		Date:	Time:

Remarks:
Rush turnaround - results by end of work on Friday 1-18-93. P.O. # 31965

Send results to: Steve Stadelman

research analyses consultation
EFEH & ASSOCIATES
10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 996-5031

January 29, 1993

Mr. Steve Stadelman
ENSCI Corporation
1108 Old Thomasville Road
High Point, North Carolina 27260

Dear Mr. Stadelman:

Following are the results of the soil samples submitted to our laboratory for analyses on January 26, 1993:

P.O. #: 31998

SAMPLE I.D.	S4R 1/23/93 09:00	S10R 1/23/93 09:00	E1 1/23/93 10:00
LAB NO.	G-2710	G-2711	G-2712
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	<0.01	0.07	<0.01
Barium, mg/l	0.16	0.21	1.41
Boron, mg/l	1.01	0.41	0.95
Cadmium, mg/l	<0.01	<0.01	<0.01
Chromium, mg/l	<0.01	<0.01	<0.01
Cobalt, mg/l	<0.01	<0.01	0.07
Lead, mg/l	0.06	<0.01	<0.01
Manganese, mg/l	0.05	0.06	1.65
Mercury, mg/l	0.006	<0.002	<0.002
Nickel, mg/l	<0.01	<0.01	0.01
Praseodymium, mg/l	<0.01	<0.01	<0.01
Selenium, mg/l	0.10	0.10	0.07
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	<0.01	0.01	<0.01
Vanadium, mg/l	<0.01	<0.01	<0.01
Zinc, mg/l	1.07	0.78	5.35

EFEH & ASSOCIATES

SAMPLE I.D.	E2 1/23/93 10:15	E3 1/23/93 11:30	E4 1/23/93 12:00
LAB NO.	G-2713	G-2714	G-2715
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	<0.01	0.09	0.01
Barium, mg/l	0.18	0.12	0.49
Boron, mg/l	2.05	2.18	5.20
Cadmium, mg/l	<0.01	<0.01	<0.01
Chromium, mg/l	<0.01	<0.01	<0.01
Cobalt, mg/l	<0.01	<0.01	<0.01
Lead, mg/l	<0.01	0.07	0.28
Manganese, mg/l	0.03	<0.01	0.01
Mercury, mg/l	<0.002	0.123	0.004
Nickel, mg/l	0.02	<0.01	0.01
Praseodymium, mg/l	<0.01	<0.01	<0.01
Selenium, mg/l	<0.01	<0.01	0.01
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	<0.01	<0.01	<0.01
Vanadium, mg/l	<0.01	<0.01	<0.01
Zinc, mg/l	5.42	0.19	0.42

SAMPLE I.D.	E5 1/23/93 12:30	6 1/23/93 13:00	5 1/23/93 13:00
LAB NO.	G-2716	G-2717	G-2718
TCLP INORGANICS (Leachate)			
Arsenic, mg/l	0.01	<0.01	0.07
Barium, mg/l	0.29	1.92	2.14
Boron, mg/l	0.83	1.24	1.53
Cadmium, mg/l	<0.01	<0.01	<0.01
Chromium, mg/l	<0.01	0.09	0.10
Cobalt, mg/l	<0.01	<0.01	<0.01
Lead, mg/l	0.03	0.03	0.01
Manganese, mg/l	0.08	<0.01	<0.01
Mercury, mg/l	0.345	0.254	0.066
Nickel, mg/l	<0.01	<0.01	<0.01
Praseodymium, mg/l	<0.01	<0.01	<0.01
Selenium, mg/l	<0.01	0.10	0.01
Silver, mg/l	<0.01	<0.01	<0.01
Titanium, mg/l	<0.01	<0.01	<0.01
Vanadium, mg/l	<0.01	<0.01	<0.01
Zinc, mg/l	0.04	<0.01	<0.01

METHODS: EPA 1311/6010/7471

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr. PhD

Shipping Address:
EFEH & Ass.
3314 Industrial Dr
Pearland, TX. 77581
ATT. David Burnette
phone (713) 996-5031

Research Analyses Consultation

EFEH & ASSOCIATES

CHAIN OF CUSTODY RECORD

Company Name & Address
ENSCI Corporation
1108 Old Thomasville Rd
High Point, NC 27260

Sta. #	Date	Time	comp	Grab	Station Location / Sample #	# of Containers	950 ml	500 ml					Remarks & Analysis Requested:
	1-23-93	0900		x	S4R	1	1						G-2710 TCLP metals per attached sheet
	1-23-93	0900		x	S10R	1	1						G-2711
	1-23-93	1000		x	E1	1		1					G-2712
	1-23-93	1015		x	E2			1					G-2713
	1-23-93	1130		x	E3			1					G-2714
	1-23-93	1200		x	E4			1					G-2715
	1-23-93	1230		x	E5			1					G-2716
	1-23-93	1300	x		6		1						G-2717
	1-23-93	1300	x		5		1						G-2718

Relinquished by:	Date:	Time:	Recieved by:	Relinquished by:	Date:	Time:
Steve Stadelman	1-25-93	1600				
Relinquished by:	Date:	Time:	Recieved by:	Relinquished by:	Date:	Time:
Relinquished by:	Date:	Time:	Recieved for Laboratory by:		Date:	Time:

Remarks: Rush turnaround. Send results c/o Steve Stadelman. P.O. # 31998

Appendix D

Geo Composite Layer Certification

C L E M

C L A Y M A X

March 1, 1993

H. Havener
ENSCI Corporation
1108 Old Thomasville Rd.
High Point, NC 27260

Re: Certification for Mannington Ceramic Tile, Project #20650

Dear H. Havener:

We herein certify that the Claymax 500SP rolls shipped under Shippers number(s) 617 meet(s) or exceed(s) the minimum or maximum values outlined below with a 95% confidence level.

The certification is based on quality control testing performed by the Clem Corporation on the specific manufactured Lot from which the delivered material was produced. Bentonite property testing was conducted on bentonite removed from the finished product. All quality control testing was performed in strict accordance with the Clem Corporation Quality Management Manual.

PROPERTY/METHOD	SPECIFICATION	TYPICAL VALUES
Hydraulic conductivity/ ASTM 5084 modified	5 X 10(-9) cm/sec @ 2 psi eff. stress	2.0 X 10 (-9) cm/sec @ 2 psi
Hydraulic conductivity on overlapped seams ASTM 5084	5 X 10(-9) cm/sec @ 2 psi eff. stress	3.0 X 10 (-9) cm/sec @ 2 psi
Bentonite Free Swell/ USP NF XVII	30 ml min.	35-40 ml
Bentonite Fluid Loss/ API 13A	15 ml max.	10-13 ml
Bentonite pH/ ASTM D4972	8.5-10.5	9.0 - 9.5
Bentonite unit weight reported @ 20% M.C.	0.95 psf min.	1.02 psf
Roll width	13.5 feet min.	13.6 feet
Roll length	per project requirements	100 feet

Sincerely,

1990 PRESIDENT'S "E" AWARD IN RECOGNITION OF OUTSTANDING EXPORT CONTRIBUTION

Thomas N. Dobras

3/1/93

Thomas N. Dobras, P.E.
Technical Manager, James Clem Corporation

Date

JAMES CLEM CORPORATION
Corporate Office 444 North Michigan Suite 1610 Chicago, IL 60611 USA Phone: 312-321-6255 Fax: 312-321-6258

C L E M

C L A Y M A X

January 28, 1993

H. Havener
ENSCI Corporation
1108 Old Thomasville Rd.
High Point, NC 27260

Re: Certification for Mannington Ceramic Tile, project #20650

Dear Mr. Havener:

We herein certify that the Claymax 200R rolls shipped under Shippers number(s) 571 meet or exceed the minimum or maximum values outlined below with a 95% confidence level.

The certification is based on quality control testing performed by the Clem Corporation on the specific manufactured Lot from which the delivered material was produced. Bentonite property testing was conducted on bentonite removed from the finished product. All quality control testing was performed in strict accordance with the Clem Corporation Quality Management Manual.

PROPERTY/METHOD	SPECIFICATION	TYPICAL VALUES
Hydraulic conductivity/ ASTM 5084 modified	5 X 10(-9) cm/sec @ 2 psi eff. stress	2.0 X 10 (-9) cm/sec @ 2 psi
Hydraulic conductivity on overlapped seams ASTM 5084	5 X 10(-9) cm/sec @ 2 psi eff. stress	3.0 X 10 (-9) cm/sec @ 2 psi
Bentonite Free Swell/ USP NF XVII	27 ml min.	35-40 ml
Bentonite Fluid Loss/ API 13A	15 ml max.	10-13 ml
Bentonite pH/ ASTM D4972	8.5-10.5	9.0 - 9.5
Bentonite unit weight reported @ 20% M.C.	0.95 psf min.	1.02 psf
Roll width	13.5 feet min.	13.6 feet
Roll length	per project requirements	100 feet

Sincerely,

Thomas N Dobras

Thomas N. Dobras, P.E.
Technical Manager, James Clem Corporation

1/28/93
Date

Appendix E

Density Results For Fill Material

LAW ENGINEERING

7347-F WEST FRIENDLY AVENUE, GREENSBORO, NC 27410

REPORT OF FIELD DENSITY TESTS

RECEIVED
MAR 19 1993

CLIENT: ENSCI CORPORATION

JOB NO.: 257-2219

PROJECT: MANNINGTON TILE
LEXINGTON, NORTH CAROLINA

TEST NUMBER	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	PROCTOR NUMBER	COMPACTION (%)	SPECIFIED COMPACTION (%)	TEST METHOD	ELEVATION OR DEPTH
		Tests Performed on 03/10/93					
1	23.7	98.6	1	99	95	1	
2	25.9	95.0	1	96	95	1	

TEST LOCATIONS:

1 95'W & 20'N OF NORTHEAST CORNER
2 220'W & 15'N OF NORTHEAST CORNER

TEST COMPARED TO:

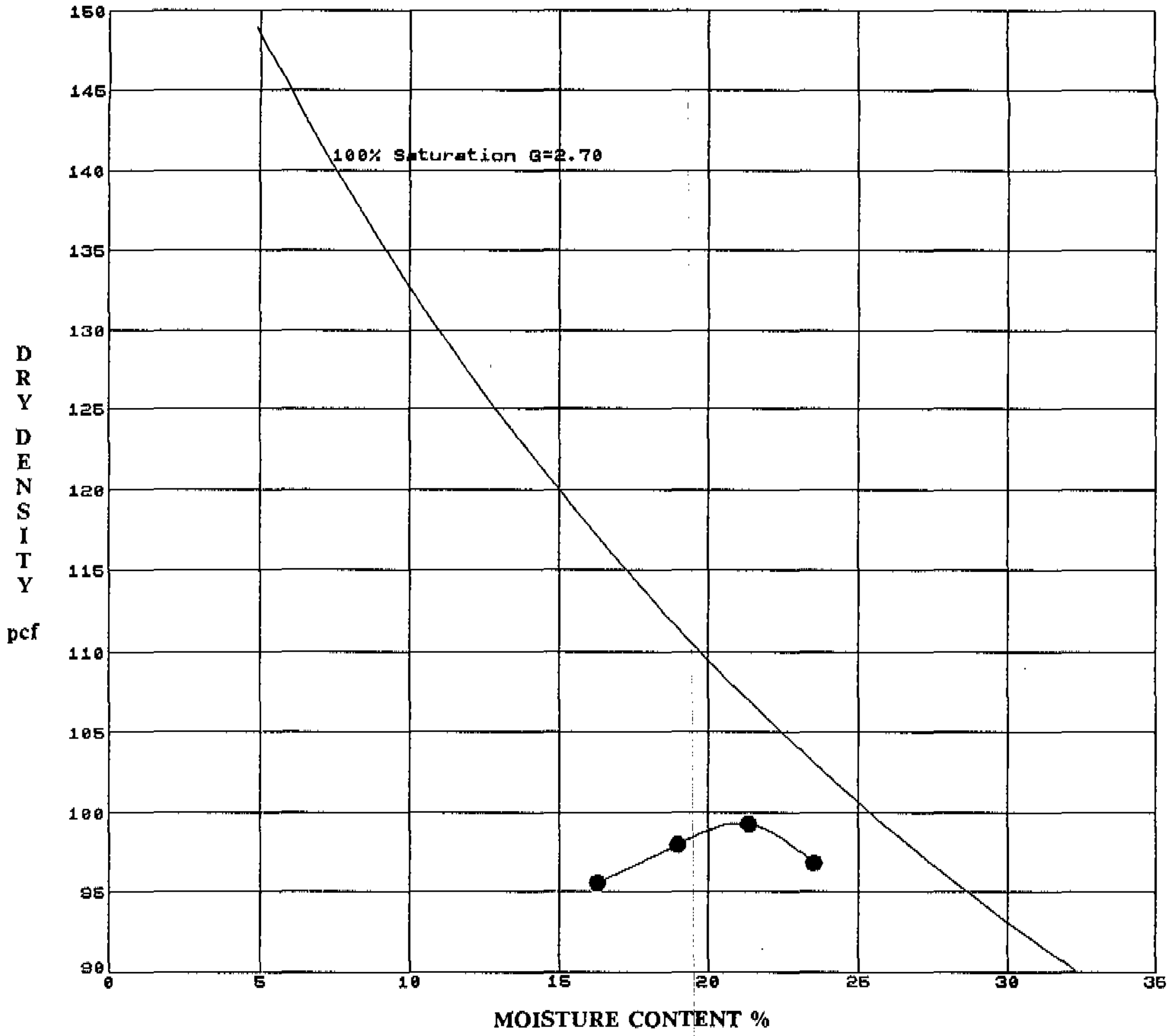
PROCTOR NUMBER	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE (%)
1	99.3	21.3

REMARKS

Performed In General Accordance With:
1 - ASTM D2937

RESPECTFULLY SUBMITTED:

Todd Parson
For THOMAS C. PEGRAM, JR., E.I.T.



SOURCE: ONSITE

CURVE NO.: 1
DESCRIPTION: RED BROWN SLIGHTLY MICACEOUS CLAYEY SILT
MAXIMUM DRY DENSITY, pcf: 99.3
OPTIMIUM MOISTURE CONTENT, %: 21.3
NATURAL MOISTURE CONTENT, %:

CLIENT NAME: ENSCI CORPORATION

March 1993

MANNINGTON TILE- LEXINGTON, NORTH CAROLINA
257-2219-01
ASTM D-698 PROCTOR COMPACTION TEST

LAW ENGINEERING- GREENSBORO, NC

FIGURE 1

Appendix F

Flexible Membrane Liner Certification

Gundle Lining Construction Corp

Gundle®

19103 Gundle Road
Houston, Texas 77073-3598
U.S.A.

Phone: (713) 443-8564
Toll Free: (800) 435-2008
Telex: 166657 GUNDLE HOU
FAX: (713) 875-6010

February 10, 1993

Henry Havener
MANNINGTON CERAMIC TILE
C/O ENSCI, Corp.
20 Victor Street
Lexington, NC 27587

RE: Quality Control Certification

Dear Mr. Havener:

This is to certify that each seam was tested within Gundle Quality Control procedures to ensure you a quality product.

> "Hot wedge welds are pressure tested, pressurizing the gap created by the split face design of the hot wedge."

If you have any questions concerning this matter, please do not hesitate to contact me at (800) 285-8336, extension 863.

Sincerely,

Paul Rone
Paul Rone
Fabrication Manager

PR/rmb

cc: Travis Teykl
Job File

Appendix G

Drainage Layer (Sand)

W. R. BONSAL COMPANY

Preliminary Test on Fine Aggregate

Date 3-12-93

Car No. Under Drain Sand

Shipped to

Destination

Lab. No.

Ret. on 1/4 in.

Color beige

Elutriation 0.7

Retained		per ct. Ret.	per ct. Pass
No. 4 4.75 mm	per ct. No. 4	0	100.0
No. 8 2.36 mm	" " No. 8	13.2	86.8
No. 16 1.15 mm	" " No. 16	35.6	64.4
No. 30 [illegible]	" " No. 30	65.6	34.4
No. 50 0.300 mm	" " No. 50	91.0	9.0
No. 100 [illegible]	" " No. 100	98.2	1.8
Total	per ct. Pass		

F. M. 304

Remarks:

d_{10} = 0.32 mm

Hydraulic conductivity calculation

The grain size distribution curve was plotted and the following determined:

d_{10} = .32 mm = .032 cm = fine sand

The hydraulic conductivity was calculated using the Hazen method (ref. Fetter, 1988).

$$K\ (cm/sec) = C\,(d_{10})^2$$

d_{10} = .032 cm

C = 40–80 for fine sand

$K = 4.1 \times 10^{-2}$ cm/sec using $C = 40$
$K = 8.2 \times 10^{-2}$ cm/sec using $C = 80$

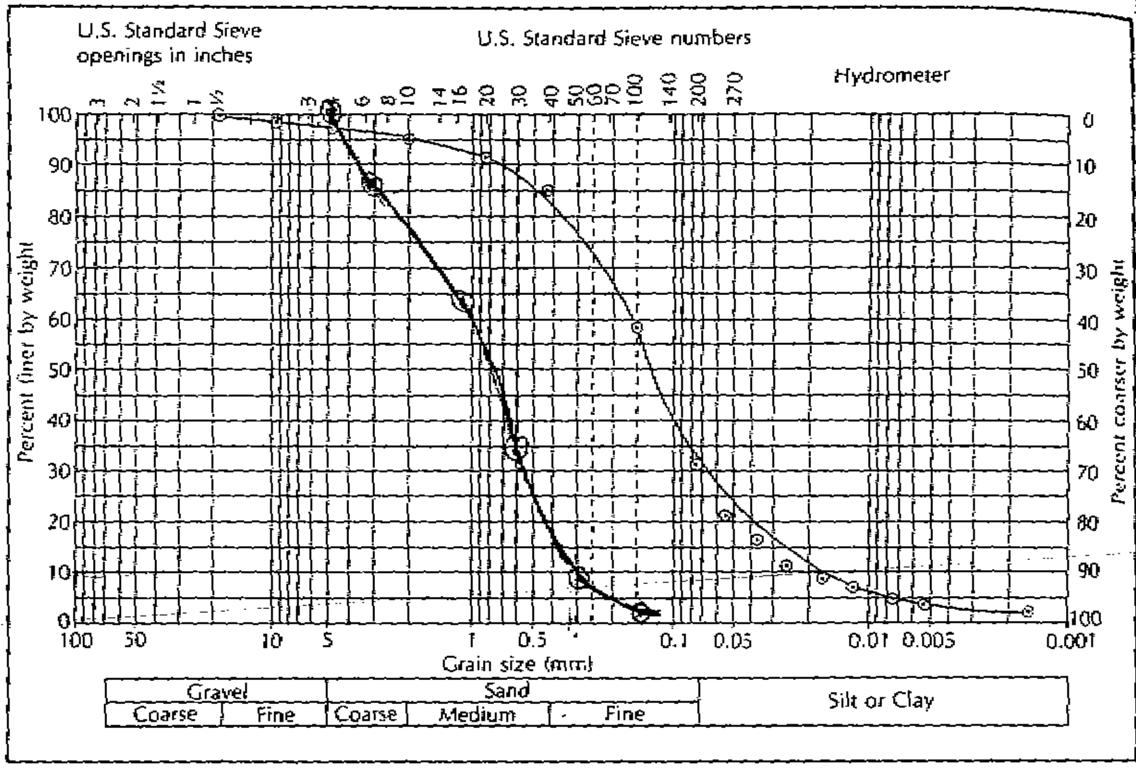


FIGURE 4.4 Grain-size distribution curve of a silty fine to medium sand.

Clays and some clay-rich or organic soils can have very high porosities. Organic materials do not pack very closely because of their irregular shapes. The dispersive effect of the electrostatic charge present on the surfaces of certain book-shaped clay minerals causes clay particles to be repelled by each other. The result is a relatively large proportion of void space.

The general range of porosity that can be expected for some typical sediments is listed in Table 4.2.

TABLE 4.2 Porosity ranges for sediments (1–4)

Well sorted sand or gravel	25–50%
Sand and gravel, mixed	20–35%
Glacial till	10–20%
Silt	35–50%
Clay	33–60%

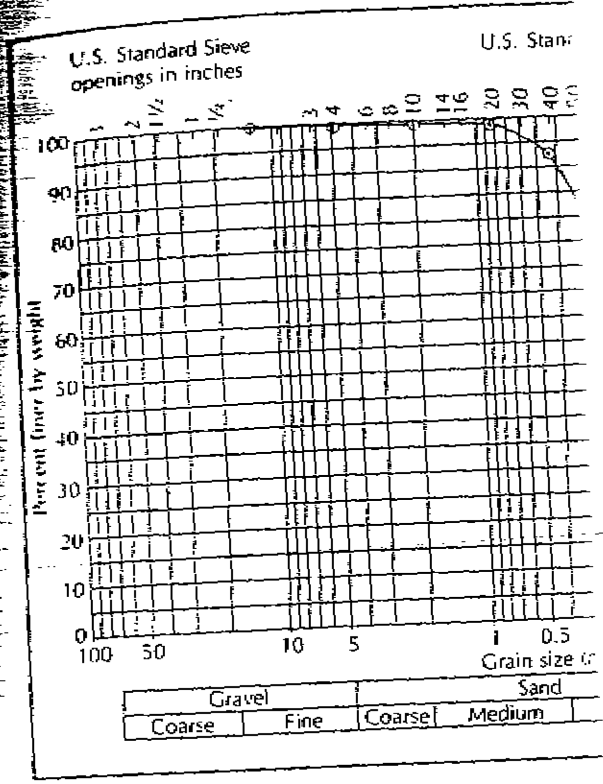


FIGURE 4.5 Grain-size distribution curve of a fine sa

4.1.3 POROSITY OF SE

Sedimentary rocks are for as **diagenesis.** A sediment, which chemically precipitated material, and physicochemical reactions wi the sediment. This includes comp rial, and transformation of minera Compaction reduces pore volume The deposition of cementing mat reduce porosity, although the diss fluid will increase porosity. The p served in the sedimentary rock. T be influenced by the grain size, si inal sediment. Diagenesis is a co rosity of a sedimentary rock will b is especially true of fine-grained se

Appendix H

Gravel Base Density Testing

LAW ENGINEERING

7347-F WEST FRIENDLY AVENUE, GREENSBORO, NC 27410

RECEIVED MAY - 5 1993

REPORT OF FIELD DENSITY TESTS

CLIENT: ENSCI CORPORATION **JOB NO.:** 257-2219

PROJECT: MANNINGTON TILE
LEXINGTON, NORTH CAROLINA

TEST NUMBER	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	PROCTOR NUMBER	COMPACTION (%)	SPECIFIED COMPACTION (%)	TEST METHOD	ELEVATION OR DEPTH
		Tests Performed on 04/19/93					
3	6.2	144.3	2	100+		2	GRADE
4	6.1	142.5	2	100+		2	GRADE
5	6.0	145.4	2	100+		2	GRADE

TEST LOCATIONS:

3 AT STATION 40+04 AND 16'N OF CENTERLINE OF ROAD
4 AT STATION 2+30 AND 2'N OF CENTERLINE OF ROAD
5 AT STATION 3+80 AND 11'N OF CENTERLINE OF ROAD

TEST COMPARED TO:

PROCTOR NUMBER	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE (%)
2	136.0	8.8

REMARKS

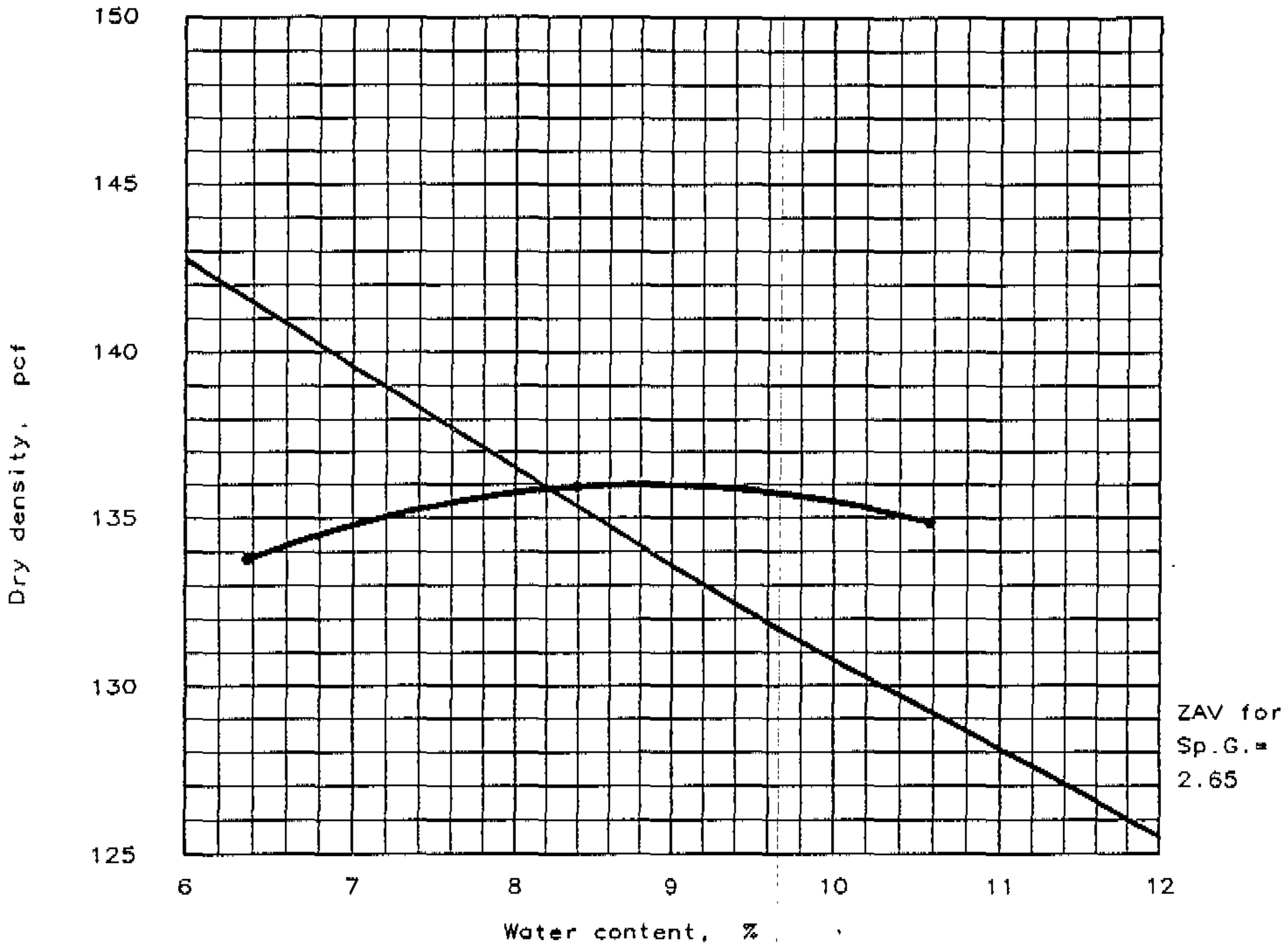
Performed In General Accordance With:
2 - ASTM D1556

RESPECTFULLY SUBMITTED:

Thomas Pegram

THOMAS C. PEGRAM, JR., E.I.T.

PROCTOR TEST REPORT



"Standard" Proctor, ASTM D 698, Method D

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 8.8 % Maximum dry density = 136.0 pcf	CRUSHER RUN

Project No.: 257-2219-01

Project: MANNINGTON TILE

Location: ON-SITE

Date: 4-19-1993

Remarks:

H. M. KERN CONSTRUCTION

PROCTOR TEST REPORT

LAW ENGINEERING

Figure No. 2

Appendix I

Asphalt Density Testing

S&ME

May 19, 1993

Ensci Corporation
1108 Old Thomasville Rd.
High Point, N.C. 28260

Attention: Mr. Steve Stadelman

Reference: Bituminous Concrete Testing Services
Mannington Ceramic Tile
Lexington, North Carolina
S&ME, Inc. Job. No. 1353-93-351 (Report 1)

Gentlemen:

S&ME, Inc. is providing asphalt testing services on part-time on call basis at the referenced project. This letter summarizes nuclear density tests performed on bituminous concrete materials on April 27, 1993.

During this reporting period an engineering technician from our office visited the site and performed fourteen (14) nuclear density tests (test 1 through 14). The field density tests were performed on the pavement areas from Station 00 + 00 to 4 + 00. All tests indicate densities ranging between 95 and 98 percent of maximum theoretical specific gravity of I-2 surface course. The results of the asphalt density tests performed on the bituminous concrete materials are enclosed for your review.

S&ME appreciate the opportunity to be of service to you. If you should have any questions or need additional information, please free to contact us at your convenience.

Very truly yours,
S&ME, Inc.

Dennis L. Apperson
Staff Engineer

Gilberto Ramos, P.E.
Construction Services Manager
N.C. Registration No. 17344

DLA/vrw

Enclosures:
Field Density Tests (test 1 through 14)

S&ME, Inc. 9751 Southern Pine Boulevard, Charlotte, North Carolina 28273, (704) 523-4726, Fax (704) 525-3953
Mailing address: P.O. Box 7668, Charlotte, North Carolina 28241-7668

Printed on Recycled Paper

REPORT OF FIELD DENSITY TESTS

CLIENT: Ensci Corporation DATE: May 6, 1993

PROJECT: Mannington Ceramic Tile, Lexington, NC JOB NO. 1353-93-351

TEST #	WET WEIGHT	PERCENT MOISTURE	DRY DENSITY	OPTIMUM DENSITY	OPTIMUM MOISTURE	PERCENT COMPACTION	LOCATION PERFORMED AT:	DEPTH/ ELEVATION
4/27/93								
1	140.5			144.1		98	Station 00+00, 20' left of CL	I-2
2	139.4			144.1		97	Station 00+10, 20' left of CL	I-2
3	137.5			144.1		96	Station 00+20, 20' left of CL	I-2
4	138.7			144.1		96	Station 00+30, 20' left of CL	I-2
5	140.9			144.1		98	Station 00+40, 20' left of CL	I-2
6	137.3			144.1		95	Station 00+50, 20' left of CL	I-2
7	138.2			144.1		96	Station 00+60, 20' left of CL	I-2
8	141.5			144.1		98	Station 00+70, 20' left of CL	I-2
9	138.7			144.1		96	Station 00+80, 20' left of CL	I-2
10	141.7			144.1		98	Station 00+90, 20' left of CL	I-2
11	139.5			144.1		97	Station 01+00, 20' left of CL	I-2
12	140.2			144.1		97	Station 02+00, 20' left of CL	I-2
13	140.8			144.1		98	Station 03+00, 20' left of CL	I-2
14	141.7			144.1		98	Station 04+00, 20' left of CL	I-2

RESPECTFULLY SUBMITTED
S & M E, INC.

S&ME

June 18, 1993

Ensci Corporation
1108 Old Thomasville Rd.
High Point, N.C. 28260

Attention: Mr. Steve Stadelman

Reference: Bituminous Concrete Testing Services
Mannington Ceramic Tile
Lexington, North Carolina
S&ME, Inc. Job. No. 1353-93-351 (Report 2)

Gentlemen:

S&ME, Inc. has provided asphalt testing services on part-time on call basis for the referenced project. This letter summarizes nuclear density tests performed on bituminous concrete materials on April 24, 1993.

During this reporting period an engineering technician from our office visited the site and performed fifteen (15) nuclear density tests (test 15 through 29). The field density tests were performed on the pavement areas from Station 00 + 00 to 4 + 00. All tests indicate densities ranging between 88 and 96 percent of Maximum Theoretical Specific Gravity of Base Surface Course. The results of the asphalt density tests performed on the bituminous concrete materials are enclosed for your review.

S&ME appreciate the opportunity to be of service to you. If you should have any questions or need additional information, please free to contact us at your convenience.

Very truly yours,
S&ME, Inc.

Dennis L. Apperson
Staff Engineer

Gilberto Ramos, P.E.
Construction Services Manager
N.C. Registration No. 17344

DLA/vrw

Enclosures:
Field Density Tests (test 15 through 29)

REPORT OF FIELD DENSITY TESTS

CLIENT: ENSCI Corporation

DATE: June 14, 1993

PROJECT: Mannington Ceramic Tile

JOB NO. 1353-93-351

TEST #	WET WEIGHT	PERCENT MOISTURE	DRY DENSITY	OPTIMUM DENSITY	OPTIMUM MOISTURE	PERCENT COMPACTION	LOCATION PERFORMED AT:	DEPTH/ ELEVATION
4/23/93								
15	141.5			161.0		88	Station 0+00	Base
16	144.8			161.0		90	Station 0+00	Base
17	141.7			161.0		88	Station 0+00	Base
18	151.5			161.0		94	Station 2+00, 20' Lt of CL	Base
19	154.1			161.0		96	Station 3+00, 20' Lt of CL	Base
20	150.8			161.0		94	Station 4+00, 20' Lt of CL	Base
21	146.5			161.0		91	Station 0+00, 15' Lt of CL	Base
22	150.6			161.0		94	Station 1+00, 15' Lt of CL	Base
23	147.3			161.0		92	Station 2+00, 15' Lt of CL	Base
24	147.3			161.0		92	Station 3+00, 15' Lt of CL	Base
25	147.6			161.0		93	Station 4+00, 15' Lt of CL	Base
26	150.3			161.0		93	Station 0+00, 5' Lt of CL	Base
27	151.3			161.0		94	Station 1+00, 5' Lt of CL	Base
28	147.7			161.0		92	Station 2+00, 5' Lt of CL	Base
29	147.4			161.0		92	Station 3+00, 5' Lt of CL	Base

RESPECTFULLY SUBMITTED
S & M E, INC.

Appendix J

Analytical Reports for Decontamination Water

Research & Analytical Laboratories, Inc.

Analytical/Process Consultations

RECEIVED
APR - 2 1993

Chemical Analysis for Selected Parameters from Samples Identified as RM03-021 - Ta[illegible] Project)

I.	Volatile Organics Method 8240	Concentration (mg/l)	Detection Limit (mg/l)
	Methylene Chloride	BDL	0.010
	Trichlorofluoromethane	BDL	0.010
	1,1-Dichloroethene	BDL	0.010
	1,1-Dichloroethane	BDL	0.010
	Chloroform	BDL	0.010
	Carbon Tetrachloride	BDL	0.010
	1,2-Dichloropropane	BDL	0.010
	Trichloroethene	BDL	0.010
	Dibromochloromethane	BDL	0.010
	1,1,2-Trichloroethane	BDL	0.010
	Tetrachloroethene	BDL	0.010
	Chlorobenzene	BDL	0.010
	Trans-1,2-Dichloroethene	BDL	0.010
	1,2-Dichloroethane	BDL	0.010
	1,1,1-Trichloroethane	BDL	0.010
	Bromodichloromethane	BDL	0.010
	Cis-1,3-Dichlropropene	BDL	0.010
	Benzene	BDL	0.010
	Trans-1,3-Dichloropropene	BDL	0.010
	Bromoform	BDL	0.010
	1,1,2,2-Tetrachloroethane	BDL	0.010
	Toluene	BDL	0.010
	Ethyl Benzene	BDL	0.010
	Chloromethane	BDL	0.010
	Bromomethane	BDL	0.010
	Vinyl Chloride	BDL	0.010
	Chloroethane	BDL	0.010
	Acetone	BDL	0.100
	Carbon Disulfide	BDL	0.010
	Vinyl Acetate	BDL	0.010
	2-Butanone	BDL	0.100
	4-Methyl-2-Pentanone	BDL	0.010
	2-Hexanone	BDL	0.010
	Styrene	BDL	0.010
	Total Xylenes	BDL	0.010
II.	Inorganics		
	Arsenic	BDL	0.010
	Barium	0.250	0.1
	Cadmium	BDL	0.005
	Chromium	BDL	0.020
	Lead	BDL	0.050
	Mercury	BDL	0.00020
	Selenium	BDL	0.005
	Silver	BDL	0.010
	Cobalt	BDL	0.025
	Manganese	0.020	0.010
	Nickel	BDL	0.050
	Zinc	0.030	0.020
	Sulfate	124	10
	Titanium	BDL	0.050
	Boron	40.7	0.010
	Vanadium	BDL	0.040
	Praseodymium	BDL	0.20
	Bromide	BDL	0.50
III.	Radiological Method 900 (pci/l)		
	Gross alpha	1.7	
	Gross Beta	15.4	
	Radium 226	.0.2	0.2
	Radium 228	0.7	0.7

IV.	BNA - Organics Method 8270	Concentration (mg/l)	Detection Limit (mg/l)
	4-Chloro-3-methylphenol	BDL	0.010
	2-Chlorophenol	BDL	0.010
	2,4-Dichlorophenol	BDL	0.010
	2,4-Dimethylphenol	BDL	0.010
	2,4-Dinitrophenol	BDL	0.050
	2-Methyl-4,6-dinitrophenol	BDL	0.050
	2-Nitrophenol	BDL	0.010
	4-Nitrophenol	BDL	0.050
	Pentachlorophenol	BDL	0.050
	Phenol	BDL	0.010
	2,4,6-Trichlorophenol	BDL	0.010
	Acenaphthene	BDL	0.010
	Acenaphthylene	BDL	0.010
	Anthracene	BDL	0.010
	Benzidine	BDL	0.050
	Benzo(a)anthracene	BDL	0.010
	Benzo(a)pyrene	BDL	0.010
	Benzo(b)fluoranthene	BDL	0.010
	Benzo(ghi)perylene	BDL	0.010
	Benzo(k)fluoranthene	BDL	0.010
	Benzy butyl phthalate	BDL	0.010
	Bis(2-chloroethoxy)methane	BDL	0.010
	Bis(2-chloroethyl)ether	BDL	0.010
	Bis(2-chloroisopropyl)ether	BDL	0.010
	Bis(2-ethyl-hexyl)phthalate	BDL	0.010
	4-Bromophenyl phenyl ether	BDL	0.010
	2-Chloronaphthalene	BDL	0.010
	4-Chlorophenyl phenyl ether	BDL	0.010
	Chrysene	BDL	0.010
	Dibenzo(a,h)anthracene	BDL	0.010
	1,2-Dichlorobenzene	BDL	0.010
	1,3-Dichlorobenzene	BDL	0.010
	1,4-Dichlorobenzene	BDL	0.010
	3,3-Dichlorobenzidine	BDL	0.020
	Diethyl phthalate	BDL	0.010
	Dimethyl phthalate	BDL	0.010
	Di-N-Butyl phthalate	BDL	0.010
	2,4-Dinitrotoluene	BDL	0.010
	2,6-Dinitrotoluene	BDL	0.010
	Di-N-Octyl phthalate	BDL	0.010
	1,2-Diphenylhydrazine	BDL	0.050
	Fluoranthene	BDL	0.010
	Fluorene	BDL	0.010
	Hexachlorobenzene	BDL	0.010
	Hexachlorobutadiene	BDL	0.010
	Hexachlorocyclopentadiene	BDL	0.010
	Hexachloroethane	BDL	0.010
	Indeno(1,2,3-cd) pyrene	BDL	0.010
	Isophorone	BDL	0.010
	Naphthalene	BDL	0.010
	Nitrobenzene	BDL	0.010
	N-Nitrosodimethylamine	BDL	0.010
	N-Nitrosodi-n-propylamine	BDL	0.010
	N-Nitrosodiphenylamine	BDL	0.010
	Phenanthrene	BDL	0.010
	Pyrene	BDL	0.010
	1,2,4-Trichlorobenzene	BDL	0.010

BDL = Below Detection Limits
mg/l = milligrams per liter = parts per million
pci/l = picocuries per liter
BNA = Base Neutral/Acid Extractable

RAL # = 162529

RESEARCH & ANALYTICAL LABORATORIES, INC.

Analytical/Process Consultations
Phone (919) 996-2841

CHAIN OF COUSTODY RECORD

JOB NO.

PROJECT NAME: ENSCI Corporation RM03-021 - tanker

SAMPLERS (SIGNATURE): [signature]

SAMPLE NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	2L G (BNA, Herb./Pest.)	2 40ml Vials (VOA)	250ml G (TOX)	250ml P (TOC)	1L P,G (BOD, TSS, Unpreserved, etc.)	1L G (Phenol, Oil & Grease)	1L P,G (COD, N,P)	1L P,G (Metals, Hardness)	1L P,G (CYANIDE)	Sterile P,G (Coliform)	250 ml			MISC.				REQUESTED ANALYSIS
1	3-11-93	1130		X	aqueous	8		V									6							analyses per attached sheet
162529																								

RELINQUISHED BY	DATE/TIME	RECEIVED BY	REMARKS:
[signature]	3-11 93	Mary Hosefeld	P.O. # 33317
RELINQUISHED BY	DATE/TIME	RECEIVED BY	ON Ice

Appendix K

Disposal Manifests for Drummed Material

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. NCD986181451	Manifest Document No. 00010	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: MANNINGTON CERAMIC TILE, 20 VICTOR ST., LEXINGTON NC 27293

4. Generator's Phone (919) 249 3931

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: ENSCI CORPORATION
6. US EPA ID Number: NCD986171031
C. State Transporter's ID
D. Transporter's Phone 919 883 7505

7. Transporter 2 Company Name: ENSCI CORPORATION
8. US EPA ID Number: NCD986171031
E. State Transporter's ID
F. Transporter's Phone 919 883 7505

9. Designated Facility Name and Site Address: LAIDLAW ENVIRONMENTAL SERVICES (TS) INC, RT. 11 BOX 3 WATLINGTON INDUSTRIAL RD, REIDSVILLE NC 27320
10. US EPA ID Number: NCD000648451
G. State Facility's ID
H. Facility's Phone 919-342 6106

	HM	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	X	HAZARDOUS WASTE SOLID, NOS (D008) ORM-E ERG-31 NA9189 (contains lead)	002	DM	00150	P	D008
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above: RVEM&101

K. Handling Codes for Wastes Listed Above: S01

15. Special Handling Instructions and Additional Information: PO#32513

INVOICE: ENSCI CORPORATION, 1108 OLD THOMASVILLE RD, HIGH POINT NC 27260

EMERGENCY CONTACT: PRETLO KNIGHT (919)883-7505

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
TONY SHAW	[signature]	04 29 93

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Michael M. Cook	Michael M. Cook	04 29 93

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
PRETLO KNIGHT	Pretlo Knight	04 29 93

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
Steven P. Grover	[signature]	04 29 93

TRANSPORTER #1

ENVIRONMENTAL SERVICES

Customer Notification And Certification

FORM A

…ly Statements with Original Signatures will be Accepted

Generator Name/Location: MANNINGTON CERAMIC TILE

EPA I.D. Number: NCD986181451

Waste Profile or ARF Designation: RVEMQ101

Manifest Number: ~~[illegible]~~ 0001

EPA Hazardous Waste Number(s): D008

Waste Analysis Attached? YES ______ NO X On file at facility. ______

Unrestricted Waste Notification (Category1)

If you generate a hazardous waste that is not a land disposal restricted waste (the waste has no applicable treatment standards), mark the statement below.

☐ I notify that I am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste is not restricted as specified in 40 CFR 268, Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d).

Restricted Waste Notification (Category 2)

If you generate a hazardous waste that is restricted from land disposal (the waste has applicable treatment standards), mark the statement below. **Note:** All appropriate standards must be accounted for. A waste may pass one or more standards and require treatment or be varianced for others. In this case, all applicable categories must be checked.

☐ I notify that I am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste is subject to the treatment standards specified in 40 CFR 268, Subpart D. Waste must be treated to the appropriate regulatory treatment standard, by the appropriate regulatory treatment method; qualifies for a variance as described by Category 3 below; or meets the standard as described under Category 4 below.

☒ For hazardous debris, the waste contains the following contaminants subject to treatment (check all that apply): ✓ § 268.45(b) (1)-Toxicity characteristic debris; ____ § 268.45(b) (2)-Debris contaminated with listed waste; ____ § 268.45(b) (3)-Cyanide reactive debris. This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45.

…responding Treatment Standard(s) 40 CFR 268.41 NWW 5 ppm

Restricted Waste Variance Notification (Category 3)

If you generate a waste which does not require treatment prior to land disposal because of a variance (including a case-by-case extension under 40 CFR 268.5, a nationwide variance under 40 CFR 268 Subpart C, a no migration petition under 40 CFR 268.6, or other applicable variance), mark the statement below and list the appropriate variance in the space provided.

(3a) Restricted Waste Variance Notification

☐ I notify pursuant to 40 CFR 268.7(a)(3) that I am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that this waste is subject to a national capacity variance under 40 CFR 268 Subpart C, or a case-by-case extension under 40 CFR 268.5, or an exemption under 40 CFR 268.6.
Applicable Variance (List the variance and give the date the waste is subject to prohibitions)

(3b) Hazardous Debris Extension Notification

☒ For the hazardous debris waste stream accompanying this notification, I notify that I have made the necessary submittals to my operating record, or files maintained pursuant to 40 CFR 268.7(a)(5), as described in the May 15, 1992 Federal Register (57 FR 20769), and therefore this hazardous debris shipment qualifies for the one-year generic case-by-case extension.

Applicable Variance (Give the date the waste is subject to prohibitions)
5-8-93

Restricted Waste Certification (Category 4)

If you generate a hazardous waste that is restricted from land disposal (the waste has applicable treatment standards), and the waste meets the standards as generated, mark the statement below. **Note:** All appropriate standards must be accounted for. A waste may pass one or more standards and require treatment or be varianced for others. In this case, all applicable categories must be checked.

☐ I certify under penalty of law that I personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR 268, Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification including the possibility of fine and imprisonment.
Applicable Standards Passed (List the appropriate standard(s) for constituents not requiring treatment)

SIGNATURE: [signature] DATE: 4/29/93

PRINT NAME: TONY SHAW TITLE: ENVIRONMENTAL MGR

revised: 8/92

Appendix L

Analytical Reports for Fill Materials

Research & Analytical Laboratories, Inc.

Analytical/Process Consultations

Steve

Chemical Analysis for Selected Parameters from Stockpile Soil Sample (RAL #162528, Ensci Corporation Job #RM03-021, 11 March 1993)

I. Volatile Organics Method 8240	Concentration (mg/kg)	Detection Limit (mg/kg)
Methylene Chloride	BDL	0.010
Trichlorofluoromethane	BDL	0.010
1,1-Dichloroethene	BDL	0.010
1,1-Dichloroethane	BDL	0.010
Chloroform	BDL	0.010
Carbon Tetrachloride	BDL	0.010
1,2-Dichloropropane	BDL	0.010
Trichloroethene	BDL	0.010
Dibromochloromethane	BDL	0.010
1,1,2-Trichloroethane	BDL	0.010
Tetrachloroethene	BDL	0.010
Chlorobenzene	BDL	0.010
Trans-1,2-Dichloroethene	BDL	0.010
1,2-Dichloroethane	BDL	0.010
1,1,1-Trichloroethane	BDL	0.010
Bromodichloromethane	BDL	0.010
Cis-1,3-Dichlropropene	BDL	0.010
Benzene	BDL	0.010
Trans-1,3-Dichloropropene	BDL	0.010
Bromoform	BDL	0.010
1,1,2,2-Tetrachloroethane	BDL	0.010
Toluene	BDL	0.010
Ethyl Benzene	BDL	0.010
Chloromethane	BDL	0.010
Bromomethane	BDL	0.010
Vinyl Chloride	BDL	0.010
Chloroethane	BDL	0.010
Acetone	BDL	0.200
Carbon Disulfide	BDL	0.010
Vinyl Acetate	BDL	0.010
2-Butanone	BDL	0.200
4-Methyl-2-Pentanone	BDL	0.010
2-Hexanone	BDL	0.010
Styrene	BDL	0.010
Total Xylenes	BDL	0.010

II. TCLP Metals	Concentration (mg/kg)	Detection Limit (mg/kg)
Arsenic	BDL	0.010
Barium	0.892	0.100
Cadmium	BDL	0.010
Chromium	BDL	0.020
Lead	0.169	0.100
Mercury	BDL	0.002
Selenium	BDL	0.010
Silver	BDL	0.010

III. BNA - Organics Method 8270	Concentration (mg/kg)	Detection Limit (mg/kg)
4-Chloro-3-methylphenol	BDL	0.33
2-Chlorophenol	BDL	0.33
2,4-Dichlorophenol	BDL	0.33
2,4-Dimethylphenol	BDL	0.33
2,4-Dinitrophenol	BDL	1.65
2-Methyl-4,6-dinitrophenol	BDL	1.65
2-Nitrophenol	BDL	0.33
4-Nitrophenol	BDL	1.65
Pentachlorophenol	BDL	1.65
Phenol	BDL	0.33
2,4,6-Trichlorophenol	BDL	0.33
Acenaphthene	BDL	0.33
Acenaphthylene	BDL	0.33
Anthracene	BDL	0.33
Benzidine	BDL	1.65
Benzo(a)anthracene	BDL	0.33
Benzo(a)pyrene	BDL	0.33
Benzo(b)fluoranthene	BDL	0.33
Benzo(ghi)perylene	BDL	0.33
Benzo(k)fluoranthene	BDL	0.33
Benzy butyl phthalate	BDL	0.33
Bis(2-chloroethoxy)methane	BDL	0.33
Bis(2-chloroethyl)ether	BDL	0.33
Bis(2-chloroisopropyl)ether	BDL	0.33
Bis(2-ethyl-hexyl)phthalate	BDL	0.33
4-Bromophenyl phenyl ether	BDL	0.33
2-Chloronaphthalene	BDL	0.33
4-Chlorophenyl phenyl ether	BDL	0.33
Chrysene	BDL	0.33
Dibenzo(a,h)anthracene	BDL	0.33
1,2-Dichlorobenzene	BDL	0.33
1,3-Dichlorobenzene	BDL	0.33
1,4-Dichlorobenzene	BDL	0.33
3,3-Dichlorobenzidine	BDL	0.66
Diethyl phthalate	BDL	0.33
Dimethyl phthalate	BDL	0.33
Di-N-Butyl phthalate	BDL	0.33
2,4-Dinitrotoluene	BDL	0.33
2,6-Dinitrotoluene	BDL	0.33
Di-N-Octyl phthalate	BDL	0.33
1,2-Diphenylhydrazine	BDL	1.65
Fluoranthene	BDL	0.33
Fluorene	BDL	0.33
Hexachlorobenzene	BDL	0.33
Hexachlorobutadiene	BDL	0.33
Hexachlorocyclopentadiene	BDL	0.33
Hexachloroethane	BDL	0.33
Indeno(1,2,3-cd) pyrene	BDL	0.33
Isophorone	BDL	0.33
Naphthalene	BDL	0.33
Nitrobenzene	BDL	0.33
N-Nitrosodimethylamine	BDL	0.33
N-Nitrosodi-n-propylamine	BDL	0.33
N-Nitrosodiphenylamine	BDL	0.33
Phenanthrene	BDL	0.33
Pyrene	BDL	0.33
1,2,4-Trichlorobenzene	BDL	0.33

BNA = Base-Neutral-Acid Extractable
mg/kg = milligrams per kilogram = parts per million
BDL = Below Detection Limit

Research & Analytical Laboratories, Inc.
Analytical/Process Consultations
Phone (919) 996-2841

CHAIN OF CUSTODY RECORD

JOB NO.	PROJECT NAME
	ENSCI Corp. RM03-021 - lift

SAMPLERS (SIGNATURE) [signature]

SAMPLE NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	2L G (BNA, Herb/Pest)	2 40ml Vials (VOA)	250ml G (TOX)	250ml P (TOC)	1L PG (BOD, TSS, Unpreserved, etc.)	1L G (Phenol, Oil & Grease)	1L PG (COD, N,P)	1L PG (Metals, Hardness)	1L PG (CYANIDE)	Sterile PG (Coliform)	REQUESTED ANALYSIS
1 162528	3-11-93	1100	X		Soil	2											8240, 8270, RCRA metals TCLP

RELINQUISHED BY	DATE/TIME	RECEIVED BY	REMARKS:
[signature]	3-11-93	[signature]	P.O. # 33316
RELINQUISHED BY	DATE/TIME	RECEIVED BY	ON Ice

March 17, 2003

Memo

To: Rosemarie Roberts

From: Sandra Moore

Re: Proposed Modifications to the Closure Plan
Porcelanite, Inc
Lexington, NC

I reviewed the partial soil investigation information for the closed sludge ponds presented in Porcelanite's "Proposed Modification to the Closure Plan". Below are my comments on a constituent by constituent basis. My comments are based on the assumption that the soil sample locations and depths were adequate and appropriate to determine the extent of contamination in the sludge pond area. Also, since I did not have a copy of Figures 2 and 3, which depict the locations of the soil samples, or the historical sampling data, I assumed that the text is correct when it refers to soil boring locations and constituent concentrations. Please let me know if there are any issues that we need to discuss concerning the site and my comments.

1. Analytical Methods 200.7 and 200.8 are both ICP methods and are basically equivalent. Method 200.8 is an ICP-MS method that is generally more sensitive. I do not see a problem with using either the 200.7 or 200.8 method.
2. EPA Methods 9056 and 300.1 both analyze for inorganic ions by ion chromotography so they should be equivalent.
3. Arsenic- I concur with the conclusion that no further investigation or remediation is warranted since all 53 soil samples and the four background samples were below the PQL (0.894 and 3.75 mg/kg range) and arsenic was not detected in the groundwater above the detection limit (PQL was 0.005 mg/L and 2L standard is 0.01 mg/L). Even though the soil PQLs are above the Region 9 residential PRG of 0.39 mg/kg, if the average soil concentration for the site fell between 0.894 mg/kg and 3.75 mg/kg, the risk from arsenic exposure to soil would fall in the range of 10 E-5 to 10 E-6. From a risk management standpoint, it would not be reasonable to require remediation for arsenic at these levels.
4. Barium- I concur with the conclusion that no further investigation or remediation is warranted based on the frequency of detection of barium in soil above the SSL of 848 mg/kg (1/53) and that no concentrations exceeded the EPA Region 9 residential PRG of 5500 mg/k). Also, barium has not been detected above the 2L groundwater standard.
5. Boron- Based on the soil data for this area it would appear that no further investigation or remediation is warranted. However, I can not make a definitive determination without more information since boron was detected above the 2L in four adjacent wells. The information I would need to make a determination would be the following: i) What is the background concentration for boron at the site? ii) What were the concentrations of boron detected in the four wells? iii) Is there another potential source of groundwater contamination adjacent to the sludge ponds? If there are no other suspected sources and the boron background concentration is close to the concentration in the four wells, I would concur with the no

further action determination. If there is not a boron background groundwater concentration and the boron concentrations in the four wells are less than the EPA Region 9 tap water values of 7 mg/L, I would conclude no further action.

6. Methods 9056 and 300.1 specifically analyze for bromide, not bromine. I would have Porcelanite confirm in writing that the lab used the appropriate method (either 9056 or 300.1 or equivalent bromide method) to analyze for bromide, not bromine, in the soil samples. **I believe that Porcelanite confirmed that bromide was analyzed for and not detected above the PQL, therefore no further action is warranted.**
7. Cadmium- I concur with the conclusion that no further soil investigation or remediation is warranted. They did not state whether or not cadmium had been detected in the groundwater so I am assuming that it has not been detected or that it has not been analyzed for.
8. Chromium- I concur with the conclusion that no further soil investigation or remediation is warranted. Since only two of the 53 soil samples were marginally (33.6 and 33.3 mg/k) above the SSL of 27.2 mg/kg and chromium has not been detected in the groundwater above the 2L, I do not believe soil removal is necessary for chromium unless other constituents are present that are greater than soil cleanup goals.
9. Cobalt- I concur with the conclusion that no further investigation is warranted and that the soil exceeding the SCSs should be removed and properly disposed. I would evaluate the groundwater cobalt levels as suggested above with boron in comment #5 to ensure that there is not another source of cobalt to groundwater in this area. The Region 9 tap water concentration for cobalt is 0.73 ug/kg or ppm. **The lab detection limit was the default NCGS. I would compare the concentrations detected in the groundwater to the Region 9 tap water PRG. If it is below, I would conclude no further action.**
10. Lead- I concur with the conclusion that no further investigation is warranted for the sludge pond area and that the soil exceeding the SCSs should be removed and properly disposed. For Porcelanite's information, the EPA Region 9 soil action levels for lead are 400 mg/kg and 750 mg/kg for protection residential and industrial human receptors, respectively.
11. Manganese- I concur with the conclusion that no further investigation is warranted and that the soil exceeding the SCSs should be removed and properly disposed. I would evaluate the groundwater manganese levels as suggested above with boron (comment #5) and cobalt (comment #9) to ensure that there is not another source of manganese to groundwater in this area. The Region 9 tap water concentration for manganese is 0.88 mg/L.
12. Mercury- All nine detections of mercury in soil were well below the EPA Region 9 residential PRG for soil mercury of 23 mg/kg. Unless mercury has been detected in the groundwater downgradient of the sludge ponds, I would concur that no further action is warranted. If mercury was not analyzed for in downgradient groundwater wells but there is not a suspected source, I would also concur that NFA was necessary.
13. Nickel- I concur that no further action is warranted.
14. Selenium- I concur that no further action is warranted.
15. Silver- I concur that no further action is warranted.
16. Sulfate- I concur that no further action is warranted since only the one holding time was exceeded (out of 53 and the fact that it has not been detected above the 2L standard in groundwater).
17. Titanium- Since there is not a 2L standard for titanium, I'm assuming that Porcelanite is referring to the PQL when they state that "past groundwater sampling indicates that titanium

has not exceeded NCGS standards in the adjacent monitoring well." If that is the case then I concur that no further investigation is warranted.

18. Vanadium- Since there is not a 2L standard for vanadium, I assume Porcelanite is referring to the PQL when they state that "past ground water sampling indicates that vanadium has not exceeded NCGS standards in the adjacent monitoring wells." If that is the case, I concur that no further investigation is warranted. There is an EPA Region 9 tap water concentration of 0.26 mg/L for vanadium that could be used for screening purposes.
19. Zinc- I concur with the conclusion that no further investigation is warranted and that the soil exceeding the SCSs should be removed and properly disposed. I would evaluate the groundwater zinc to ensure that there is not another source of zinc to groundwater in this area.
20. Gross Alpha- I concur with the conclusion that no further investigation or remediation is warranted.
21. Gross Beta- I concur with the conclusion that no further investigation is warranted in this area; however, I would evaluate the groundwater gross beta levels as suggested to ensure that there is not another source of gross beta to groundwater in this area since past groundwater sampling indicates that gross beta has exceeded NCGS in the adjacent monitoring wells.
22. Radium 226 and Radium 228- I concur with the conclusion that no further investigation or remediation is warranted; however, I would check and see if there have been any detections in groundwater in downgradient wells.

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

July 14, 2004

Ms. Elizabeth Cannon- Section Chief
North Carolina Department of Environment
and Natural Resources
Hazardous Waste Section
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Reference: Revised Closure Plan
Former Settling Ponds
Porcelanite, Inc.
Lexington, North Carolina
NCD 986 181 451
Waters Edge Job No. R1-21

Dear Ms. Cannon:

We had an April 1, 2004 meeting with a representative from the North Carolina Department of Environment and Natural Resources (NCDENR), Hazardous Waste Section (HWS), concerning the closure status of the former settling ponds at the Porcelanite facility located in Lexington, North Carolina (see Figure 1). We were attempting to determine the most prudent approach to document closure of this hazardous waste management unit (HWMU). This HWMU had undergone partial closure according to the May 1992 *Revised Closure Plan* submitted by ENSCI which was documented in a June 29, 1993 *Closure Report for Settling Ponds*. Based upon continued negotiations with NCDENR, it was decided to purse a modified closure using risk-based concentrations (RBCs).

Based on some additional sampling outside of the former settling ponds, it appeared that some of the settling pond material had overflowed over the ponds during their operation. Several investigative efforts were conducted to determine the horizontal and vertical extent of the affected soil. Also, during this time period, NCDENR began to adopt a RBC approach to determining remedial thresholds. These levels were finally accepted by both Porcelanite and NCDENR and are shown in Table 1 and locations shown in Figure 2 along with the results of the soil investigative efforts. Based upon these levels, Porcelanite has removed almost all of the affected soils, which were disposed in an approved landfill with disposal manifests shown in Appendix A. There were a few soil samples, which slightly exceeded isolated RBCs (see Figures 3 and 4). The area of affected soil removed is shown in Figure 5.

Subsequent to these efforts, based upon direction from NCDENR, we provided a November 5, 2002 modified risk assessment to justify our position that the remaining slight exceedances should remain in place (see supporting documentation in Appendix B). This risk assessment was subsequently accepted by representatives of NCDENR and would comprise our modification to the existing closure plan.

If you have any questions regarding this report or require additional information, please call me at 919.859.9987.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip L. Rahn, P.G.
President

04-074/PLR

Figures

Tables

Appendices

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-1 0 - 1' 5/27/94	SS-2 0 - 1' 11/4/99	SS-3 0 - 1' 11/4/99	SS-4 0 - 1' 11/4/99	SS-4-2 3' 9/13/02	SS-4-2 5' 9/13/02	SS-5 0 - 1' 11/4/99	SS-6 0 - 1' 11/4/99	SS-7 0 - 1' 11/4/99	SS-7-2 3' 9/13/02	SS-7-2 5' 9/13/02	SS-8 0 - 1' 5/27/94	SS-9 0 - 1' 5/27/94	SS-16 0 - 1' 11/10/99	SS-17 0 - 1' 11/10/99
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<3.62	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<3.73	<3.75	<1.13	<1.15
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	80.1	246	149	47.7	NA	NA	373	64.3	146	NA	NA	186	31.7	25.3	21.8
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	26	30.9	61.9	74.2	NA	NA	<10.5	31.6	<12.7	NA	NA	61.2	11.2	18.2	<11.5
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	NA	NA	<10	<10	<10	NA	NA	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.725	0.712	0.696	0.623	NA	NA	0.335	0.249	0.329	NA	NA	<0.746	<0.806	<0.113	<1.15
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.19	15.4	33.6	33.3	8.39	6.74	4.81	8.58	13.2	NA	NA	8.58	4.04	8.03	6.71
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	<3.62	19.9	11.3	6.48	NA	NA	20.9	6.96	19.9	NA	NA	14	<4.04	1.58	1.26
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	93.4	225	207	18.5	NA	NA	155	145	397	<11.8	12.6	996	42.7	10.5	25.5
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	82.4	392	298	201	NA	NA	312	290	285	NA	NA	122	278	58.4	35.1
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	<0.145	0.901	1.28	0.855	NA	NA	0.855	0.413	0.662	NA	NA	<0.149	<0.172	0.476	0.652
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	3.12	13.3	8.77	6.48	NA	NA	7.32	3.73	10.0	NA	NA	7.31	<4.04	2.26	1.72
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.45	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<1.49	<1.50	2.37	1.72
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<0.725	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<0.746	<0.807	<1.13	<1.15
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	168	49.9	<25	97.5	NA	NA	48.2	51.8	<25	NA	NA	537	172	27.6	<250
Titanium	NL	Method 200.7	996.31	996.00	92.2	789	1,040	948	NA	NA	59	453	130	NA	NA	118	36.1	39.3	43.5
Vanadium	NL/550	Method 200.7	184.91	550	33.8	66	151	173	NA	NA	12.2	56	37.6	NA	NA	33.2	9.62	28.7	21.6
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	388	2,290	625	330	NA	NA	3,680	269	855	NA	NA	5,230	39.6	62.3	111
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	15.4	7.7	9.3	10.6	NA	NA	10.8	19.5	7.7	NA	NA	16.3	8	29.1	28.8
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	38.6	13.3	12.9	8.9	NA	NA	27.2	32.1	20.7	NA	NA	29	33.3	38.1	47.9
Praseodymium	NL	Method 1620	MDL	MDL	<6.71	<11.9	<12.9	<12.2	NA	NA	<10.4	<12.2	<12.7	NA	NA	<7.46	<7.52	<11.3	<11.5
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	0.6	0.7	1.4	1.5	NA	NA	1.2	1.0	1.6	NA	NA	2.2	1.2	0.7	1.1
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	1.1	<1.0	<1.0	<0.9	NA	NA	<0.9	<1.0	<1.0	NA	NA	1.2	<0.8	<1.0	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg
c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-18 0 - 1' 11/10/99	SS-19 0 - 1' 11/10/99	SS-20 0 - 1' 11/10/99	SS-21 0 - 1' 11/10/99	SS-22 0 - 1' 11/4/99	SS-23 0 - 1' 11/18/99	SS-24 0 - 1' 11/18/99	SS-24 3' 11/18/99	SS-24-2 4' 9/13/02	SS-24-2 6' 9/13/02	SS-25 0 - 1' 11/4/99	SS-25 3' 11/18/99	SS-26 0 - 1' 11/10/99	SS-27 0 - 1' 1/19/00	SS-28 0 - 1' 1/19/00
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.16	<1.00	<1.01	<1.09	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	19.2	20.1	15.3	12	1,490	47	64.8	260	NA	NA	54.4	78.7	135	18.1	8.3
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	13.1	<10	<10.1	13.6	33.8	<8.94	11.1	44.2	NA	NA	27.2	70.4	<10.1	6.09	7.41
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.116	<0.100	<0.101	<0.109	1.37	0.335	0.168	0.331	NA	NA	0.228	0.318	<0.101	<0.113	<0.111
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.95	3.11	2.71	10.1	8.32	18.3	17	15.9	NA	NA	9.44	21	4.65	6.66	4.65
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	1.63	2.0	1.51	1.53	39.6	2,000	203	285	11.4	9.96	3.23	3.37	6.27	1.35	<1.11
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	6.16	9.02	12.7	7.08	6,830	3.58	65.9	972	372	170	19.4	20.2	65.2	17.2	6.19
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	33.4	161	172	42.7	225	193	267	235	NA	NA	180	97	189	51.5	37.2
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	0.488	<0.200	<0.201	<0.218	2.62	<0.179	<0.189	<0.194	NA	NA	1.28	0.404	4.02	0.904	0.592
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.76	<1.0	<1.01	2.29	23.8	50.2	12.9	17.7	NA	NA	3.68	4.24	2.82	1.58	1.22
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	1.51	<1.0	<1.01	2.51	1.48	1.52	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.16	<1.0	<1.01	<1.09	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	48.1	<100	<100	<25	34.8	35	25.8	53	NA	NA	30.9	62.8	<250	100	275
Titanium	NL	Method 200.7	996.31	996.00	21.9	15.5	17	34.4	46.4	543	639	451	NA	NA	317	398	23.8	106	57.5
Vanadium	NL/550	Method 200.7	184.91	550	27.8	6.91	4.83	30	17.9	51.5	32.7	31.2	NA	NA	44.2	117	9.2	26.3	26.9
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	34.3	13.1	21.5	17.2	7,020	28.7	131	1,200	1,070	710	40	417	885	13.1	12.3
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	23.3	14.8	11.1	22.8	11.6	1.9	2.1	8.9	NA	NA	20.2	22.8	15.4	NA	NA
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	36.6	40.3	36	38.1	24.4	9.9	8.6	16.3	NA	NA	29.8	17.3	43.5	NA	NA
Praseodymium	NL	Method 1620	MDL	MDL	<11.6	<10.0	<10.1	<10.9	<11.4	NA	<9.42	<9.63	NA	NA	<11.5	<12.5	<10.1	NA	NA
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	2.4	1.1	0.9	0.6	0.9	1.1	0.5	0.9	NA	NA	1.3	0.5	0.8	NA	NA
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	1.0	1.1	<1.0	1.5	1.0	<1.1	<1.0	<1.1	NA	NA	<1.0	<1.1	<1.0	NA	NA

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
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c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

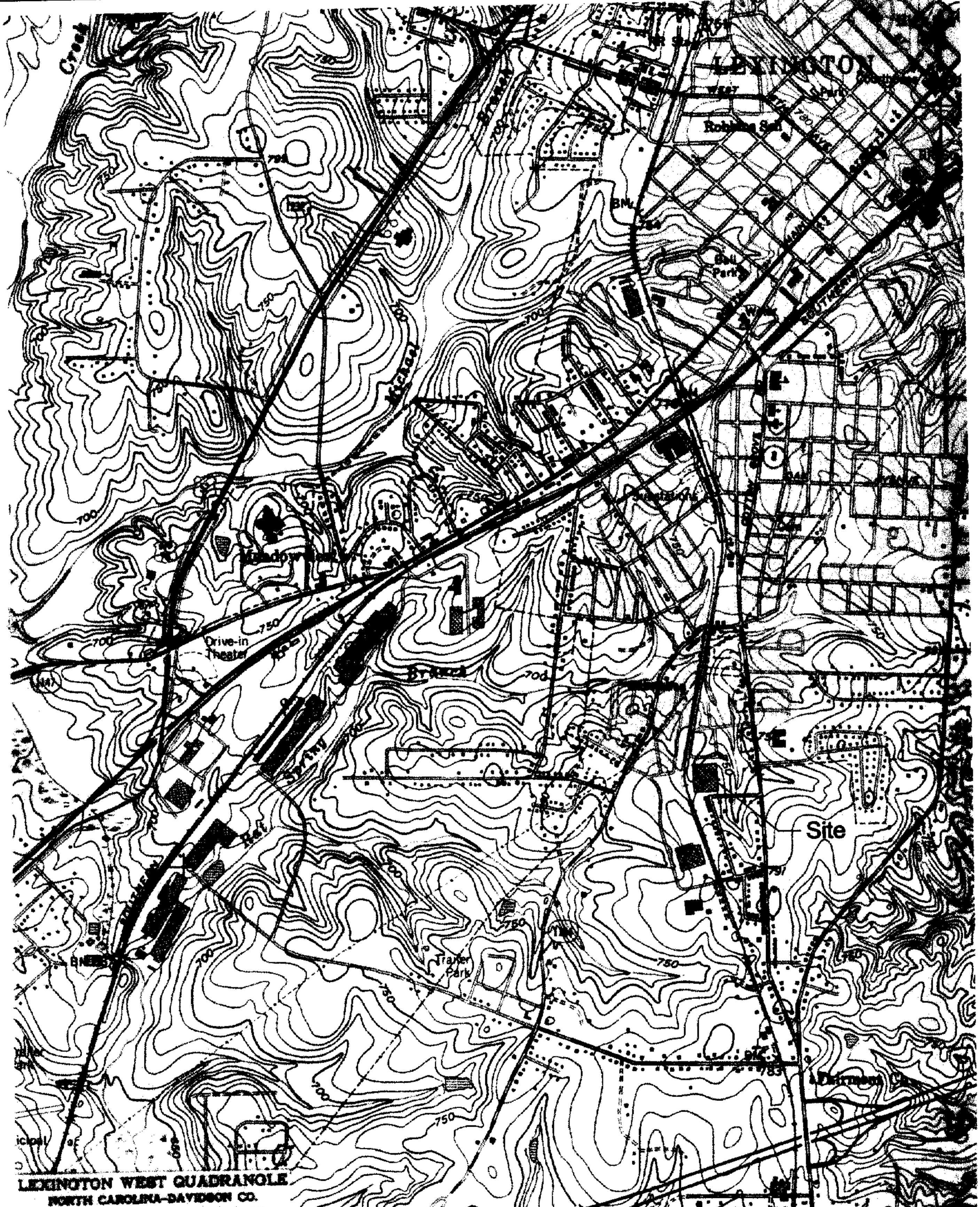
Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-29 0 - 1' 1/19/00	SS-30 0 - 1' 1/19/00	SS-31 0 - 1' 1/19/00	SS-32 0 - 1' 1/19/00	SS-33 0 - 1' 1/19/00	SS-33 3' 1/19/00	SS-34 0 - 1' 1/19/00	SS-34 3' 1/19/00	SS-35 0 - 1' 1/19/00	SS-35 3' 1/19/00	SS-36 0 - 1' 1/19/00	SS-36 3' 1/19/00	SS-36-2 3' 9/13/02	SS-37 0 - 1' 1/19/00	SS-37 3' 1/19/00
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	13	22.9	30	25.8	25.5	25.2	39.9	29.9	23.1	17.2	690	10.2	NA	14.6	5.4
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	11.8	7.72	8.05	<5.19	<5.20	12.5	<5.30	19.0	107	31.9	56	22.4	NA	32.3	22.0
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	<10	**	<10	**	<10	**	<10	**	NA	<10	**
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.113	<0.107	<0.105	<0.104	<0.098	0.159	<0.106	<0.105	<0.122	0.226	<0.126	0.162	NA	<0.120	<0.120
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	7.13	7.29	6.66	4.15	6.97	11.0	5.08	8.42	17.1	12.2	13.2	3.86	NA	10.2	3.6
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	1.92	1.29	4.23	2.7	2.26	2.35	4.45	3.05	3.42	1.86	3.42	1.87	NA	1.32	<1.20
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	4.87	3.75	15.9	9.12	10.5	5.44	12.5	8.21	17.5	9.16	23.5	7.36	NA	7.46	4.2
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	87.9	26.5	298	305	408	73.5	164	105	120	62.7	91.5	168	NA	28.9	47.1
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	2.19	0.858	0.918	0.624	1.41	**	0.425	**	3.87	**	1.43	**	NA	2.66	**
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.81	1.29	1.16	<1.04	<0.982	1.71	1.17	2.63	5.74	3.01	4.43	1.64	NA	1.56	<1.20
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	<25	43	<250	43.4	<250	**	<250	**	67	**	5,560	**	101	36.8	**
Titanium	NL	Method 200.7	996.31	996.00	137	51.3	61.1	42.8	34.2	13.3	81.7	16.4	339	150	187	47.2	NA	62.2	22.9
Vanadium	NL/550	Method 200.7	184.91	550	29.2	19	12.2	6.74	6.09	21.0	8.69	22.9	210	66.1	87.7	23.8	NA	34.2	14.7
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	25.4	11.7	9.31	4.15	21.6	60.3	15.5	8.1	21.7	23.7	37.1	33.0	NA	11.4	19.9
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	NA	NA	NA	NA	12.7	16.8	17.7	14.1	18.4	19.0	64.8	30.4	NA	27.2	38.2
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	NA	NA	NA	NA	39.4	32.5	42.8	32.6	15.7	23.7	48.7	55.6	NA	34.7	42.5
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	NA	NA	NA	NA	0.5	1.2	1.4	1.0	1.0	0.9	0.5	0.8	NA	0.7	0.6
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	NA	NA	NA	NA	<1.0	<1.1	<1.1	<1.0	<1.0	<1.1	1.1	<1.0	NA	1.0	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg
c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

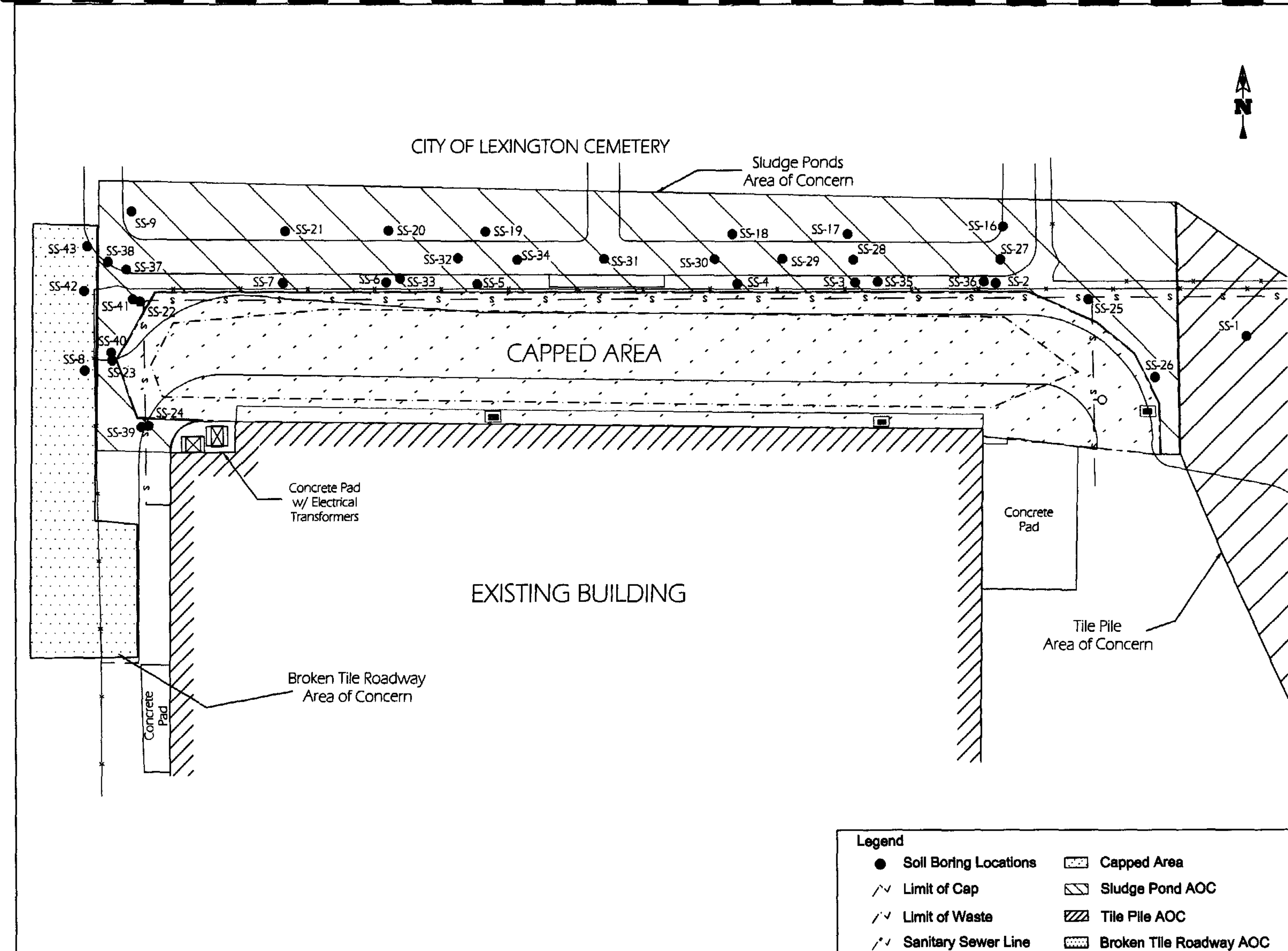
Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-38 0 - 1' 1/19/00	SS-38 3' 1/19/00	SS-39 0 - 1' 2/17/00	SS-39 3' 2/17/00	SS-40 0 - 1' 2/17/00	SS-40 3' 2/17/00	SS-41 0 - 1' 2/17/00	SS-41 3' 2/17/00	SS-42 0 - 1' 2/17/00	SS-43 0 - 1' 2/17/00	SS-43 3' 2/17/00	BG-1 11/10/99	BG-2 11/10/99	GS-3 11/18/99	GS-4 11/18/99
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09	<1.15	<1.12
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	25	4.62	40.2	<4.19	39.5	63.5	435	50.6	140	34.8	55.1	19.2	43.12	67.4	45
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	6.55	<9.82	<9.53	<10.5	<9.39	<11.3	<10.8	<10.4	13.0	<10.3	<11.1	24.3	<10.9	42.4	57.3
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.101	<0.098	<0.095	<0.105	<0.094	<0.113	<0.108	<0.104	<0.097	<0.103	<0.111	<0.118	<0.109	0.23	0.504
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.07	3.14	12.7	<1.05	16.7	3.16	4.53	8.14	11.8	6.82	8.64	11.5	6.76	18.8	20.6
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	2.82	1.18	6.00	<1.05	8.07	9.59	5.82	10.5	9.42	3.82	3.77	2.0	2.94	8.64	20.4
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	7.77	5.5	4.67	<0.523	1.03	11.5	44.6	20.5	239	16.8	32.7	13.4	13.2	44.1	52.7
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	90.5	42.0	219	<1.05	234	4.21	519	153	142	302	119	42.5	123	183	305
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	0.942	**	<0.191	<0.209	<0.188	<0.226	0.307	<0.209	<0.194	<0.206	<0.221	5.54***	0.862	<0.231	<0224
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.72	<0.982	6.96	<1.05	9.95	3.50	1.94	2.19	6.31	1.76	2.66	2.82	2.73	6.34	8.28
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	2.47	1.2	<1.15	<1.12
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09	<1.15	<1.12
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	37.3	**	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	27	57.7
Titanium	NL	Method 200.7	996.31	996.00	47.2	13.4	357	<10.5	384	356	24.8	26.9	84.7	22.3	26.3	65.7	181	644	649
Vanadium	NL/550	Method 200.7	184.91	550	16.6	9.53	20.6	1.46	22.5	33.4	7.87	16.0	20.1	12.2	25.6	45.2	27.6	89.4	148
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	6.56	7.76	34.9	2.83	26.2	32.3	390	78.8	258	21.2	9.60	149	124	124	101
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	16.1	13.6	<2.3	<2.0	<2.2	20.3	19.8	10.0	7.9	13.3	27.4	22.4	23.5	7.9	6.1
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	40.6	38.9	9.1	2	10.8	29.6	30.0	16.1	14.0	37.6	37.6	31	33.2	6.2	6.8
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<11.8	<10.9	<11.5	<11.2
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	0.7	0.7	0.2	<0.3	<0.4	1.3	0.8	1.5	1.0	0.7	0.5	1	1.1	0.6	0.7
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.1	<1.1	<1.1	1.0	1.8	<1.0	0.9	<1.1	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg
c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

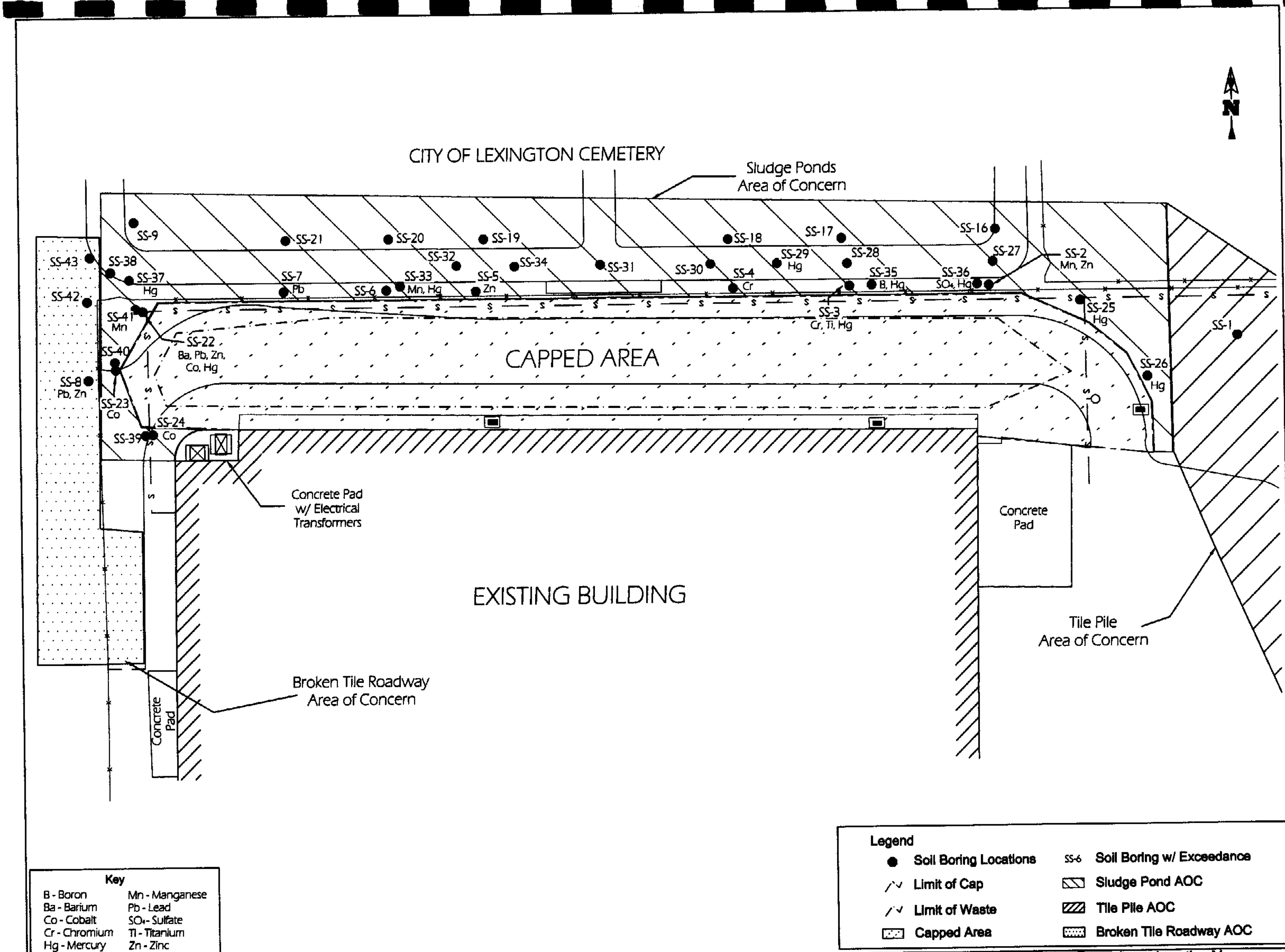


WATERS EDGE ENVIRONMENTAL, LLC	Author jme	Drawing R1-21	Layers	Date 1-24-01	Title Project Location Map
	Job No. R1-21	Revision 11-1-02	Figure 1	Scale 1"=2000'	Project Porcelanite, Inc. Lexington, North Carolina

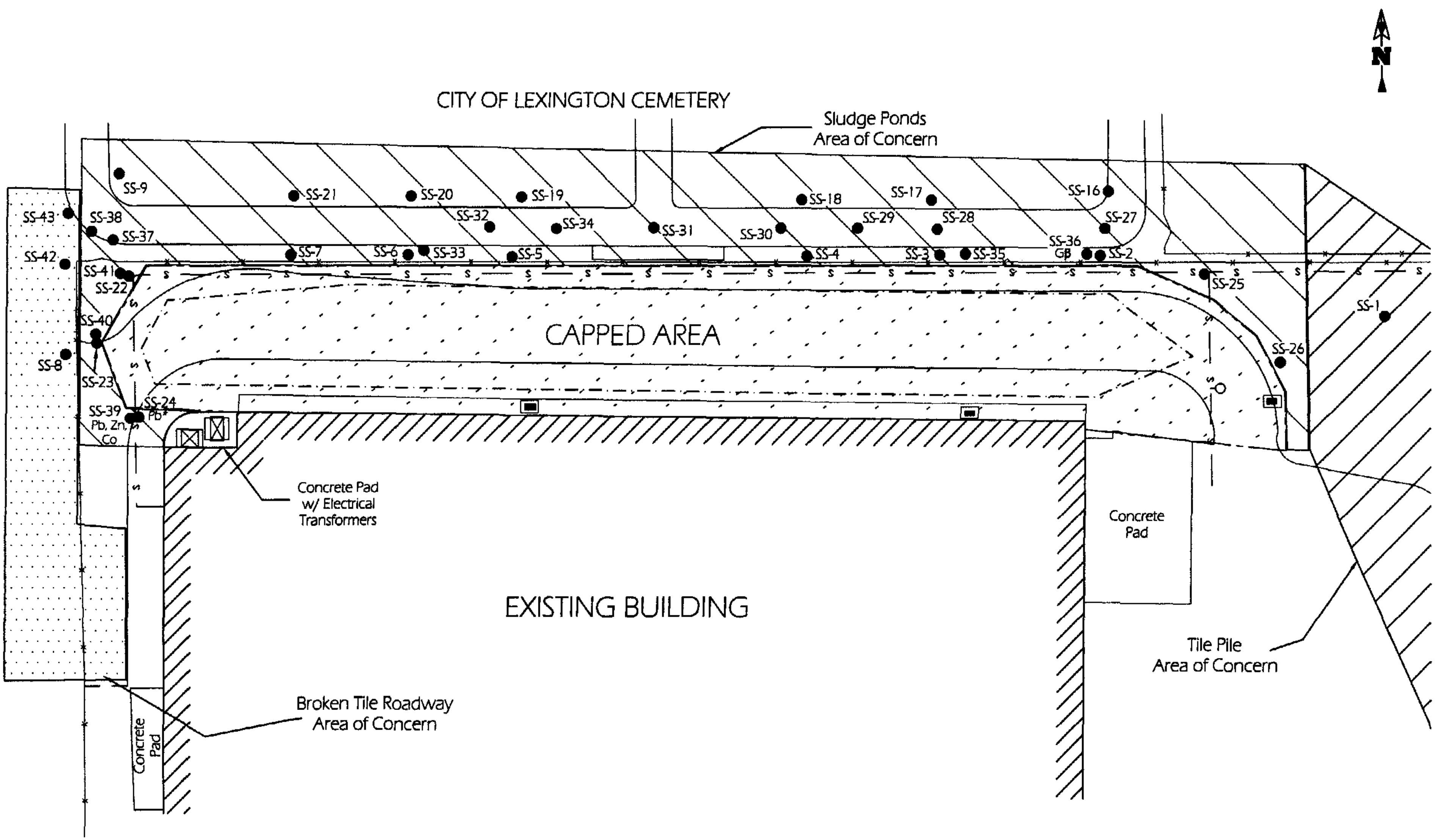


WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
jme	04-074 CAPMod		09-19-02	Soil Boring Location Map Adjacent to Former Lagoons
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	07-02-04	2	1" = 60'	Porcelanite Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 04-074 CAPMod	Layers	Date: 09-19-02	Title: Soil Boring Exceedance Location Map 1-ft Depth
	Job No.: R1-21	Revision: 07-02-04	Figure: 3	Scale: 1" = 60'	Project: Porcelanite Lexington, North Carolina



Legend

●	Soil Boring Locations	SS-6	Soil Boring w/ Exceedance
	Limit of Cap		Sludge Pond AOC
	Limit of Waste		Tile Pile AOC
	Capped Area		Broken Tile Roadway AOC

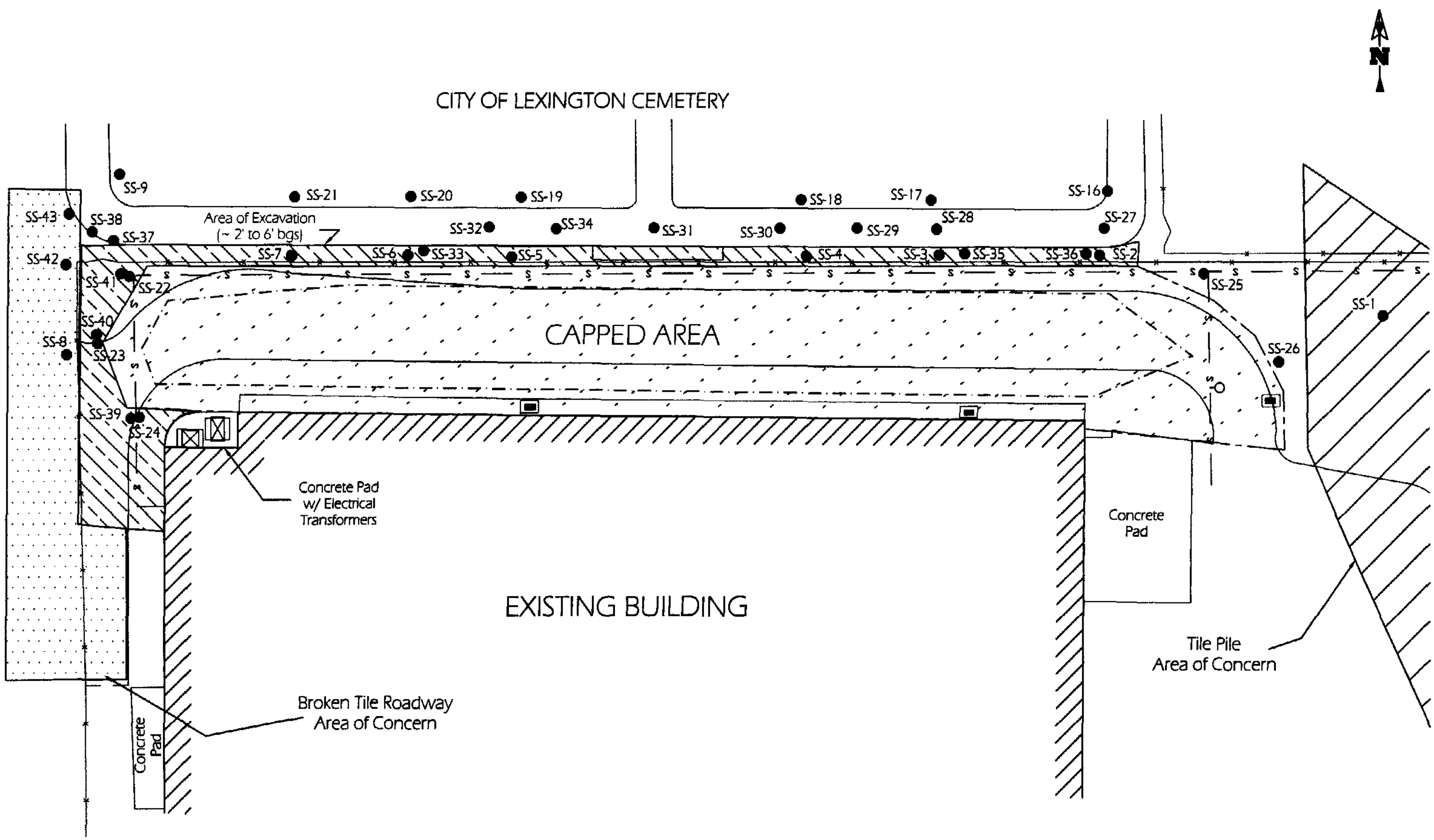
Key

Co - Cobalt	Pb - Lead
Gβ - Gross Beta	Zn - Zinc

Note - All Exceedances at 3-ft bgs, except Pb in SS-24 @ 4-ft bgs

WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
jme	04-074 CAPMod		09-19-02	Soil Boring Exceedance Location Map 3-6 ft Depth
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	07-02-04	4	1" = 60'	Porcelanite Lexington, North Carolina



Legend

- Soil Boring Locations
- Limit of Cap
- Limit of Waste
- Sanitary Sewer Line
- Capped Area
- Broken Tile Roadway AOC
- Area of Excavation
- Limits of Excavation Area

WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
jme	04-074 CAPMod		09-19-02	Area of Excavation Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	07-02-04	5	1" = 60'	Porcelanite Lexington, North Carolina

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284
910-595-8677
A Waste Management Company

NON-HAZARDOUS MANIFEST

53369

GENERATOR

Generator Porcelonite, Inc.
Address 20 Victor St.
Lexington, NC 27292
Phone 336-434-7750

I.D. # ____
Generator's Shipping Location of Waste ____
(If different from generator address)
Address ____
Phone ____

Description of Waste Materials	Profile Number	Total Quantity	Unit of Measure	Container Type
Soil	CM1569		Tons	Dump

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable regulations.

Eric D. McManus — Eric D. McManus — 10-26-00
Generator Authorized Agent Name (Print) — *Signature* — Delivery Date

TRANSPORTER

Transporter Name South Co
Address Brentwood St.
High Point, NC

I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.

Ronnie Brewer 10-26-00
Driver Signature Shipment Date

Driver Name (Print) Ronnie Brewer
Truck Number 4602
Truck Type ____

I hereby acknowledge that the above-described materials were received from the generator site and were transported without incident to the destination listed below.

Ronnie Brewer 10-26-00
Driver Signature Delivery Date

DESTINATION

Site Name PIEDMONT LANDFILL AND RECYCLING CENTER Phone Number (910) 595-8677
Address 9900 FREEMAN ROAD, KERNERSVILLE, NC 27284
Disposal Location: SAME

I hereby acknowledge receipt of the above-described materials.

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284

Butler 10/26/00
Authorized Agent — *Signature* — Receipt Date

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284
910-595-6677
A Waste Management Company

Box 20-1

NON-HAZARDOUS MANIFEST

53370

GENERATOR

Generator Porcelonite Inc

I.D. #

Address 20 Victor St
Lexington, NC

Generator's Shipping Location of Waste (if different from generator address)

Address

Phone 336-434-7750

Phone

Description of Waste Materials	Profile Number	Total Quantity	Unit of Measure	Container Type
Soil	CM1569		Tons	Dump

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable regulations.

E. D. Memmonis — E. D. Memmonis — 10-26-00

Generator Authorized Agent Name (Print) — Signature — Delivery Date

TRANSPORTER

Transporter Name South Co.

Address Brentwood St
High Point, NC

Driver Name (Print) Ronnie Brewer

Truck Number 8602

Truck Type

I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.

Ronnie Brewer — 10.26.00

Driver Signature — Shipment Date

I hereby acknowledge that the above-described materials were received from the generator site and were transported without incident to the destination listed below.

Ronnie Brewer — 10.29.00

Driver Signature — Delivery Date

DESTINATION

Site Name PIEDMONT LANDFILL AND RECYCLING CENTER Phone Number (910) 595-6677

Address 9900 FREEMAN ROAD, KERNERSVILLE, NC 27284

Disposal Location: SAME

I hereby acknowledge receipt of the above-described materials.

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284

Authorized Agent — Signature — 10/30/00 Receipt Date

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284
910-595-6677
A Waste Management Company

NON-HAZARDOUS MANIFEST

53371

GENERATOR

Generator Porcelanite Inc. I.D. #

Address 20 Victor St. Lexington, NC

Generator's Shipping Location of Waste (If different from generator address)

Address

Phone 336-434-7750 Phone

Description of Waste Materials	Profile Number	Total Quantity	Unit of Measure	Container Type
Soil	CM1569		tons	Dump

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable regulations.

Eric D McManus — Generator Authorized Agent Name (Print)
Signature: E D McManus
Delivery Date: 10-26-00

TRANSPORTER

Transporter Name A-D Env.
Address 2718 Uwharrie Rd. High Point, NC

Driver Name (Print) Guy Summers
Truck Number 02
Truck Type DT

I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.

Driver Signature: Guy Summers Shipment Date

I hereby acknowledge that the above-described materials were received from the generator site and were transported without incident to the destination listed below.

Driver Signature Delivery Date 10/27/00

DESTINATION

Site Name PIEDMONT LANDFILL AND RECYCLING CENTER Phone Number (910) 595-6677

Address 9900 FREEMAN ROAD, KERNERSVILLE, NC 27284

Disposal Location SAME

I hereby acknowledge receipt of the above-described materials.

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284

Authorized Agent

Signature Receipt Date 10/27/00

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284
910-595-6677
A Waste Management Company

BOY. 214

NON-HAZARDOUS MANIFEST

53378

GENERATOR

Generator Porcelonite Inc L.D. # ________

Address 20 [illegible] St
Lexington, NC 27292

Generator's Shipping Location of Waste ________
(If different from generator address)

Address ________

Phone ________ Phone ________

Description of Waste Materials	Profile Number	Total Quantity	Unit of Measure	Container Type
Soil	CM1569		Tons	Dump

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable regulations.

Eric D. McManus — Eric D. McManus — 10-26-00
Generator Authorized Agent Name (Print) — *Signature* — Delivery Date

TRANSPORTER

Transporter Name South Co.
Address Brentwood St
High Point, NC

Driver Name (Print) Ronnie Brewer
Truck Number 6607
Truck Type ________

I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.

Ronnie Brewer 10-26-00
Driver Signature — Shipment Date

I hereby acknowledge that the above-described materials were received from the generator site and were transported without incident to the destination listed below.

Ronnie Brewer 10-30-00
Driver Signature — Delivery Date

DESTINATION

Site Name PIEDMONT LANDFILL AND RECYCLING CENTER Phone Number (910) 595-6677

Address 9900 FREEMAN ROAD, KERNERSVILLE, NC 27284

Disposal Location: SAME

I hereby acknowledge receipt of the above-described materials.

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284

Authorized Agent — [signature] *Signature* — 10/30/00 Receipt Date

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284
910-595-6677
A Waste Management Company

17690

NON-HAZARDOUS MANIFEST

GENERATOR

Generator Porcelonite Inc.
Address 20 Victor St.
Lexington, NC
Phone 336-434-7750

I.D. #
Generator's Shipping Location of Waste (If different from generator address)
Address
Phone

Description of Waste Materials	Profile Number	Total Quantity	Unit of Measure	Container Type
Soil	CM1569	17.73	tons	Dump

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR Part 261 or any applicable state law, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable regulations.

Eric D. McManus — Eric D. McManus — 10-26-00
Generator Authorized Agent Name (Print) — Signature — Delivery Date

TRANSPORTER

Transporter Name A + D Env.
Address 2718 [illegible] Dr.
High Point, NC

Driver Name (Print) Guy Summers
Truck Number 02
Truck Type DT

I hereby acknowledge receipt of the above-described materials for transport from the generator site listed above.

Guy Summers 10-26-00
Driver Signature — Shipment Date

I hereby acknowledge that the above-described materials were received from the generator site and were transported without incident to the destination listed below.

Guy Summers 10-26-00
Driver Signature — Delivery Date

DESTINATION

Site Name PIEDMONT LANDFILL AND RECYCLING CENTER Phone Number (910) 595-6677
Address 9900 FREEMAN ROAD, KERNERSVILLE, NC 27284
Disposal Location: SAME

I hereby acknowledge receipt of the above-described materials.

Piedmont Landfill and Recycling Center
9900 Freeman Road
Kernersville, NC 27284

Authorized Agent — Signature Butler — Receipt Date 10/26/00

"... waste I delivered to this facility on this date does n... regulated hazardous, toxic, radioactive wastes or substances, or other non-allowable wastes. I also agree to remove any non-allowable wastes I bring to this facility, or pay all costs for proper removal of such wastes, upon request from this facility."

DRIVER: PLEASE SIGN HERE

5551369

Piedmont Landfill
9900 Freeman Road
Kernersville, NC 27284-0000

Page: 01 of 01

TICKET NUMBER: 0217307

ORIGINAL

CUSTOMER NAME	TRUCK	OPERATOR	TIME IN	TIME OUT	DATE
SOUTHCO ENTERPRISES	4604	EAB	1:46PM	2:10PM	10/30/2000

PORCELANITE

GROSS Lbs : 72,540.00 IN-2
TARE Lbs : 43,780.00 OUT-2
NET Lbs : 28,760.00

A. & D 0004461

NC PUBLIC WEIGHMASTER EXP. 6/30/01
HAVE A LOVELY DAY!!

ADJUSTED Lbs : 28,760.00

ERICA ALAYNE BURTON

SOURCES	OTHER INFORMATION
DAVIDSON COUNTY	CM 1569 SOIL MANIF 53378

WASTE MANAGEMENT

7.2,I.0,885

MATERIAL CODE DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
691 -SPECIAL WASTE	14.38	TONS		

"I certify that the waste I delivered to this facility on this date does not contain any regulated, hazardous, toxic, radioactive wastes or substances, or other non-allowable wastes. I also agree to remove any non-allowable wastes I bring to this facility, or pay all costs for proper removal of such wastes, upon request from this facility."

DRIVER: PLEASE SIGN HERE

5550932

Piedmont Landfill
9900 Freeman Road
Kernersville, NC 27284-0000

Page: 01 of 01

TICKET NBR: 0216874

ORIGINAL

HAULER NAME	TRUCK	OPERATOR	TIME IN	TIME OUT	DATE
SOUTHCO ENTERPRISES	4602	NJB	12:14PM	12:47PM	10/26/2000

PORCELANITE

GROSS Lbs : 85,460.00IN-2
TARE Lbs : 41,880.00OUT-1
NET Lbs : 43,580.00

A & D 0004461

NC PUBLIC WEIGHMASTER EXP. 06/30/01
PLEASE FOLLOW ALL REQUEST BY PLF

ADJUSTED Lbs : 43,580.00

NINA BUTLER

SOURCES / OTHER INFORMATION

DAVIDSON COUNTY

CM 1569 SOIL
MANIF 53369

WASTE MANAGEMENT

GRID: E7.2,I.0,885

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
691 -SPECIAL WASTE	21.79	TONS		

"I certify that the waste I delivered to this facility on this date does not contain any regulated hazardous, toxic, radioactive wastes or substances, or other non-allowable wastes. I also agree to remove any non-allowable wastes I bring to this facility, or pay all costs for proper removal of such wastes, upon request from this facility."

DRIVER: PLEASE SIGN HERE

5551125

Piedmont Landfill
9900 Freeman Road
Kernersville, NC 27284-0000

Page: 01 of 01

TICKET NUMBER
0217066

ORIGINAL

HAULER NAME	TRUCK	OPERATOR	TIME IN	TIME OUT	DATE
A&D ENVIRONMENTAL	D-2	EAB	1:30PM	1:31PM	10/27/2000

PORCELANITE

GROSS Lbs : 56,740.00IN-1
TARE Lbs : 29,540.00OUT-0
NET Lbs : 27,200.00

A & D 0004461

NC PUBLIC WEIGHMASTER EXP. 6/30/01
HAVE A LOVELY DAY!!

ADJUSTED Lbs : 27,200.00

ERICA ALAYNE BURTON

SOURCE / OTHER INFORMATION

DAVIDSON COUNTY

CM 1569 SOIL
MANIF 53371

WASTE MANAGEMENT 7.2,1.0,885

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
681 -SPECIAL WASTE	13.60	TONS		

"I certify that the waste I delivered to this facility on this date does not contain any regulated hazardous, toxic, radioactive wastes or substances, or other non-allowable wastes. I also agree to remove any non-allowable wastes I bring to this facility, or pay all costs for proper removal of such wastes, upon request from this facility."

DRIVER: PLEASE SIGN HERE

5550916

Piedmont Landfill
9900 Freeman Road
Kernersville, NC 27284-0000

Page: 01 of 01

0216858

ORIGINAL

A&D ENVIRONMENTAL	D-2	NJB	11:59AM	12:14PM	10/26/2000

PORCELANITE

GROSS Lbs : 65,000.00IN-1
TARE Lbs : 29,540.00OUT-1
NET Lbs : 35,460.00

A & D 0004461

NC PUBLIC WEIGHMASTER EXP. 06/30/01
PLEASE FOLLOW ALL REQUEST BY PLF

NINA BUTLER

ADJUSTED Lbs : 35,460.00

DAVIDSON COUNTY

CM 1569 SOIL
MANIF 17690

WASTE MANAGEMENT 27.2, I.0,885

681 -SPECIAL WASTE	17.73	TONS			

Proposed Modification to the Closure Plan
Lagoon Closure Activities
Porcelanite, Inc.
Lexington, North Carolina
November 5, 2002

Prepared For

Porcelanite, Inc.
Lexington, North Carolina

Prepared By

Waters Edge Environmental, LLC
Raleigh, North Carolina

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Appendix

2 Site Setting

2.1 Topographic Setting

The site is located in the central portion of the Piedmont Physiographic province in North Carolina. The Piedmont region is characterized by rolling hill topography. This topography was developed by tectonic uplift and subsequent erosion of the region between the Blue Ridge Mountains and the Atlantic Ocean.

The site lies on the margin of a minor first order stream known as Walltown Drain. Site topography is dictated by the stream valley and is characterized by an average topographic grade of approximately 0.085 foot per foot (ft/ft) sloping to the northeast.

2.2 Geologic Setting

The site is situated in the eastern portion of the Charlotte Lithotectonic Belt, which is a zone of regionally metamorphosed amphibolite facies igneous rocks with a similar character, bounded on the east and west sides by shear zones. According to the Charlotte geologic quadrangle map, Late Proterozoic aged undivided metavolcanic rocks underlie the site. However, bedrock ideologies encountered at the site consist of massive, quartz-potassium feldspar-muscovite granite to granodiorite that are likely associated with the Pennsylvanian to Permian aged Churchland Pluton.

2.3 Hydrogeologic Setting

As is typical of the Piedmont Physiographic Province, ground water occurs in two aquifers at the site. These include the unconsolidated (regolith) shallow aquifer water table and the underlying fractured bedrock deep aquifer. These two aquifers are directly interconnected and are not separated by a confining layer at the site. The regolith zone acts as the storage reservoir for the underlying bedrock zone, thus recharging the bedrock aquifer in response to any withdrawal of water from the bedrock. Ground water in the shallow aquifer has been mapped to illustrate the direction and gradient of ground water flow from the most recent quarterly sampling round in September 2002 (see the *Third Quarter 2002 Monitoring Report* for Porcelanite, Inc. submitted by Waters Edge on October 30, 2002). Ground water in the aquifer flows toward the northeast under a hydraulic gradient measured at 0.030 ft/ft. The local point of shallow ground water discharge from the aquifer appears to be Walltown Drain. Recharge to the aquifer occurs as surface water infiltrates through the unconsolidated (regolith) zone from higher topographic regions southwest of the site. Based upon slug testing conducted on existing monitoring wells at the site, the hydraulic conductivity of the regolith water table aquifer is approximately 0.4 ft/day.

Ground water monitoring has been conducted at the site since 1989. A total of 18 monitoring wells are currently being utilized to monitor the ground water including eight wells hydraulically cross-gradient and downgradient of the closed sludge ponds (MW-3A, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 and MW-28). It is estimated that the shallow ground water at the site is approximately 20 feet below ground surface (bgs) in the area of the closed sludge ponds.

3 Soil Boring Investigations

Since 1994, a total of 53 borings have been conducted adjacent to the former lagoons, which are depicted in Figures 2 and 3. We have also conducted four background soil borings at areas on the site, which are felt to be background borings unaffected by past operations (see Figure 2). Most of the borings were sampled for the constituent list presented as part of closure, which is comprised of 17 inorganic constituents and originally 5 radionucleides. Praseodymium was subsequently dropped at a point during these investigation activities since it was not detected in the soils. These borings were sampled at 1' bgs, with selected samples at 3' bgs dependant on whether the 1' interval met the SCS being negotiated at that point in time. Additional borings have been performed at several locations to depths of up to 6' bgs for the purpose of determining the vertical extent of contamination at locations with SCS exceedances at the 3' depth. The results are summarized in Table 1 and the current closure standard exceedances for the 1' and 3'-6' depths are depicted in Figure 4 and 5 respectively.

4 Limited Risk-Based Assessment

Based on the current soil boring cleanup objectives proposed by NCDENR, we have included a discussion of the soil analytical results versus the SCS objective on a constituent by constituent basis.

4.1 Arsenic

All 53 investigation soil samples collected adjacent to the former sludge ponds and four background soil borings were below the PQL ranging between 0.894 mg/kg and 3.75 mg/kg. Since all results were below the PQL, this meets the arsenic SCS proposed by NCDENR even though all of the PQLs would be above the Region 9 Residential Preliminary Remediation Goal (PRG) of 0.39 mg/kg; however, all of the arsenic levels are below the Region 9 Industrial PRG of 2.7 mg/kg.

4.9 Manganese

Three of the 53 investigation soil borings exceed the manganese SCS of 384.5 mg/kg. This is at SS-2 (0-1' bgs) at 392 mg/kg, SS-33 (0-1' bgs) at 408 mg/kg and SS-41 (0-1' bgs) at 519 mg/kg. SS-35 is adjacent to SS-3 and meets the manganese SCS at 3' bgs, SS-33 met the manganese SCS at 3' bgs and SS-41 met the manganese SCS at 3' bgs, therefore the extent appears to be very limited. These manganese levels are below the industrial and residential soil ingestion levels of 47,000 mg/kg and 1,800 mg/kg respectively. Past ground water sampling indicates that manganese has been detected above NCGS standards in the adjacent monitoring wells (MW-3A, MW-9, MW-12, MW28). Further investigation is not warranted and the soil exceeding the SCSs will be removed and disposed in accordance with local, state and federal regulations at SS-2, SS-33 and SS-41.

4.10 Mercury

Nine of the 53 investigation soil borings exceed the mercury SCS of 1.23 mg/kg. This is at SS-3 (0-1' bgs) at 1.28 mg/kg, SS-22 (0-1' bgs) at 2.62 mg/kg, SS-25 (0-1' bgs) at 1.28 mg/kg, SS-26 (0-1' bgs) at 4.02 mg/kg, SS-29 (0-1' bgs) at 2.19 mg/kg, SS-33 (0-1' bgs) at 1.41 mg/kg, SS-35 (0-1' bgs) at 3.67 mg/kg, SS-36 (0-1' bgs) at 1.43 mg/kg, and SS-37 (0-1' bgs) at 2.65 mg/kg. These mercury levels are all below one of the background soil samples, which detected 5.54 mg/kg but was considered a statistical outlier. Porcelanite has also documented (attached document in Appendix A) that mercury was never contained in any of their processes or waste materials. Therefore, we would conclude that the detection of mercury in these soil samples are due to background conditions and no further consideration be given to further investigation or remediation.

4.11 Nickel

All 53 investigation soil borings were less than the nickel SCS of 56.4 mg/kg. Past ground water sampling indicates that nickel has not exceeded NCGS standards in the adjacent monitoring wells. No further investigation or remediation is warranted.

4.12 Selenium

All 53 investigation soil borings were less than the selenium SCS of 12.2 mg/kg. Past ground water sampling indicates that selenium has not exceeded NCGS standards in the adjacent monitoring wells. No further investigation or remediation is warranted.

4.16 Vanadium

All 53 investigation soil borings were less than the vanadium SCS at 550 mg/kg. Past ground water sampling indicates that vanadium has not exceeded NCGS standards in the adjacent monitoring wells. No further investigation or remediation is warranted.

4.17 Zinc

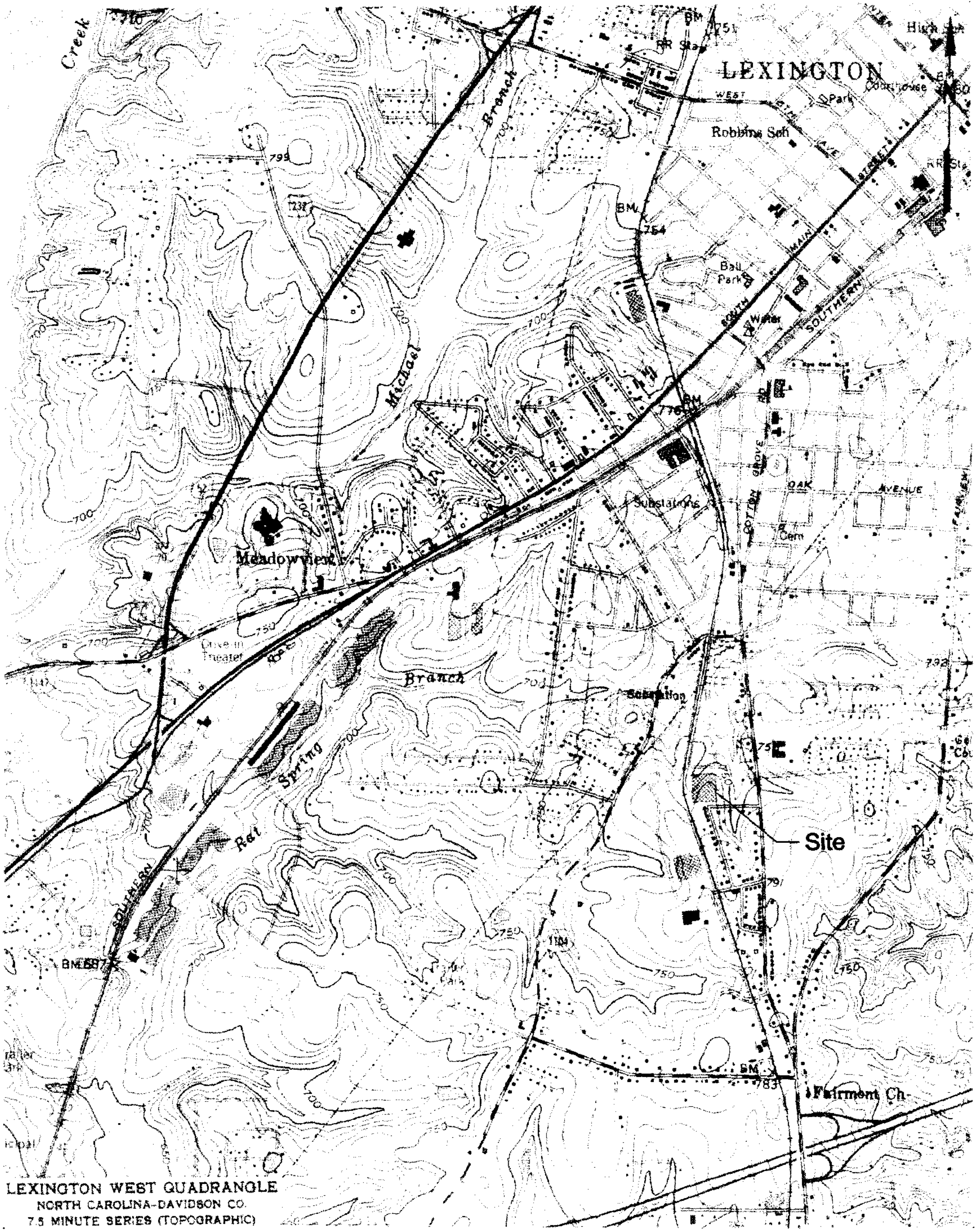
Five of the 53 investigation soil borings exceed the zinc SCS of 1,100 mg/kg. This is at SS-2 (0-1' bgs) at 2,290 mg/kg, SS-5 (0-1' bgs) at 3,680 mg/kg, SS-8 (0-1' bgs) at 5,230 mg/kg, SS-22 (0-1' bgs) at 7,020 mg/kg, and SS-24 (3' bgs) at 1,200 mg/kg. SS-36 is adjacent to SS-2 and meets the zinc SCS at 3' bgs, SS-34 is adjacent to SS-5 and meets the zinc SCS at 3' bgs, SS-8 is not considered part of the sludge pond closure process and will be handled as another area of concern in future investigation activities (e.g. broken tile roadway), SS-41 is adjacent to SS-22 and meets the zinc SCS at 3' bgs and SS-24 meets the SCS at 4' and 6' bgs (1,070 mg/kg and 710 mg/kg respectively). These zinc levels are below the industrial and residential soil ingestion levels of 610,000 mg/kg and 23,000 mg/kg respectively. Past ground water sampling indicates that zinc has been detected above NCGS standards in the adjacent monitoring well MW-12. Further investigation is not warranted and the soil will be removed and disposed in accordance with local, state and federal regulations at SS-2, SS-5, SS-22 and SS-24.

4.18 Gross Alpha

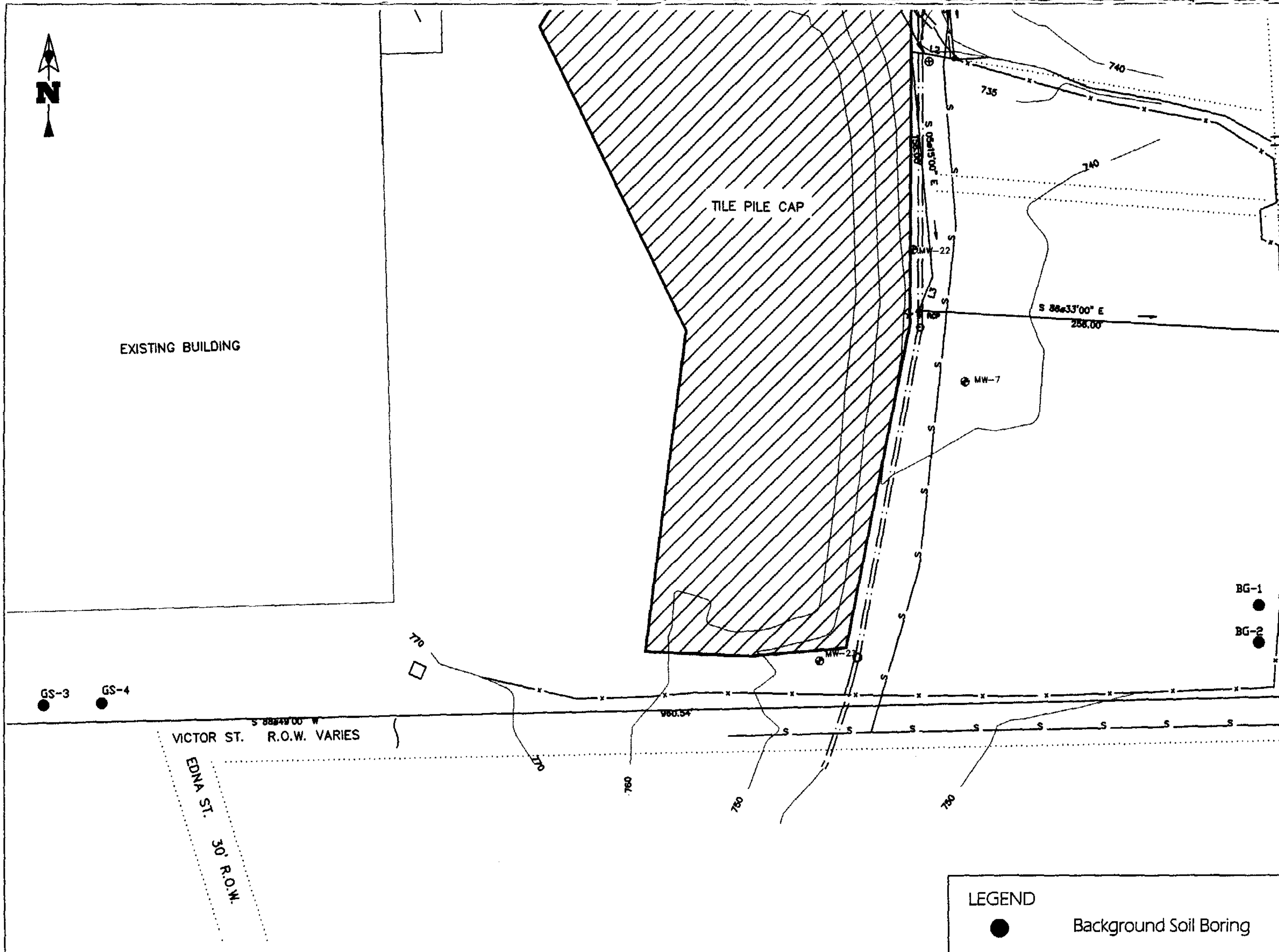
One of the 53 investigation soil borings exceeds the gross alpha SCS of 50 pCi/g. This is at SS-36 (0-1' bgs) at 64.8 pCi/g. SS-36 at 3' bgs meets the gross alpha SCS, therefore the extent appears to be very limited. There are no published industrial and residential soil ingestion levels for gross alpha. Past ground water sampling indicates that gross alpha has not exceeded NCGS standards in the adjacent monitoring wells. No further investigation or remediation is warranted due to the limited SCS exceedances.

4.19 Gross Beta

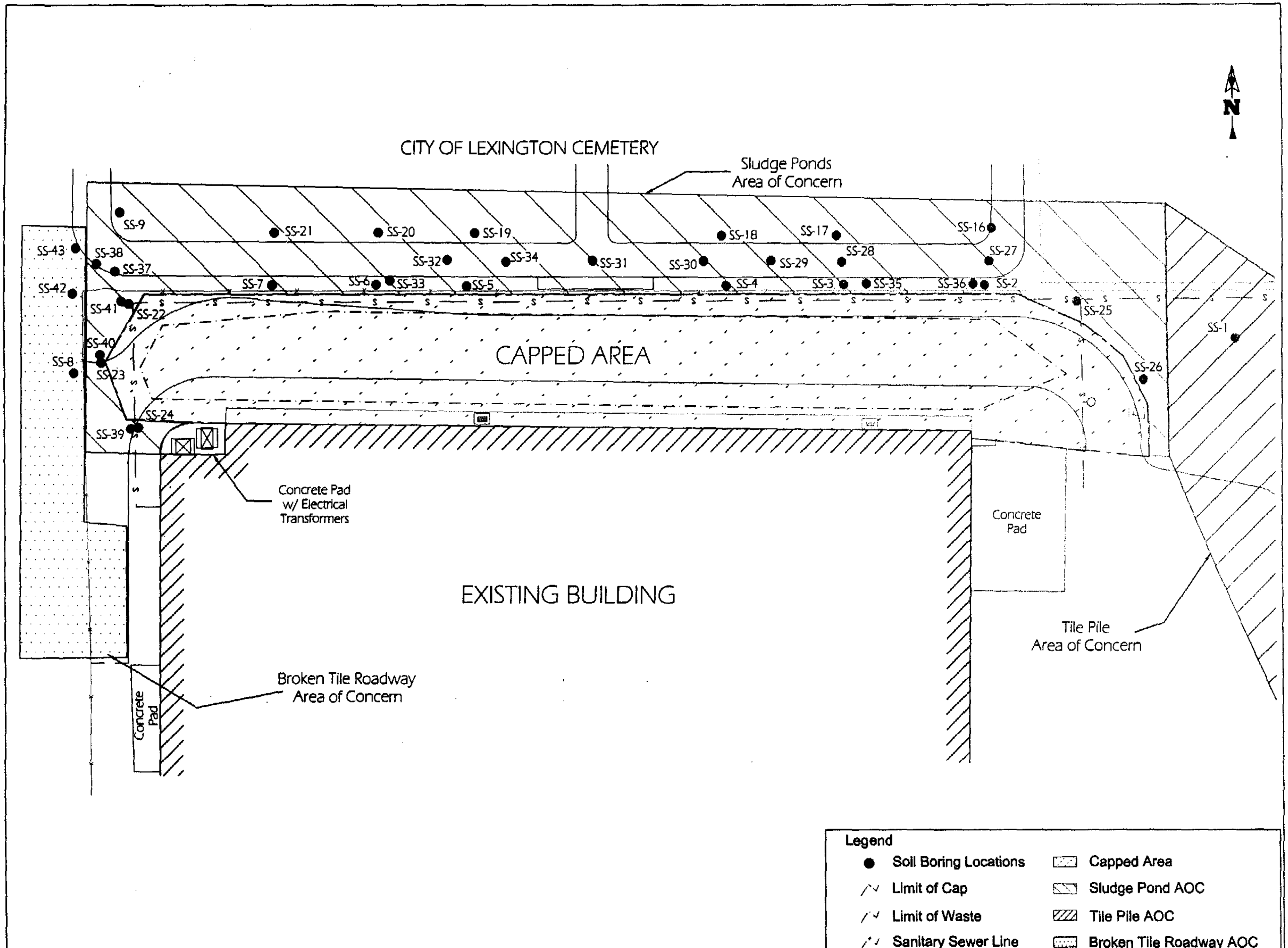
One of the 53 investigation soil borings exceeds the gross beta SCS of 50 pCi/g. This is at SS-36 (3' bgs) at 55.6 pCi/g. There is no deeper boring; however, this only exceedance is very close to the SCS. There are no published industrial and residential soil ingestion levels for any gross beta. Past ground water sampling indicates that gross beta has exceeded NCGS standards in the adjacent monitoring wells (MW-1, MW-3A, MW-9, MW-12 and MW-28). No further investigation or remediation is warranted due to the limited SCS exceedances.



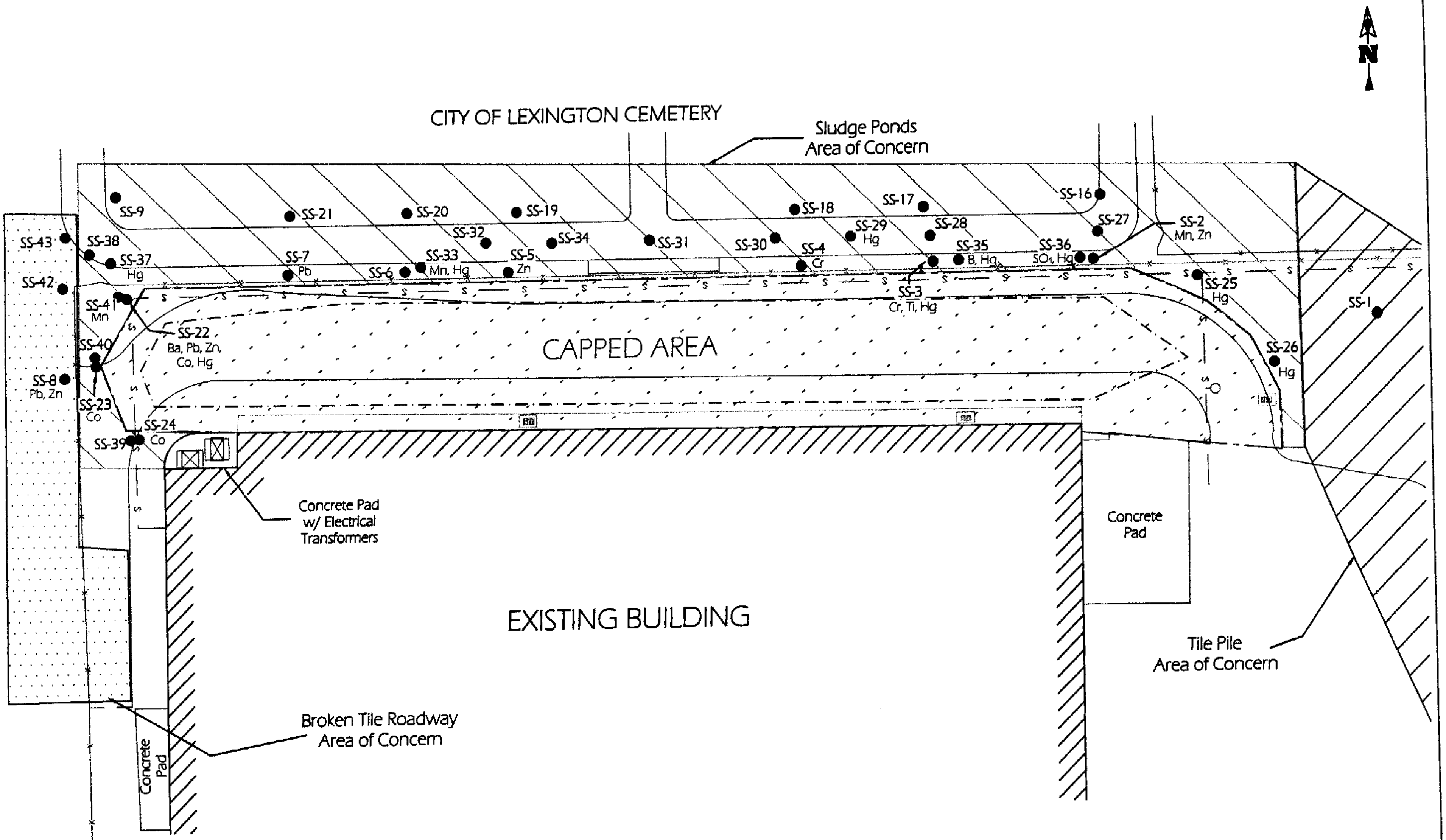
WATERS EDGE ENVIRONMENTAL, LLC	Author	Drawing	Layers	Date	Title
	jme	R1-21		1-24-01	Site Location Map
	Job No.	**Revision**	**Figure**	**Scale**	**Project**
	R1-21	11-1-02	1	1"=2000'	Porcelanite, Inc. Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 0902-F02	Layers	Date: 09-23-96	Title: Background Boring Location Map
	Job No.: R1-21	Revision: 09-25-02	Figure: 2	Scale: 1" = 90'	Project: Porcelanite Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 0902-F03	Layers:	Date: 09-19-02	Title: Soil Boring Location Map Adjacent to Former Lagoons
	Job No.: R1-21	Revision: 09-25-02	Figure: 3	Scale: 1" = 60'	Project: Porcelanite Lexington, North Carolina



Key

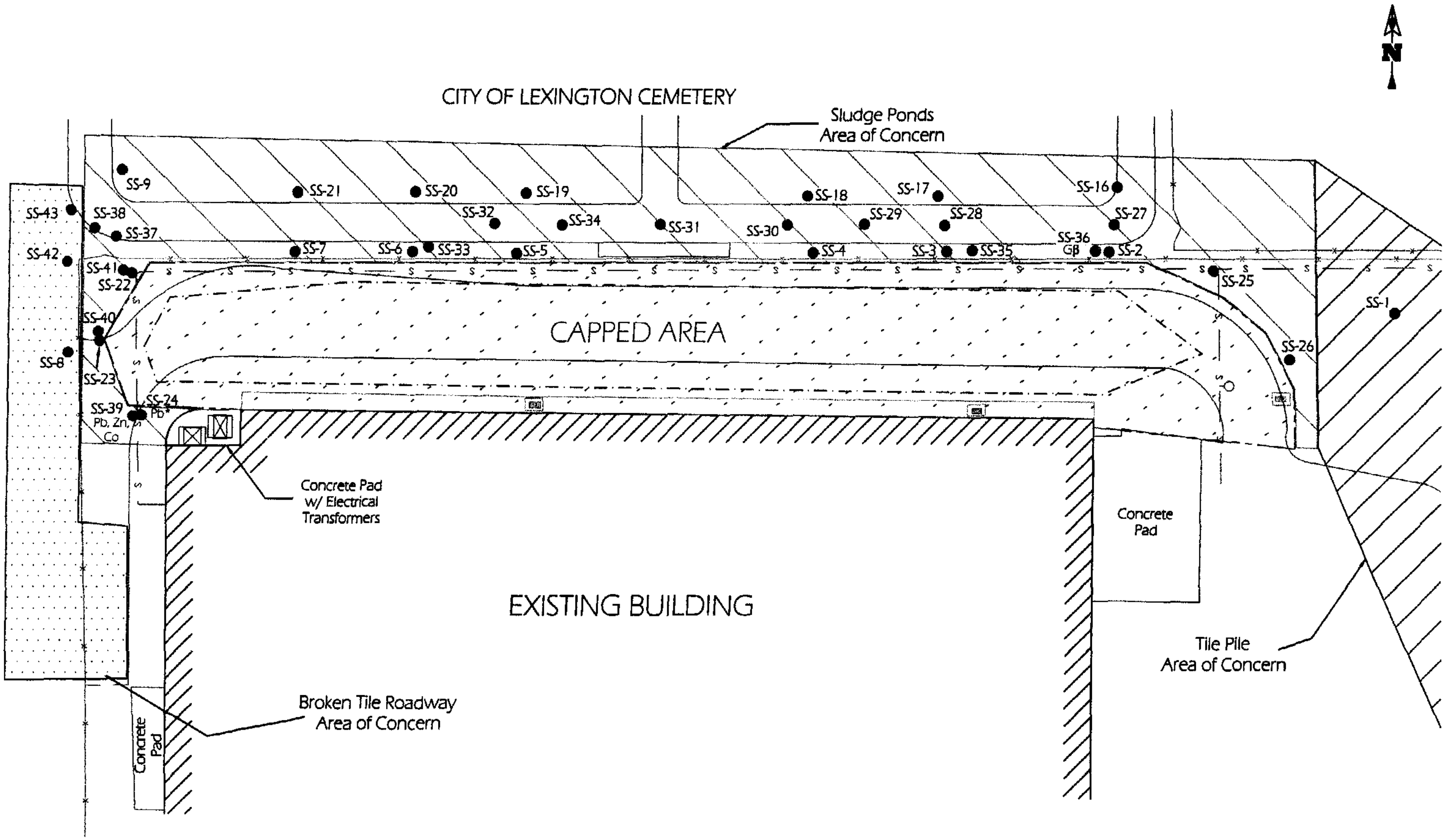
B - Boron	Mn - Manganese
Ba - Barium	Pb - Lead
Co - Cobalt	SO_4 - Sulfate
Cr - Chromium	Ti - Titanium
Hg - Mercury	Zn - Zinc

Legend

- ● Soil Boring Locations
- SS-6 Soil Boring w/ Exceedance
- Limit of Cap
- Sludge Pond AOC
- Limit of Waste
- Tile Pile AOC
- Capped Area
- Broken Tile Roadway AOC

WATERS EDGE ENVIRONMENTAL, LLC

Author: jme	Drawing: 0902-F04	Layers:	Date: 09-19-02	Title: Soil Boring Exceedance Location Map 1-ft Depth	
Job No.: R1-21	Revision: 09-25-02	Figure: 4	Scale: 1" = 60'	Project: Porcelanite Lexington, North Carolina	



Legend

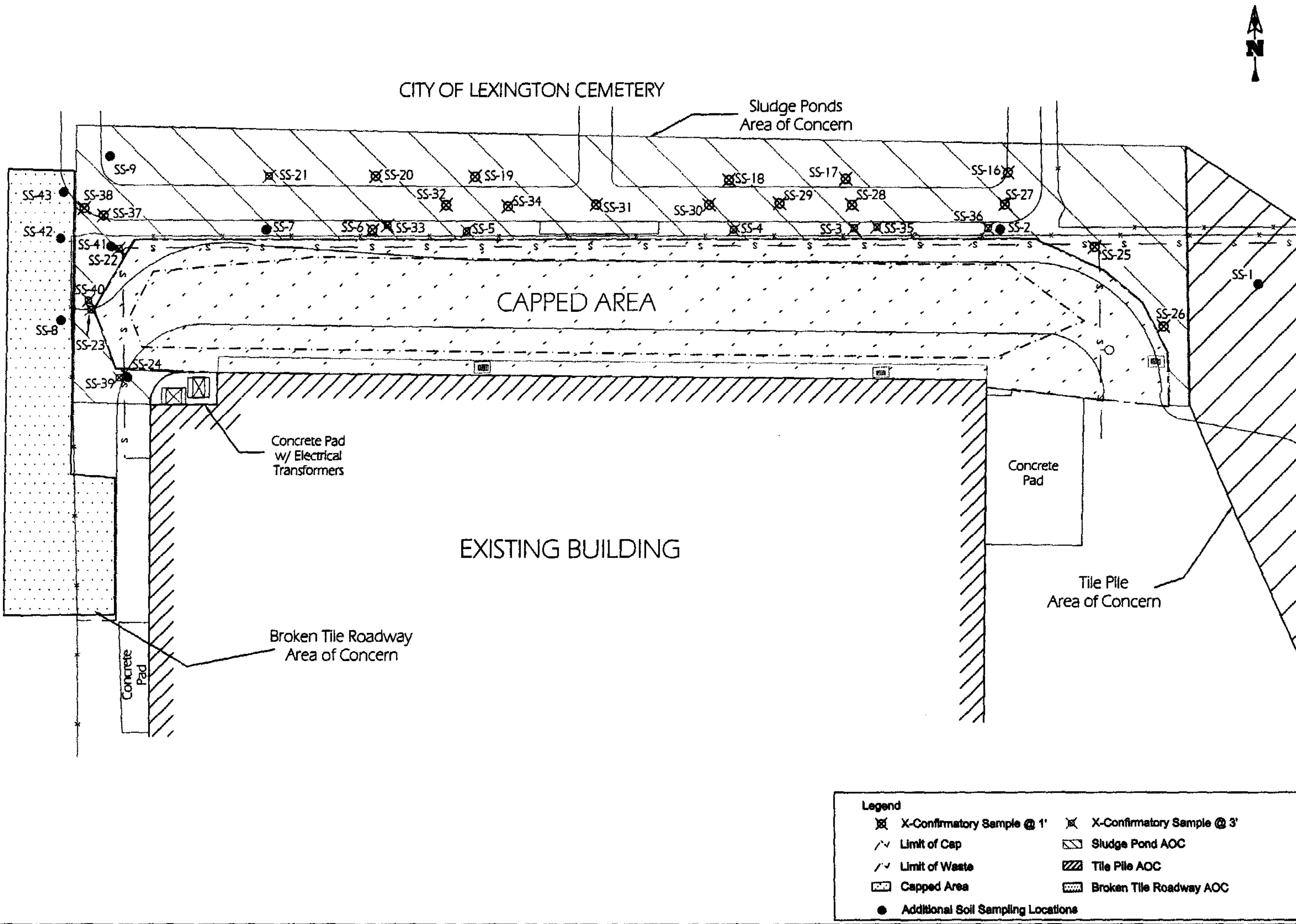
- ● Soil Boring Locations
- SS-6 Soil Boring w/ Exceedance
- Limit of Cap
- Sludge Pond AOC
- Limit of Waste
- Tile Pile AOC
- Capped Area
- Broken Tile Roadway AOC

Key

Co - Cobalt
Pb - Lead
Gβ - Gross Beta
Zn - Zinc

Note - All Exceedances at 3-ft bgs, except Pb in SS-24 @ 4-ft bgs

WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 0902-F05	Layers:	Date: 09-19-02	Title: Soil Boring Exceedance Location Map 3-6 ft Depth
	Job No.: R1-21	Revision: 10-28-02	Figure: 5	Scale: 1" = 60'	Project: Porcelanite Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 0902-F06	Layers	Date: 09-19-02	Title: "X" Confirmatory Sampling Location Map
	Job No.: R1-21	Revision: 09-25-02	Figure: 6	Scale: 1" = 60'	Project: Porcelanite Lexington, North Carolina

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-1 0 - 1' 5/27/94	SS-2 0 - 1' 11/4/99	SS-3 0 - 1' 11/4/99	SS-4 0 - 1' 11/4/99	SS-4-2 3' 9/13/02	SS-4-2 5' 9/13/02	SS-5 0 - 1' 11/4/99	SS-6 0 - 1' 11/4/99	SS-7 0 - 1' 11/4/99	SS-7-2 3' 9/13/02	SS-7-2 5' 9/13/02	SS-8 0 - 1' 5/27/94	SS-9 0 - 1' 5/27/94	SS-16 0 - 1' 11/10/99	SS-17 0 - 1' 11/10/99
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<3.62	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<3.73	<3.75	<1.13	<1.15
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	80.1	246	149	47.7	NA	NA	373	64.3	146	NA	NA	186	31.7	25.3	21.8
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	26	30.9	61.9	74.2	NA	NA	<10.5	31.6	<12.7	NA	NA	61.2	11.2	18.2	<11.5
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	NA	NA	<10	<10	<10	NA	NA	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.725	0.712	0.696	0.623	NA	NA	0.335	0.249	0.329	NA	NA	<0.746	<0.806	<0.113	<1.15
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.19	15.4	33.6	33.3	8.39	6.74	4.81	8.58	13.2	NA	NA	8.58	4.04	8.03	6.71
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	<3.62	19.9	11.3	6.48	NA	NA	20.9	6.96	19.9	NA	NA	14	<4.04	1.58	1.26
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	93.4	225	207	18.5	NA	NA	155	145	397	<11.8	12.6	996	42.7	10.5	25.5
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	82.4	392	298	201	NA	NA	312	290	285	NA	NA	122	278	58.4	35.1
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	<0.145	0.901	1.28	0.855	NA	NA	0.855	0.413	0.662	NA	NA	<0.149	<0.172	0.476	0.652
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	3.12	13.3	8.77	6.48	NA	NA	7.32	3.73	10.0	NA	NA	7.31	<4.04	2.26	1.72
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.45	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<1.49	<1.50	2.37	1.72
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<0.725	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA	<0.746	<0.807	<1.13	<1.15
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	168	49.9	<25	97.5	NA	NA	48.2	51.8	<25	NA	NA	537	172	27.6	<250
Titanium	NL	Method 200.7	996.31	996.00	92.2	789	1,040	948	NA	NA	59	453	130	NA	NA	118	36.1	39.3	43.5
Vanadium	NL/550	Method 200.7	184.91	550	33.8	66	151	173	NA	NA	12.2	56	37.6	NA	NA	33.2	9.62	28.7	21.6
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	388	2,290	625	330	NA	NA	3,680	269	855	NA	NA	5,230	39.6	62.3	111
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	15.4	7.7	9.3	10.6	NA	NA	10.8	19.5	7.7	NA	NA	16.3	8	29.1	28.8
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	38.6	13.3	12.9	8.9	NA	NA	27.2	32.1	20.7	NA	NA	29	33.3	38.1	47.9
Praseodymium	NL	Method 1620	MDL	MDL	<6.71	<11.9	<12.9	<12.2	NA	NA	<10.4	<12.2	<12.7	NA	NA	<7.46	<7.52	<11.3	<11.5
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	0.6	0.7	1.4	1.5	NA	NA	1.2	1.0	1.6	NA	NA	2.2	1.2	0.7	1.1
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	1.1	<1.0	<1.0	<0.9	NA	NA	<0.9	<1.0	<1.0	NA	NA	1.2	<0.8	<1.0	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.

** = past holding time for analysis

*** Considered Statistical Outlyer - not used

a = NC Hazardous Waste Section Target Remediation Guidelines

b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

DL = Detection Limit

NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence

NL = No Level

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-18 0 - 1' 11/10/99	SS-19 0 - 1' 11/10/99	SS-20 0 - 1' 11/10/99	SS-21 0 - 1' 11/10/99	SS-22 0 - 1' 11/4/99	SS-23 0 - 1' 11/18/99	SS-24 0 - 1' 11/18/99	SS-24 3' 11/18/99	SS-24-2 4' 9/13/02	SS-24-2 6' 9/13/02	SS-25 0 - 1' 11/4/99	SS-25 3' 11/18/99	SS-26 0 - 1' 11/10/99	SS-27 0 - 1' 1/19/00	SS-28 0 - 1' 1/19/00
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.16	<1.00	<1.01	<1.09	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	19.2	20.1	15.3	12	1,490	47	64.8	260	NA	NA	54.4	78.7	135	18.1	8.3
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	13.1	<10	<10.1	13.6	33.8	<8.94	11.1	44.2	NA	NA	27.2	70.4	<10.1	6.09	7.41
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.116	<0.100	<0.101	<0.109	1.37	0.335	0.168	0.331	NA	NA	0.228	0.318	<0.101	<0.113	<0.111
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.95	3.11	2.71	10.1	8.32	18.3	17	15.9	NA	NA	9.44	21	4.65	6.66	4.65
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	1.63	2.0	1.51	1.53	39.5	2,000	203	285	11.4	9.96	3.23	3.37	6.27	1.35	<1.11
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	6.16	9.02	12.7	7.08	6,830	3.58	65.9	972	372	170	19.4	20.2	65.2	17.2	6.19
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	33.4	161	172	42.7	225	193	267	235	NA	NA	180	97	189	51.5	37.2
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	0.488	<0.200	<0.201	<0.218	2.62	<0.179	<0.189	<0.194	NA	NA	1.28	0.404	4.02	0.904	0.592
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.76	<1.0	<1.01	2.29	23.8	50.2	12.9	17.7	NA	NA	3.68	4.24	2.82	1.58	1.22
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	1.51	<1.0	<1.01	2.51	1.48	1.52	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.16	<1.0	<1.01	<1.09	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	48.1	<100	<100	<25	34.8	35	25.8	53	NA	NA	30.9	62.8	<250	100	275
Titanium	NL	Method 200.7	996.31	996.00	21.9	15.5	17	34.4	46.4	543	639	451	NA	NA	317	398	23.8	106	57.5
Vanadium	NL/550	Method 200.7	184.91	550	27.8	6.91	4.83	30	17.9	51.5	32.7	31.2	NA	NA	44.2	117	9.2	26.3	26.9
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	34.3	13.1	21.5	17.2	7,020	28.7	131	1,200	1,070	710	40	417	885	13.1	12.3
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	23.3	14.8	11.1	22.8	11.6	1.9	2.1	8.9	NA	NA	20.2	22.8	15.4	NA	NA
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	36.6	40.3	36	38.1	24.4	9.9	8.6	16.3	NA	NA	29.8	17.3	43.5	NA	NA
Praseodymium	NL	Method 1620	MDL	MDL	<11.6	<10.0	<10.1	<10.9	<11.4	NA	<9.42	<9.63	NA	NA	<11.5	<12.5	<10.1	NA	NA
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	2.4	1.1	0.9	0.6	0.9	1.1	0.5	0.9	NA	NA	1.3	0.5	0.8	NA	NA
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	1.0	1.1	<1.0	1.5	1.0	<1.1	<1.0	<1.1	NA	NA	<1.0	<1.1	<1.0	NA	NA

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg
c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-29 0 - 1' 1/19/00	SS-30 0 - 1' 1/19/00	SS-31 0 - 1' 1/19/00	SS-32 0 - 1' 1/19/00	SS-33 0 - 1' 1/19/00	SS-33 3' 1/19/00	SS-34 0 - 1' 1/19/00	SS-34 3' 1/19/00	SS-35 0 - 1' 1/19/00	SS-35 3' 1/19/00	SS-36 0 - 1' 1/19/00	SS-36 3' 1/19/00	SS-36-2 3' 9/13/02	SS-37 0 - 1' 1/19/00	SS-37 3' 1/19/00
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	13	22.9	30	25.8	25.5	25.2	39.9	29.9	23.1	17.2	690	10.2	NA	14.6	5.4
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	11.8	7.72	8.05	<5.19	<5.20	12.5	<5.30	19.0	107	31.9	56	22.4	NA	32.3	22.0
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	<10	<10	<10	<10	**	<10	**	<10	**	<10	**	NA	<10	**
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.113	<0.107	<0.105	<0.104	<0.098	0.159	<0.106	<0.105	<0.122	0.226	<0.126	0.162	NA	<0.120	<0.120
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	7.13	7.29	6.66	4.15	6.97	11.0	5.08	8.42	17.1	12.2	13.2	3.86	NA	10.2	3.6
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	1.92	1.29	4.23	2.7	2.26	2.35	4.45	3.05	3.42	1.86	3.42	1.87	NA	1.32	<1.20
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	4.87	3.75	15.9	9.12	10.5	5.44	12.5	8.21	17.5	9.16	23.5	7.36	NA	7.46	4.2
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	87.9	26.5	298	305	408	73.5	164	105	120	62.7	91.5	168	NA	28.9	47.1
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	2.19	0.858	0.918	0.624	1.41	**	0.425	**	3.67	**	1.43	**	NA	2.65	**
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.81	1.29	1.16	<1.04	<0.982	1.71	1.17	2.63	5.74	3.01	4.43	1.64	NA	1.56	<1.20
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.13	<1.07	<1.05	<1.04	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	<25	43	<250	43.4	<250	**	<250	**	67	**	5,560	**	101	36.8	**
Titanium	NL	Method 200.7	996.31	996.00	137	51.3	61.1	42.8	34.2	13.3	81.7	16.4	339	150	187	47.2	NA	62.2	22.9
Vanadium	NL/550	Method 200.7	184.91	550	29.2	19	12.2	6.74	6.09	21.0	8.69	22.9	210	66.1	87.7	23.8	NA	34.2	14.7
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	25.4	11.7	9.31	4.15	21.6	60.3	15.5	8.1	21.7	23.7	37.1	33.0	NA	11.4	19.9
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	NA	NA	NA	NA	12.7	16.8	17.7	14.1	18.4	19.0	64.8	30.4	NA	27.2	38.2
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	NA	NA	NA	NA	39.4	32.5	42.8	32.6	15.7	23.7	48.7	55.6	NA	34.7	42.5
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	NA	NA	NA	NA	0.5	1.2	1.4	1.0	1.0	0.9	0.5	0.8	NA	0.7	0.6
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	NA	NA	NA	NA	<1.0	<1.1	<1.1	<1.0	<1.0	<1.1	1.1	<1.0	NA	1.0	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
b = North Carolina Groundwater Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg
c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

Table 1- Soil Sampling Analytical Results Versus Soil Closure Standard, Porcelanite, Inc., Lexington, NC

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Method Detection Limit (MDL) (mg/kg)	Site Specific Background Levels* + 2X S.D. (mg/kg)	Soil Closure Standard	SS-38 0 - 1' 1/19/00	SS-38 3' 1/19/00	SS-39 0 - 1' 2/17/00	SS-39 3' 2/17/00	SS-40 0 - 1' 2/17/00	SS-40 3' 2/17/00	SS-41 0 - 1' 2/17/00	SS-41 3' 2/17/00	SS-42 0 - 1' 2/17/00	SS-43 0 - 1' 2/17/00	SS-43 3' 2/17/00	BG-1 11/10/99	BG-2 11/10/99	GS-3 11/18/99	GS-4 11/18/99
Inorganics (mg/Kg)																			
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09	<1.15	<1.12
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	25	4.62	40.2	<4.19	39.5	63.5	435	50.6	140	34.8	55.1	19.2	43.12	67.4	45
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	6.55	<9.82	<9.53	<10.5	<9.39	<11.3	<10.8	<10.4	13.0	<10.3	<11.1	24.3	<10.9	42.4	57.3
Bromide	NL	EPA Method 300	DL (Method 300)	PQL (10)	<10	**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.101	<0.098	<0.095	<0.105	<0.094	<0.113	<0.108	<0.104	<0.097	<0.103	<0.111	<0.118	<0.109	0.23	0.504
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	8.07	3.14	12.7	<1.05	16.7	3.16	4.53	8.14	11.8	6.82	8.64	11.5	6.76	18.8	20.6
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	2.82	1.18	6.00	<1.05	8.07	9.59	5.82	10.5	9.42	3.82	3.77	2.0	2.94	8.64	20.4
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	7.77	5.5	4.67	<0.523	1.03	11.5	44.6	20.5	239	16.8	32.7	13.4	13.2	44.1	52.7
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	90.5	42.0	219	<1.05	234	4.21	519	153	142	302	119	42.5	123	183	305
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	0.942	**	<0.191	<0.209	<0.188	<0.226	0.307	<0.209	<0.194	<0.206	<0.221	5.54***	0.862	<0.231	<0224
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	1.72	<0.982	6.96	<1.05	9.95	3.50	1.94	2.19	6.31	1.76	2.66	2.82	2.73	6.34	8.28
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	2.47	1.2	<1.15	<1.12
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09	<1.15	<1.12
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	37.3	**	<25	<25	<25	<26	<25	<25	<25	<25	<25	<100	<100	27	57.7
Titanium	NL	Method 200.7	996.31	996.00	47.2	13.4	357	<10.5	384	356	24.8	26.9	84.7	22.3	26.3	65.7	181	644	649
Vanadium	NL/550	Method 200.7	184.91	550	16.6	9.53	20.6	1.46	22.5	33.4	7.87	16.0	20.1	12.2	25.6	45.2	27.6	89.4	148
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	6.56	7.76	34.9	2.83	26.2	32.3	390	78.8	258	21.2	9.60	149	124	124	101
Radionuclides																			
Gross Alpha (pCi/g)	50	Method 9310	33.47	50	16.1	13.6	<2.3	<2.0	<2.2	20.3	19.8	10.0	7.9	13.3	27.4	22.4	23.5	7.9	6.1
Gross Beta (pCi/g)	50	Method 9310	48.92	48.92	40.6	38.9	9.1	2	10.8	29.6	30.0	16.1	14.0	37.6	37.6	31	33.2	6.2	6.8
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<11.8	<10.9	<11.5	<11.2
Radium 226 (pCi/g)	5[c]	Method 9315	1.33	5	0.7	0.7	0.2	<0.3	<0.4	1.3	0.8	1.5	1.0	0.7	0.5	1	1.1	0.6	0.7
Radium 228 (pCi/g)	5[c]	Method 9315	1.09	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.1	<1.1	<1.1	1.0	1.8	<1.0	0.9	<1.1	<1.0

* = EPA Engineering Forum Issue. Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites. December 1995.
** = past holding time for analysis
*** Considered Statistical Outlyer - not used
a = NC Hazardous Waste Section Target Remediation Guidelines
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c = reference September 3, 2002 DENR Correspondence
DL = Detection Limit
NA = Not Analyzed per December 6, 1999 & September 3, 2002 DENR Correspondence
NL = No Level

1327 Lincoln Drive
High Point, North Carolina
27260-9945

336 • 884 - 5600
FAX
336 • 812 - 1984

MANNINGTON.
MANNINGTON WOOD FLOORS

November 4, 2002

Mr. Bob Glaser
H W Facility Management Branch Manager
NC Department of Environment
& Natural Resources
401 Oberlin Road
Raleigh, NC 27605

Re: Porcelanite Tile, Inc.
20 Victor Street
Lexington, NC 27292
EPA ID No. NCD 986 181 451

Dear Mr. Glaser,

This response represents information concerning the Lagoon closure efforts underway at the Porcelanite Tile Facility (formally Mannington Ceramic Tile, Inc.) located in Lexington, Davidson County, in regards to mercury. Mercury was exhibited in soil analytical testing conducted around the Lagoon closure, as well as, background sampling conducted at this location. Research of material safety data sheets for material used during production of ceramic tile at this facility indicate that mercury appears to have never been used, nor was it a part of any material used for manufacturing ceramic tile. The presence of mercury is unknown to anyone who was involved with production at this facility.

Mannington would therefore conclude that mercury is naturally occurring and not due to any of Mannington's past manufacturing or disposal activities.

Sincerely,

Tony Shaw
Environmental/Safety Manager
Mannington Wood Division

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

August 10, 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Tony Shaw
Environmental/Safety Manager
Mannington
1327 Lincoln Drive
High Point, North Carolina 27260-9945

Re: Approval of the Settling Ponds Closure Plan
Porcelanite, Inc.
EPA ID # NCD 986 181 451

Dear Mr. Shaw:

This letter is to notify you that the modified closure plan dated November 5, 2002 for the two settling ponds has been reviewed and a public notice of closure was placed in the Lexington Dispatch on August 18, 2004. A comment period of thirty (30) days has since passed without any comments. This office now gives final approval of the modified closure plan which includes risk based cleanup levels for the soil at the site.

It is the understanding of the North Carolina Hazardous Waste Section (HWS) that all closure activities have been completed, including the removal of contaminated soil above the risk-based cleanup levels. Once Porcelanite submits a closure certification report documenting that all closure activities are complete, including the removal of contaminated soil the HWS will issue a closure certification acceptance letter. The certification of closure report must include the survey plat as required by 40 CFR 265.115 and 265.116 respectively.

If you have any questions, please contact Karim Pathan at (919) 508-8558.

Sincerely,

Bud McCarty
Facility Management Branch Head
Hazardous Waste Section

cc: Narindar Kumar, US EPA, Region 4
Alan Klimek, DWQ
Ernie Lawrence, Waste Management Specialist
Robert Hyatt, Davidson County Manager
R. Duke Whisenant Lexington City Manager
Diane Crouse, Davidson County Health Director
Phil Rahn, Water Edge Environmental, Raleigh

rc: Bud McCarty
Liz Cannon
Robert L. Glaser RG
Karim Pathan

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NCDENR
North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

February 1, 2006

Mr. Tony Shaw
Environmental/Safety Manager
Mannington
1327 Lincoln Drive
High Point, North Carolina 27260-9945

Re: Settling Ponds Closure Certification
Porcelanite, Inc., Lexington
EPA ID # NCD 986 181 451

Dear Mr. Shaw:

The Hazardous Waste Section (HWS) has reviewed the closure report and the August 9, 2005 closure certification report for the Porcelanite site in Lexington. Because of the several modifications to the closure plan, the closure report includes several documents including: a) the June 20, 1993 Closure report for the Porcelanite settling ponds; b) the proposed modification to the Closure Plan dated November 5, 2002; c) the memo from Sandra Moore to Rosemarie Roberts dated March 17, 2003 discussing the rational for the amended closure performance standards; d) July 14, 2004 revised Closure Plan; and e) the August 9, 2005 report documenting additional soil excavation. All of these documents together satisfy the closure and closure certification requirements for the settling ponds.

Since the closure certification was submitted Mr. Ernest Lawrence of the HWS conducted a closure inspection on January 5, 2006, and found the facility to be in compliance with the approved closure plan.

With the completion of these activities the HWS accepts the closure certification for the two settling ponds. A copy of this letter will be forwarded to our Financial Unit. They will address details concerning financial assurance for closure under a separate letter.

If you have any questions, please contact Karim Pathan at (919) 508-8558.

Sincerely,

Robert L. Glaser
Unit Supervisor
Facility Management Branch
Hazardous Waste Section

cc: Jon D. Johnston, US EPA, Region 4
Doug Holyfield
Jesse Wells
Jenny Lopp
Ernest Lawrence

rc: Bud McCarty
Robert Glaser
Mary Siedlecki
Karim Pathan

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Appendix I-2- Post-Closure Care Plans for SWMU-2 and SWMU-3

Post-Closure Care Plan for Settling Ponds—Revision #6
Porcelanite, Inc.
Lexington, North Carolina
February 14, 2005

Prepared For

Department of Environment, Health and Natural Resources
Raleigh, North Carolina

Prepared By

Waters Edge Environmental, LLC
Raleigh, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

February 14, 2005

Mr. Bob Glaser
North Carolina Department of Environment
and Natural Resources
Hazardous Waste Section
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Reference: Post-Closure Care Plan – Revision #6
Settling Ponds
Porcelanite, Inc.
Lexington, North Carolina
NCD 986 181 451
Waters Edge Job No. R1-21

Dear Mr. Glaser:

Waters Edge Environmental, LLC (Waters Edge) has been authorized to prepare and submit this document for Mannington Mills, Inc. and Porcelanite, Inc. Mannington Mills, Inc., as operator and Porcelanite, Inc., as owner, are submitting this revised Post-Closure Care Plan for the settling ponds located in Lexington, North Carolina.

If you have any questions regarding this report or require additional information, please call me at 919.859.9987.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip L. Rahn, P.G.
President

05-023/PLR/aht

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Figures

Appendix

Post-Closure Care Plan for Settling Ponds—Revision #6
Porcelanite, Inc.
Lexington, North Carolina
February 14, 2005

1 Introduction

Porcelanite, Inc. (Porcelanite 1995-present) (formerly Mannington Ceramic Tile 1986-1995) operated a ceramic tile manufacturing facility located in Lexington, North Carolina (see Figure 1). Prior to 1990, wastewater used in the manufacturing process was treated in settling ponds. ENSCI Corporation developed a May 1992 *Revised Closure Plan* for these settling ponds, which have now been closed with a closure certification correspondence submitted to the North Carolina Department of Environment & Natural Resources (NCDENR). On March 26, 1996, NCDENR completed a comprehensive ground water monitoring evaluation that was documented in a November 8, 1996, correspondence to Mannington. This correspondence also commented on the November 17, 1992, *Post-Closure Care Plan* for the settling ponds. Mannington is submitting this *Revised Post-Closure Care Plan* reflecting recommendations made during several meetings with NCDENR over the course of the last year and to provide more consistency with the most recently approved *Sampling and Analysis Plan (SAP).* This document addresses post-closure care for the settling ponds in accordance with the landfill requirements listed in 40 CFR 265.310.

1.1 Wastewater Treatment Process Description

Prior to January 1, 1990, Mannington discharged wastewater from its Lexington, North Carolina, facility into Rat Spring Branch, located in the Yadkin-Pee Dee River Basin, pursuant to National Pollutant Discharge Elimination System (NPDES) permit #NC0006459 (reissued April 24, 1986, with expiration April 30, 1991). The wastewater treatment process under this permit consisted of passing the water through a series of holding ponds that allowed solids to settle before discharge into Rat Spring Branch (see Figure 1).

On January 1, 1990, after substantial modification of the wastewater treatment system, Mannington voluntarily stopped this discharge and began discharging its wastewater into the City of Lexington POTW. The modified pretreatment process consisted of an open-top solids precipitating tank with pH control. Solids generated under the system were ran through a filter press and subsequently transported to the Kernersville Landfill for disposal based on approval from the Solid Waste Management Branch.

1.2 Closure Plan Development

Mannington contracted ENSCI Corporation to provide environmental consulting services concerning the closure and post-closure care of the settling ponds. ENSCI partially closed the ponds in accordance with the May 1992 *Revised Closure Plan.* Based upon continued negotiations with NCDENR, it was decided to present a modified closure using risk-based concentrations (RBCs).

Based on some additional sampling outside of the former settling ponds, it was determined that some of the settling pond material may have overflowed over the ponds during their operation. Several investigative efforts were conducted to determine the horizontal and vertical extent of the affected soil. Also, during this time period, NCDENR began to adopt a RBC approach to determining remedial thresholds. Both Mannington and NCDENR finally accepted these levels. Based upon these levels, Mannington removed all of the affected soils per NCDENR. Again, based upon direction from NCDENR, Mannington provided NCDENR with a November 5, 2002 modified risk assessment. Based upon these documents, a revised closure certification was submitted. A figure depicting the closed settling ponds and monitoring well network is shown in Figure 2.

2 Post-Closure Care Plan

This revised *Post-Closure Care Plan* has been developed to address the ongoing activities as well as supplement the modifications proposed in the SAP. The following items are included in this plan:

- The name, address, and phone number of the contact for the hazardous waste disposal unit during the post-closure care period.
- The address where copies of the *Revised Post-Closure Care Plan* will be maintained.
- A description of the planned inspection and maintenance activities as well as schedule for the cover system, security fence, and monitoring wells.
- A post-closure care cost estimate for the closed unit and a description of the financial assurance mechanism adopted by Mannington.
- Recordkeeping and reporting requirements during post-closure care.

2.1 Post-Closure Care Plan Contacts and Maintenance

During the post-closure care period, the environmental coordinator is the contact person for the hazardous waste disposal unit. The current environmental manager, Mr. Tony Shaw, may be reached as follows:

Mr. Tony Shaw	Phone#	(336) 812-4908
Mannington Wood Floors	Fax#	(336) 812-4981
1327 Lincoln Drive		
High Point, N.C. 27260		
E-mail	Tony_Shaw@mannington.com	

Mannington will maintain a copy of the approved *Revised Post-Closure Care Plan* and all revisions until the end of the post-closure care period. One copy of the *Revised Post-Closure Care Plan* and all revisions will be kept in the office of Mr. Tony Shaw at the following address:

Mr. Tony Shaw	Phone#	(336) 812-4908
Mannington Wood Floors	Fax#	(336) 812-4981
1327 Lincoln Drive		
High Point, N.C. 27260		

The person responsible for updating the post-closure care plan will be Mr. Shaw or his designee. As the post-closure care plan is updated or amended, the date and number of the revision will be placed on the lower left corner of each revised page; the revision will be noted on the Plan's title page.

2.2 Ground Water Monitoring Activities

During the post-closure care period, ground water monitoring will be conducted using procedures and scheduling in accordance with the most currently approved SAP. The ground water will be analyzed for the parameters specified in the most currently approved SAP. The SAP *upon approval by NCDENR* may be modified as required based on the results of this program. Figure 2 depicts the current monitoring well network at the facility.

Sampling will be conducted for the duration of the post closure care period. The results of these sampling events will be documented in ground water monitoring reports. Mannington will continue to implement the current and any updated ground water assessment plans during the post-closure period.

2.3 Planned Inspection and Maintenance

To ensure that the closed settling ponds are properly maintained, Mannington will inspect the following areas quarterly to determine any required maintenance: (A copy of the inspection report which has both Tile Pile and Lagoon is attached in Appendix A)

- asphalt roadway cover
- run-on/run-off control system
- Subsidence
- security fence
- monitoring wells

The cover was sloped to provide positive site drainage away from the closed settling ponds. The cover will be visually inspected quarterly to ensure that the asphalt cap is maintained.

As previously discussed in the *Closure Plan*, subsidence of the compacted fill and asphalt cap is not expected since the waste was stabilized, fill and cover system materials were compacted, run-on is controlled, infiltration through the cap is minimized, and no surcharge load is placed on the cap. Inspections will be conducted during the post-closure care period for cracks or erosion from run-off; if noted, they will be immediately repaired.

2.4 Cost Estimate and Financial Assurance Mechanism

2.4.1 Post-Closure Cost Estimate

The post-closure cost information is submitted in accordance with the requirements of 40 CFR 265.144. An estimated $60,000 (based on 30 years) will be needed to perform annual post-closure care. These costs are broken down in more detail in Section 3. However, the cost for post closure care may change once the ground water assessment has been completed. Therefore, the post-closure care cost estimate may require an amendment once the ground water assessment is completed.

The post-closure cost estimate will be kept on file at Mannington Wood Floors in High Point, NC with Mannington's site manager and will be revised within thirty (30) days in the event that a change in the post-closure care plan affects the cost of post-closure care. It will be adjusted annually within thirty (30) days after Mannington's fiscal year and concurrent with submission of the updated information to the DSWM as specified in 265.145 (e)(5) from the date of its original development to reflect changes caused by inflation. The Department of Commerce's Annual Implicit Price Deflator for Gross National Product will be used to make this or any corresponding adjustment.

2.4.2 Financial Assurance Mechanism

Financial assurance information has been submitted in accordance with the requirements of 40 CFR 265.145. Mannington has reviewed the five mechanisms for financial assurance and has chosen a mechanism for the Lexington facility.

2.4.2a Post-Closure Trust Fund

Not applicable.

2.4.2b Surety Bond

Not applicable.

2.4.2c Post-Closure Letter of Credit

Not applicable.

2.4.2d Post-Closure Insurance

Not applicable.

2.4.2e Financial Test and Corporate Guarantee for Post-Closure Plan

Mannington meets the financial test criteria of 40 CFR 265.145(e). In accordance with Section 265, Mannington has provided the following items to the NCDENR:

1. The Corporate Guarantee for Closure or Post-Closure Care, using the language specified in 40 CFR 264.151(h).

2. A letter signed by Mannington's Chief Financial Officer in support of the Corporate Guarantee that is worded as specified in Section 264.151(f).

3. A copy of the report from an independent certified public accountant who examined Mannington's financial statement for the most recent fiscal year.

4. A copy of the special report from Mannington's independent certified accountant to Mannington that:

(a) He has compared the data which the letter from the Chief Financial Officer specified as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

(b) In connection with that procedure, no matters came to his attention which has caused him to believe that the specified data should be adjusted.

2.5 Certification of Completion of Post-Closure Care

Within 60 days after completing the established post-closure care period for the settling ponds, Mannington will submit to the NCDENR, by registered mail, a certification that the post-closure care for the post-closure care period was performed in accordance with the specifications in the approved post-closure care plan. The certification will be signed by the owner or operator and an independent registered professional engineer. Documentation specified in 40 CFR 265.120 will be furnished to the NCDENR upon request.

2.6 Notice to Local Land Authority

Mannington did within 60 days after non-clean closure was completed submit to the Davidson County Register of Deeds and to the HWS a survey plat indicating the location and dimensions of the Settling Ponds with respect to permanently surveyed benchmarks. This plat was prepared and certified by a registered professional land surveyor in the State of North Carolina. The plat contained a note, prominently displayed, which states Porcelanite's obligation to restrict disturbances of the site in accordance with 40 CFR 264.117(c).

2.7 Record Keeping and Reporting Requirements

All records and reports from inspections, maintenance, and ground water monitoring will be maintained by the Mannington site manager at Mannington Wood Floors in High Point, NC for the duration of the 30-year post-closure care period. Updates on costs of the post-closure care period, as discussed in Section 2.4.1, will also be maintained.

The ground water monitoring reports discussed in Section 2.2 will be forwarded to the implementing agency within 90 days of completion.

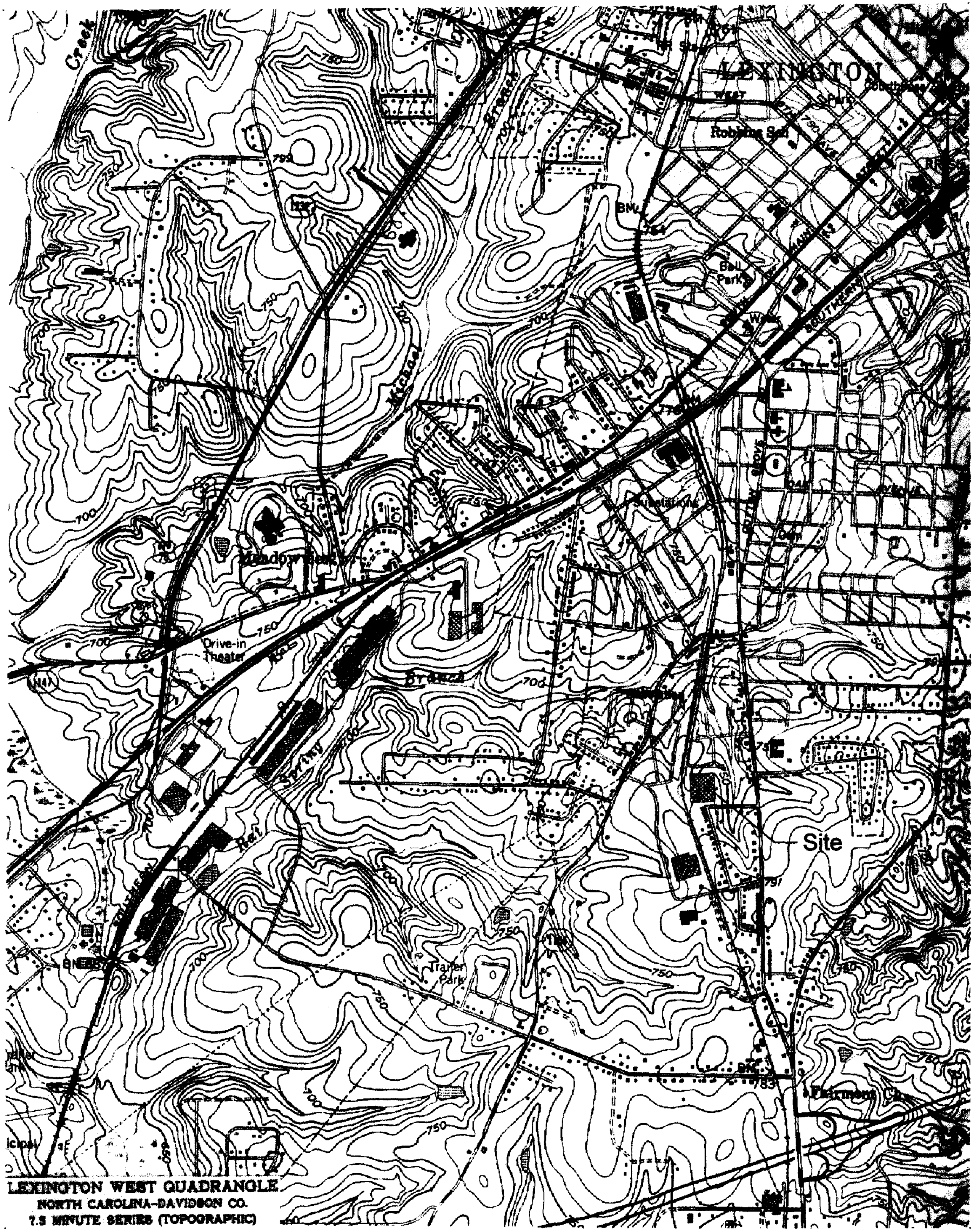
3 Costs

Settling Ponds Post-Closure Care Costs (current dollars)

1. Ground Water Monitoring	
• Semi-Annual compliance monitoring and report	$ 1,500
• Inspections *	$ 100
• Maintain Cover System (contingency)	$ 400
Annual Total	$ 2,000
Total Cost for 30-Year Post-Closure Care Period	$60,000

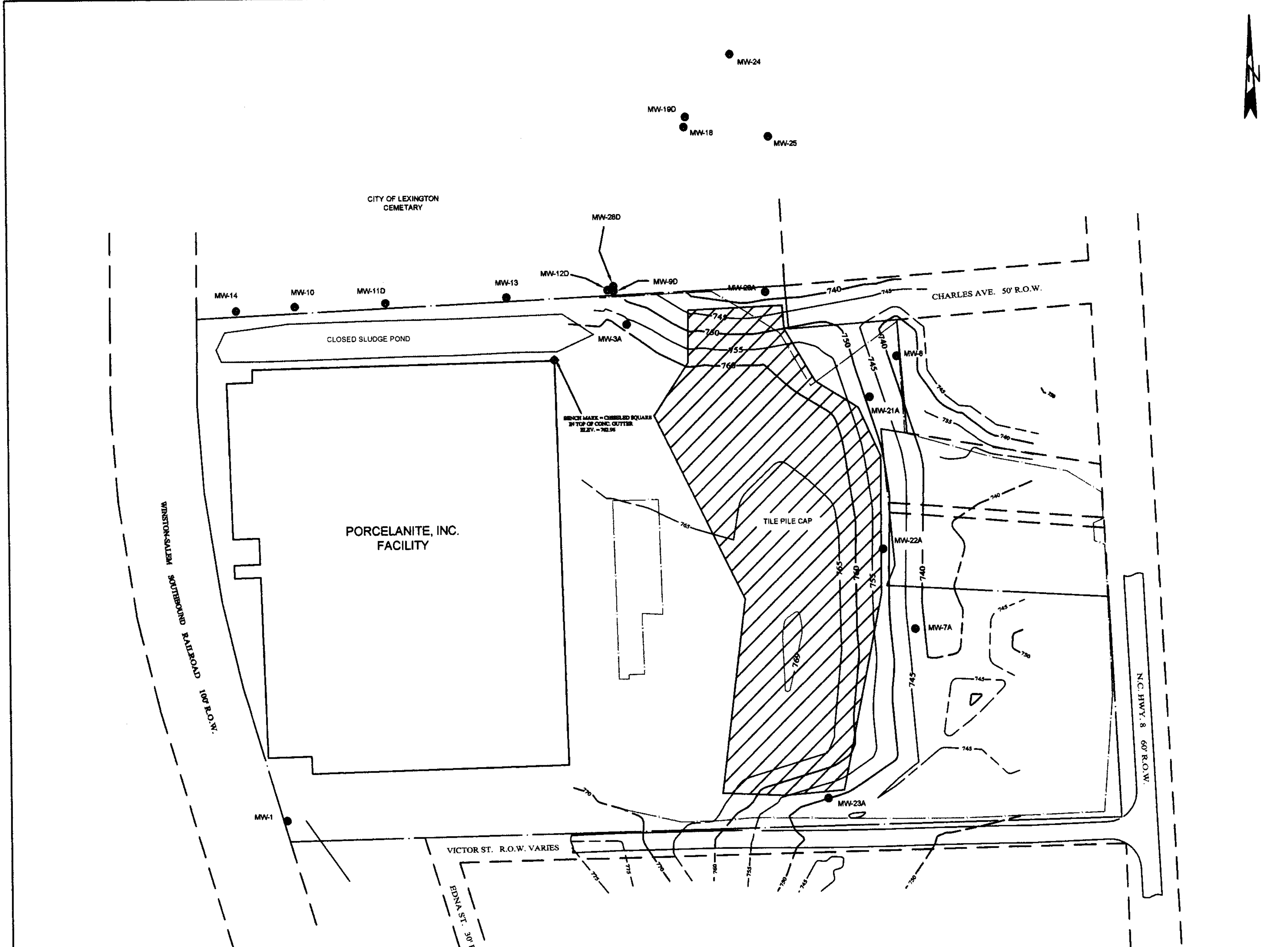
Site ground water assessment (Tile Pile and Settling Ponds) estimate cost: $ 20,000

* The quarterly Tile Pile and Lagoon inspections will be completed at the same time by an independent inspector.



WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
jme	R1-21		1-24-01	Project Location Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	11-1-02	1	1"=2000'	Porcelanite, Inc. Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author: jme	Drawing: 05-023 & 05-024	Layers	Date: 04-19-04	Title: Site Location Map, Settling Pond & Tile Pile
	Job No.: R1-21	Revision: 02-02-05	Figure: 2	Scale: 1" = 150'	Project: Porcelanite, Inc Facility, Lexington, North Carolina

Appendix A
Quarterly Inspection Log
Porcelanite Tile Plant

Lexington, North Carolina
Davidson County

Settling Ponds

	1s Quarter	2nd Quarter	3rd Quarter	4th Quarter
Asphalt roadway cover				
Run-on/Run-off Control System				
Subsidence				
Security Fence				
Monitoring wells				

Tile Pile

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Erosion Damage				
Vegetative/Stone/or asphalt Cover				
Run-on/Run-off Control System				
Subsidence				
Monitoring wells				
Security Fence				

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date of inspections:				
Inspected By:				

Post-Closure Care Plan – Revision #5
Ceramic Chip Tile Pile
Porcelanite, Inc.
Lexington, North Carolina
February 14, 2005

Prepared For

Department of Environment, Health and Natural Resources
Raleigh, North Carolina

Prepared By

Waters Edge Environmental, LLC
Raleigh, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

February 14, 2005

Mr. Bob Glaser
North Carolina Department of Environment
and Natural Resources
Hazardous Waste Section
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Reference: Post-Closure Care Plan – Revision #5
Ceramic Chip Tile Pile
Porcelanite, Inc.
Lexington, North Carolina
NCD 986 181 451
Waters Edge Job No. R1-21

Dear Mr. Glaser:

Waters Edge Environmental, LLC (Waters Edge) has been authorized to prepare and submit this document for Mannington Mills, Inc. and Porcelanite, Inc. Mannington Mills, Inc., as operator and Porcelanite, Inc., as owner, are submitting this revised Post-Closure Care Plan for the ceramic chip tile pile located in Lexington, North Carolina.

If you have any questions regarding this report or require additional information, please call me at 919.859.9987.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip L. Rahn, P.G.
President

05-024/PLR/aht

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Figures

Appendix

Post-Closure Care Plan-Revision #5
Ceramic Tile Pile
Porcelanite, Inc.
Lexington, North Carolina
February 14, 2005

1 Introduction

Porcelanite, Inc. (Porcelanite, 1995-present) (formerly Mannington Ceramic Tile 1986-1995) operated a ceramic tile manufacturing facility located in Lexington, North Carolina. Off-specification tile was stored in a pile located in the eastern portion of the site as shown in Figure 1. Based upon several investigatory efforts, it has been determined that the tile material exhibited the characteristics of a hazardous waste for lead and must be closed in accordance with the applicable regulations of the North Carolina Department of Environment, & Natural Resources (NCDENR). A closure plan and a certification of closure have been submitted to the NCDENR under separate cover for the closure of the tile pile. This document addresses post-closure care for the tile pile in accordance with the landfill requirements listed in 40 CFR 265.310. The following items are included:

1. Ground Water Monitoring Plan - All ground water monitoring will be conducted in accordance with the most recent ground water Sampling & Analysis Plan (SAP).

2. A description of the planned maintenance activities and frequencies at which they will be performed for the cap, security fence and monitoring wells.

3. The name, addresses, and phones number of the person or office to contact about the hazardous waste disposal unit during the post-closure care period.

4. Recordkeeping and reporting during post-closure:
   - ground water monitoring data and evaluation of data;
   - annual report until closure is complete;
   - updates on costs of post-closure care; and
   - All records will be maintained for the post closure care period.

5. Copies of the Post-Closure Care Plan will be maintained at:

   Mr. Tony Shaw
   Mannington Wood Floors
   1327 Lincoln Drive
   High Point, N.C. 27260

   Phone# (336) 812-4908
   Fax# (336) 812-4981
   E-mail Tony_Shaw@mannington.com

   The person responsible for updating the Post-Closure Care Plan will be the facility representative mentioned or his designee. As the Post-Closure Care Plan is updated or amended, the date and number of the revision will be noted on the plan's title page.

6. A Financial Assurance mechanism adopted by Mannington will be included.

2 Post Closure Care Plan

2.1 Inspection and Maintenance

Mannington will ensure that the closed tile pile is properly maintained by inspecting it quarterly in the following areas: (A copy of the inspection form is attached Appendix A)

1. Erosion damage
2. Vegetative/stone/or asphalt cover
3. Run-on/run-off control system
4. Subsidence
5. Monitoring wells
6. Security fence

The caps were sloped to provide positive site drainage away from the tile pile as shown on the drawings in the Closure Plan (see site map in Figure 2). The sloped cap is designed so that the maximum drainage velocity leaving the cap is less than the velocity likely to cause erosion for the selected vegetation. The cap will be visually inspected quarterly to ensure that the positive drainage slopes are maintained. Should minor subsidence or spot irregularities be discovered, new topsoil will be placed on the slope cap, the area will be regraded, and the topsoil layer will be reseeded.

The sloped cap will also be protected from erosion by maintaining an appropriate vegetative cover (grass appropriate too the piedmont area). Maintenance activities for the vegetative cover will include mowing, seeding, and fertilizing during the year. The activities will be performed on an as-needed basis due to the seasonal nature of vegetation.

The flat top surface cap will be quarterly inspected for subsidence. Areas of subsidence that allow ponding and possible infiltration of the ponded waters will be repaired as necessary.

As previously discussed in the tile pile closure plan, subsidence of the tile pile and caps are not expected since: (1) the tile pile material have settled over the 16 years since the last disposal of the chips, (2) the cap materials will be compacted, (3) run-on will be controlled, (4) infiltration through the cap will be minimized, and (5) only light surcharge loads will be placed on the cap.

2.2 Site Security

Site security is provided by perimeter fencing of the property, which includes the present tile pile and all the proposed area affected by closure.

2.3 Post-Closure Cost and Financial Assurance

2.3.1 Post-Closure Cost Estimate

The post-closure cost information presented is submitted according to the requirements of 40 CFR 265.144, *Cost Estimate for Post-Closure Care.* An estimated $75,000 (based on 30 years) will be needed to perform post-closure care of the Mannington tile pile. These costs are broken down in more detail and summarized in Table 1.

These post-closure care estimates will be kept on file by the Mannington site manager and will be revised whenever a change in the Post-Closure Care Plan affects the cost of post-closure. It will be adjusted annually from the date of its original development to reflect changes in the post-closure cost brought about by inflation. The Department of Commerce's Annual implicit Price Deflater for Gross National Product (published by U.S. Department of Commerce in its monthly publication "Survey of Current Business") will be used to make this adjustment.

2.3.2 Financial Assurance Mechanism

Mannington, as the operator of the tile pile, has retained responsibility for the post-closure care of the tile pile. Mannington, as the operator and submitter of the post-closure care plan, will continue to maintain the financial assurance and liability requirements in compliance with 40 CFR 265 Subpart H-*Financial Requirements.*

The financial assurance information is submitted according to the requirements of 40 CFR 265.145, *Financial Assurance for Post-Closure Care.* Mannington has reviewed the five mechanisms for financial assurance and has chosen a mechanism for the Lexington facility.

2.3.2a Post-Closure Trust Fund
Not applicable.

2.3.2b Surety Bond
Not applicable.

2.3.2c Post-Closure Letter of Credit
Not applicable.

2.3.2d Post-Closure Insurance
Not applicable.

2.3.2e Financial Test and Corporate Guarantee for Post-Closure Care

Mannington meets the financial test criteria of 40 CFR 265.145. The following items have been submitted to the HWS for 1996 in accordance with Section 265.145. An updated financial assurance package will be submitted to the HWS as required in 1997 by Mannington. The items that will be addressed are:

1. A copy of a letter signed by Mannington's Chief Financial Officer that is worded as specified in Section 264.151(f).

2. A copy of the independent Certified Public Accountant's report on examination of Mannington's financial statement for the latest completed fiscal year.

3. A copy of the special report from Mannington's independent Certified Accountant to Mannington that:

    (a) He has compared the data which the letter from the Chief Financial Officer specified as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

    (b) In connection with that procedure, no matters came to his attention, which has caused him to believe that the specified data should be adjusted.

2.4 Certificate of Completion of Post-Closure Care

Within 60 days of completing the established post-closure care period for the tile pile Mannington will submit to the HWS a certification by both Mannington and Porcelanite and an independent Registered Professional Engineer in the State of North Carolina that the tile pile post-closure care for the post-closure care period has been performed according to the Post-Closure Care Plan. Documentation supporting the independent registered professional engineer's certification will be furnished to the HWS (Regional Administrator) upon request.

2.5 Notice to Local Land Authority

Mannington did within 60 days after non-clean closure was completed submit to the Davidson County Register of Deeds and to the HWS a survey plat indicating the location and dimensions of the tile pile with respect to permanently surveyed benchmarks. This plat will be prepared and certified by a registered professional land surveyor in the State of North Carolina. The plat contained a note, prominently displayed, which states Porcelanite's obligation to restrict disturbances of the site in accordance with 40 CFR 264.117(c).

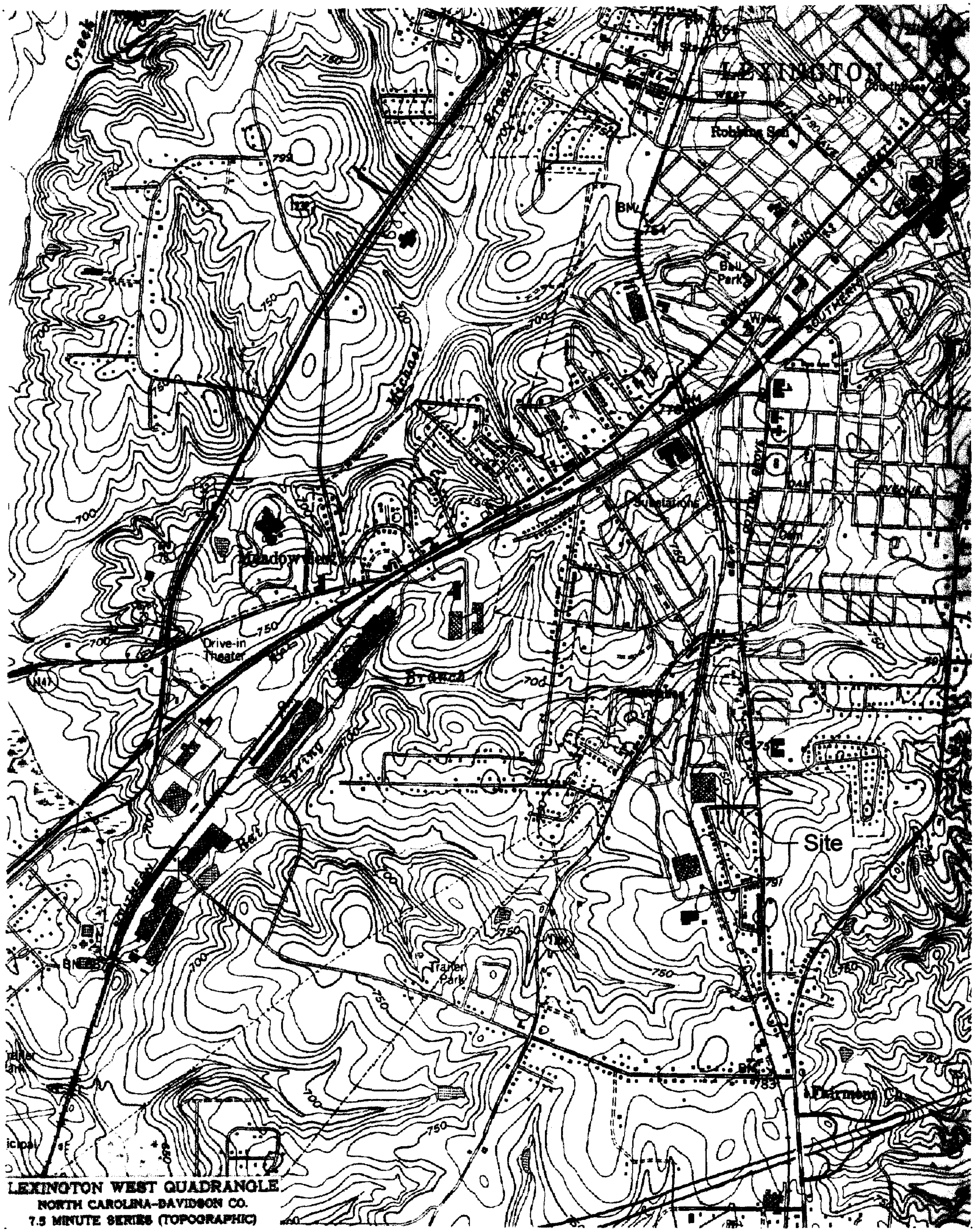
3 Cost

Cost Estimate[1] for Post-Closure Care of Ceramic Chip Tile Pile (current dollars)

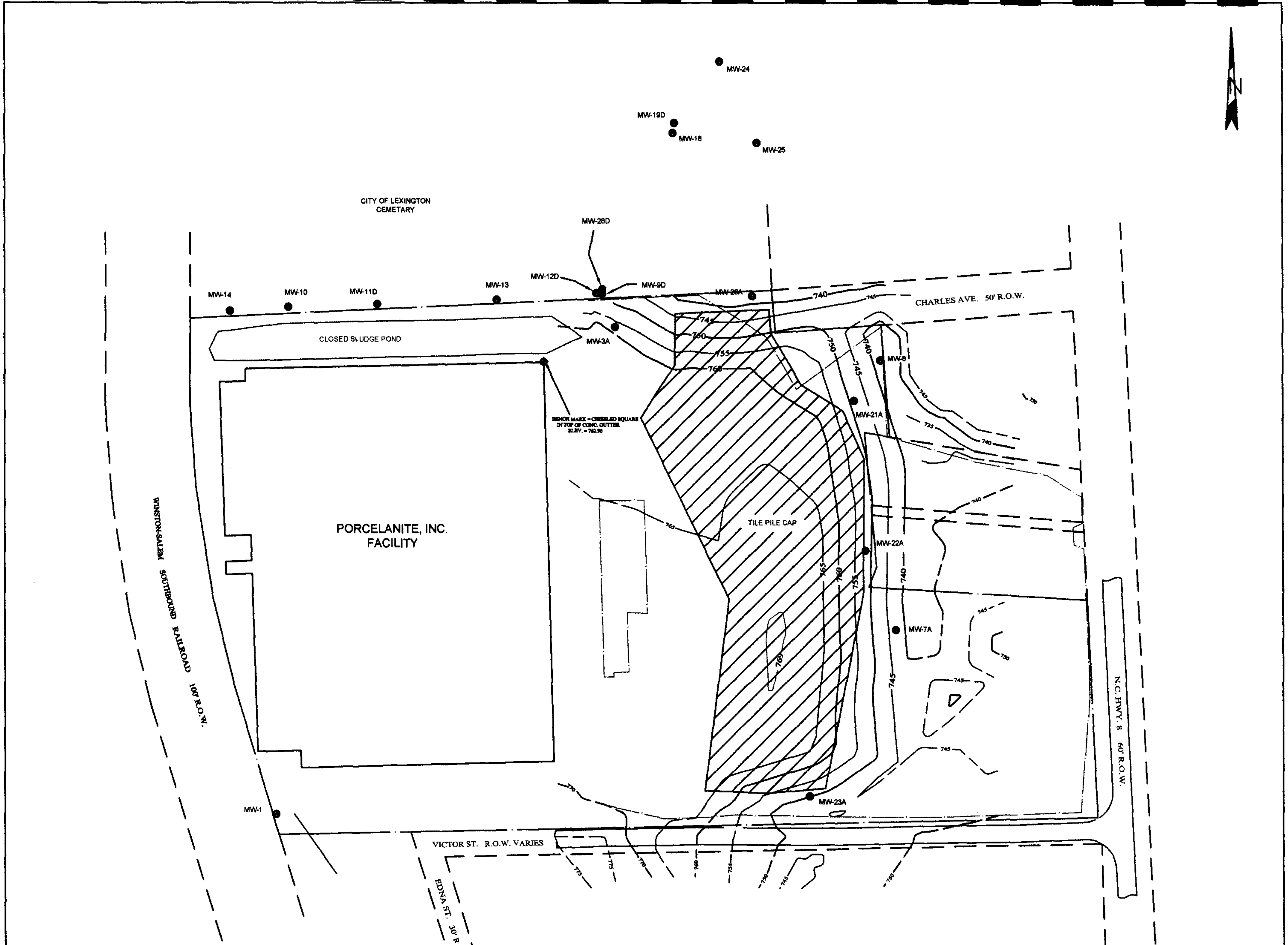
1.	Sampling Events of Monitoring Wells (includes equipment, analysis, labor, and report)	$	**1,500**
2.	Maintain Cover on slope, surface cap including inspection and maintenance of cap system • Quarterly Inspections-$ 200 annual * • Mowing - $500 annual • Contingency $300 annual	$	**1,000**
	Annual Total	$	**2,500**
	Total Cost for 30-Year Post-Closure Care Period	$	**75,000**

Additional cost: Ground water assessment estimated cost for entire site is $ 20,000

* The quarterly Tile Pile and Lagoon inspections will be completed at the same time by an independent inspector.



WATERS EDGE ENVIRONMENTAL, LLC	Author	Drawing	Layers	Date	Title
	jme	R1-21		1-24-01	Project Location Map
	Job No.	Revision	Figure	Scale	Project
	R1-21	11-1-02	1	1"=2000'	Porcelanite, Inc. Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	*Author* jme	*Drawing* 05-023 & 05-024	*Layers*	*Date* 04-19-04	*Title* Site Location Map Settling Pond & Tile Pile
	Job No. R1-21	*Revision* 02-02-05	*Figure* 2	*Scale* 1" = 150'	*Project* Porcelanite, Inc Facility Lexington, North Carolina

Appendix A
Quarterly Inspection Log
Porcelanite Tile Plant

Lexington, North Carolina
Davidson County

Settling Ponds

	1s Quarter	2nd Quarter	3rd Quarter	4th Quarter
Asphalt roadway cover				
Run-on/Run-off Control System				
Subsidence				
Security Fence				
Monitoring wells				

Tile Pile

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Erosion Damage				
Vegetative/Stone/or asphalt Cover				
Run-on/Run-off Control System				
Subsidence				
Monitoring wells				
Security Fence				

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date of inspections:				
Inspected By:				

Appendix I-3- Hazardous Waste Facility Certification of Liability Insurance Policy

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

1. Indian Harbor Insurance Company, the Insurer of Seaview House, 70 Seaview Avenue, Stamford, CT 06902-6040, hereby certifies that it has issued liability insurance covering bodily injury and property damage to Mannington Mills, Inc., the Insured, of 75 Mannington Mills Road, Salem, NJ 08079 in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at EPA ID#NCD986181451, Porcelanite, Inc., 20 Victor Street, Lexington, NC 27292 for sudden accidental occurrences. If coverage is for multiple facilities and the coverage is different for different facilities, indicate which facility(ies) are insured for sudden accidental occurrences, which are insured for nonsudden accidental occurrences, and which are insured for both. The limits of liability are $1,000,0000 each occurrence and $2,000,0000 annual aggregate, exclusive of legal defense costs. The coverage is provided under policy number PEC000801603 issued on December 31, 2015. The effective date of said policy is December 31, 2015.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or insolvency of the Insured shall not relieve the Insurer of its obligations under the policy.

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the Insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).

   (c) Whenever requested by "Secretary" of the Department of Environment and Natural Resources (DENR), the Insurer agrees to furnish to the "Secretary" a signed duplicate original of the policy and all endorsements.

   (d) Cancellation of the insurance, whether by the Insurer, the Insured, a parent corporation providing insurance coverage for its subsidiary, or by a firm having an insurable interest in and obtaining liability insurance on behalf of the owner or operator of the hazardous waste management facility, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the Secretary.

   (e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Secretary.

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

(Signature of Authorized Representative of Insurer)

Date: 2/21/17

Anthony Gentile, Vice President

Authorized Representative of Indian Harbor Insurance Company

c/o XL Catlin
505 Eagleview Boulevard
Exton, PA 19341-0636

Appendix I-4- Indian Harbor Policy Endorsement (#31)

ENDORSEMENT #031

This endorsement, effective 12:01 a.m., December 31, 2015 forms a part of Policy No. PEC000801603 issued to MANNINGTON MILLS, INC. by Indian Harbor Insurance Company.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RCRA AMENDATORY ENDORSEMENT

This endorsement modifies insurance provided under the following:

POLLUTION AND REMEDIATION LEGAL LIABILITY POLICY

The INSURED and the Company agree to the following Policy change(s):

Item 3. Limits of Liability, of the Declarations, is amended by the addition of the following:

(i) The Dedicated Annual Sublimits of Liability set forth below can only be reduced by LOSS or REMEDIATION EXPENSE required to satisfy the INSURED's Resource Conservation and Recovery Act (RCRA) Hazardous Waste financial responsibility obligations for the COVERED LOCATION listed in the Location Schedule below.

(ii) Except as outlined in Item (i) above, the Dedicated Annual Sublimits of Liability set forth below are not available to satisfy any coverage otherwise afforded by this Policy.

(iii) Any LOSS or REMEDIATION EXPENSE described in Item (i) above that exceed the Dedicated Annual Sublimits of Liability set forth below are subject to the Limits of Liability outlined in Items 3.a. and 3.b. of the Declarations.

(iv) Notwithstanding the terms and conditions in Items (i), (ii), and (iii) above, the maximum Limits of Liability applicable under this Policy will not exceed the Aggregate Liability shown in Item 3.b. of the Declarations.

Dedicated Annual Sublimits of Liability:

\$1,000,000	LOSS or REMEDIATION EXPENSE for each POLLUTION CONDITION
\$2,000,000	LOSS or REMEDIATION EXPENSE Aggregate Liability

In consideration of the above Dedicated Annual Sublimits of Liability and the five (5) year POLICY PERIOD, the above Dedicated Annual Sublimits of Liability provides an overall POLICY PERIOD Dedicated Sublimits of Liability of \$1,000,000 each POLLUTION CONDITION / \$10,000,000 Aggregate Liability under this Policy for the INSURED's financial responsibility obligations outlined in item (i) above. This overall POLICY PERIOD Dedicated Sublimits of Liability are not available to satisfy any coverage otherwise afforded by this Policy.

Solely with regards to any POLLUTION CONDITION associated with the Ceramic Tile Pile Unit covered under this Policy for the INSURED's RCRA financial responsibility obligations for the COVERED LOCATION listed in the Location Schedule below, the INSURED and the Company agree to the following Policy change(s):

Item 4. Self-Insured Retention Amount, of the Declarations, is deleted in its entirety and replaced with the following:

4. Deductible:

$ 100,000 each POLLUTION CONDITION

LEGAL EXPENSE, as well as LOSS and REMEDIATION EXPENSE, shall be included within the Deductible.

Section VI. LIMITS OF LIABILITY AND SELF-INSURED RETENTION, Paragraphs A. and B. are deleted in their entirety and replaced with the following:

A. The Company will pay one hundred percent (100%) of all covered LOSS, REMEDIATION EXPENSE, LEGAL EXPENSE and any other coverages afforded by endorsement attached to this Policy subject to the Limits of Liability stated in Item 3. of the Declarations and the other terms and conditions of this Policy.

B. The applicable Deductible stated in Item 4. of the Declarations shall apply.

It is further agreed that the term "Self-Insured Retention Amount" referenced throughout this Policy and Declarations is amended to read "Deductible". The Company is liable for the payment of amounts within the Deductible applicable to this Policy, with a right of reimbursement from any INSURED for payment made by the Company.

If the Company advances all or part of the Deductible, the INSURED will immediately reimburse the Company for all sums advanced upon the Company's request. If the INSURED does not reimburse the Company for a Deductible payment made within the time frame stated by the Company or there is the commencement of a proceeding under bankruptcy or insolvency laws by or against the INSURED, the Company reserves the right to require collateral as financial security in an amount and form acceptable to the Company for all present and future financial obligations of the INSURED to the Company. In the event of a collateral demand by the Company, the INSURED will immediately deliver such collateral to the Company.

Location Schedule:

20 Victor Street
Lexington, NC 27292

All other terms and conditions remain the same.

Part J
Other Federal Laws

Part J- Other Federal Laws

Acronym List

NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality (formerly NCDENR, and renamed effective September 18, 2015).
USFWS	United States Fish and Wildlife Service
Waters Edge	Waters Edge Environmental, LLC

Part J- Other Federal Laws

Based on the Module J Checklist provided by NCDEQ, on behalf of this Part B application, Waters Edge has contacted the following agencies to provide demonstration with applicable Federal laws or is of the opinion that some laws do not apply:

- Wild and Scenic Rivers Act- Waters Edge requested State Wild and Scenic Rivers Act information twice via email and received no response
- National Historic Preservation Act of 1966- This is not applicable at this site
- Endangered Species Act-
    1. Allen Ratzlaff, a Fish and Wildlife Biologist with the USFWS, responded electronically stating "no federally listed species or their habitats occur in the project area. Therefore, we believe the requirements under Section 7 of the of the Endangered Species Act of 1973 are fulfilled."
    2. Mr. David Cox with the NC Wildlife Resources Commission was contacted by electronic mail on January 24, 2017 for information regarding any National or State Wildlife Refuges, State lands designated for wildlife or game management, Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or Areas in lakes in which fish spend extended periods of time, or Spawning areas critical for the maintenance of fish/shellfish species within river or lake waters. Ms. Olivia Munzer, Western Piedmont Habitat Conservation Coordinator, responded electronically stating "There are no national refuges or state-owned, wildlife-designated or management lands within 1.0 mile of the site. However, lands managed by Davidson County as Open-Space are located with 1.0 mile of the site. There are no migratory or feeding grounds for anadromous fish or spawning areas critical for the maintenance of fish/shellfish species, or large lakes or reservoirs with areas that fish spend extended periods of time occur[sic] within 1.0 mile of the Facility.
- Coastal Zone Management Act- This does not apply at this site
- Fish and Wildlife Coordination Act- This does not apply at this site

Part K
Certification

Part K - Certification

Former Porcelanite Facility, Lexington, North Carolina

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 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 possibility of fine and imprisonment for knowing violations.

Mr. Dave Kitts
Vice-President-Environment
Mannington Mills, Inc.
75 Mannington Mills Road
Salem, NJ 08079

3/1/17
Date

Mr. Alejandro Sanchez
President
Condumex, Inc.
2590 114th Street, Suite 200
Grand Prairie, Texas 27505

Date

Part L
Information Requirements for Solid Waste Management Units

Part L - Information Requirements for Solid Waste Management Units

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Figures

Tables

Appendix

Acronym List

ACL	Alternative Concentration Limits
AOC	Area of Concern
BGS	below ground surface
BQL	below quantitation limits
CAP	Corrective Action Plan
°C	Celsius
COCs	Constituents of Concern
CS	Confirmatory Sampling
EP	Extraction Procedure
Ft/ft	Foot per foot
HWMU	Hazardous Waste Management Unit
HWS	Hazardous Waste Section
IHSB	Inactive Hazardous Sites Branch
Mannington	Mannington Ceramic Tile
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilograms or parts per million
NC	North Carolina
NCDEHNR	North Carolina Department of Environment, Health, and Natural Resources
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality (formerly NCDENR, and renamed effective September 18, 2015).
NCGS	North Carolina Groundwater Standards
NFA	No Further Action

Porcelanite	Porcelanite, Inc.
PGW	Protection of Groundwater
POTW	Publicly-Owned Treatment Works
PQL	Practical Quantitation Limit
PPM	Priority Pollutant Metals
PSRG	Preliminary Soil Remediation Goal
PVC	Polyvinyl Chloride
RCRA	Resource Conservation Recovery Act
RFI	Recommend Further Investigation and RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SIC	Standard Industrial Classification
SVOCs	Semivolatile Organic Compounds
SWMU	Solid Waste Management Units
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
VSI	Visual Site Inspection
Waters Edge	Waters Edge Environmental, LLC

Part L - Information Requirements for Solid Waste Management Units

L-1 Minimum Information Requirements for Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)

An RFA report was completed on April 29, 2004 by an EPA contractor (Booz Allen, 2004) and finally submitted on February 16, 2005 (see Appendix B-1). The RFA identified eleven (11) SWMUs and three (3) AOCs as depicted on Figure L-1. Based on the 2005 RFA, Table L-1 lists the SWMUs and AOCs identified along with the recommended course of action in 2004 and after reevaluation in 2016. Portions of the following SWMU and AOC descriptions and past investigation summaries are directly referenced from the February 2005 RFA.

Table L-1
SWMU/AOC Identification and Past Status

Unit	Name	2005
SWMU-1	Wastewater Pretreatment System	CS
SWMU-2	Sludge Settling Ponds (Regulated)	NFA
SWMU-3	Ceramic Tile Pile (Regulated)	NFA
SWMU-4	20 cubic yard Sludge Roll-Off Container	NFA
SWMU-5	20 cubic yard Floor Sweeping Roll–Off Container	NFA
SWMU-6	Baghouse	CS
SWMU-7	Walltown Branch	RFI
SWMU-8	Off-Spec Tile Accumulation Roll-Off	NFA
SWMU-9	Filter Cake Waste Pile Area	NFA
SWMU-10	Maintenance Building Waste Management	NFA
SWMU-11	Spray Line Area Sumps	CS
AOC-1	Area of Discharge from Tile Pile	RFI
AOC-2	Broken Ceramic Tile Roadway	CS
AOC-3	Former UST and AST Area	NFA

Notes:
CS = Confirmatory Sampling
NFA = No Further Action
RFI = Recommended Further Investigation
These determinations of CS, NFA or RFI are excerpted from the Booz Allen 2005 RFA

L-1a Description of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)

At the request of Ms. Mary Siedlecki with the NCDEQ, this Section includes a description of all eleven (11) SWMUs and three (3) AOCs that are listed in Table L-1. There are also numerous refences to the previous names of the current NCDEQ including NCDENR and NCDEHNR; however, for consistency, we will use NCDEQ throughout this document. The locations of the SWMUs and AOCs are shown on Figure L-1 with current photodocumentation of the existing SWMUs and AOCs or areas of former SWMUs shown in Appendix A-1. Four (4) SWMUs and two (2) AOCs are currently recommended for additional investigation. SWMU-1 was identified as the Wastewater Pretreatment System, SWMU-2 was identified as the two Sludge Settling Ponds, SWMU-3 was identified as the Ceramic Tile Pile (the latter two are both regulated units), and SWMU-7 was identified as Walltown Branch, a previously piped-in stream. Two AOCs were identified as an Area of Discharge from the Tile Pile (AOC-1) and the Broken Ceramic Tile Roadway (AOC-2). SWMU-2 and SWMU-3 have successfully undergone closure which has been accepted by NCDEQ. Portions of the following SWMU and AOC descriptions and past investigation summaries are directly referenced from the February 2005 RFA.

L-1a (1) SWMU-1 - Wastewater Pretreatment System Operational History

TYPE OF UNIT: Wastewater Pretreatment System comprised of holding tanks with secondary containment, precipitation tanks, a filter press, and a sump.

PERIOD OF OPERATION: January 1989 to 1999 (facility permanently shut down)

PHYSICAL DESCRIPTION AND CONDITION:

Historically, wastewater generated by the tile manufacturing operations was discharged to the Sludge Settling Ponds (“SWMU-2”). In 1988, a substantial modification of the wastewater treatment system at the Facility occurred in that all wastewater which had previously been discharged to the Sludge Settling Ponds (“SWMU-2”) was channeled to a new Wastewater Pretreatment System (“SWMU-1” - see Figure L-1) (ENSCI, 1993).

SWMU-1 was located in a 60-foot long by 30-foot wide by 25-foot high room in the northwest corner of the former Main Process Building. The floor of this room was covered in tile and a sump 6 inches wide and 12 inches deep bisected the room into eastern and western halves. According to Facility representatives, this sump collected wastewater spilled during treatment so it could be pumped back into the holding tanks. The two halves of the room formed two distinct areas with the holding tank area in the eastern half and the precipitation tank/filter press area in the western half. The holding tank area was a rectangular area surrounded by a six-foot high, concrete secondary containment wall that was 55 feet long and 25 feet wide. This area contained two 3,000-gallon fiberglass tanks that received wastewater from the process area. According to facility representatives, wastewater was primarily generated by spray lines used to cool the fired tiles that exited the kilns. The tiles were conveyed from the tile presses via a conveyor belt to the spray lines where water and glaze were applied to "green" tile before being sent to the kilns. The water from the spray heads was captured beneath the conveyor belt through floor grates that covered a series of subsurface trenches. This wastewater was conveyed to the holding tanks by a series of open trenches and grate-covered sumps that made up the Spray Line Area Sumps (SWMU-11) (Booz Allen, 2003).

The western portion of the wastewater treatment room contained four (4) precipitating tanks of various sizes (estimated to be between 250- and 500-gallon capacity) located in the northwestern corner of the room, and a filter press located in the west-central portion of the room. Wastewater from the holding tanks was pumped to the precipitation tanks where solids were allowed to settle. Flocculent was added to increase the rate of precipitation and pH adjusting solutions were added. At the time of the September 2003 RCRA VSI, four (4) drums of chemicals were stored near the precipitation tanks. Two (2) of the drums, labeled Selfloc and PolySep 1127, were described as flocculants by facility representatives. The other two (2) drums, one unlabeled and one labeled as caustic soda, were described as pH adjusting solutions by facility representatives. Treated wastewater from the precipitation tanks was discharged under a POTW permit to the City of Lexington sewer system. In the past, some of the treated wastewater was reclaimed and returned to the spray lines. Sludge from the precipitation tanks was pumped to the filter press, where additional water was extracted from the solids by compressing it into a filter cake. The extracted water was returned to the precipitating tanks. The filter cake left the filter press via a conveyer belt that dropped it through a hole in the western wall of the Main Process Building, into the Filter Cake Waste Pile Area (SWMU-9) (Booz Allen, 2003).

Information pertaining to releases and a detailed site assessment history of SWMU-1 are provided in Sections L-1b (1) and L-1c (1), respectively.

L-1a (2) SWMU-2 - Sludge Settling Ponds Operational History and Closure Activities

TYPE OF UNIT: Surface Impoundments

PERIOD OF OPERATION: 1972 to 1989 (capped in 1993)

PHYSICAL DESCRIPTION AND CONDITION:

SWMU-2 consisted of two surface impoundments estimated at 130' (L) x 30' (W) each (based on preliminary assessment figures) located in the northwestern corner of the Facility, between the northern property boundary and the northern wall of the former Main Building as shown on Figure L-1. Previous calculations indicated a total volume for both ponds to be approximately 8,240 cubic yards, consisting of approximately 3,625 cubic yards in the Western Pond and approximately 4,615 cubic yards in the Eastern Pond. Prior to January 1, 1989, wastewater treatment conducted at the Facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU-2), allowing solids to settle prior to discharge. After wastewater passed through the second (eastern) settling pond, Mid-State Tile and subsequently Mannington discharged wastewater directly into Rat Spring Branch of the Yadkin-Pee Dee River Basin pursuant to NPDES permit #NC0006459 (ENSCI, 1993, 1994).

Prior to 1990, the clay and silica used at the Facility likely contained hazardous constituents such as lead and chromium. In addition, according to Facility representatives, the pH of the incoming wastewater was usually in the range of 4 to 6. A site assessment of the Facility, prepared by Mannington, and dated April 12, 1990, consisted of a field investigation in which samples were collected from the Sludge Settling Ponds. TCLP analysis results detected leachable lead levels in the sludge ranging from 230 mg/L to 1,230 mg/L, which is well above the 5.0 mg/L threshold for a characteristic hazardous waste. All VOCs and SVOCs were BDL with the exception of methylene chloride, acetone, and carbon disulfide, which are considered laboratory artifacts. As a result, the solid waste (i.e., sludge) disposed in the Sludge Settling Ponds was a characteristic hazardous waste (D008) (NCDEQ, 1990b; ENSCI, 1993, 1994).

In July 1993, Mannington completed closure of the Sludge Settling Ponds (SWMU-2) according to the NCDEQ approved Closure Plan. Mannington submitted a certified closure report to NCDEQ on November 9, 2005, which NCDEQ subsequently accepted on February 1, 2006. As a result of closure activities, sludge was removed from both sludge ponds and stabilized with Portland Cement, such that the waste passed TCLP for lead. The stabilized material was placed back into the ponds and the area was capped with a RCRA compliant cap. According to facility representatives, the cap included a 30-millimeter synthetic liner and an asphalt cap that serves as the top layer. Additionally, all piping associated with the sludge ponds was removed. Some of the surrounding soils north and west of the Sludge Settling Ponds were excavated and placed on the Ceramic Tile Pile ("SWMU-3") prior to its closure in 1997. According to a September 1992 Consent Agreement, sludge from SWMU-2 was also deposited in SWMU-3. At the time of the September 2003 VSI, the asphalt cover appeared to be in good condition with no significant cracks, staining, or erosion identified (Booz Allen RFI, 2005).

Information pertaining to releases and a detailed site assessment history of SWMU-2 are provided in Sections L-1b (2) and L-1c (2), respectively.

L-1a (3) SWMU-3 – Waste Ceramic Tile Pile Operational History

TYPE OF UNIT: Waste Ceramic Tile Pile
PERIOD OF OPERATION: 1950s or 1960s to 1990 (capped in 1995)
PHYSICAL DESCRIPTION AND CONDITION:

SWMU-3 is located east of the former Main Process Building and immediately west of the Walltown Branch (SWMU-7). The unit extends approximately 12 feet north of the southern property fence line to the Area of Discharge from the Ceramic Tile Pile (AOC-1) to Rat Springs Branch as shown on Figures L-1 and L-2. The total volume of the unit is estimated at approximately 260,000 tons (*Transmittal of Revised Closure and Post-Closure Care Plans*, July

30, 1997). The Facility used the unit to store off-specification unfired and fired glazed ceramic tile. Additionally, in the early 1990s, soil north of SWMU-2 exhibiting elevated lead and zinc concentrations was excavated and placed on top of the Ceramic Tile Pile prior to closure of the unit, as was material from the Broken Tile Roadway (AOC-2). In 1990, Mannington stopped depositing waste tile material in SWMU-3 (NCDEQ, 1990d, 1990e, and 1990f).

Information pertaining to releases and a detailed site assessment history of SWMU-3 are provided in Sections L-1b (3) and L-1c (3), respectively.

L-1a (4) SWMU-4 - 20 Cubic Yard Sludge Roll-off Container Operational and Site Assessment History

TYPE OF UNIT: 20 Cubic Yard Sludge Roll-off Container
PERIOD OF OPERATION: 1990-1999 (according to facility representative)
PHYSICAL DESCRIPTION AND CONDITION:

A concrete pad with no secondary containment where 20 cubic yard steel roll-off containers were placed to receive sludge filter cake from SWMU-1 was situated adjacent to the western wall of the Main Building. This unit is referred to as SWMU-4 ("SWMU-4") and is located, approximately 40 feet south of the Filter Cake Waste Pile Area ("SWMU-9") as shown on Figure L-1. The concrete pad was approximately 15 feet wide and 40 feet long. At the time of the September 2003 VSI, no roll-off box was present at SWMU-4 and the concrete pad was in fair condition. Some cracks in the concrete pad and some vegetation growing in the cracks were noted by Booz Allen during its September 2003 site visit (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to facility representatives, a small front-end loader (e.g., Bobcat®) was used to transfer the sludge from the Filter Cake Waste Pile Area (SWMU-9) to roll-off containers in SWMU-4. Once the roll-off container was full, it was sent to the Kernersville, NC landfill (Subtitle D operated by Waste Management, Inc.) for disposal.

SWMU-4 Site Assessment History

In 1990, samples were collected from the filter cake and were analyzed for RCRA primary metals in extracted leachate (EP Toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The filter cake waste stream samples contained bis(2-ethylhexyl) phthalate at a concentration of 1.5 mg/kg. All other constituents were ND. Based on these sampling results, it was determined by NCDEQ that the filter cake waste stream was a nonhazardous waste that could be disposed of in a Subtitle D landfill. According to facility representatives, the solids generated by the filter press were characterized annually to ensure that the wastes were nonhazardous (USEPA, 1993).

HISTORY AND/OR EVIDENCE OF RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the September 2003 VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS:

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1a (5) SWMU-5 - 20 Cubic Yard Floor Sweeping Roll-Off Container Operational History

TYPE OF UNIT: 20 Cubic Yard Sludge Roll-off Container
PERIOD OF OPERATION: 1990 -1999 (facility permanently shut-down)
PHYSICAL DESCRIPTION AND CONDITION:

This unit was located adjacent to the eastern central wall of the former Main Process Building and consisted of a 20-cubic yard steel roll-off container ("SWMU-5") placed on the asphalt parking area (see Figure L-1). Floor sweepings from the Main Process Building, containing dust, small tile pieces, and other wastes spilled on the floor during tile manufacturing operations, and were swept up daily and deposited in SWMU-5. According to facility representatives, a tarpaulin was used to cover the top of the roll-off container. At the time of the September 2003 VSI, the area where the roll-off container was formerly located appeared to be in good condition (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED

The waste stream managed by this unit consisted of daily sweepings from the floor of the process area in the former Main Process Building. According to correspondence from NCDEQ to Mannington in 1990, as much as 5,000 pounds per week of floor sweepings were generated by ceramic tile manufacturing operations.

SWMU-5 Site Assessment History

In 1990, floor sweeping samples were collected and were analyzed for RCRA primary metals using the EP Toxicity Test (EP Toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The floor sweepings samples contained 1,1,1-trichloroethane (0.087 mg/kg), bis(2-ethylhexyl) phthalate (15 mg/kg), and benzyl butyl phthalate (3.6 mg/kg). In addition, the extractable leachate from the floor sweepings sample also contained 0.84 mg/L of lead. Based on these sampling results, NCDENR determined that the floor sweepings were a nonhazardous waste (USEPA, 1993; NCDEQ, 1990d, 1990e, 1990f).

HISTORY AND/OR EVIDENCE OF RELEASE(S)

No evidence of a release from this unit was identified in the available file material. In addition, according to Facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the September 2003 VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1a (6) SWMU-6 – Baghouse Operational History

TYPE OF UNIT: Baghouse
PERIOD OF OPERATION: 1960s to 1999 (facility permanently shut-down)
PHYSICAL DESCRIPTION AND CONDITION:

The Baghouse (“SWMU-6”) was historically located at the southwest corner of the former Main Process Building (see Figure L-1). The remaining footprint of the Baghouse is located above a concrete pad, which is approximately 2 feet high by 30 feet long by 8 feet wide. The Baghouse was used to collect particulates originating from the process area generated during production of the green tile. The unit operated under Air Permit #S408RS, issued by the City of Lexington. The dates of this permit are unknown. No information on the physical characteristics of this unit was identified in the available file material and Facility representatives could not provide any specific details. In addition, no information regarding the waste management practices associated with this unit, such as handling and disposal of spent filters, was available. Finally, no information on permit conditions or violations was identified in the available file material. According to Facility representatives, the particulates captured by this unit were recycled back into the raw materials stage of the tile production process. The unit was reportedly removed in 1999 or 2000 and was not present at the time of the September 2003 VSI. No information regarding the removal of this unit was identified in the available file material and Facility representatives could only provide the removal date (Booz Allen, 2003; Mannington 1992).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to facility representatives, this unit captured dust generated during production of the “green” tile, primarily from the pressing operations that molded raw materials into various sizes of tile. Facility representatives also indicated the dust collected by this unit was generated prior to addition of lead-containing glaze. Therefore, no hazardous waste was managed by this unit (Booz Allen, 2003; Mannington 1992).

No evidence of a release from this unit was identified in the available file material. In addition, according to Facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. At the time of the September 2003 VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1a (7) SWMU-7 - Walltown Branch History

TYPE OF UNIT: Surface Water Drainage Ditch
PERIOD OF OPERATION: 1960s to present

PHYSICAL DESCRIPTION AND CONDITION:

Walltown Branch (“SWMU-7”) is located immediately east of the Ceramic Tile Pile (SWMU-3) and drains to the north of the Facility approximately 0.5 miles to Rat Springs Branch, which flows to the southwest approximately 2 miles to Swearing Creek, a tributary of the Yadkin River. As of 1997, the NCDEQ Winston-Salem Regional Water Quality Office classified Rat Springs Branch as a "C" surface water designation (Aquaterra, 1997 - Tile Pile Closure Plan). The Walltown Branch was enclosed in pipe in 1992-1993 under a Nationwide 26 permit from the USACE. This permit was issued based on the determination by the USACE that no significant wetlands were present at the site (Aquaterra, 1997 - Tile Pile Closure Plan). The piping was installed to prevent surface water runoff from SWMU-3 to discharge into the creek. At the time the piping was installed at Walltown Branch, a permanent 25-foot easement was conveyed to the City of Lexington. A sanitary sewer line and storm sewer line also run parallel to SWMU-7 northward across the eastern portion of the property and a permanent 25-foot easement for these lines was also conveyed to the City of Lexington (Aquaterra, 1997b, 2000; Booz Allen, 2003; Mannington, 2004).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

This unit was not designed to manage or handle waste. This unit is a tributary that was located on the Facility property prior to the property being purchased or the Facility being operated. SWMU-3 is located west and adjacent to the Walltown Branch as shown on Figure L-1. SWMU-3 is upgradient of the Walltown Branch. Prior to its enclosure, runoff from the Ceramic Tile Pile and the Facility entered into the Walltown Branch. As a result, according to Booz Allen, SWMU-7 may have received hazardous constituents from the waste tile fragments primarily consisting of RCRA metals such as lead (Booz Allen, 2003).

Information pertaining to releases and a detailed site assessment history for SWMU-7 are provided in Sections L-1b (4) and L-1c (4), respectively.

L-1a (8) SWMU-8 - Off-Specification Tile Accumulation Roll-Off Container Operational and Site Assessment History

TYPE OF UNIT: 40 Cubic Yard Roll-off Container
PERIOD OF OPERATION: 1990-1999 (facility permanently shut-down)
PHYSICAL DESCRIPTION AND CONDITION:

A 40-cubic yard roll-off container that was situated on an asphalt surface was located on the asphalt roadway covering the area formerly occupied by the Sludge Settling Ponds (SWMU-2), adjacent to the north central wall of the Main Process Building ("SWMU-8") (see Figure L-1). According to facility representatives, once waste tile was no longer deposited in the Ceramic Tile Pile (SWMU-3), this unit was used to store broken and off-specification tile from the manufacturing operation before it was disposed off-site. At the time of the September 2003 VSI, the roll-off container associated with this unit was no longer present at the facility; however, a metal frame structure with a corrugated metal roof was observed in the unit location. According to Booz Allen, Facility representatives indicated that the metal frame roof was installed at an unknown date to cover the roll-off container (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to several RCRA Inspection Reports, after closure of the Ceramic Tile Pile (SWMU-3) in 1990, ceramic tile wastes accumulated at the facility were stored in this roll off container before being transported to the Davidson County landfill (Subtitle D) for disposal. The waste stream managed by this unit consisted of unfired and fired ceramic tile and chips that were rejected during quality control inspections because they did not meet technical specifications. According to correspondence from NCDEQ to Mannington in 1990, as much as 20,000 pounds per week of unfired glaze ceramic tile and 110,000 pounds per week of fired glaze ceramic tile were generated by ceramic tile manufacturing operations (USEPA, 1991; NCDEQ, 1990d, 1990e, 1990f).

SWMU-8 Site Assessment History

In 1990, samples were collected from each of the fired and unfired tile waste streams. The samples were analyzed for RCRA primary metals in extracted leachate (EP toxicity characteristic via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The samples collected from the fired glaze ceramic tile waste stream were ND. The unfired glaze ceramic tile waste stream samples contained bis(2-ethylhexyl) phthalate at a concentration of 5.6 mg/kg. All other constituents in all of the waste stream samples were ND. Based on these sampling results, it was determined by NCDEQ that the fired and unfired glaze ceramic tile waste streams were nonhazardous waste that could be disposed of in a Subtitle D landfill. As a result, waste from SWMU-8 was sent to the Davidson County landfill for disposal (USEPA, 1991; NCDEQ, 1990d, 1990e, 1990f).

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of nonhazardous or hazardous waste from this unit have ever occurred. Finally, at the time of the VSI, no visual evidence of a release (i.e., staining) was observed.

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS:

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1a (9) SWMU-9 - Filter Cake Waste Pile Area Operational History

TYPE OF UNIT: Waste Pile
PERIOD OF OPERATION: 1988/89 -1999 (facility permanently shut down)
PHYSICAL DESCRIPTION AND CONDITION:

SWMU-9 is the former location of the discharged waste cake from the Facility filter press (see Figure L-1). The unit is comprised of a concrete floor, three (3) partial concrete walls with three (3) partial metal sides, and a roof. The unit dimensions are 8 feet wide by 8 feet deep by 10 feet tall. A conveyer belt extends from the filter press unit located in the Wastewater Pretreatment System (SWMU-1) room through the west wall of the former Main Process Building, which was used to convey the filter cake outside to the floor of the unit. The open western wall of SWMU-9 was used to allow a front-end loader (e.g., Bobcat®) to transfer the filter cake waste pile to the 20-Cubic Yard Sludge Roll-Off Container (SWMU-4) for disposal. At the time of its inspection, Booz Allen reported the unit contained residual solids and observed staining on the concrete floor from the filter press (Booz Allen, 2003).

SWMU-9 Site Assessment History

The filter press received wastewater from the Facility spray lines and sump pumps. In 1990, samples were collected from the filter cake and were analyzed for RCRA primary metals in extracted leachate (EP toxicity via EPA Method 1310), VOCs (EPA Method 8240), and base neutral extractable compounds (EPA Method 8270). The filter cake waste stream samples contained bis(2-ethylhexyl) phthalate at a concentration of 1.5 mg/kg. All other constituents were ND. Based on these sampling results, it was determined by NCDEQ that the filter cake waste stream was nonhazardous waste and could be disposed of in a Subtitle D landfill. According to facility representatives, the solids generated by the filter press were characterized annually to ensure that the wastes were nonhazardous (NCDEQ, 1993).

No evidence of a release from this unit was identified in the available file material. According to Booz Allen's 2003 report, facility representatives told them the conveyor deposited solids from the filter press outside of the covered unit to an area as far as the chain-link fence located parallel to the Facility's western property line. Also, runoff from rain events may have allowed the filter cake and residual materials to leach onto the surrounding soils. An asphalt cover was reportedly added to AOC-2 to inhibit impact from the solids or potential runoff. Finally, solids and residual dust were identified on the concrete floor and walls and on the soils directly in front of the unit at the time of the VSI (Booz Allen, 2003).

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS:

The 2005 RFA recommended no further action other than improved storage procedures to prevent further release of the filter cake solids to the soils in front of the unit. Now that there are no longer filter cake solids remaining and the building and all structures have been demolished, Waters Edge concurs that no further action is recommended.

L-1a (10) SWMU-10 - Maintenance Building Waste Management Areas Operational History

TYPE OF UNIT:

a. Drum Storage Area
b. Parts Washer

PERIOD OF OPERATION: 1960s to 1999 (facility permanently shut-down)

PHYSICAL DESCRIPTION AND CONDITION:

The former Maintenance Building Waste Management Areas ("SWMU-10") were located in the southwest corner of the facility property, west of the Former UST and AST Area (AOC-3) and east of the Baghouse (SWMU-6) (see Figure L-1). The former Maintenance Building is a metal, enclosed building with two large rolling bay doors and a concrete floor. The building is approximately 40 feet long by 40 feet wide by 20 feet high. The Facility, according to Booz Allen, reportedly ceased using this building in 2000 (& related production operation ceased in 1999). The building was used to store chemicals, such as wastewater treatment chemicals, bulk chemicals, solvents, used oil, and lubricants which were used at the facility to perform maintenance on forklifts. The chemicals were stored primarily in 55-gallon drums, which were stored in various locations inside the Maintenance Building. A parts washing tank was also stored in the former Maintenance Building. Finally, a subsurface work area that was used to allow mechanics better access to the forklifts was located in the western central portion of the former Maintenance Building. The subsurface work area was approximately 4 feet wide by 8 feet long by 3 feet deep. Booz Allen observed dark staining on the concrete west of the two bay doors and some minor staining in the subsurface work area (Booz Allen, 2003; USEPA, 1991, 1992a, 1993).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED

The Booz Allen report indicates the Facility used the former Maintenance Building to store 55-gallon drums containing chemicals used at the facility. The chemicals stored included wastewater treatment chemicals, bulk chemicals, and used oil. According to a RCRA Inspection Report dated December 4, 1991, wastes generated at this unit included flammable waste petroleum naphthalene (D001) used in a parts washing tank, and used oil stored in drums generated by routine maintenance activities. Spent parts washing solvents and used oil were removed from the site monthly for recycling/reprocessing. According to a RCRA Inspection Report dated May 27, 1994, the Facility eventually eliminated the parts washers, thereby eliminating the generation of flammable waste petroleum naphthalene (D001) (Booz Allen, 2003; USEPA, 1991, 1992a, 1993).

SWMU-10 Site Assessment History

No evidence of a release from this unit was identified in the available file material. Additionally, according to Facility representatives in communicating with Booz Allen, no releases of nonhazardous or hazardous waste from this unit have ever occurred. At the time of the September 2003 VSI, Booz Allen observed dark staining on the concrete west of the two bay doors and some minor staining in the subsurface work area. However, it should be noted that the staining did not extend off of the concrete surfaces and no cracks were identified in the concrete. According to Facility representatives in communicating with Booz Allen, the source of this staining is not known. At the time of the September 2003 VSI, the staining appeared to be due to rusting of the metal walls of SWMU-10, according to Booz Allen. (Booz Allen, 2003).

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1a (11) SWMU-11 - Spray Line Area Wastewater Sumps Operational History

TYPE OF UNIT: Wastewater Sumps
PERIOD OF OPERATION: 1960s or 1970s to 1999 (facility permanently shut-down)
PHYSICAL DESCRIPTION AND CONDITION:

The spray lines and associated sumps ("SWMU-11") were previously located in one of the large process rooms in the northern portion of the former Main Process Building. According to Booz Allen, Facility representatives reported that the tiles were conveyed from the tile presses via a conveyor belt to the spray lines where water and glaze were applied to "green" tile before they were sent to the kilns. The water from the spray heads was captured beneath the conveyor belt through several floor grates, which covered a series of subsurface trenches. The wastewater was then channeled, by use of sumps, to the Wastewater Pretreatment System (SWMU-1) or, historically, to the Sludge Settling Ponds (SWMU-2) to be treated and disposed. According to Booz Allen, Facility representatives advised them that some of the wastewater from the Wastewater Pretreatment System (SWMU-1) was also looped back into the spray lines. At the time of the September 2003 VSI, the spray lines and equipment were no longer present. The equipment was reportedly removed in 2000 and transferred to another Porcelanite company facility. During the September 2003 VSI, Booz Allen reported that the area appeared to be in good condition; however, the unit was overflowing with water so the bottom and sides of the sump could not be inspected. The trenches were overflowing with water that, according to Facility representatives, originated from water leaks in the roof of the building (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

SWMU-11 managed wastewater generated by the spray lines. According to Booz Allen's report of conversations with Facility representatives, the wastewater contained high concentrations of solids, primarily clay and silica, raw materials used to make the tile, as well as glaze and stain overspray from the coloring of unfired tile. The clay, silica, and glaze formerly contained metals such as lead and chromium. In addition, the wastewater entering the Wastewater Pretreatment System (SWMU-1) from the Spray Line Area Sumps (SWMU-11) had a pH in the range of 4-6 (e.g. nonhazardous characteristic) (Booz Allen, 2003; Mannington, 2004).

SWMU-11 Site Assessment History

No evidence of a release from this unit was identified in the available file material. In addition, according to Booz Allen's report of conversations with Facility representatives, no releases of nonhazardous or hazardous waste from this unit have occurred. Finally, at the time of the VSI, Booz Allen saw no visual evidence of a release (i.e., staining) was observed; however, the unit was overflowing with water so the bottom and sides of the sump could not be inspected (Booz Allen, 2003; Mannington, 2004).

The 2005 RFA stated that because the unit was filled with water at the time of the September 2003 VSI, a more thorough inspection of this unit was recommended. Based on this recommendation, on February 10, 2015, a Waters Edge environmental technician and vacuum truck were mobilized to the facility. Both sumps and trenches were cleaned of debris and also pumped out and then a squeegee was used to expose the floor of the sumps and trenches. The sump walls, the sumps, and the trenches were determined by Waters Edge personnel to be intact and there were no indications of cracking that would jeopardize the integrity of the unit. Photo documentation collected by Waters Edge and provided to NCDEQ included the following (see Appendix L-1):

- Photograph #5 and #6 - Surficial Condition of Spray Line Trench Area
- Photograph #7 and #8 - Spray Line Sump Walls Depicting Non-Cracked Condition
- Photograph #9, #10 and #11 - Non-Cracked Condition of Spray Line Sump Floor
- Photograph #12 and #13 - Non-Cracked Condition of Spray Line Trench Bottom

As such, Waters Edge recommended no further action required for SWMU-11. In a May 7, 2015 NCDEQ correspondence, NCDEQ concurred with this conclusion.

L-1a (12) AOC-1 Area of Discharge North of the Ceramic Tile Pile Operational History

Our first point for this Section involves a clarification of the description of this particular area. In the 2005 RFA, AOC-1 is described as an "Area of Discharge from the Sludge Settling Ponds to Rat Springs Branch"; however, the associated figure in the 2005 RFA clearly depicts an area north of the Ceramic Tile Pile. Based on a discussion with NCDEQ, it was determined that the figure depicting the area north of the Ceramic Tile Pile was correct and accurately characterized AOC-1 as discussed in this Section.

TYPE OF UNIT: Discharge Area from the Ceramic Tile Pile
PERIOD OF OPERATION: 1972 to 1990 (No wastewater discharge received after 1990)

PHYSICAL DESCRIPTION AND CONDITION:

The Area of Discharge from the Ceramic Tile Pile ("AOC-1") is located adjacent to the northeast corner of the Facility property line (see Figure L-1) (Aquaterra, 1997b; Booz Allen, 2003). A description of the operational history of the Ceramic Tile Pile has been previously discussed in Section L-1a (3). AOC-1 represents an area impacted from constituents from SWMU-3 that have migrated to the north.

Information pertaining to releases and a detailed site assessment history of AOC-1 are provided in Sections L-1b (5) and L-1c (5), respectively.

L-1a (13) AOC-2 Broken Ceramic Tile Roadway Operational History

TYPE OF UNIT: Road paved with broken ceramic tile
PERIOD OF OPERATION: Unknown date prior 1992 to present

PHYSICAL DESCRIPTION AND CONDITION:

The Broken Ceramic Tile Roadway constitutes Area of Concern 2 ("AOC-2"). It consists of an eight-foot wide roadway that begins in the northwest corner of the property beneath the asphalt cap constructed as part of the Sludge Settling Ponds (SWMU-2) closure activities, extends south for approximately 500 feet and terminates in the vicinity of the Baghouse (SWMU-6) and the Maintenance Building Waste Management Areas (SWMU-10) (see Figures L-1 and L-3). AOC-2 was partially constructed of waste tile fragments that were applied to the ground in the 1980s. During Sludge Settling Pond closure activities in the early 1990s, the northern portion of the roadway was excavated and placed on the tile pile. There was reportedly a confirmatory sample collected when the excavation was halted; however, this information cannot presently be documented. This excavated portion and the remainder of AOC-2 was subsequently covered with asphalt and gravel. The asphalt portion of the roadway is located on the north and south ends of the roadway. The gravel-covered portion of this unit is located in the middle portion of the road near the Filter Cake Waste Pile Area (SWMU-9) and the 20-Cubic Yard Sludge Container (SWMU-4). At the time of the September 2003 VSI, Booz Allen reported that the roadway appeared to be in good physical condition, with little significant cracking or deterioration of the asphalt (ENSCI, 1992; Booz Allen, 2003; ENSCI, 1994).

Information pertaining to releases and a detailed site assessment history of AOC-2 are provided in Sections L-1b (6) and L-1c (6), respectively.

L-1a (14) AOC-3 -Former UST and AST Area Operational History

TYPE OF UNIT: USTs and ASTs
PERIOD OF OPERATION: Unknown (Estimated 1960s) to 1989
PHYSICAL DESCRIPTION AND CONDITION:

Area of Concern 3 is comprised of the former UST and AST Area ("AOC-3"). AOC-3 is located in the southwest portion of the Facility, between the road running parallel to the southern wall of the former Main Building and Victor Street (see Figure L-1). The Maintenance Building Waste Management Areas (SWMU-10) are located immediately west of AOC-3. In 2003, AOC-3 was a grass-covered area with a short concrete curb running along the northern edge of the area and a barbed-wire topped fence, marking the facility property boundary on the southern edge of the area (Aquaterra, 1990a; NCDEQ, 1990a; Booz Allen, 2003).

According to Mr. Tony Shaw representing Mannington, two (2) steel, 2,000-gallon USTs were installed at an unknown time that was estimated to be in the 1960's. These USTs were used to store gasoline and #2 fuel oil that was used in vehicles operated at the facility. In November 1989, the USTs and associated piping were removed and soil samples were collected from the excavation. Initially, four soil samples were collected by Aquaterra, Inc., from the bottom of the excavation, which ranged from 9 to 15 feet bgs. The samples were analyzed for TPHs via EPA Methods 3550 and 5030. After the excavation of additional impacted soil in the western portion of the pit, the excavation was backfilled with clean fill. On May 29, 1990, NCDEQ issued a letter indicating that the UST system had been closed in accordance with UST regulations (40 CFR Subpart 280.71 and 280.72) (Aquaterra, 1990a; NCDEQ, 1990a; Booz Allen, 2003).

According to Mr. Tony Shaw representing the Facility, in 1993, a 750-gallon steel AST was installed in the location formerly occupied by the USTs. The AST was surrounded by a steel secondary containment system. This AST was used to store diesel fuel for facility vehicles. At some point between 1999 and 2000 (full facility closure), Facility representatives indicated that the AST was removed and that no releases or staining were observed during removal activities; however, no sampling was conducted (Booz Allen, 2003).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No wastes were managed at this unit; however, the gasoline, #2 fuel oil, and diesel fuel stored in the USTs and AST all contain hazardous constituents, such as benzene, toluene, ethylbenzene, and xylene (Aquaterra, 1990a; NCDEQ, 1990a; Booz Allen, 2003).

RECOMMENDATION: No Further Action (X)

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS

The 2005 RFA recommended no further action and Waters Edge concurs with this recommendation.

L-1b Information Pertaining to Releases

Based on the 2005 RFA, a total of eleven (11) SWMUs and three (3) AOCs had been identified at the Facility as summarized in Table L-1 and as depicted on Figure L-1. Four (4) SWMUs and two (2) AOCs are currently under evaluation for possible additional assessment including the following:

- Waste Water Pretreatment System (SWMU-1)
- Two (2) Sludge Settling Ponds (SWMU-2)
- Ceramic Tile Pile (SWMU-3)
- Walltown Branch (SWMU-7)
- Area of Discharge from the Tile Pile (AOC-1)
- Broken Ceramic Tile Roadway(AOC-2)

Note: As described in Section L-1a (11)- SWMU-11 was recommended for NFA determination which was agreed upon in a May 7, 2015 NCDEQ correspondence.

L-1b (1) Wastewater Pretreatment System (SWMU-1)

Previously, SWMU-1 received wastewater that was primarily generated by spray lines associated with the tile manufacturing operation. According to facility representatives, the wastewater contained high concentrations of solids which primarily consisted of clay and silica raw materials used to manufacture the tile.

Prior to 1990, the clay and silica contained hazardous constituents such as lead and chromium; however, it is unclear if SWMU-1 received wastewater contaminated with metals. If this unit did receive wastewater contaminated with metals, there is potential that it would be characteristic for toxicity, most likely for lead (D008); however, no sampling data was available to confirm this possibility. In addition, the pH of the incoming wastewater was usually in the range of 4 to 6. As a result, caustic soda was added to neutralize the pH to a nominal range of 7 to 8 before discharge to the sanitary sewer system (ENSCI, 1993; Booz Allen, 2003; Mannington, 2004). The City of Lexington POTW sampled this discharge regularly per their permit to assure no lead was present.

L-1b (2) Two (2) Sludge Settling Ponds (SWMU-2)

SWMU-2 consisted of two surface impoundments estimated at 130' (L) x 30' (W) each (based on preliminary assessment figures) located in the northwestern corner of the Facility, between the northern property boundary and the northern wall of the former Main Building. Prior to January 1, 1989, wastewater treatment conducted at the Facility consisted of passing wastewater through a series of two Sludge Settling Ponds (SWMU-2), allowing solids to settle prior to discharge. After wastewater passed through the second (eastern) settling pond, the wastewater discharged directly into Rat Spring Branch of the Yadkin-Pee Dee River Basin.

Prior to 1990, the clay and silica used at the Facility likely contained hazardous constituents such as lead and chromium. In addition, according to Facility representatives, the pH of the incoming wastewater was usually in the range of 4 to 6. A site assessment of the Facility dated April 12, 1990, consisted of a field investigation in which samples were collected from the Sludge Settling Ponds. TCLP analysis results detected leachable lead levels in the sludge ranging from 230 mg/L to 1,230 mg/L, which is well above the 5.0 mg/L threshold for a characteristic hazardous waste. All VOCs and SVOCs were BDL with the exception of methylene chloride, acetone, and carbon disulfide, which are considered laboratory artifacts. As a result, the solid waste (i.e., sludge) disposed in the Sludge Settling Ponds was a characteristic hazardous waste (D008) (NCDEQ, 1990b; ENSCI, 1993, 1994).

In July 1993, Mannington completed closure of the Sludge Settling Ponds (SWMU-2) according to the NCDEQ approved Closure Plan. Mannington submitted a certified closure report to NCDEQ on November 9, 2005, which NCDEQ subsequently accepted on February 1, 2006. As a result of closure activities, sludge was removed from both sludge ponds and stabilized with Portland Cement, such that the waste passed TCLP for lead. The stabilized material was placed back into the ponds and the area was capped with a RCRA compliant cap. According to facility representatives, the cap included a 30-millimeter synthetic liner and an asphalt cap that serves as the top layer. Additionally, all piping associated with the sludge ponds was removed. Some of the surrounding soils north and west of the Sludge Settling Ponds were excavated and placed on the Ceramic Tile Pile ("SWMU-3") prior to its closure in 1997. According to a September 1992 Consent Agreement, sludge from SWMU-2 was also deposited in SWMU-3. At the time of the September 2003 VSI, the asphalt cover appeared to be in good condition with no significant cracks, staining, or erosion identified (Booz Allen RFI, 2005).

L-1b (3) Waste Ceramic Tile Pile (SWMU-3)

There have been numerous Ceramic Tile Pile and soil assessment efforts conducted as part of the tile pile waste characterization and soil assessment in support of the closure of SWMU-3. Based on the site assessments conducted between 1991 and 1997 at the Facility, sample analysis results detected leachable lead levels in the Waste Ceramic Tile Pile considered to be a characteristic hazardous waste. Results ranged from 7.57 mg/L (sample 2HA-1) to 187 mg/L (sample Comp-1) (see Table L-7). As a result, the solid waste (i.e., ceramic tile) disposed on the Waste Ceramic Tile Pile was considered a characteristic hazardous waste (D008) in that samples from several different areas contained TCLP lead levels in excess of the regulatory limit of 5.0 mg/L (NCDEQ, 1990b).

In addition, impacted sludge/soil from SWMU-2 was also deposited in the Waste Ceramic Tile Pile prior to closure as follows:

- An unknown quantity of partially stabilized sludge and additional impacted soil located north and west of the Sludge Settling Ponds (SWMU-2) was excavated and deposited on the Ceramic Tile Pile (SWMU-3) prior to closure. According to the Closure Report for the Sludge Settling Ponds (SWMU-2), the partially stabilized sludge exceeded the NCGS via TCLP for mercury and zinc (closure standards NCDEQ temporarily used during that period of time) and the TCLP regulatory limit for lead when it was deposited on the Ceramic Tile Pile (SWMU-3) (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003). This excavated area also included one soil sample location SS-2 (see Figure L-4) from the area northeast of SWMU-2 which exceeded the lead TCLP threshold of 5.0 mg/L at a concentration of 6.64 mg/L.

- Impacted soil from along former Charles Avenue north of the Ceramic Tile Pile near the northern property boundary (see Figure L-2) was excavated and placed on the Waste Ceramic Tile Pile based on the results of borings HA-9 (total lead detected at 1,370 mg/kg in excess of the 1997 lead closure standard of 49.32 mg/kg) and 4HA-48 (total lead detected at 5,140 mg/kg in excess of the lead closure standard of 49.32 mg/kg). It is our understanding that no confirmation sampling was collected subsequent to the soil removal.

After the aforementioned multiple phases of soil assessment effort, the Facility initiated closure with wastes in place of the Ceramic Tile Pile (SWMU-3) due to soils exhibiting leachable levels of lead in excess of USEPA standards that were considered a characteristic hazardous waste (D008). Consistent with the approved 1997 Closure Plan, wastes were left in place and the unit was closed with a RCRA-compliant cap. The unit is capped with a "flat top surface cap" and a "slope surface cap" using a RCRA-compliant cap including a vegetative cover, geotextile liner, HDPE liner, and another managed vegetative cap. The top portion of the unit is level with the facility parking lot and has gravel covering the majority of the top of the unit. The sloped sides of the unit are covered with native vegetation. The 1997 approved *Ceramic Tile Pile Closure Plan* also depicted an area which exceeded three (3) times background levels for the metals barium, boron, lead, manganese and zinc. These other areas that showed elevated total inorganic values in excess of three (3) times background levels were covered with the silty clay cover material used to stabilize the RCRA cap as shown on Figure L-2. The silty clay cover was two (2) or more feet thick over these elevated total inorganic areas, thus preventing dermal contact and minimizing leaching of the metals from the soils to the groundwater. (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003). This closure plan was approved by NCDEQ on April 26, 2004.

L-1b (4) Walltown Branch (SWMU-7), a previously piped-in stream

Walltown Branch (SWMU-7) was not designed to manage or handle waste. This unit is a tributary that was located on the Facility property prior to the property being purchased or the Facility being operated. SWMU-3 is located west and adjacent to the Walltown Branch as shown on Figure L-1. SWMU-3 is upgradient of the Walltown Branch. Prior to its enclosure, runoff from the Ceramic Tile Pile and the Facility entered into the Walltown Branch. As a result, according to Booz Allen, SWMU-7 may have received hazardous constituents from the waste tile fragments primarily consisting of RCRA metals such as lead (Booz Allen, 2003). This unit would no longer receive hazardous constituents as it was piped in 1992/1993 to exclude runoff from SWMU-3.

L-1b (5) Area of Discharge from the Tile Pile (AOC-1)

The Area of Discharge from the Tile Pile (AOC-1) was not designed to manage or handle waste. AOC-1 is located adjacent to the northeast corner of the Facility property line (see Figure L-1) (Aquaterra, 1997b; Booz Allen, 2003). A description of the Operational History of the Waste Ceramic Tile Pile has been previously discussed in Section L-1a (3). AOC-1 may have received hazardous constituents from the waste tile fragments primarily consisting of RCRA metals such as lead.

L-1b (6) Broken Ceramic Tile Roadway(AOC-2)

The Broken Ceramic Tile Roadway (AOC-2) was not designed to manage or handle waste. This AOC consists of an 8-foot wide roadway that begins in the northwest corner of the property beneath the asphalt cap constructed as part of the Sludge Settling Ponds (SWMU-2) closure activities, extends south for approximately 500 feet and terminates in the vicinity of the Baghouse (SWMU-6) and the Maintenance Building Waste Management Areas (SWMU-10) (see Figures L-1 and L-3). AOC-2 was partially constructed of waste tile fragments that were applied to the ground in the 1980s.

L-1c Sampling and Analysis

L-1c (1) SWMU-1 Site Assessment History

At the time of the September 2003 VSI conducted by Booz Allen, SWMU-1 was reportedly in poor condition. According to Booz Allen, numerous stains were observed both inside the secondary containment and on the tile floor beneath the precipitating tanks and the filter press. In addition, Booz Allen reported the tile floor to be cracked and deteriorating in several places and a substantial amount of an unknown white powdery residue was observed on the floor and secondary containment walls. Also, according to Booz Allen, a significant amount of liquid was observed in the sump and on the tile floor. The source of the liquid could not be determined; however, it appeared to Booz Allen that the liquid was untreated or partially treated wastewater that had spilled or leaked from the precipitating tanks. Finally, Booz Allen observed the bung on the metal drum containing PolySep 1127 was open and a significant amount of rust was observed on the top and sides of the drum. In general, Booz Allen reported observing very poor housekeeping procedures associated with the Wastewater Pretreatment System (SWMU-1) (Booz Allen, 2003).

Because of the poor housekeeping procedures observed by Booz Allen associated with SWMU-1 during the 2003 VSI, the poor structural condition of the floor (e.g., cracks), and the extensive staining they observed, Booz Allen recommended that sampling be performed to further investigate the potential for release of hazardous constituents. The 2005 RFA prepared by Booz Allen recommended sampling to include wipe sampling of the floor and walls in the areas of staining, an investigation to determine the integrity of the sump and floor of the unit, and, if it is determined that the sump or floor integrity has been compromised, sampling of the soils beneath the unit. The RFA recommended that samples be analyzed for RCRA metals, specifically lead.

Based on this recommendation, on January 23, 2015 Waters Edge collected four (4) wipe samples from the surface of SWMU-1 using a hexane wipe and submitted the samples to a laboratory according to EPA-approved methodologies. All four (4) samples were analyzed for RCRA Primary Metals according to Method 6010 and Method 7470. The following metals were detected in at least one (1) of the four (4) wipe samples at concentrations above the method detection limit:

- arsenic (ND to 4.1 total µg)
- barium (134 to 854 total µg)
- cadmium (0.83 to 7.8 total µg)
- chromium (14.0 to 38.5 total µg)
- lead (262 to 2,000 total µg)
- selenium (2.7 to 4.0 total µg)
- silver (ND to 6.3 total µg)
- mercury (ND to 5.6 total µg)

The March 5, 2015 report documenting these activities, including photo documentation of the sample locations, is provided in Appendix L-1.

On May 7, 2015, Ms. Mary Siedlecki representing NCDEQ reviewed the above mentioned interim remediation and assessment effort and recommended in a correspondence to attempt to power wash the concrete pad, collect rinsate water, and analyze wipe samples in an attempt to demonstrate results below method detection limits. Achieving all "non-detect" sample results at such low levels would likely be a challenge on most any industrial or commercial surface. We are considering alternative options.

L-1c (2) SWMU-2 Site Assessment History

The site assessment history surrounding the closed Sludge Settling Ponds (SWMU 2) has been developed from several previous investigations as follows:

1989 Soil/Tile Material and Sludge Settling Pond Assessment

The 1989 soil assessment consisted of fourteen (14) soil test borings advanced in background native soils (B-1, B-2, and B-3), in the area of SWMU-3 (B-7 to B-14) and in the area of the Sludge Settling Ponds (B-4 to B-6). Soil sample B-4 was collected at a depth of 6.0 to 7.5 feet bgs, soil sample B-5 was collected at a depth of 1.0 to 2.5 feet and 6.0 to 7.5 feet bgs, and soil sample B-6 was collected at a depth of 2.5 to 4.0 feet and 17.5 to 19.0 feet bgs for PPM analysis. PPM were not detected in samples B-4 to B-6 above the method detection limits. A photocopy of the data tables and a figure showing location of borings is contained in the July 11, 1997 *Ceramic Tile Closure Plan*- Appendix A. Results for B-4 to B-6, related to the Sludge Settling Pond, are contained in Tables L-2 and L-3 and shown on Figure L-4.

1994-2002 Sludge Settling Pond Assessment

- **Soil Assessment**- Subsequent to the previously mentioned closure activities, numerous rounds of additional soil assessment were conducted both north of SWMU-2 and west along the Broken Ceramic Tile Roadway (AOC-2) from 1994 to 2002. The location of thirty-seven (37) soil assessment borings (SS-1 to SS-9 and SS-16 to SS-43) are depicted on Figure L-4, and five (5) background boring sample locations (B-1 to B-3, BG-1 and BG-2) are depicted on Figure L-5. Historic information regarding soil borings SS-10 through SS-15 could not be located. Initially, soil samples surrounding SWMU-2 were collected at a depth of 1 to 2 feet bgs. If sample results indicated a concentration above the risk-based standards outlined below, additional soil samples were collected at depths of 3 feet bgs and 5 feet bgs, as necessary, with the exception of sample SS-24, where additional samples were collected at depths of 3, 4 and 6 feet bgs. Soil samples associated with SWMU 2 were analyzed for PPM (both total and via TCLP) and radionuclides, with the assessment results summarized in Table L-2 (TCLP results are contained in the July 14, 2004 Revised Closure Plan for SWMU 2). The background soil samples were collected at depths of 2.5 to 4 feet bgs and 10 to 11.5 feet bgs in boring B-1, at a depth of 2.5 to 4.0 feet bgs in boring B-2, and at a depth of 3.5 to 5.0 feet bgs in boring B-3 for PPM analysis. Background soil samples BG-1 and BG-2 were collected at a depth of 0.0 to 1.0 foot bgs for PPM analysis. Native soil samples, BG-1 and BG-2, are depicted in the November 5, 2002 *Proposed Modification to the Closure Plan, Lagoon Closure Activities*, Figure 2 and Table 1.

The background samples results are summarized in Table L-4. Based on direction from representatives of NCDEQ in the 1990s, for closure purposes, soil sample results were compared to the highest of the following three risk-based standards:

- 1993 Soil Screening Level (SSL) Protective of Groundwater
- Region 9 Risk-Based Concentration (RBC)
- Site Specific Background Level plus two times (2X) the Standard Deviation

Based on these risk-based standards, additional material exhibiting concentrations above the risk-based standards (SS-2, SS-3, SS-5 through SS-7, SS-22 through SS-24, SS-33, SS-35, and SS-36 sample locations) was removed from these areas and deposited on SWMU-3 prior to its closure in 1997 (see depicted area on Figure L-4). This included one location, SS-2 outside the northeastern fence line, where the surface soil contained 6.64 mg/L of leachable lead, which exceeds the 5 mg/L TCLP regulatory limit. With the exception of areas represented by samples SS-22 through SS-24, where confirmatory samples SS-39 through SS-41 were collected (western area of excavation), confirmatory sampling was not conducted in these areas after the removal of impacted material. These areas (SS-2, SS-3, SS-5 through SS-7, SS-33, SS-35, and SS-36) would be considered data gaps and confirmatory sampling for metals is recommended. It was also determined that the radionuclides did not exceed background levels; therefore, were considered benign. This removal action and risk evaluation is further documented in the July 14, 2004 *Revised Closure Plan for the Former Settling Ponds*.

- **Surface Water and Sediment-** There is no surface water or sediment associated with SWMU-2.

- **Groundwater Assessment**- There have been numerous groundwater assessment monitoring wells placed upgradient, side-gradient and downgradient of SWMU-2. These include groundwater monitoring wells MW-1 (upgradient), MW-3A, MW-9D, MW-10, MW-11D, MW-12, MW-13, MW-14 and MW-28D (see Part E - Groundwater Monitoring). Prior to initiating closure activities at this unit, groundwater monitoring results indicated the presence of cadmium, iron, lead, manganese, nickel, and zinc in shallow and deep groundwater monitoring wells at concentrations that exceeded the NCGS. Specifically, groundwater samples collected from monitoring wells MW-1 (upgradient), MW-3A, MW-9D, MW-10, MW-11D, MW-12, MW-13, MW-14 and MW-28D all contained exceedances of the NCGS during numerous previous groundwater sampling events in 1990, 1991, and/or 1992 (ENSCI, 1993, 1994; NCDEQ, 1999a, 1999b, 1999d). Groundwater impact is discussed as a separate site-wide media in Part E - Groundwater Monitoring.

SWMU-2 Past Soil Assessment Results versus Current Risk-Based Standards and Existing Data Gaps

In an effort to evaluate the extent of impacted soil remaining outside the area of SWMU-2 as defined by current risk-based Inactive Hazardous Site Branch (IHSB) standards, the past soil analytical results were compared to the following criteria:

Current IHSB PGW PSRGs
- Current IHSB Industrial PSRGs and PGW PSRGs

Based on the criteria mentioned above, soils from the following boring locations outside the closed Sludge Settling Ponds were not removed but still exceed either IHSB PGW or Industrial PSRGs:

SWMU-2 Current IHSB RBC Exceedances

Boring Location	**Above IHSB PGW PSRG**	**Above IHSB Industrial PSRG**
SS-1(0-1')	Cobalt (<3.62 versus 0.9 PSRG) Manganese (82.4 versus 65 PSRG) Vanadium (33.8 versus 6.0 PSRG)	Arsenic (<3.62 versus 3.0 PSRG)
SS-2 (0-1')	Cobalt (19.9 versus 0.9 PSRG) Manganese (392 versus 65 PSRG) Vanadium (66 versus 6.0 PSRG) Zinc (2,290 versus 1,200 PSRG)	None
SS-3 (0-1')	Boron (61.9 versus 45 PSRG) Cobalt (11.3 versus 0.9 PSRG) Manganese (298 versus 65 PSRG) Mercury (1.28 versus 1.0 PSRG) Vanadium (151 versus 6.0 PSRG)	None
SS-4 (0-1')	Boron (74.2 versus 45 PSRG) Cobalt (6.48 versus 0.9 PSRG) Manganese (201 versus 65 PSRG) Vanadium (173 versus 6.0 PSRG)	None
SS-5 (0-1')	Cobalt (20.9 versus 0.9 PSRG) Manganese (312 versus 65 PSRG) Vanadium (12.2 versus 6.0 PSRG) Zinc (3,680 versus 1,200 PSRG)	None
SS-6 (0-1')	Cobalt (6.96 versus 0.9 PSRG)	None

	Manganese (290 versus 65 PSRG) Vanadium (56 versus 6.0 PSRG)	
SS-7 (0-1')	Cobalt (19.9 versus 0.9 PSRG) Lead (397 versus 270 PSRG) Manganese (285 versus 65 PSRG) Vanadium (37.6 versus 6.0 PSRG)	None
SS-8 (0-1')	Boron (61.2 versus 45 PSRG) Cobalt (14 versus 0.9 PSRG) Lead (996 versus 270 PSRG) Manganese (122 versus 65 PSRG) Vanadium (33.2 versus 6.0 PSRG) Zinc (5,230 versus 1,200 PSRG)	Arsenic (<3.73 versus 3.0 PSRG Lead (996 versus 800 PSRG)
SS-9 (0-1')	Cobalt (<4.04 versus 0.9 PSRG) Manganese (278 versus 65 PSRG) Vanadium (9.62 versus 6.0 PSRG)	Arsenic (<3.75 versus 3.0 PSRG)
SS-16(0-1')	Cobalt (1.58 versus 0.9 PSRG) Selenium (2.37 versus 2.1 PSRG) Vanadium (28.7 versus 6.0 PSRG)	None
SS-17 (0-1')	Cobalt (1.26 versus 0.9 PSRG) Vanadium (21.6 versus 6.0 PSRG)	None
SS-18 (0-1')	Cobalt (1.63 versus 0.9 PSRG) Vanadium (27.8 versus 6.0 PSRG)	None
SS-19 (0-1')	Cobalt (2.0 versus 0.9 PSRG) Manganese (161 versus 65 PSRG) Vanadium (6.91 versus 6.0 PSRG)	None
SS-20 (0-1')	Cobalt (1.51 versus 0.9 PSRG) Manganese (172 versus 65 PSRG)	None
SS-21 (0-1')	Cobalt (1.53 versus 0.9 PSRG) Selenium (2.51 versus 2.1 PSRG) Vanadium (30 versus 6.0 PSRG)	None
SS-22 (0-1')	Barium (1,490 versus 580 PSRG) Cobalt (39.5 versus 0.9 PSRG) Lead (6,830 versus 270 PSRG) Manganese (225 versus 65 PSRG) Mercury (2.62 versus 1.0 PSRG) Vanadium (17.9 versus 6.0 PSRG) Zinc (7,020 versus 1,200 PSRG)	Lead (6,830 versus 800 PSRG)
SS-23(0-1')	Cobalt (2,000 versus 0.9 PSRG) Manganese (193 versus 65 PSRG) Vanadium (51.5 versus 6.0 PSRG)	Cobalt (2,000 versus 70 PSRG)
SS-24 (0-1')	Cobalt (203 versus 0.9 PSRG) Manganese (267 versus 65 PSRG)	Cobalt (203 versus 70 PSRG)

	Vanadium (32.7 versus 6.0 PSRG)	
SS-24 (3')	Cobalt (285 versus 0.9 PSRG) Lead (972 versus 270) Manganese (235 versus 65 PSRG) Vanadium (31.2 versus 6.0 PSRG)	Cobalt (285 versus 70 PSRG) Lead (972 versus 800 PSRG)
SS-24-2 (4')	Cobalt (11.4 versus 0.9 PSRG) Lead (372 versus 270 PSRG)	None
SS-24-2 (6')	Cobalt (9.96 versus 0.9 PSRG)	None
SS-25(0-1')	Cobalt (3.23 versus 0.9 PSRG) Manganese (180 versus 65 PSRG) Mercury (1.28 versus 1.0 PSRG) Vanadium (44.2 versus 6.0 PSRG)	None
SS-25 (3')	Boron (70.4 versus 45 PSRG) Cobalt (3.37 versus 0.9 PSRG) Manganese (97 versus 65 PSRG) Vanadium (117 versus 6.0 PSRG)	None
SS-26 (0-1')	Cobalt (6.27 versus 0.9 PSRG) Manganese (189 versus 65 PSRG) Mercury (4.02 versus 1.0 PSRG) Vanadium (9.2 versus 6.0 PSRG)	Mercury (4.02 versus 3.1 PSRG)
SS-27 (0-1')	Cobalt (1.35 versus 0.9 PSRG) Vanadium (26.3 versus 6.0 PSRG)	None
SS-28 (0-1')	Cobalt (<1.11 versus 0.9 PSRG) Vanadium (26.9 versus 6.0 PSRG)	None
SS-29(0-1')	Cobalt (1.92 versus 0.9 PSRG) Manganese (87.9 versus 65 PSRG) Mercury (2.19 versus 1.0 PSRG) Vanadium (29.2 versus 6.0 PSRG)	None
SS-30(0-1')	Cobalt (1.29 versus 0.9 PSRG) Vanadium (19 versus 6.0 PSRG)	None
SS-31 (0-1')	Cobalt (4.23 versus 0.9 PSRG) Manganese (298 versus 65 PSRG) Vanadium (12.2 versus 6.0 PSRG)	None
SS-32 (0-1')	Cobalt (2.7 versus 0.9 PSRG) Manganese (305 versus 65 PSRG) Vanadium (6.74 versus 6.0 PSRG)	None
SS-33 (0-1')	Cobalt (2.26 versus 0.9 PSRG) Manganese (408 versus 65 PSRG) Mercury (1.41 versus 1.0 PSRG) Vanadium (6.09 versus 6.0 PSRG)	None

SS-33 (3')	Cobalt (2.35 versus 0.9 PSRG) Manganese (73.5 versus 65 PSRG) Vanadium (21 versus 6.0 PSRG)	None
SS-34 (0-1')	Cobalt (4.45 versus 0.9 PSRG) Manganese (164 versus 65 PSRG) Vanadium (8.69 versus 6.0 PSRG)	None
SS-34 (3')	Cobalt (3.05 versus 0.9 PSRG) Manganese (105 versus 65 PSRG) Vanadium (22.9 versus 6.0 PSRG)	None
SS-35 (0-1')	Boron (107 versus 45 PSRG) Cobalt (3.42 versus 0.9 PSRG) Manganese (120 versus 65 PSRG) Mercury (3.67 versus 1.0 PSRG) Vanadium (210 versus 6.0 PSRG)	Mercury (3.67 versus 3.1 PSRG)
SS-35 (3')	Cobalt (1.86 versus 0.9 PSRG) Vanadium (66.1 versus 6.0 PSRG)	None
SS-36 (0-1')	Barium (690 versus 580 PSRG Boron (56 versus 45 PSRG) Cobalt (3.42 versus 0.9 PSRG) Manganese (91.5 versus 65 PSRG) Mercury (1.43 versus 1.0 PSRG) Vanadium (87.7 versus 6.0 PSRG)	None
SS-36 (3')	Cobalt (1.87 versus 0.9 PSRG) Manganese (168 versus 65 PSRG) Vanadium (23.8 versus 6.0 PSRG)	None
SS-37 (0-1')	Cobalt (1.32 versus 0.9 PSRG) Mercury (2.65 versus 1.0 PSRG) Vanadium (34.2 versus 6.0 PSRG)	None
SS-37 (3')	Cobalt (<1.2 versus 0.9 PSRG) Vanadium (14.7 versus 6.0 PSRG)	None
SS-38 (0-1')	Cobalt (2.82 versus 0.9 PSRG) Manganese (90.5 versus 65 PSRG) Vanadium (16.6 versus 6.0 PSRG)	None
SS-38 (3')	Cobalt (1.18 versus 0.9 PSRG) Vanadium (9.53 versus 6.0 PSRG)	None
SS-39 (0-1')	Cobalt (6.0 versus 0.9 PSRG) Manganese (219 versus 65 PSRG) Vanadium (20.6 versus 6.0 PSRG)	None
SS-39 (3')	Cobalt (<1.05 versus 0.9 PSRG)	None
SS-40 (0-1')	Cobalt (8.07 versus 0.9 PSRG) Manganese (234 versus 65 PSRG)	None

	Vanadium (22.5 versus 6.0 PSRG)	
SS-40 (3')	Cobalt (9.59 versus 0.9 PSRG) Vanadium (33.4 versus 6.0 PSRG)	None
SS-41 (0-1')	Cobalt (5.82 versus 0.9 PSRG) Manganese (519 versus 65 PSRG) Vanadium (7.87 versus 6.0 PSRG)	None
SS-41 (3')	Cobalt (10.5 versus 0.9 PSRG) Manganese (153 versus 65 PSRG) Vanadium (16 versus 6.0 PSRG)	None
SS-42 (0-1')	Cobalt (9.42 versus 0.9 PSRG) Manganese (142 versus 65 PSRG) Vanadium (20.1 versus 6.0 PSRG)	None
SS-43 (0-1')	Cobalt (3.82 versus 0.9 PSRG) Manganese (302 versus 65 PSRG) Vanadium (12.2 versus 6.0 PSRG)	None
SS-43 (3')	Cobalt (3.77 versus 0.9 PSRG) Manganese (119 versus 65 PSRG) Vanadium (25.6 versus 6.0 PSRG)	None

Note: All concentrations in (mg/kg).

Results of data comparisons are shown in Table L-3 and soil sample locations are shown on Figure L-4.

All borings outside the cap and area of excavation exceed either current IHSB PGW or Industrial PSRGs (SS-8, SS-9, SS-16, SS-17, SS-18, SS-19, SS-20, SS-21, SS-25, SS-26, SS-27, SS-28, SS-29, SS-30, SS-31, SS-32, SS-34, SS-37, SS-38, SS-42 and SS-43..; however, consideration must be given whether these are representative of background conditions. We would also comment that further assessment would largely occur in a cemetery which would be considered an objectionable activity.

A No Further Action recommendation for SWMU-2 was made by EPA contractor Booz Allen in the 2005 RFA, contingent upon continued compliance with the approved closure and post-closure plans.

L-1c (3) *SWMU-3 Site Assessment History*

The site assessment of the existing Ceramic Tile Pile material has been developed from several previous investigations as follows:

- **Soil Assessment**
  - A soil assessment conducted by Aquaterra in November and December of 1989. *Soil Boring Assessment, Mannington Ceramic Tile, Lexington, North Carolina,* Aquaterra report number R835-90, dated January 31, 1990.

  - A site assessment of the facility, prepared by Mannington, and dated April 12, 1990 which was previously detailed and discussed in Section 6.3 of the 2005 RFA.

  - A tile pile material assessment conducted by Aquaterra in October 1991. *Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina,* Aquaterra report number R1547-92, dated January 7, 1992.

  - An additional tile pile material assessment conducted by Aquaterra in March 1992. *Additional Sampling of Waste Ceramic Chip Tile, Mannington Ceramic Tile, Lexington, North Carolina,* Aquaterra report number R1646-92, dated April 1, 1992.

  - Additional tile pile testing and treatability study conducted by ENSCI during September 1992. *Comprehensive Tile Pile Testing Program and Treatability Study, Mannington Ceramic Tile, Lexington, North Carolina,* ENSCI report dated October 20, 1992.

  - In December 1996, March, April and May 1997, Aquaterra conducted additional post-closure assessment of the soil and tile pile.

Figures showing the approximate location of all the previous sample locations through 1992 are contained in the July 11, 1997 *Ceramic Tile Closure Plan*- Appendices A, B, and C. Sample locations for the 1996 and 1997 assessments are shown on the July 11, 1997 *Ceramic Tile Closure Plan*- Figure 2-1. Based on all previous investigations, we have depicted a combined SWMU-3 and AOC-1 (Area of Discharge from the Tile Pile) past soil sample location map on Figure L-2.

- **Surface Water and Sediment-** There have been both surface water and sediment assessments conducted in Walltown Branch (SWMU-7) which borders the eastern portion of the Ceramic Tile Pile. This is further discussed as part of SWMU-7 in Section L-1c (4).

- **Groundwater Assessment**- There have been numerous groundwater assessment monitoring wells placed upgradient, side-gradient and downgradient of SWMU 3. These include groundwater monitoring wells MW-1 (upgradient), MW-7A, MW-18, MW-19D, MW-21A, MW-22A, MW-23A, MW-24, MW-25, MW-26-A-2 and MW-29 (see Part E - Groundwater Monitoring). Prior to initiating closure activities at this unit, groundwater monitoring results indicated the presence of numerous inorganic parameters exceeding the NCGS. Groundwater impact is discussed as a separate site-wide media in Part E - Groundwater Monitoring.

Results of the Past Ceramic Tile Pile and Soil Investigations

1989 Soil/Tile Material Assessment

The 1989 soil assessment consisted of fourteen (14) soil test borings advanced in background native soils (B-1, B-2, and B-3), in the area of SWMU 3 (B-7 to B-14), and in the area of the Sludge Settling Ponds (B-4 to B-6). A photocopy of the data tables and a figure showing location of borings is contained in the July 11, 1997 *Ceramic Tile Closure Plan*- Appendix A. The background boring locations (B-1 to B-3) are shown on Figure L-5 and borings B-7 to B-14 are shown on Figure L-2. Borings B-4 to B-6 were previously described in Section L-1c (1). The samples were analyzed for the eight (8) RCRA metals. Soil samples were collected at a depth of 5.0 to 6.5 feet bgs in boring B-7, at depths of 7.5 to 9.0 feet bgs and 20 to 21 feet bgs in boring B-8, and at a depth of 2.5 to 4.0 feet bgs in borings B-9 to B-14. The background sample results for borings B-1, B-2, and B-3 are summarized in Table L-4. The remaining sample results for SWMU-3 (B-7 to B-14) are summarized in Table L-5 and compared to the 1997 approved closure plan standards (three [3] times background levels) for five (5) inorganic constituents.

With the exception of B-8 at depth of 7.5 to 9.0 feet bgs, which exhibited lead above the 1997 closure standard and was required to be placed under the cap, the sample results for SWMU-3(B-7 to B-14) did not exceed three (3) times the background levels for the five (5) metals (barium, boron, lead, manganese and zinc) listed in the approved 1997 closure plan.

Table L-6 compares the sample results for SWMU 3 (B-7 to B-14) to current IHSB PGW PSRGs and IHSB Industrial Health-Based PSRGs for the eight (8) RCRA metals. There are no exceedances of the current IHSB PGW PSRG, IHSB or Industrial Health-Based PSRG with the exception of B-8 which exhibited a lead concentration above background levels, and was located under the cap.

October 1991 Tile Pile Material Assessment

The October 1991 tile pile assessment consisted of excavating four (4) test pits approximately 16 to 18 feet deep in the middle portion of the Ceramic Tile Pile. Samples were collected every 2 feet and composited into one (1) composite sample per test pit (TP-1, TP-2, TP-3, and TP-4 – see Figure L-2). The samples were analyzed for the following total metals:

aluminum	iron	sodium
antimony	lead	tin
barium	magnesium	titanium
boron	nickel	vanadium
calcium	potassium	zinc
chromium, total	silver	zirconium
cobalt		

The samples were also analyzed for the following additional inorganic and indicator parameters:

alkalinity	fluoride	pH units
bromide	phosphates	
chloride	sulfates	

Additionally, the samples were analyzed for the TCLP metals and the following radionuclides:

gross alpha	radium 226	radium 228
gross beta	praseodymium	

The photocopies of the analytical results and figures showing the sample locations are shown in the July 11, 1997 *Ceramic Tile Closure Plan* - Appendix A. Analytical results are summarized in Table L-5 for total metals, Table L-7 for TCLP metals, and Table L-6 for additional metals. Sample locations are shown on Figure L-2.

The conclusions gained from this investigation are summarized below:

- All four sample results exceeded the background levels for barium, lead and zinc as listed in the 1997 approved closure plan, with the exception of barium in sample TP-3, which was below the background level. Additionally, one of the samples (TP-4) exceeded the background level for boron. Sample results are summarized in Table L-5.
- Lead exceeded the regulatory level of 5 mg/L for the TCLP extract in all four samples with concentrations ranging from 47 mg/L to 130 mg/L. Sample results are summarized in Table L-7.
- All four composite sample results exceed PGW PSRGs and/or range of background sample concentrations for barium, boron, cobalt, lead, silver, vanadium, and zinc, except samples TP-2 and TP-3 which do not exceed either level for barium and samples TP-1, TP-2, and TP-3 which do not exceed either level for silver. All four borings exceed the PGW PSRG, Industrial PSRG and range of background sample concentrations for lead. Sample results are summarized in Table L-6.

Per the approved closure plan, all four boring locations were placed under the cap. The remaining analytes were deemed to not exceed risk-based concentrations or to not be considered radioactive.

March 1992 Tile Pile Material Assessment

The March 1992 tile pile material assessment consisted of four soil borings (B-1, B-2, B-3, and B-4) advanced to depths of approximately 22 to 24.5 feet bgs as shown on Figure L-2. Soil samples were collected and analyzed for VOCs according to SW-846 Method 8240, SVOCs according to SW-846 Method 8270, and formaldehyde. Photocopies of the analytical data table and figure showing boring locations are contained in the July 11, 1997 *Ceramic Tile Closure Plan*-Appendix A and the laboratory results are summarized in Table L-8.

Methylene chloride, the only VOC detected, was identified in all four samples ranging in concentration from 820 μg/kg to 860 μg/kg. Bis(2-ethylhexyl) phthalate, the only SVOC detected, was identified in all four samples ranging in concentrations from 1,900 μg/kg to 5,300 μg/kg. No formaldehyde was detected. It was suspected that the methylene chloride was a laboratory artifact and that the bis(2-ethylhexyl) phthalate came from the vinyl gloves worn by the samplers and/or the laboratory personnel. These constituents were not used in the manufacturing of ceramic tile. In the 1997 closure plan, these constituents were not deemed to be constituents of concern.

Based on current RBCs, all methylene chloride sample results are above current PGW PSRGs but below Industrial PSRGs. All bis(2-ethylhexyl) phthalate sample results are below both PGW PSRGs and Industrial PSRGs (see Table L-8). We believe that these should not be considered chemicals of concern ("COCs"); however, these samples represent material situated under the cap.

September 1992 Tile Pile Material Assessment

The September 1992 tile pile material assessment consisted of four test pits (EX-1, EX-2, EX-3, and EX-4) placed as close as possible to the four test pits (TP-1, TP-2, TP-3, and TP-4) discussed in Section 2.2.2 of the *October 1991 Tile Pile Material Assessment*. The four test pits were excavated to a depth of 21 feet. Samples were collected in EX-1 at 18 feet, EX-2 at 20 feet, EX-3 at 16 feet, and EX-4 at 21 feet bgs. The samples were analyzed for VOCs (Method 8240), SVOCs (Method 8270), formaldehyde, and the radionuclides gross alpha, gross beta, radium 226, radium 228, and uranium 238. Summary data tables and a figure showing test pit locations are contained in the July 11, 1997 *Ceramic Tile Closure Plan*- Appendix A, and are depicted on Figure L-2 and summarized in Table L-8.

No VOCs, SVOCs, or formaldehyde were detected in the four test pit samples (EX-1, EX-2, EX-3, and EX-4). The radionuclide results in pCi/g were determined to be benign.

December 1996 Tile Pile Material Assessment

Four soil borings (SB-1, SB-2, SB-3, and SB-4) were installed on the tile pile from depths of 15 to 30 feet bgs (locations contained in the July 11, 1997 *Ceramic Tile Closure Plan*- see Figure 2-1 and Figure B-1 in Appendix B), and boring locations are also depicted on Figure L-2 of this document. One sample from each boring was randomly chosen (SB-1-15′, SB-2-10′, SB-3-15′, and SB-4-10′) and then two of the four samples (SB-1-15′ and SB-4-10′) were submitted to the laboratory for analysis. Additionally, two soil borings (SB-5-2.5' bgs and SB-6-2.5' bgs) as shown on Figure L-2 were advanced adjacent to the tile pile and were considered background borings in the 1997 *Ceramic Tile Closure Plan*; however, we would disagree and conclude that these would be considered soil assessment borings. Samples from these borings were also submitted to the laboratory. The samples (SB-1-15' bgs, SB-4-10' bgs, SB-5-2.5' bgs and SB-6-2.5' bgs) were analyzed for the following total metals:

arsenic	chromium, total	mercury	titanium
barium	cobalt	nickel	vanadium
boron	lead	selenium	zinc
cadmium	manganese	silver	

The inorganics bromide, nitrates, sulfates, and phenols, and the radionuclides gross alpha and gross beta were also analyzed for each sample. One composite sample (Comp-1) of the four random samples was analyzed for the TCLP metals.

The conclusions gained from this investigation are summarized below:

- The composite sample (Comp-1) detected lead in the TCLP extract at a concentration of 187 mg/L which is in excess of the 5.0 mg/L standard and would be considered a characteristic hazardous waste (see Table L-7).
- Sample SB-1-15' exceeded the 1997 NCDEHNR approved background closure standard for barium, boron, lead and zinc. Sample SB-4-10' exceeded the 1997 NCDEHNR approved background levels for barium, lead and zinc. Samples SB-5-2.5' and SB-6-2.5' were below all 1997 NCDEHNR closure standards (see Table L-5). Sample locations SB-1-15', SB-4-10' and SB-6-2.5' were placed under the full RCRA cap while SB-5-2.5' was placed under a clay cap.
- All four soil borings exceeded both IHSB PGW PSRGs and range of background samples as follows (see Table L-6):
    - SB-1-15'- barium, boron, lead and zinc
    - SB-4-5'- lead and zinc
    - SB-5-2.5'- boron
    - SB-6-2.5'- vanadium
- Two of the four borings, SB-1-15' and SB-4-10', also exceeded the IHSB Industrial Health-Based PSRG for lead (see Table L-6).

Again, these four (4) soil boring locations are currently under either the full RCRA-cap or clay cap. The gross alpha and gross beta values were concluded to be benign.

Additional December 1996 Tile Pile Soil Assessment

In December 1996, Aquaterra personnel collected the following additional samples:

- Three (3) soil samples (HA-1, HA-2, and HA-3 along the north and east edge of the tile pile
- Two (2) native soil background samples (HA-4 and HA-5)

All samples were analyzed for the five metals (barium, boron, lead, manganese, and zinc) which were part of the approved 1997 closure plan. The sample locations are depicted in the July 11, 1997 *Ceramic Tile Closure Plan*- Figure 2-1. The borings considered background are HA-4 and HA-5, which are depicted on Figure L-5, while the remaining borings (HA-1, HA-2, and HA-3) are depicted on Figure L-2 since they are located under the SWMU-3 Ceramic Tile Pile cap. The background sample analytical results are summarized in Table L-4 and the remaining sample results are summarized in Tables L-5 and L-6 since they are part of the closure samples for SWMU-3 and are all located under the HDPE or clay cap.

Soil borings SB-5-2.5′ and SB-6-2.5′, collected during the initial December 1996 sampling event, and hand auger boring HA-1 were located along the toe of the tile pile and adjacent to Walltown Branch which had been piped in as of the date of the report in 1997. These samples were collected to evaluate if any metals had migrated from the tile pile into the downgradient native soils. Hand auger borings HA-2 and HA-3 were placed north and east of the tile pile along Walltown Branch. Hand auger boring HA-4 was placed downgradient and east of the tile pile adjacent to the eastern property boundary. HA-5 was placed upgradient and west of the tile pile and approximately 250 feet east of monitoring well MW-1. Hand auger borings HA-1, HA-2, and HA-3 represent assessment borings adjacent to Walltown Branch while HA-4 and HA-5 represent background borings.

The concentrations for the four samples (HA-2, HA-3, HA-4, and HA-5) were compared as an average range of background values and then compared to samples SB-5-2.5′, SB-6-2.5′, and HA-1. Sample HA-1 showed elevated levels of barium, lead, and zinc compared to the background samples. However, the concentrations were well below the levels of lead and zinc seen in the tile pile samples SB-1-15′ and SB-4-10′ (see Table L-5). Based on this data, there has not been significant migration of constituents from the tile pile into the native soils at HA-2 and HA-3. However, ultimately all locations (HA-1, HA-2, HA-3, SB-5-2.5’, and SB-6-2.5’) were placed under the ceramic tile pile cap during closure.

We also compared these past sample results versus current IHSB PGW PSRGs and Industrial Health-Based PSRGs and had the following exceedances (see Table L-6):

- SB-5-2.5’ PGW PSRG exceedance for boron (127 mg/kg versus PGW PSRG at 45 mg/kg and a range of background samples of <10.5 mg/kg-123 mg/kg)

- SB-6-2.5' PGW PSRG exceedance for vanadium (736 mg/kg versus PGW PSRG at 6.0 mg/kg and a range of background samples of 5.01 mg/kg-199 mg/kg)
- HA-1 PGW PSRG exceedance for lead (501 mg/kg versus PGW PSRG at 270 mg/kg and range of background samples of <0.5-18.8 mg/kg), and zinc (1,430 mg/kg versus PGW PSRG at 1,200 mg/kg and range of background samples of 27.3 mg/kg-124 mg/kg)
- HA-2 PGW PSRG exceedance for boron (59.4 mg/kg versus PGW PSRG at 45 mg/kg), cobalt (17.1 mg/kg versus PGW PSRG at 0.9 mg/kg), manganese (589 mg/kg versus PGW PSRG at 65 mg/kg and range of background samples at 56.6 mg/kg-449 mg/kg), and vanadium (79.5 mg/kg versus PGW PSRG at 6.0 mg/kg)
- HA-3 PGW PSRG exceedance for vanadium (29.7 mg/kg versus PGW PSRG at 6.0 mg/kg)

March, April, and May 1997 Additional Tile Pile Soil Assessment

In March, April, and May 1997, Aquaterra personnel collected the following samples:

- HA-6 to HA-18 (collected from locations at the perimeter of the tile pile, no depths specified)
- TP-1A to TP-1F (collected from interior tile pile locations, no depths specified)
- 2HA-22, 2HA-23, 2HA-35, 2HA-38, 2HA-40, 2HA-42, 2HA-43, 2HA-44, 2HA-46 to 2HA-49
- MS-1 to MS-6 (collected from the northwestern side of the tile pile at depths ranging from 1.0 feet bgs to 1.66 feet bgs)

All samples were analyzed for the five metals (barium, boron, lead, manganese, and zinc) which were part of the approved closure plan. Additionally, thirteen samples (2HA-1, 2HA-2, 2HA-7, 2HA-9, 2HA-10, 2HA-23, 2TP-1C, MS-1, MS-3, MS-5, 4HA-47, 4HA-47-2, and 4HA-48) were analyzed for lead via TCLP. The sample locations are depicted in the July 11, 1997 *Ceramic Tile Closure Plan*- Figure 2-1 and on Figure 8. The analytical results are depicted in Tables L-5 and L-6 for the total metals. The lead via TCLP is summarized in Table L-7.

Conclusions from Past Waste Ceramic Tile Pile Material and Soil Assessments

Tile Pile Closure

Based on the site assessments conducted between 1991 and 1997 at the Facility, sample analysis results detected leachable lead levels in the Waste Ceramic Tile Pile considered to be a characteristic hazardous waste. Results ranged from 7.57 mg/L (sample 2HA-1) to 187 mg/L (sample Comp-1) (Table L-7). As a result, the solid waste (i.e., ceramic tile) disposed on the Waste Ceramic Tile Pile was considered a characteristic hazardous waste (D008) in that samples from several different areas contained TCLP lead levels in excess of the regulatory limit of 5.0 mg/L (NCDEQ, 1990b).

In addition, impacted sludge/soil from SWMU-2 was also deposited in the Waste Ceramic Tile Pile prior to closure as follows:

- An unknown quantity of partially stabilized sludge and additional impacted soil located north and west of the Sludge Settling Ponds (SWMU-2) was excavated and deposited on the Ceramic Tile Pile (SWMU-3) prior to closure. According to the Closure Report for the Sludge Settling Ponds (SWMU-2), the partially stabilized sludge exceeded the NCGS via TCLP for mercury and zinc (closure standards NCDEQ temporarily used during that period of time) and the TCLP regulatory limit for lead when it was deposited on the Ceramic Tile Pile (SWMU-3) (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003). This excavated area also included one soil sample location SS-2 (see Figure L-4) from the area northeast of SWMU-2 which exceeded the lead TCLP threshold of 5.0 mg/L at a concentration of 6.64 mg/L.

- Impacted soil from along former Charles Avenue north of the Ceramic Tile Pile near the northern property boundary (see Figure L-2) was excavated and placed on the Waste Ceramic Tile Pile based on the results of borings HA-9 (total lead detected at 1,370 mg/kg in excess of the 1997 lead closure standard of 49.32 mg/kg) and 4HA-48 (total lead detected at 5,140 mg/kg in excess of the lead closure standard of 49.32 mg/kg). It is our understanding that no confirmation sampling was collected subsequent to the soil removal.

After the aforementioned multiple phases of soil assessment effort, the Facility initiated closure with wastes in place of the Ceramic Tile Pile (SWMU-3) due to soils exhibiting leachable levels of lead in excess of USEPA standards that were considered a characteristic hazardous waste (D008). Consistent with the approved 1997 Closure Plan, wastes were left in place and the unit was closed with a RCRA-compliant cap. The unit is capped with a "flat top surface cap" and a "slope surface cap" using a RCRA-compliant cap including a vegetative cover, geotextile liner, HDPE liner, and another managed vegetative cap. The top portion of the unit is level with the facility parking lot and has gravel covering the majority of the top of the unit. The sloped sides of the unit are covered with native vegetation. The 1997 approved *Ceramic Tile Pile Closure Plan* also depicted an area which exceeded three (3) times background levels for the metals barium, boron, lead, manganese and zinc. These other areas that showed elevated total inorganic values in excess of three (3) times background levels were covered with the silty clay cover material used to stabilize the RCRA cap as shown on Figure L-2. The silty clay cover was two (2) or more feet thick over these elevated total inorganic areas, thus preventing dermal contact and minimizing leaching of the metals from the soils to the groundwater. (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003). This closure plan was approved by NCDEQ on April 26, 2004.

SWMU-3 Past Soil Assessment Results versus Current Risk-Based Standards and Existing Data Gaps

SOIL

There have been numerous Ceramic Tile Pile and soil assessment efforts conducted as part of the tile pile waste characterization and soil assessment in support of the closure of the RCRA unit (SWMU-3). In Table L-6, Table L-8, and Table L-11, we have compared all past soil sampling for inorganic constituents, VOCs, SVOCs, formaldehyde and phenols to current PGW PSRGs and Industrial PSRGs. Based on the entire population of soil samples, we have summarized the soil borings which exceed PGW PSRGs and Industrial Health-Based PSRGs (locations depicted on Figure L-2):

SWMU-3 Current RBC Exceedances

Boring Location	**Above IHSB PGW PSRGs**	**Above IHSB Industrial PSRGs**
TP-1 (0-1.5’)	Boron (53 versus 45 PSRG) Cobalt (12 versus 0.9 PSRG) Lead (1,600 versus 270 PSRG) Vanadium (10 versus 6.0 PSRG) Zinc (2,400 versus 1,200 PSRG)	Lead (1,600 versus 800 PSRG)
TP-2 (0-1.5’)	Boron (130 versus 45 PSRG) Cobalt (26 versus 0.9 PSRG) Lead (3,100 versus 270 PSRG) Vanadium (7.3 versus 6.0 PSRG) Zinc (2,000 versus 1,200 PSRG)	Lead (3,100 versus 800 PSRG)
TP-3 (0-1.5’)	Boron (200 versus 45 PSRG) Cobalt (13 versus 0.9 PSRG) Lead (3,900 versus 270 PSRG) Vanadium (8.5 versus 6.0 PSRG) Zinc (2,700 versus 1,200 PSRG)	Lead (3,900 versus 800 PSRG)
TP-4 (0-1.5’)	Barium (820 versus 580 PSRG) Boron (240 versus 45 PSRG) Cobalt (23 versus 0.9 PSRG) Lead (4,000 versus 270 PSRG) Silver (14 versus 3.4 PSRG) Vanadium (9.7 versus 6.0 PSRG) Zinc (6,100 versus 1,200 PSRG)	Lead (4,000 versus 800 PSRG)
SB-1 (15’)	Barium (659 versus 580 PSRG) Boron (426 versus 45 PSRG)	Lead (1,090 versus 800 PSRG)

Boring Location	**Above IHSB PGW PSRGs**	**Above IHSB Industrial PSRGs**
	Cobalt (14.5 versus 0.9 PSRG) Lead (1,090 versus 270 PSRG) Vanadium (15.8 versus 6.0 PSRG) Zinc (4,900 versus 1,200 PSRG)	
SB-4 (10’)	Boron (90.8 versus 45 PSRG) Cobalt (9.84 versus 0.9 PSRG) Lead (17,400 versus 270 PSRG) Vanadium (11.2 versus 6.0 PSRG) Zinc (3,080 versus 1,200 PSRG)	Lead (17,400 versus 800 PSRG)
SB-5 (2.5’)	Boron (127 versus 45 PSRG) Cadmium (4.6 versus 3.0 PSRG) Cobalt (7.9 versus 0.9 PSRG) Manganese (273 versus 65 PSRG) Vanadium (131 versus 6.0 PSRG)	None
SB-6 (2.5’)	Boron (104 versus 45 PSRG) Cadmium (4.18 versus 3.0 PSRG) Cobalt (1.88 versus 0.9 PSRG) Vanadium (736 versus 6.0 PSRG)	None
HA-1 (NDS)	Boron (60.8 versus 45 PSRG) Cobalt (17.7 versus 0.9 PSRG) Lead (501 versus 270 PSRG) Manganese (307 versus 65 PSRG) Vanadium (59.3 versus 6.0 PSRG) Zinc (1,430 versus 1,200 PSRG)	None
HA-2 (NDS)	Boron (59.4 versus 45 PSRG) Cobalt (17.1 versus 0.9 PSRG) Manganese (589 versus 65 PSRG) Vanadium (79.5 versus 6.0 PSRG)	None
HA-3 (NDS)	Cobalt (5.5 versus 0.9 PSRG) Vanadium (29.7 versus 6.0 PSRG)	None
HA-6 (NDS)	Cadmium (3.44 versus 3.0 PSRG) Cobalt (4.76 versus 0.9 PSRG) Manganese (143 versus 65 PSRG) Vanadium (15.2 versus 6.0 PSRG) Zinc (1,270 versus 1,200 PSRG)	None
HA-7 (NDS)	Cadmium (5.75 versus 3.0 PSRG) Cobalt (16.4 versus 0.9 PSRG) Lead (288 versus 270 PSRG)	Arsenic (3.2 versus 3.0 PSRG)

Boring Location	**Above IHSB PGW PSRGs**	**Above IHSB Industrial PSRGs**
	Manganese (388 versus 65 PSRG) Vanadium (40.6 versus 6.0 PSRG) Zinc (1,560 versus 1,200 PSRG)	
HA-8 (NDS)	Boron (128 versus 45 PSRG) Cobalt (9.13 versus 0.9 PSRG) Lead (2,260 versus 270 PSRG) Vanadium (15.1 versus 6.0 PSRG) Zinc (2,350 versus 1,200 PSRG)	Arsenic (3.04 versus 3.0 PSRG) Lead (2,260 versus 800 PSRG)
HA-9* (NDS)	Cadmium (6.99 versus 3.0 PSRG) Cobalt (20.2 versus 0.9 PSRG) Lead (1,370 versus 270 PSRG) Manganese (313 versus 65 PSRG) Vanadium (56.9 versus 6.0 PSRG) Zinc (1,990 versus 1,200 PSRG)	Lead (1,370 versus 800 PSRG)
HA-10 (NDS)	Boron (73.2 versus 45 PSRG) Cadmium (10.6 versus 3.0 PSRG) Cobalt (22.3 versus 0.9 PSRG) Manganese (708 versus 65 PSRG) Mercury (22.5 versus 1.0 PSRG) Vanadium (94.6 versus 6.0 PSRG)	Arsenic (3.61 versus 3.0 PSRG) Mercury (22.5 versus 3.0 PRG)
HA-11 (NDS)	Cadmium (6.52 versus 3.0 PSRG) Cobalt (17.1 versus 0.9 PSRG) Manganese (265 versus 65 PSRG) Vanadium (60 versus 6.0 PSRG)	None
HA-12 (NDS)	Boron (51.6 versus 45 PSRG) Cobalt (1.42 versus 0.9 PSRG)Vanadium (14.2 versus 6.0 PSRG)	None
HA-13 (NDS)	Boron (145 versus 45 PSRG) Cadmium (6.1 versus 3.0 PSRG) Cobalt (9.54 versus 0.9 PSRG) Manganese (1,300 versus 65 PSRG) Vanadium (77.2 versus 6.0 PSRG)	None
HA-14 (NDS)	Cobalt (2.0 versus 0.9 PSRG) Manganese (109 versus 65 PSRG) Vanadium (10.8 versus 6.0 PSRG)	None
HA-15 (NDS)	Cobalt (2.19 versus 0.9 PSRG) Manganese (114 versus 65 PSRG)	None

Boring Location	**Above IHSB PGW PSRGs**	**Above IHSB Industrial PSRGs**
	Vanadium (17.5 versus 6.0 PSRG)	
HA-16 (NDS)	Boron (70 versus 45 PSRG) Cadmium (9.46 versus 3.0 PSRG) Cobalt (6.86 versus 0.9 PSRG) Manganese (437 versus 65 PSRG) Vanadium (56.4 versus 6.0 PSRG)	Arsenic (3.42 versus 3.0 PSRG)
HA-17 (NDS)	Cobalt (1.68 versus 0.9 PSRG) Manganese (89.4 versus 65 PSRG) Vanadium (15.9 versus 6.0 PSRG)	None
HA-18 (NDS)	Cobalt (2.67 versus 0.9 PSRG) Manganese (65.2 versus 65 PSRG) Vanadium (21.6 versus 6.0 PSRG)	None
TP-1D (NDS)	Boron (92.5 versus 45 PSRG) Lead (711 versus 270 PSRG)	None
TP-1E (NDS)	Boron (178 versus 45 PSRG) Lead (1,050 versus 270 PSRG)	Lead (1,050 versus 800 PSRG)
TP-1F (NDS)	Boron (118 versus 45 PSRG) Lead (1,410 versus 270 PSRG)	Lead (1,410 versus 800 PSRG)
2HA-22 (NDS)	Boron (53.9 versus 45 PSRG)	None
2HA-35 (NDS)	Boron (51.8 versus 45 PSRG) Manganese (90.6 versus 65 PSRG)	None
2HA-40 (NDS)	Cadmium (3.72 versus 3.0 PSRG)	None
2HA-43 (NDS)	Barium (2,810 versus 580 PSRG) Lead (12,700 versus 270 PSRG)	Lead (12,700 versus 800 PSRG)
2HA-44 (NDS)	Boron (87 versus 45 PSRG) Cadmium (5.58 versus 3.0 PSRG) Cobalt (5.51 versus 0.9 PSRG) Manganese (281 versus 65 PSRG)	None
2HA-46 (NDS)	Boron (48 versus 45 PSRG) Cadmium (5.13 versus 3.0 PSRG) Cobalt (5.51 versus 0.9 PSRG) Manganese (260 versus 65 PSRG)	None
3HA-7 (NDS)	Lead (1,230 versus 270 PSRG)	Lead (1,230 versus 800 PSRG)
4HA-47	Lead (2,720 versus 270 PSRG)	Lead (2,720 versus 800 PSRG)

Boring Location	**Above IHSB PGW PSRGs**	**Above IHSB Industrial PSRGs**
4HA-47-2 (2')	Lead (2,040 versus 270 PSRG)	Lead (2,040 versus 800 PSRG)
4HA-48*	Lead (5,140 versus 270 PSRG)	Lead (5,140 versus 800 PSRG)
4HA-49 (NDS)	Cobalt (12.6 versus 0.9 PSRG) Manganese (409 versus 65 PSRG)	None
MS-2 (1.0')	Boron (115 versus 45 PSRG)	None
MS-3 (1.0')	Boron (47.8 versus 45 PSRG)	None
MS-5 (1.33')	Boron (98.7 versus 45 PSRG) Lead (407 versus 270 PSRG)	None
MS-6 (1.33')	Boron (115 versus 45 PSRG)	None

Note:
1. All concentrations in (mg/kg).
2. NDS- No Depth Specified
3. Methylene Chloride detected during March 1992 investigation was considered a laboratory artifact and not included in the table.
4. *- Area around HA-9 and 4HA-48 has been removed and/or placed on the tile pile prior to closure

Again, all of these borings are situated under the cap which was constructed as part of the approved 1997 *Tile Pile Closure Plan.* However, we believe that one important further evaluation would be to identify any soil samples beyond the outer extent of either the HDPE or clay cap versus either PGW PSRGs or Industrial Health-Based PSRGs. Below, are the boring soil sample locations with exceedances listed (depicted on Figure L-6):

SWMU-3 Current PSRG Soil Boring Exceedances for Area Outside of Tile Pile Cap

Boring Location (Ordinal Direction)	Above NCDEQ PGW PSRGs	Above NCDEQ Ind. PSRGs
HA-7 (North)	Cd, Co, Mn, Pb, Mn, V and Zn, V	As
4HA-49 (North)	Co and Mn	None
2HA-23 (Northeast)	Pb	None
2HA-44 (Northeast)	B, Cd, Co and Mn	Co

Note:
1. All concentrations in (mg/kg).

2. This includes the area considered as AOC-1 since it is felt that they overlap.

A No Further Action recommendation for SWMU-3 was made in the 2005 RFA contingent upon continued compliance with the approved closure and post-closure plans. Based on our current assessment, these four (4) borings listed above are considered the existing data gaps in that they are beyond the perimeter of the closed Ceramic Tile Pile with the remainder of the borings being located under the cap which has been closed and certified by NCDEQ. These four (4) borings at the perimeter would be considered for review and potential further assessment.

L-1c (4) SWMU-7 Site Assessment History

All historical surface water/sediment sampling events are described below with results tabulated in Table L-9 (Surface Water), Table L-10 (Sediment), and NCDEQ 2B or RBC exceedances depicted on Figure L-7 (with the exception of 1996 and 1999 sample results) which are described below.

March 1996 Surface Water Sampling Results

On March 26, 1996, representatives from the NCDEHNR and Mannington split surface water samples collected from the Walltown Branch for analysis of boron. One sample was collected from an onsite upstream location and one sample was collected from an onsite downstream location at the Facility. Boron was observed in both samples, measuring 1.9 mg/L in the onsite downstream sample and 0.084 mg/L in the onsite upstream sample. Boron is not a RCRA regulated hazardous waste and is not regulated under, 15A NCAC Subtitle 2B Surface Water Standards. An ecological surface water chronic screening value of 0.75 mg/L was listed in Table 1 of the Supplemental Guidance to Risk Assessment Guidance for Superfund (RAGS): Region 4 Bulletins, Ecological Risk Assessment (US EPA 2001). The onsite downstream sample exceeded the ecological surface water chronic screening value.

March 1999 Surface Water/Sediment Sampling Results

The Facility conducted an additional surface water/sediment sampling event March 1999 in response to an NCDEQ request. The sample results for the surface water identified increases in levels of RCRA metals and other identified elements in the Downgradient (DG) sample versus the Upgradient (UG) sample as follows (results summarized in Table L-9):

- Barium at a concentration of 0.059 mg/L UG versus 0.127 mg/L DG versus a 2B Standard of 1.0 mg/L (Water Supply).
- Boron below the method detection limit UG versus 1.06 mg/L DG. There is no 2B standard for boron; however, there is an EPA ecological screening value of 0.75 mg/L.
- Copper at a concentration of 0.010 mg/L UG versus 0.110 mg/L DG versus a 2B Standard of 0.007 mg/L (Freshwater).

- Iron at a concentration of 1.34 mg/L UG versus 2.58 mg/L DG. There is no 2B Standard for iron.
- Lead below the method detection limit UG versus 0.011 mg/L DG versus a 2B Standard of 0.025 mg/L (Freshwater).
- Manganese at a concentration of 0.109 mg/L UG versus 0.23 mg/L DG versus a 2B Standard of 0.02 mg/L (Water Supply).
- Zinc at a concentration of 0.035 mg/L UG versus 0.142 mg/L DG versus a 2B Standard at 0.05 mg/L (Freshwater).

Boron exceeds its EPA ecological screening value (downgradient). Copper (upgradient and downgradient), manganese (upgradient and downgradient), and zinc (downgradient) exceed their respective NCDEQ 2B Standards.

Sediment Results

The sample results for the sediment identified increases in levels of RCRA and non-RCRA metals in the Downgradient samples versus the Upgradient samples as follows (results summarized in Table L-10):

- Barium at a concentration of 49.9 mg/L UG versus 93.9 mg/L DG
- Boron at a concentration of 13.7 mg/L UG versus 33.0 mg/L DG
- Cadmium at a concentration of 0.486 mg/L UG versus 0.716 mg/L DG
- Chromium at a concentration of 12.9 mg/L UG versus 20.7 mg/L DG
- Cobalt at a concentration of 4.46 mg/L UG versus 9.76 mg/L DG
- Lead at a concentration of 48.6 mg/L UG versus 125 mg/L DG
- Nickel at a concentration of 4.0 mg/L UG versus 5.03 mg/L DG
- Titanium at a concentration of 93.2 mg/L UG versus 163 mg/L DG
- Vanadium at a concentration of 39.4 mg/L UG versus 54.3 mg/L DG
- Zinc at a concentration of 121 mg/L UG versus 365 mg/L DG
  Note: mg/L denoted in sediment sample results versus mg/kg potentially due to high water content in the sample aliquot.

Both upgradient and downgradient sediment samples exhibited concentrations of cobalt and vanadium above the current IHSB PGW PSRGs. Neither sample exceeds the Health-Based Industrial PSRG standard for either vanadium or cobalt. All other sediment sample results were below the current IHSB PGW PSRGs and Health-Based Industrial PSRGs.

The 2005 RFA reported that these levels of increase identify potential releases originating from the Facility that have impacted the Walltown Branch and its recipient waters (NCDEQ, 1998b, 1999c; Aquaterra, 1997b; USEPA, 2002; Mannington, 2004). However, we would also mention that the remaining analytes not reported in the 2005 RFA are suspected as either being stable or decreasing, and basing these "increases" on selected analytes while ignoring the remaining results is not considered a measured conclusion. An alternate conclusion for these results could be that they are entirely consistent with the heterogeneities in soil/sediment which are not impacted by man-made effects.

We have compared sediment samples versus PGW PSRGs and Health-Based Industrial PSRGs (see results in Table L-10). All sample results were below Health-Based Industrial PSRGs. There were the following exceedances of PGW PSRGs as follows:

- Cobalt- Both upgradient (4.46 mg/L) and downgradient (9.76 mg/L) results exceed the cobalt PGW PSRG at 0.9 mg/kg
- Titanium- There is no PGW PSRG so it would technically default to a detection limit which is exceeded at a concentration of 93.2 mg/L UG and 163 mg/L DG
- Vanadium- Both upgradient (39.4 mg/L) and downgradient (54.3 mg/L) results exceed the vanadium PSRG at 6.0 mg/kg
  Note: mg/L denoted in sediment sample results versus mg/kg potentially due to high water content in the sample aliquot.

This would be a data gap and potentially require further evaluation. We would also note that another data gap needing attention is a trivalent chromium PSRG Standard was used for comparison. This would be corroborated by analyzing an Onsite Downgradient (worst case) sediment sample for hexavalent chromium to assure that it is not detected and the trivalent chromium PSRG standard can be used for the Facility.

December 2004 Surface Water/Sediment Sampling Results

On December 29, 2004 Waters Edge mobilized a sampling technician to the site to collect four surface water (S-1 to S-4) and four sediment samples (S-1 to S-4) along an on-site east to west trending tributary, which feeds into Walltown Branch (see Figure L-7). At each location, a surface water sample and sediment sample were collected and submitted to the laboratory according to EPA-accepted procedures. Both the surface water and sediment samples were analyzed for total boron only with the following results:

Sampling Location	***Surface Water (mg/L)***	***Sediment (mg/kg)***
S-1	BDL	87.8
S-2	BDL	104
S-3	BDL	89.6
S-4	0.223	78.9

These results indicate the following:

- The surface water samples indicate little contribution of boron from off site; however, the last sample prior to the confluence with Walltown Branch did detect boron at a concentration of 0.223 mg/L which is below the EPA screening value of 0.75 mg/L. This could represent contribution from a former Laundromat, which operated on a tract east of the Ceramic Tile Pile and west of SR 8.

  The four sediment samples collected exhibit elevated concentration of boron when compared to previous sediment samples collected at locations closer to the closed RCRA units. We would conclude the potential impact from the former Laundromat may have been the source of these elevated boron readings. All four sediment samples are above the IHSB PGW PSRG of 45 mg/kg but below the health-based Industrial PSRG at 46,000 mg/kg. While this technically represents an exceedance of one PSRG, we would comment that the Upgradient concentration of boron exceeds the Downgradient sample concentration and could be due to contribution from an offsite source.

February 2005 Surface Water/Sediment Sampling Results

Waters Edge mobilized a sampling technician to the site on February 8, 2005 to collect several surface water and sediment samples as follows:

- S-5 represents an upgradient sampling location north of Victor Street in a drainage swale that migrates onto the site from the south.
- S-6 represents a second upgradient sampling location east of Highway 8 in a drainage swale that migrates onto the site from the east.
- S-7 represents a downgradient sampling location immediately north of the culvert, which drains surface water from the Facility.

These locations are shown on Figure L-7 and the results are summarized in Table L-9 and Table L-10. At each location, a surface water and sediment sample were collected and submitted to the laboratory according to EPA-accepted procedures. Both the surface water samples and sediment samples were analyzed for total boron with the following results:

Sampling Location	***Surface Water (mg/L)***	***Sediment (mg/kg)***
S-5 North of Victor Street	0.104	BDL
S-6 West of SR 8	BDL	BDL
S-7 Downgradient of Facility	2.89	BDL

These results indicate the following:

- The surface water sample (S-5) collected at the upgradient southern portion of the Facility detected 0.104 mg/L of boron, indications that there is an upgradient source of boron migrating onto the site from the south; however, the concentration is below the EPA screening value of 0.75 mg/L.
- There appears to be an additional contribution of boron from on site in that the S-7/Onsite Downgradient sample detected boron at a concentration of 2.89 mg/L which exceeds the EPA screening value of 0.75 mg/L.
- Downward migration of boron from the surface water to sediment is not substantiated in that the sediment samples taken below the surface water samples were all BDL.

Other Potential Sources of Impact to Walltown Branch

The 2005 RFA mentions results of a 1997 surface soil sampling investigation that detected lead at a maximum concentration of 12,700 mg/kg in soils in the northern edge of SWMU-7 (2HA-43-see Tables L-5 and L-6). The location of this maximum detected concentration is in the northeastern corner of the property and is discussed later as part of AOC-1 in Section L-1c (5) (Aquaterra, 1997b; Mannington, 2004; NCDEQ, 1997a, 1997b; Booz Allen 2003).

SWMU-7 Past Surface Water/Sediment Results versus Current Risk Based Standards and Existing Data Gaps

<u>Surface Water</u>
Based on the results of the surface water sampling, we would conclude that while there is potential off-site contribution of boron into the surface water entering the Facility (upgradient boron concentrations detected include 0.084 mg/L [March 1996], BDL [March 1999], and BDL /0.104 mg/L [two upgradient locations analyzed, west of SR 8 and north of Victor Street, respectively, February 2005]), there are increases in the boron concentration in the downgradient samples collected at the property line (Onsite Downgradient (S-7) boron concentrations detected include 1.93 mg/L [March 1996], 1.06 mg/L [March 1999], 0.223 mg/L [December 2004], and 2.89 mg/L [February 2005]). The Onsite Downgradient (S-7) March 1996, March 1999, and February 2005 boron concentrations exceed the EPA screening value of 0.75 mg/L. We would add that the levels of copper, manganese (Onsite Upgradient-S-5 and Onsite Downgradient- S-7), and zinc (downgradient only) also exceeded the 2B Standard in the March 1999 sampling event. The 2005 RFA recommends determination of the downgradient extent of the potential surface water impact. Based on the above sample results, we would concur that a data gap exists relating to why the surface water exceeds the NCDEQ 2B Standards for copper, manganese, and zinc, and the EPA screening value for boron at the Onsite Downstream sampling location (S-7), and copper and manganese exceed the NCDEQ 2B Standards at the Onsite Upstream sampling location (S-5). These sampling locations as well as the remainder of Walltown Branch to the confluence of Rat Springs Branch should be considered for further review and potential assessment.

Sediment

Based on the historic sediment sample results, while there may be increases of individual constituents, there are no Health-based Industrial PSRG exceedances in all past sampling results. There are individual PGW PSRG exceedances in the March 1999 investigation for cobalt and vanadium (both Onsite Upgradient (S-5) and Onsite Downgradient (S-7)). There are individual PGW PSRG exceedances in the December 2004 investigation for boron; however, upgradient background levels (S-1, S-2, and S-3) are higher than downgradient levels. Finally, there is a data gap in that a trivalent chromium standard was used which would be corroborated by analyzing for hexavalent chromium at the worst cased location (S-7-Onsite Downgradient) to assure that we can use trivalent chromium PSRGs.

L-1c (5) AOC-1 Site Assessment History

In conjunction with the closure of SWMU-3, additional soil sampling was conducted in AOC-1, north of SWMU-3.

March, April, and May 1997 Additional Tile Pile Soil Assessment

In March, April, and May 1997, Aquaterra personnel collected the following samples:

- HA-7 and HA-9, collected north of SWMU-3 (March 25, 1997), and analyzed for arsenic, barium, boron, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium, silver, titanium, vanadium, and zinc.
- 2-HA-23, 2-HA-24, 2HA-25, 2-HA-26, 2-HA-33, 2-HA-34, 2-HA-44 (April 24, 1997) with all samples analyzed for barium and lead. Sample 2-HA-44 was analyzed for boron, cadmium, chromium, cobalt, manganese, and zinc.
- 4HA-48 and 4-HA-49 (May 30, 1997) were analyzed for lead only.

The sample locations are depicted in the July 11, 1997 *Ceramic Tile Closure Plan*- Figure 2-1 and are shown on Figure L-2. The analytical results are depicted in Table L-11. While no depth interval is specified for these borings in past reports, based on past information provided by Dr. Bryson Trexler of Aquaterra, these were described as hand auger borings conducted between 0-2’ bgs.

Soil samples collected from this area during the 1996 and 1997 site investigations also identified several areas containing elevated metals concentrations. Specifically, hand auger soil samples collected north of the Ceramic Tile Pile in AOC-1 contained significantly elevated concentrations of lead, barium, and boron. Lead concentrations in sampling locations 2-HA-23 and 4-HA-48, were 458 mg/kg and 5,140 mg/kg, respectively. In addition, the TCLP results for lead from soil sample 4HA-48 was 60.8 mg/L. Sample locations 4HA-48 and 2HA-23 are located on the vegetated bank in the southern portion of this unit in an area depicted as Former Charles Avenue. Sampling from locations 2-HA-24, 2-HA-25, and 2-HA-26 were collected north of sampling locations 4HA-48 and 2HA-23. This sampling detected lead concentrations similar to background levels; thereby establishing delineation in that direction. Based on these past investigations, the soils in the Former Charles Avenue area (HA-9 and 4-HA-48) were removed and placed on the waste Ceramic Tile Pile prior to closure in 1997. A soil boring location map is depicted on Figure L-2 and the analytical results are depicted in Table L-11 (NCDEQ, 1990a, 1998b, 1999c; Aquaterra, 1997b; Booz Allen, 2003).

Surface Water

There is also existing surface water impact above NCDEQ 2B standards in Walltown Branch which transects AOC-1 and was previously discussed in Sections L-1a (3), L-1 b (3) and L-1 c (3).

Groundwater

There are also several groundwater monitoring wells in this area (e.g. MW-9D, MW-12, MW-19D, MW24, MW-25, MW-26-A-2 and MW-28D) which have impacts above NCGS with the main constituent being boron. Groundwater impact is discussed as a separate site-wide media in Part E - Groundwater Monitoring.

Past Sampling Results Versus Current Risk-Based Standards and Existing Data Gaps

We have compared the past sampling results versus current risk based standards in Table L-6 and Table L-11. Borings with current PGW or Industrial PSRG exceedances that were not removed and placed on the Ceramic Tile Pile (e.g. soils along former Charles Avenue) are the following (locations depicted on Figure L-8):

AOC-1 Current PSRG Soil Boring Exceedances for Area Outside of Tile Pile Cap

Boring Location (Ordinal Direction)	Above NCDEQ PGW PSRGs	Above NCDEQ Industrial PSRGs
HA-7 (North)	Cd, Co, Mn, Pb Mn, V and Zn	As
4HA-49 (North)	Co and Mn	None
2HA-23 (Northeast)	Pb	None
2HA-44 (Northeast)	B, Cd, Co and Mn	Co

Note:
1. All concentrations in (mg/kg).
2. This includes some of the area considered as SWMU-3 since it is felt that they overlap.

Based on the current PSRGs exceedances, there are four (4) boring locations (HA-7, 4HA-49, 2-HA-23 and 2-HA-44), which would be considered data gaps. These areas should be considered for review and potential additional assessment.

L-1c (6) AOC-2 Site Assessment History

<u>Past Site Assessment Results Versus Current Risk-Based Standards and Existing Data Gaps</u>

As part of the site assessment associated with the Sludge Settling Ponds (SWMU-2), three soil borings (SS-8, SS-42, and SS-43) were advanced in what was later designated in the 2005 RFA as AOC-2. Sample SS-8 was collected on May 27, 1994, and samples SS-42 and SS-43 were collected on February 17, 2000. Soil samples were collected at depths of 0 to 1-foot bgs at each boring location, and at a depth of 3 feet bgs at the SS-43 boring location for analysis of priority pollutant metals. The boring locations are shown on Figures L-4 and L-3 and the sample results are summarized in Table L-12. Based on current PGW and Industrial PSRGs, the following exceedances were noted:

AOC-2 Current PSRG Exceedances

Boring Location	**Above NCDEQ PGW PSRGs**	**Above NCDEQ Industrial PSRGs**
SS-8 (0-1’)	Boron (61.2 versus 45 PSRG) Cobalt (14 versus 0.9 PSRG) Lead (996 versus 270 PSRG) Manganese (122 versus 65 PSRG) Vanadium (33.2 versus 6.0 PSRG) Zinc (5,230 versus 1,200 PSRG)	Arsenic (<3.73 versus 3.0 PSRG) Lead (996 versus 800 PSRG)
SS-42 (0-1’)	Cobalt (9.42 versus 0.9 PSRG) Manganese (142 versus 65 PSRG) Vanadium (20.1 versus 6.0 PSRG)	None
SS-43 (0-1’)	Cobalt (3.82 versus 0.9 PSRG) Manganese (302 versus 65 PSRG) Vanadium (12.2 versus 6.0 PSRG)	None
SS-43 (3’)	Cobalt (3.77 versus 0.9 PSRG) Manganese (119 versus 65 PSRG) Vanadium (25.6 versus 6.0 PSRG)	None

Note: All concentrations in (mg/kg).

While there were some exceedances of PSRGs for lead at the SS-8 location (0-1’), the sample was also tested for lead via TCLP, and sample results detected 6.31 mg/L TCLP lead, which exceeds the 5.0 mg/L level considered a characteristic hazardous waste.

Based upon the results of the confirmatory sampling and a risk evaluation of the COCs remaining in the soil outside SWMU-2 (Sludge Settling Ponds), additional material was removed from north and west of the former Sludge Settling Ponds and in the northern extent of AOC-2 as depicted on Figures L-3 and L-4. This impacted soil was deposited on the Ceramic Tile Pile (SWMU-3) prior to its closure in 1997. The removal action and risk evaluation north and west of the Sludge Ponds is documented in the July 14, 2004 Revised Closure Plan for the Former Settling Ponds (Aquaterra, 1997c; NCDEQ, 1990a; ENSCI, 1992; Booz Allen, 2003; ENSCI, 1994). We were unable to find any documentation for removal of the northern portion of AOC-2; therefore, this would be considered a data gap.

2005 RFA COMMENTS AND PROPOSED ASSESSMENT WORK TASKS:

The 2005 RFA stated that confirmatory sampling was recommended to fully characterize the horizontal and vertical extent of the lead contamination located in the entire extent of AOC-2. Based on the current evaluation versus current PSRG Standards, cobalt, manganese and vanadium were above PGW PSRGs at SS-42 and SS-43. We have not included SS-8 since it was removed but there was no confirmatory sampling. We could not locate any additional assessment or confirmatory sampling information for the remainder of AOC-2, which extends south of SS-8 for approximately 500 feet (see Figure L-3). Therefore, we conclude that the entire AOC-2 area should be considered for review and potential future assessment.

L-1-d Additional Requirements

L-1d (1) Ongoing Sampling

Current ongoing sampling at the Facility includes semiannual sampling of monitoring wells MW-1 (upgradient well for the Facility), MW-9D, MW-12, MW-22A, MW-26A-2, and MW-28D in accordance with the most recently approved October 2007 SAP. Analysis of groundwater samples collected from the wells includes six metals (boron, cadmium, chromium, cobalt, lead, manganese, and zinc) which are analyzed according to EPA Method 200.7. Detailed information regarding ongoing sampling is discussed in Part E - Groundwater Monitoring.

L-1d (2) Cost Estimate for Assessment and Remediation of SWMUs and AOCs

As previously discussed, four (4) SWMUs and two (2) AOCs are currently recommended for additional investigation: Wastewater Pretreatment System (SWMU-1), Sludge Settling Ponds (SWMU-2), Ceramic Tile Pile (SWMU-3), Walltown Branch (SWMU-7), an Area of Discharge from the Tile Pile (AOC-1) and the Broken Ceramic Tile Roadway (AOC-2). It should be noted that SWMU-2 and SWMU-3 have successfully undergone closure which has been accepted by NCDEQ.

Part L Figures

WATERS EDGE ENVIRONMENTAL, LLC

Drawing	Image Source	Layers	Revision Date	Title
15-006 Fig L-1	Google Earth		11.30.2017	SWMU and AOC Location Map
Job No.	**Image Date**	**Figure**	**Scale**	**Project**
R1-21	4.8.2017	L-1	1" ~ 200'	Former Porcelanite Facility Lexington, North Carolina

Soil Sample Legend

- January 1992 Investigation
- Initial Soil Samples (Pre-1996)
- December 1996 Soil Sample SCS Exceedances
- March 1997 Soil Sample SCS Exceedances
- April 1997 Soil Sample SCS Exceedances
- May 1997 Soil Sample SCS Exceedances

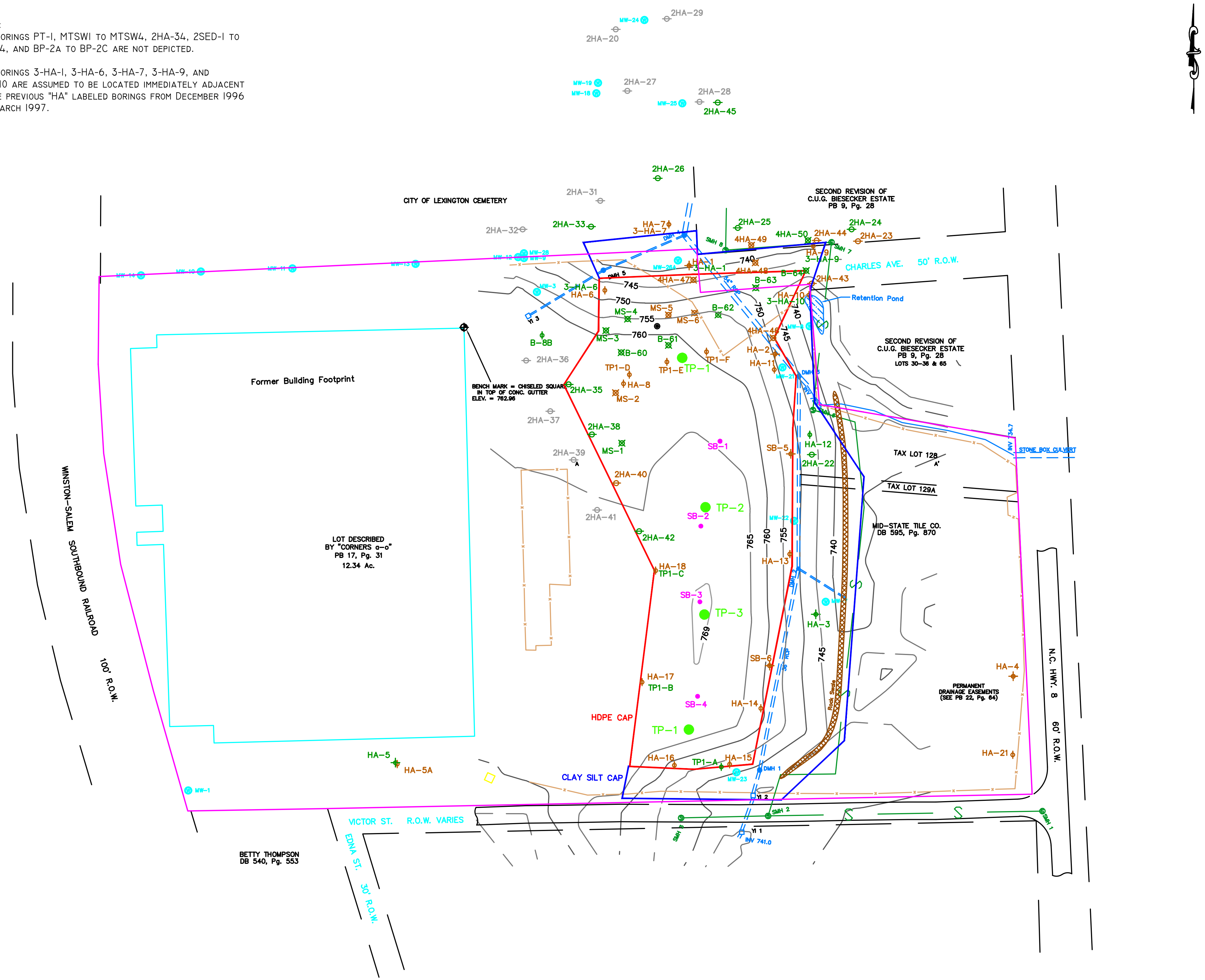
Green — Text Indicates Soil Samples Below SCS

Lt Gy — Text Indicates Soil Sample Not Analyzed (Apr 97)

SCS — Soil Cleanup Standard

Notes:
Soil Borings PT-1, MTSW1 to MTSW4, 2HA-34, 2SED-1 to 2SED-4, and BP-2A to BP-2C are not depicted.

Soil Borings 3-HA-1, 3-HA-6, 3-HA-7, 3-HA-9, and 3-HA-10 are assumed to be located immediately adjacent to the previous "HA" labeled borings from December 1996 and March 1997.



LEGEND:
- ● = EXISTING IRON PIN
- ○ = NEW IRON PIN
- ⊗ = COMPUTED POINT
- ⊙ = UTILITY POLE
- R.O.W. = RIGHT-OF-WAY
- PB = PLAT BOOK REFERENCE
- DB = DEED BOOK REFERENCE
- ● = STORM SEWER MANHOLE
- Ⓢ = SANITARY SEWER MANHOLE
- —S— = SANITARY SEWER LINE
- Ⓦ = MONITORING WELL LOCATION
- □ = STORM INLET
- —X— = FENCE LINE
- —— = PROPERTY BOUNDARY

0 125 250

SCALE IN FEET

PROJECT NUMBER 2017.0008.WATR

DRAFTER KTS

CHECKED BY JME

PROJECT MANAGER M.TERRY

DATE 11/21/2017

FILE Part L Fig L-2 SWMU 3 AOC 1 Past Soil Boring.dwg

WATERS EDGE ENVIRONMENTAL, LLC

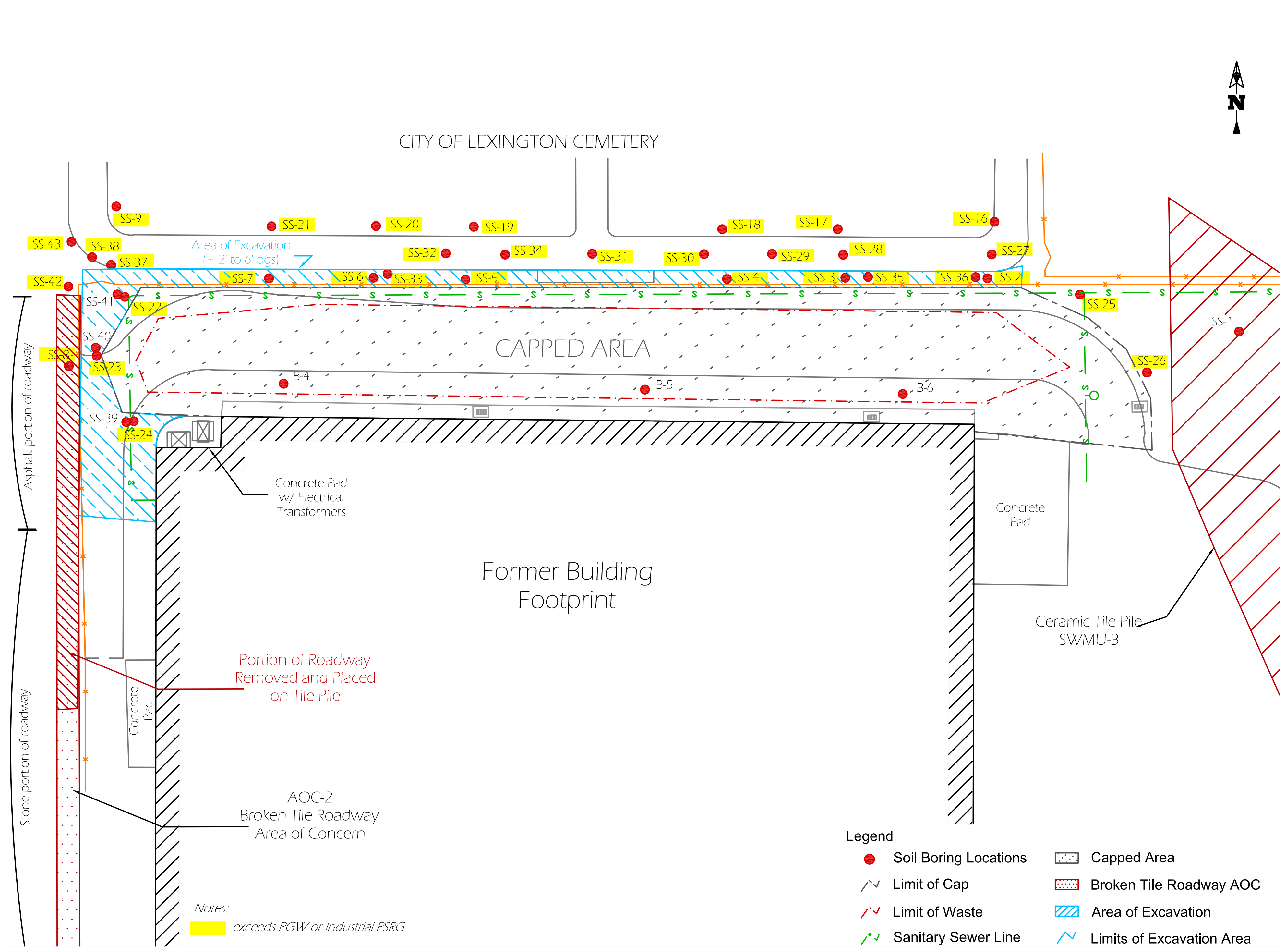
FORMER PORCELANITE FACILITY
LEXINGTON, NORTH CAROLINA

SWMU-3 AND AOC-1 PAST SOIL SAMPLE LOCATION AND RCRA CLOSURE CAP DELINEATION MAP

FIGURE: L-2

J:\Project Files\Porcelanite Part A\Current Drawings\Porcelanite Part A.dwg

WATERS EDGE ENVIRONMENTAL, LLC	*Author*	*Drawing* Part L Fig L-3	*Date* 10.18.2016	*Title* AOC-2 Soil Boring Location Map Location Map
	Job No. R1-21	*Figure* L-3	*Sacle* 1" ` 100'	*Project* Former Porcelanite Facility Lexington, North Carolina



WATERS EDGE ENVIRONMENTAL, LLC	Author jme	Drawing Part L Fig L-4	Layers	Date 1.21.15	Title SWMU-2 / AOC-2 Past Sample and Current RBC Exceedance Map
	Job No. R1-21	Revision 12.15.2017	Figure L-4	Scale 1" = 60'	Project Former Porcelanite Facility Lexington, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC

Job No.	Image/Photo	Revision Date	Title	
R1-21	Google Earth 4/8/17	12/6/2017		Background Soil Sample Location Map
File Name	*Figure*	*Scale*	*Project*	Former Procelanite Facility
Part L Fig L-5	L-5	1" ~ 200'		Lexington, North Carolina

Soil Sample Legend

- Initial Soil Samples (Pre-1996)
- December 1996 Soil Sample SCS Exceedances
- March 1997 Soil Sample SCS Exceedances
- April 1997 Soil Sample SCS Exceedances
- May 1997 Soil Sample SCS Exceedances
- Green — Text Indicates Soil Samples Below SCS
- Lt Gy — Text Indicates Soil Sample Not Analyzed (Apr 97)
- SCS — Soil Cleanup Standard
- *exceeds PGW PSRG*
- *exceeds PGW and Industrial PSRG*

PSRG Exceedances

HA-7 PGW Exceedances for Cd, Co, Mn, Pb, V and Zn
Ind PSRG Exceedances for As

2HA-23 PGW Exceedance for Pb

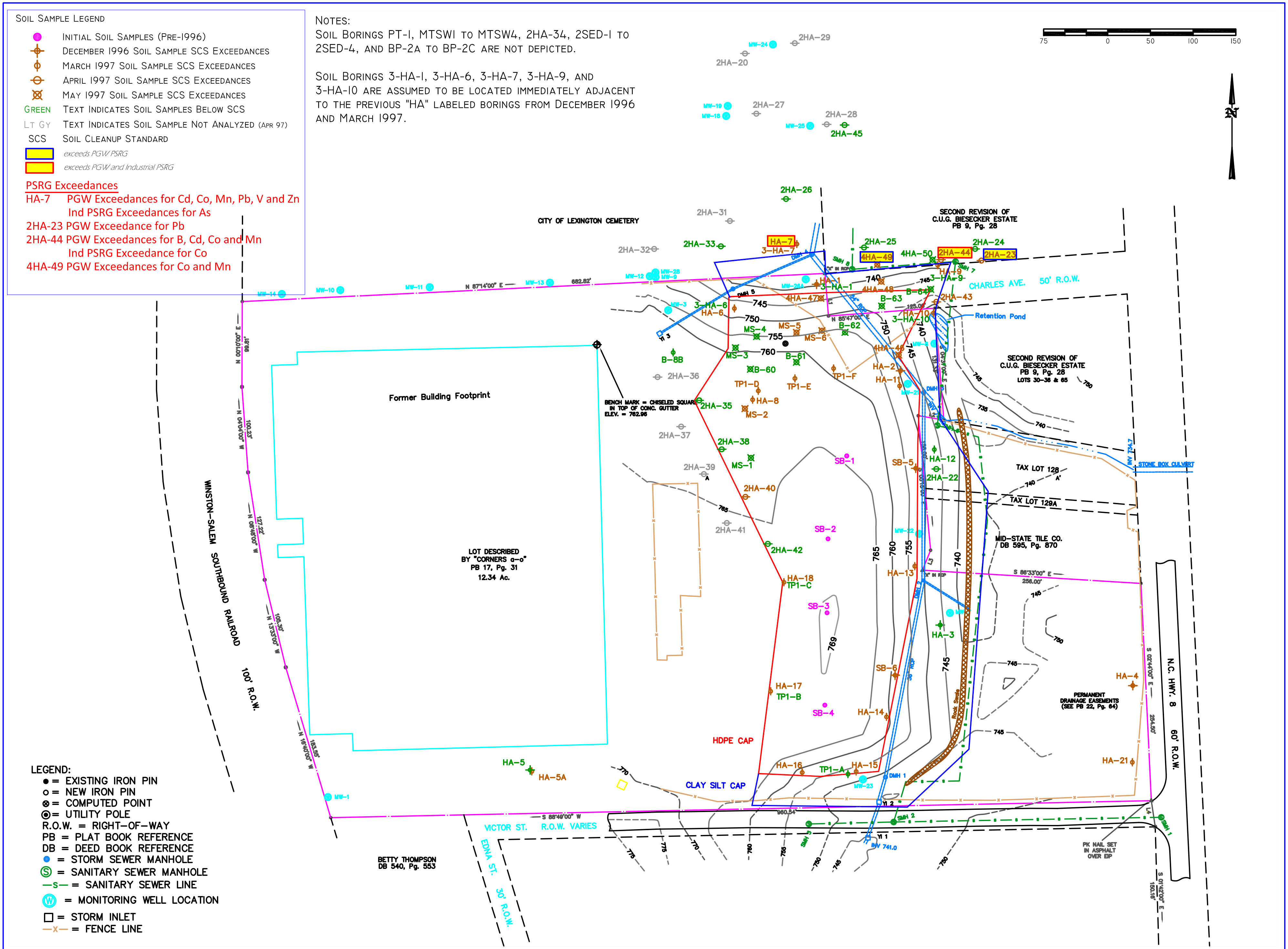
2HA-44 PGW Exceedances for B, Cd, Co and Mn
Ind PSRG Exceedance for Co

4HA-49 PGW Exceedances for Co and Mn

Notes:

Soil Borings PT-1, MTSW1 to MTSW4, 2HA-34, 2SED-1 to 2SED-4, and BP-2A to BP-2C are not depicted.

Soil Borings 3-HA-1, 3-HA-6, 3-HA-7, 3-HA-9, and 3-HA-10 are assumed to be located immediately adjacent to the previous "HA" labeled borings from December 1996 and March 1997.



LEGEND:

- ● = EXISTING IRON PIN
- ○ = NEW IRON PIN
- ⊗ = COMPUTED POINT
- ◉ = UTILITY POLE
- R.O.W. = RIGHT-OF-WAY
- PB = PLAT BOOK REFERENCE
- DB = DEED BOOK REFERENCE
- ● = STORM SEWER MANHOLE
- Ⓢ = SANITARY SEWER MANHOLE
- —S— = SANITARY SEWER LINE
- Ⓦ = MONITORING WELL LOCATION
- □ = STORM INLET
- —X— = FENCE LINE

WATERS EDGE ENVIRONMENTAL, LLC

Author	Drawing	Layers	Date	Title
m.terry/jme	Part L Fig L-6		1.21.15	SWMU-3\AOC-1 PSRG Exceedance Map Beyond Perimeter of CAP
Job No.	**Revision**	**Figure**	**Scale**	**Project**
R1-21	12.18.2017	L-6	see scalebar	Former Porcelanite Facility Lexington, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC

Job No.	Image/Photo	Revision Date	Title	
R1-21	Google Earth 4/8/17	12/6/2017		Past Surface Water Sample/Sediment 2B/RBC Exceedances
File Name	Figure	Scale	Project	
Part L Fig L-7	L-7	1" ~ 200'		Former Porcelanite Facility Lexington, North Carolina

Part L Tables

Table L-1
SWMU/AOC Identification and Past and Current Status
Former Porcelanite Facility
Lexington, North Carolina

Unit	Name	2005
SWMU 1	Wastewater Pretreatment System	CS
SWMU 2	Sludge Settling Ponds (Regulated)	NFA
SWMU 3	Ceramic Tile Pile (Regulated)	NFA
SWMU 4	20 cubic yd Sludge Roll-Off Container	NFA
SWMU 5	20 cubic yd Floor Sweeping Roll–Off	NFA
SWMU 6	Baghouse	CS
SWMU 7	Walltown Drain	RFI
SWMU 8	Off-Spec Tile Accumulation Roll-Off	NFA
SWMU 9	Filter Cake Waste Pile Area	NFA
SWMU 10	Maintenance Building Waste Management	NFA
SWMU 11	Spray Line Area Sumps	CS
AOC 1	Area of Discharge from Tile Pile	RFI
AOC 2	Broken Ceramic Tile Roadway	CS
AOC 3	Former UST and AST Area	NFA

Notes:
Based on Booz Allen 2005 RFA Recommendations

CS = Confirmatory Sampling

NFA = No Further Action

RFI = Recommended Further Investigation

Table L-2
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus 1993 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Analytical Method	Site Specific Background Levels* + 2X S.D. (mg/kg)	1993 Soil Closure Standard (mg/kg)	B-4 6-7.5' 11/22/89	B-5 1-2.5' 11/24/89	B-5 6-7.5' 11/24/89	B-6 2.5-4' 11/24/89	B-6 17.5-19' 11/24/89	SS-1 0 - 1' 5/27/94	SS-2 0 - 1' 11/4/99	SS-3 0 - 1' 11/4/99	SS-4 0 - 1' 11/4/99	SS-4-2 3' 9/13/02	SS-4-2 5' 9/13/02	SS-5 0 - 1' 11/4/99	SS-6 0 - 1' 11/4/99
Inorganics (mg/kg)																	
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.0	<1.0	<1.0	<1.0	<1.0	<3.62	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	<10	<10	<10	<10	<10	80.1	246	149	47.7	NA	NA	373	64.3
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	NA	NA	NA	NA	NA	26	30.9	61.9	74.2	NA	NA	<10.5	31.6
Bromide	NL	EPA Method 300	MDL	PQL (10)	NA	NA	NA	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.5	<0.5	<0.5	<0.5	<0.5	<0.725	0.712	0.696	0.623	NA	NA	0.335	0.249
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	<1.0	<1.0	<1.0	<1.0	<1.0	8.19	15.4	**33.6**	**33.3**	8.39	6.74	4.81	8.58
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	NA	NA	NA	NA	NA	<3.62	19.9	11.3	6.48	NA	NA	20.9	6.96
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	<1.0	<1.0	<1.0	<1.0	<1.0	93.4	225	207	18.5	NA	NA	155	145
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	NA	NA	NA	NA	NA	82.4	**392**	298	201	NA	NA	312	290
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.145	0.901	**1.28**	0.855	NA	NA	0.855	0.413
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	NA	NA	NA	NA	NA	3.12	13.3	8.77	6.48	NA	NA	7.32	3.73
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1.45	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.0	<1.0	<1.0	<1.0	<1.0	<0.725	<1.19	<1.29	<1.25	NA	NA	<1.05	<1.24
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	NA	NA	NA	NA	NA	168	49.9	<25	97.5	NA	NA	48.2	51.8
Titanium	NL	Method 200.7	996.31	996	NA	NA	NA	NA	NA	92.2	789	**1,040**	948	NA	NA	59	453
Vanadium	NL/550	Method 200.7	184.91	550	NA	NA	NA	NA	NA	33.8	66	151	173	NA	NA	12.2	56
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	NA	NA	NA	NA	NA	388	**2,290**	625	330	NA	NA	**3,680**	269
Radionuclides (pCi/g)																	
Gross Alpha	50	Method 9310	33.47	50	NA	NA	NA	NA	NA	15.4	7.7	9.3	10.6	NA	NA	10.8	19.5
Gross Beta	50	Method 9310	48.92	48.92	NA	NA	NA	NA	NA	38.6	13.3	12.9	8.9	NA	NA	27.2	32.1
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	<6.71	<11.9	<12.9	<12.2	NA	NA	<10.4	<12.2
Radium 226	5[c]	Method 9315	1.33	5	NA	NA	NA	NA	NA	0.6	0.7	1.4	1.5	NA	NA	1.2	1.0
Radium 228	5[c]	Method 9315	1.09	5	NA	NA	NA	NA	NA	1.1	<1.0	<1.0	<0.9	NA	NA	<0.9	<1.0

Notes:

Result Exceeds 1993 Soil Closure Standard

* = EPA Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites, December 1995.

** = past holding time for analysis

a = NC Hazardous Waste Section Target Remediation Guidelines

b = NC GW Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

MDL = Method Detection Limit

NA = Not Analyzed per December 6, 1999 and September 3, 2002 DENR Correspondence

NL = No Level

Table L-2
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus 1993 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Analytical Method	Site Specific Background Levels* + 2X S.D. (mg/kg)	1993 Soil Closure Standard (mg/kg)	SS-7 0 - 1' 11/4/99	SS-7-2 3' 9/13/02	SS-7-2 5' 9/13/02	SS-8 0 - 1' 5/27/94	SS-9 0 - 1' 5/27/94	SS-16 0 - 1' 11/10/99	SS-17 0 - 1' 11/10/99	SS-18 0 - 1' 11/10/99	SS-19 0 - 1' 11/10/99	SS-20 0 - 1' 11/10/99	SS-21 0 - 1' 11/10/99	SS-22 0 - 1' 11/4/99	SS-23 0 - 1' 11/18/99
Inorganics (mg/kg)																	
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<1.28	NA	NA	<3.73	<3.75	<1.13	<1.15	<1.16	<1.00	<1.01	<1.09	<1.14	<0.894
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	146	NA	NA	186	31.7	25.3	21.8	19.2	20.1	15.3	12	**1,490**	47
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	<12.7	NA	NA	61.2	11.2	18.2	<11.5	13.1	<10	<10.1	13.6	33.8	<8.94
Bromide	NL	EPA Method 300	MDL	PQL (10)	<10	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	0.329	NA	NA	<0.746	<0.806	<0.113	<1.15	<0.116	<0.100	<0.101	<0.109	1.37	0.335
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	13.2	NA	NA	8.58	4.04	8.03	6.71	8.95	3.11	2.71	10.1	8.32	18.3
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	19.9	NA	NA	14	<4.04	1.58	1.26	1.63	2.0	1.51	1.53	**39.5**	**2,000**
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	**397**	<11.8	12.6	**996**	42.7	10.5	25.5	6.16	9.02	12.7	7.08	**6,830**	3.58
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	285	NA	NA	122	278	58.4	35.1	33.4	161	172	42.7	225	193
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	0.662	NA	NA	<0.149	<0.172	0.476	0.652	0.488	<0.200	<0.201	<0.218	**2.62**	<0.179
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	10.0	NA	NA	7.31	<4.04	2.26	1.72	1.76	<1.0	<1.01	2.29	23.8	50.2
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<1.28	NA	NA	<1.49	<1.50	2.37	1.72	1.51	<1.0	<1.01	2.51	1.48	1.52
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<1.28	NA	NA	<0.746	<0.807	<1.13	<1.15	<1.16	<1.0	<1.01	<1.09	<1.14	<0.894
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	<25	NA	NA	537	172	27.6	<250	48.1	<100	<100	<25	34.8	35
Titanium	NL	Method 200.7	996.31	996	130	NA	NA	118	36.1	39.3	43.5	21.9	15.5	17	34.4	46.4	543
Vanadium	NL/550	Method 200.7	184.91	550	37.6	NA	NA	33.2	9.62	28.7	21.6	27.8	6.91	4.83	30	17.9	51.5
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	855	NA	NA	**5,230**	39.6	62.3	111	34.3	13.1	21.5	17.2	**7,020**	28.7
Radionuclides (pCi/g)																	
Gross Alpha	50	Method 9310	33.47	50	7.7	NA	NA	16.3	8	29.1	28.8	23.3	14.8	11.1	22.8	11.6	1.9
Gross Beta	50	Method 9310	48.92	48.92	20.7	NA	NA	29	33.3	38.1	47.9	36.6	40.3	36	38.1	24.4	9.9
Praseodymium	NL	Method 1620	MDL	MDL	<12.7	NA	NA	<7.46	<7.52	<11.3	<11.5	<11.6	<10.0	<10.1	<10.9	<11.4	NA
Radium 226	5[c]	Method 9315	1.33	5	1.6	NA	NA	2.2	1.2	0.7	1.1	2.4	1.1	0.9	0.6	0.9	1.1
Radium 228	5[c]	Method 9315	1.09	5	<1.0	NA	NA	1.2	<0.8	<1.0	<1.0	1.0	1.1	<1.0	1.5	1.0	<1.1

Notes:

[shaded box] *Result Exceeds 1993 Soil Closure Standard*

* = EPA Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites, December 1995.

** = past holding time for analysis

a = NC Hazardous Waste Section Target Remediation Guidelines

b = NC GW Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

MDL = Method Detection Limit

NA = Not Analyzed per December 6, 1999 and September 3, 2002 DENR Correspondence

NL = No Level

Table L-2
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus 1993 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Analytical Method	Site Specific Background Levels* + 2X S.D. (mg/kg)	1993 Soil Closure Standard (mg/kg)	SS-24 0 - 1' 11/18/99	SS-24 3' 11/18/99	SS-24-2 4' 9/13/02	SS-24-2 6' 9/13/02	SS-25 0 - 1' 11/4/99	SS-25 3' 11/18/99	SS-26 0 - 1' 11/10/99	SS-27 0 - 1' 1/19/00	SS-28 0 - 1' 1/19/00	SS-29 0 - 1' 1/19/00	SS-30 0 - 1' 1/19/00	SS-31 0 - 1' 1/19/00	SS-32 0 - 1' 1/19/00
Inorganics (mg/kg)																	
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	64.8	260	NA	NA	54.4	78.7	135	18.1	8.3	13	22.9	30	25.8
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	11.1	44.2	NA	NA	27.2	70.4	<10.1	6.09	7.41	11.8	7.72	8.05	<5.19
Bromide	NL	EPA Method 300	MDL	PQL (10)	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	0.168	0.331	NA	NA	0.228	0.318	<0.101	<0.113	<0.111	<0.113	<0.107	<0.105	<0.104
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	17	15.9	NA	NA	9.44	21	4.65	6.66	4.65	7.13	7.29	6.66	4.15
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	**203**	**285**	11.4	9.96	3.23	3.37	6.27	1.35	<1.11	1.92	1.29	4.23	2.7
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	65.9	**972**	**372**	170	19.4	20.2	65.2	17.2	6.19	4.87	3.75	15.9	9.12
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	267	235	NA	NA	180	97	189	51.5	37.2	87.9	26.5	298	305
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	<0.189	<0.194	NA	NA	**1.28**	0.404	**4.02**	0.904	0.592	**2.19**	0.858	0.918	0.624
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	12.9	17.7	NA	NA	3.68	4.24	2.82	1.58	1.22	1.81	1.29	1.16	<1.04
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<0.942	<0.972	NA	NA	<1.15	<1.25	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	25.8	53	NA	NA	30.9	62.8	<250	100	275	<25	43	<250	43.4
Titanium	NL	Method 200.7	996.31	996	639	451	NA	NA	317	398	23.8	106	57.5	137	51.3	61.1	42.8
Vanadium	NL/550	Method 200.7	184.91	550	32.7	31.2	NA	NA	44.2	117	9.2	26.3	26.9	29.2	19	12.2	6.74
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	131	**1,200**	1,070	710	40	417	885	13.1	12.3	25.4	11.7	9.31	4.15
Radionuclides (pCi/g)																	
Gross Alpha	50	Method 9310	33.47	50	2.1	8.9	NA	NA	20.2	22.8	15.4	NA	NA	NA	NA	NA	NA
Gross Beta	50	Method 9310	48.92	48.92	8.6	16.3	NA	NA	29.8	17.3	43.5	NA	NA	NA	NA	NA	NA
Praseodymium	NL	Method 1620	MDL	MDL	<9.42	<9.63	NA	NA	<11.5	<12.5	<10.1	NA	NA	NA	NA	NA	NA
Radium 226	5[c]	Method 9315	1.33	5	0.5	0.9	NA	NA	1.3	0.5	0.8	NA	NA	NA	NA	NA	NA
Radium 228	5[c]	Method 9315	1.09	5	<1.0	<1.1	NA	NA	<1.0	<1.1	<1.0	NA	NA	NA	NA	NA	NA

Notes:

Result Exceeds 1993 Soil Closure Standard

* = EPA Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites, December 1995.

** = past holding time for analysis

a = NC Hazardous Waste Section Target Remediation Guidelines

b = NC GW Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

MDL = Method Detection Limit

NA = Not Analyzed per December 6, 1999 and September 3, 2002 DENR Correspondence

NL = No Level

Table L-2
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus 1993 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	**SSL Protective of Ground Water/Region 9 Risk-Based Concentration** (RBC)	**Analytical Method**	**Site Specific Background Levels* + 2X S.D.** (mg/kg)	**1993 Soil Closure Standard** (mg/kg)	**SS-33** 0 - 1' 1/19/00	**SS-33** 3' 1/19/00	**SS-34** 0 - 1' 1/19/00	**SS-34** 3' 1/19/00	**SS-35** 0 - 1' 1/19/00	**SS-35** 3' 1/19/00	**SS-36** 0 - 1' 1/19/00	**SS-36** 3' 1/19/00	**SS-36-2** 3' 9/13/02	**SS-37** 0 - 1' 1/19/00	**SS-37** 3' 1/19/00	**SS-38** 0 - 1' 1/19/00	**SS-38** 3' 1/19/00
Inorganics (mg/kg)																	
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20	<1.01	<0.982
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	25.5	25.2	39.9	29.9	23.1	17.2	690	10.2	NA	14.6	5.4	25	4.62
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	<5.20	12.5	<5.30	19.0	**107**	31.9	56	22.4	NA	32.3	22.0	6.55	<9.82
Bromide	NL	EPA Method 300	MDL	PQL (10)	<10	**	<10	**	<10	**	<10	**	NA	<10	**	<10	**
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.098	0.159	<0.106	<0.105	<0.122	0.226	<0.126	0.162	NA	<0.120	<0.120	<0.101	<0.098
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	6.97	11.0	5.08	8.42	17.1	12.2	13.2	3.86	NA	10.2	3.6	8.07	3.14
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	2.26	2.35	4.45	3.05	3.42	1.86	3.42	1.87	NA	1.32	<1.20	2.82	1.18
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	10.5	5.44	12.5	8.21	17.5	9.16	23.5	7.36	NA	7.46	4.2	7.77	5.5
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	**408**	73.5	164	105	120	62.7	91.5	168	NA	28.9	47.1	90.5	42.0
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	**1.41**	**	0.425	**	**3.67**	**	**1.43**	**	NA	**2.65**	**	0.942	**
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	<0.982	1.71	1.17	2.63	5.74	3.01	4.43	1.64	NA	1.56	<1.20	1.72	<0.982
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20	<1.01	<0.982
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<0.982	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA	<1.20	<1.20	<1.01	<0.982
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	<250	**	<250	**	67	**	**5,560**	**	101	36.8	**	37.3	**
Titanium	NL	Method 200.7	996.31	996	34.2	13.3	81.7	16.4	339	150	187	47.2	NA	62.2	22.9	47.2	13.4
Vanadium	NL/550	Method 200.7	184.91	550	6.09	21.0	8.69	22.9	210	66.1	87.7	23.8	NA	34.2	14.7	16.6	9.53
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	21.6	60.3	15.5	8.1	21.7	23.7	37.1	33.0	NA	11.4	19.9	6.56	7.76
Radionuclides (pCi/g)																	
Gross Alpha	50	Method 9310	33.47	50	12.7	16.8	17.7	14.1	18.4	19.0	**64.8**	30.4	NA	27.2	38.2	16.1	13.6
Gross Beta	50	Method 9310	48.92	48.92	39.4	32.5	42.8	32.6	15.7	23.7	48.7	**55.6**	NA	34.7	42.5	40.6	38.9
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium 226	5[c]	Method 9315	1.33	5	0.5	1.2	1.4	1.0	1.0	0.9	0.5	0.8	NA	0.7	0.6	0.7	0.7
Radium 228	5[c]	Method 9315	1.09	5	<1.0	<1.1	<1.1	<1.0	<1.0	<1.1	1.1	<1.0	NA	1.0	<1.0	<1.0	<1.0

Notes:

Result Exceeds 1993 Soil Closure Standard

* = EPA Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites, December 1995.

** = past holding time for analysis

a = NC Hazardous Waste Section Target Remediation Guidelines

b = NC GW Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

MDL = Method Detection Limit

NA = Not Analyzed per December 6, 1999 and September 3, 2002 DENR Correspondence

NL = No Level

Table L-2
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus 1993 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	SSL Protective of Ground Water/Region 9 Risk-Based Concentration (RBC)	Analytical Method	Site Specific Background Levels* + 2X S.D. (mg/kg)	1993 Soil Closure Standard (mg/kg)	SS-39 0 - 1' 2/17/00	SS-39 3' 2/17/00	SS-40 0 - 1' 2/17/00	SS-40 3' 2/17/00	SS-41 0 - 1' 2/17/00	SS-41 3' 2/17/00	SS-42 0 - 1' 2/17/00	SS-43 0 - 1' 2/17/00	SS-43 3' 2/17/00	BG-1 0-1' 11/10/99	BG-2 0-1' 11/10/99
Inorganics (mg/kg)															
Arsenic	5.24/0.39 mg/kg[a]	Method 200.7	0.61	PQL	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09
Barium	848/5,400 mg/kg[a]	Method 200.7	83.07	848	40.2	<4.19	39.5	63.5	435	50.6	140	34.8	55.1	19.2	43.12
Boron	20.5/5,500 mg/kg[a]	Method 200.7	77.26	77.24	<9.53	<10.5	<9.39	<11.3	<10.8	<10.4	13.0	<10.3	<11.1	24.3	<10.9
Bromide	NL	EPA Method 300	MDL	PQL (10)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	2.72/39 mg/kg[a]	Method 200.7	0.796	2.72	<0.095	<0.105	<0.094	<0.113	<0.108	<0.104	<0.097	<0.103	<0.111	<0.118	<0.109
Chromium	27.2/30 mg/kg[a]	Method 200.7	27.3	27.2	12.7	<1.05	16.7	3.16	4.53	8.14	11.8	6.82	8.64	11.5	6.76
Cobalt	22/4,700 mg/kg[a]	Method 200.7	39.49	39.50	6.00	<1.05	8.07	9.59	5.82	10.5	9.42	3.82	3.77	2.0	2.94
Lead	270/400 mg/kg[a]	Method 200.7	71.98	270	4.67	<0.523	1.03	11.5	44.6	20.5	239	16.8	32.7	13.4	13.2
Manganese	65.2/NL mg/kg[a]	Method 200.7	384.53	384.5	219	<1.05	234	4.21	**519**	153	142	302	119	42.5	123
Mercury	0.0154/23 mg/kg[a]	Method 200.7	1.22	1.23	<0.191	<0.209	<0.188	<0.226	0.307	<0.209	<0.194	<0.206	<0.221	5.54***	0.862
Nickel	56.4/1,600 mg/kg[a]	Method 200.7	10.51	56.4	6.96	<1.05	9.95	3.50	1.94	2.19	6.31	1.76	2.66	2.82	2.73
Selenium	12.2/390 mg/kg[a]	Method 200.7	2.99	12.2	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	2.47	1.2
Silver	0.223/390 mg/kg[a]	Method 200.7	0.61	PQL	<0.953	<1.05	<0.939	<1.13	<1.08	<1.04	<0.971	<1.03	<1.11	<1.18	<1.09
Sulfate	2,500 mg/kg[b]	Method 9038	72.75	2,500	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100
Titanium	NL	Method 200.7	996.31	996	357	<10.5	384	356	24.8	26.9	84.7	22.3	26.3	65.7	181
Vanadium	NL/550	Method 200.7	184.91	550	20.6	1.46	22.5	33.4	7.87	16.0	20.1	12.2	25.6	45.2	27.6
Zinc	1,100/23,000 mg/kg	Method 200.7	163.71	1,100	34.9	2.83	26.2	32.3	390	78.8	258	21.2	9.60	149	124
Radionuclides (pCi/g)															
Gross Alpha	50	Method 9310	33.47	50	<2.3	<2.0	<2.2	20.3	19.8	10.0	7.9	13.3	27.4	22.4	23.5
Gross Beta	50	Method 9310	48.92	48.92	9.1	2	10.8	29.6	30.0	16.1	14.0	37.6	37.6	31	33.2
Praseodymium	NL	Method 1620	MDL	MDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	<11.8	<10.9
Radium 226	5[c]	Method 9315	1.33	5	0.2	<0.3	<0.4	1.3	0.8	1.5	1.0	0.7	0.5	1	1.1
Radium 228	5[c]	Method 9315	1.09	5	<1.0	<1.0	<1.0	<1.1	<1.1	<1.1	<1.1	1.0	1.8	<1.0	0.9

Notes:

Result Exceeds 1993 Soil Closure Standard

* = EPA Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites, December 1995.

** = past holding time for analysis

a = NC Hazardous Waste Section Target Remediation Guidelines

b = NC GW Quality Standard for Sulfate of 250 mg/L x 10 (dilution/attenuation factor) = 2,500 mg/kg

c = reference September 3, 2002 DENR Correspondence

MDL = Method Detection Limit

NA = Not Analyzed per December 6, 1999 and September 3, 2002 DENR Correspondence

NL = No Level

Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	B-4 6-7.5' 11/22/89	B-5 1-2.5' 11/24/89	B-5 6-7.5' 11/24/89	B-6 2.5-4' 11/24/89	B-6 17.5-19' 11/24/89	SS-1 0 - 1' 5/27/94	SS-2 0 - 1' 11/4/99	SS-3 0 - 1' 11/4/99
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.0	<1.0	<1.0	<1.0	<1.0	<3.62	<1.19	<1.29
Barium	580	44,000	<10-413	<10	<10	<10	<10	<10	80.1	246	149
Boron	45	46,000	<10.5-123	NA	NA	NA	NA	NA	26	30.9	61.9
Bromide	NS	NS	<10-<10	NA	NA	NA	NA	NA	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.725	0.712	0.696
Chromium	360,000	100,000	<0.5-123	<1.0	<1.0	<1.0	<1.0	<1.0	8.19	15.4	33.6
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	NA	<3.62	19.9	11.3
Lead	270	800	<0.5-18.8	<1.0	<1.0	<1.0	<1.0	<1.0	93.4	225	207
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	NA	82.4	392	298
Mercury	1.0	3.1	<0.0005-0.862	<0.2	<0.2	<0.2	<0.2	<0.2	<0.145	0.901	1.28
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	3.12	13.3	8.77
Selenium	2.1	1,200	<0.1-2.47	<0.5	<0.5	<0.5	<0.5	<0.5	<1.45	<1.19	<1.29
Silver	3.4	1,200	<0.5-<1.34	<1.0	<1.0	<1.0	<1.0	<1.0	<0.725	<1.19	<1.29
Sulfate	NS	NS	<100-<100	NA	NA	NA	NA	NA	168	49.9	<25
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	92.2	789	1,040
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	33.8	66	151
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	NA	388	2,290	625

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

** = past holding time for analysis

*** = Considered Statistical Outlier - not used

NA = Not Analyzed

NS = No Standard

Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-4 0 - 1' 11/4/99	SS-4-2 3' 9/13/02	SS-4-2 5' 9/13/02	SS-5 0 - 1' 11/4/99	SS-6 0 - 1' 11/4/99	SS-7 0 - 1' 11/4/99	SS-7-2 3' 9/13/02	SS-7-2 5' 9/13/02
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA
Barium	580	44,000	<10-413	47.7	NA	NA	373	64.3	146	NA	NA
Boron	45	46,000	<10.5-123	74.2	NA	NA	<10.5	31.6	<12.7	NA	NA
Bromide	NS	NS	<10-<10	<10	NA	NA	<10	<10	<10	NA	NA
Cadmium	3.0	200	<0.1-12.7	0.623	NA	NA	0.335	0.249	0.329	NA	NA
Chromium	360,000	100,000	<0.5-123	33.3	8.39	6.74	4.81	8.58	13.2	NA	NA
Cobalt	0.9	70	2.02-47.2	6.48	NA	NA	20.9	6.96	19.9	NA	NA
Lead	270	800	<0.5-18.8	18.5	NA	NA	155	145	397	<11.8	12.6
Manganese	65	5,200	56.6-449	201	NA	NA	312	290	285	NA	NA
Mercury	1.0	3.1	<0.0005-0.862	0.855	NA	NA	0.855	0.413	0.662	NA	NA
Nickel	130	4,400	2.77-12	6.48	NA	NA	7.32	3.73	10.0	NA	NA
Selenium	2.1	1,200	<0.1-2.47	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA
Silver	3.4	1,200	<0.5-<1.34	<1.25	NA	NA	<1.05	<1.24	<1.28	NA	NA
Sulfate	NS	NS	<100-<100	97.5	NA	NA	48.2	51.8	<25	NA	NA
Titanium	NS	NS	46.1-1,020	948	NA	NA	59	453	130	NA	NA
Vanadium	6.0	1,200	5.01-199	173	NA	NA	12.2	56	37.6	NA	NA
Zinc	1,200	70,000	27.3-124	330	NA	NA	3,680	269	855	NA	NA

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

** = past holding time for analysis
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NA = Not Analyzed
NS = No Standard

Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-8 0 - 1' 5/27/94	SS-9 0 - 1' 5/27/94	SS-16 0 - 1' 11/10/99	SS-17 0 - 1' 11/10/99	SS-18 0 - 1' 11/10/99	SS-19 0 - 1' 11/10/99	SS-20 0 - 1' 11/10/99	SS-21 0 - 1' 11/10/99
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<3.73	<3.75	<1.13	<1.15	<1.16	<1.00	<1.01	<1.09
Barium	580	44,000	<10-413	186	31.7	25.3	21.8	19.2	20.1	15.3	12
Boron	45	46,000	<10.5-123	61.2	11.2	18.2	<11.5	13.1	<10	<10.1	13.6
Bromide	NS	NS	<10-<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.746	<0.806	<0.113	<1.15	<0.116	<0.100	<0.101	<0.109
Chromium	360,000	100,000	<0.5-123	8.58	4.04	8.03	6.71	8.95	3.11	2.71	10.1
Cobalt	0.9	70	2.02-47.2	14	<4.04	1.58	1.26	1.63	2.0	1.51	1.53
Lead	270	800	<0.5-18.8	996	42.7	10.5	25.5	6.16	9.02	12.7	7.08
Manganese	65	5,200	56.6-449	122	278	58.4	35.1	33.4	161	172	42.7
Mercury	1.0	3.1	<0.0005-0.862	<0.149	<0.172	0.476	0.652	0.488	<0.200	<0.201	<0.218
Nickel	130	4,400	2.77-12	7.31	<4.04	2.26	1.72	1.76	<1.0	<1.01	2.29
Selenium	2.1	1,200	<0.1-2.47	<1.49	<1.50	2.37	1.72	1.51	<1.0	<1.01	2.51
Silver	3.4	1,200	<0.5-<1.34	<0.746	<0.807	<1.13	<1.15	<1.16	<1.0	<1.01	<1.09
Sulfate	NS	NS	<100-<100	537	172	27.6	<250	48.1	<100	<100	<25
Titanium	NS	NS	46.1-1,020	118	36.1	39.3	43.5	21.9	15.5	17	34.4
Vanadium	6.0	1,200	5.01-199	33.2	9.62	28.7	21.6	27.8	6.91	4.83	30
Zinc	1,200	70,000	27.3-124	5,230	39.6	62.3	111	34.3	13.1	21.5	17.2

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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NS = No Standard

Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-22 0 - 1' 11/4/99	SS-23 0 - 1' 11/18/99	SS-24 0 - 1' 11/18/99	SS-24 3' 11/18/99	SS-24-2 4' 9/13/02	SS-24-2 6' 9/13/02	SS-25 0 - 1' 11/4/99	SS-25 3' 11/18/99
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25
Barium	580	44,000	<10-413	1,490	47	64.8	260	NA	NA	54.4	78.7
Boron	45	46,000	<10.5-123	33.8	<8.94	11.1	44.2	NA	NA	27.2	70.4
Bromide	NS	NS	<10-<10	<10	<10	<10	<10	NA	NA	<10	<10
Cadmium	3.0	200	<0.1-12.7	1.37	0.335	0.168	0.331	NA	NA	0.228	0.318
Chromium	360,000	100,000	<0.5-123	8.32	18.3	17	15.9	NA	NA	9.44	21
Cobalt	0.9	70	2.02-47.2	39.5	2,000	203	285	11.4	9.96	3.23	3.37
Lead	270	800	<0.5-18.8	6,830	3.58	65.9	972	372	170	19.4	20.2
Manganese	65	5,200	56.6-449	225	193	267	235	NA	NA	180	97
Mercury	1.0	3.1	<0.0005-0.862	2.62	<0.179	<0.189	<0.194	NA	NA	1.28	0.404
Nickel	130	4,400	2.77-12	23.8	50.2	12.9	17.7	NA	NA	3.68	4.24
Selenium	2.1	1,200	<0.1-2.47	1.48	1.52	<0.942	<0.972	NA	NA	<1.15	<1.25
Silver	3.4	1,200	<0.5-<1.34	<1.14	<0.894	<0.942	<0.972	NA	NA	<1.15	<1.25
Sulfate	NS	NS	<100-<100	34.8	35	25.8	53	NA	NA	30.9	62.8
Titanium	NS	NS	46.1-1,020	46.4	543	639	451	NA	NA	317	398
Vanadium	6.0	1,200	5.01-199	17.9	51.5	32.7	31.2	NA	NA	44.2	117
Zinc	1,200	70,000	27.3-124	7,020	28.7	131	1,200	1,070	710	40	417

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-26 0 - 1' 11/10/99	SS-27 0 - 1' 1/19/00	SS-28 0 - 1' 1/19/00	SS-29 0 - 1' 1/19/00	SS-30 0 - 1' 1/19/00	SS-31 0 - 1' 1/19/00	SS-32 0 - 1' 1/19/00	SS-33 0 - 1' 1/19/00
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04	<0.982
Barium	580	44,000	<10-413	135	18.1	8.3	13	22.9	30	25.8	25.5
Boron	45	46,000	<10.5-123	<10.1	6.09	7.41	11.8	7.72	8.05	<5.19	<5.20
Bromide	NS	NS	<10-<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.101	<0.113	<0.111	<0.113	<0.107	<0.105	<0.104	<0.098
Chromium	360,000	100,000	<0.5-123	4.65	6.66	4.65	7.13	7.29	6.66	4.15	6.97
Cobalt	0.9	70	2.02-47.2	6.27	1.35	<1.11	1.92	1.29	4.23	2.7	2.26
Lead	270	800	<0.5-18.8	65.2	17.2	6.19	4.87	3.75	15.9	9.12	10.5
Manganese	65	5,200	56.6-449	189	51.5	37.2	87.9	26.5	298	305	408
Mercury	1.0	3.1	<0.0005-0.862	4.02	0.904	0.592	2.19	0.858	0.918	0.624	1.41
Nickel	130	4,400	2.77-12	2.82	1.58	1.22	1.81	1.29	1.16	<1.04	<0.982
Selenium	2.1	1,200	<0.1-2.47	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04	<0.982
Silver	3.4	1,200	<0.5-<1.34	<1.01	<1.13	<1.11	<1.13	<1.07	<1.05	<1.04	<0.982
Sulfate	NS	NS	<100-<100	<250	100	275	<25	43	<250	43.4	<250
Titanium	NS	NS	46.1-1,020	23.8	106	57.5	137	51.3	61.1	42.8	34.2
Vanadium	6.0	1,200	5.01-199	9.2	26.3	26.9	29.2	19	12.2	6.74	6.09
Zinc	1,200	70,000	27.3-124	885	13.1	12.3	25.4	11.7	9.31	4.15	21.6

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-33 3' 1/19/00	SS-34 0 - 1' 1/19/00	SS-34 3' 1/19/00	SS-35 0 - 1' 1/19/00	SS-35 3' 1/19/00	SS-36 0 - 1' 1/19/00	SS-36 3' 1/19/00	SS-36-2 3' 9/13/02
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA
Barium	580	44,000	<10-413	25.2	39.9	29.9	23.1	17.2	690	10.2	NA
Boron	45	46,000	<10.5-123	12.5	<5.30	19.0	107	31.9	56	22.4	NA
Bromide	NS	NS	<10-<10	**	<10	**	<10	**	<10	**	NA
Cadmium	3.0	200	<0.1-12.7	0.159	<0.106	<0.105	<0.122	0.226	<0.126	0.162	NA
Chromium	360,000	100,000	<0.5-123	11.0	5.08	8.42	17.1	12.2	13.2	3.86	NA
Cobalt	0.9	70	2.02-47.2	2.35	4.45	3.05	3.42	1.86	3.42	1.87	NA
Lead	270	800	<0.5-18.8	5.44	12.5	8.21	17.5	9.16	23.5	7.36	NA
Manganese	65	5,200	56.6-449	73.5	164	105	120	62.7	91.5	168	NA
Mercury	1.0	3.1	<0.0005-0.862	**	0.425	**	3.67	**	1.43	**	NA
Nickel	130	4,400	2.77-12	1.71	1.17	2.63	5.74	3.01	4.43	1.64	NA
Selenium	2.1	1,200	<0.1-2.47	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA
Silver	3.4	1,200	<0.5-<1.34	<1.07	<1.06	<1.05	<1.22	<1.16	<1.26	<1.17	NA
Sulfate	NS	NS	<100-<100	**	<250	**	67	**	5,560	**	101
Titanium	NS	NS	46.1-1,020	13.3	81.7	16.4	339	150	187	47.2	NA
Vanadium	6.0	1,200	5.01-199	21.0	8.69	22.9	210	66.1	87.7	23.8	NA
Zinc	1,200	70,000	27.3-124	60.3	15.5	8.1	21.7	23.7	37.1	33.0	NA

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-37 0 - 1' 1/19/00	SS-37 3' 1/19/00	SS-38 0 - 1' 1/19/00	SS-38 3' 1/19/00	SS-39 0 - 1' 2/17/00	SS-39 3' 2/17/00	SS-40 0 - 1' 2/17/00	SS-40 3' 2/17/00
Inorganics (mg/kg)											
Arsenic	5.8	3.0	<0.5-4.38	<1.20	<1.20	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13
Barium	580	44,000	<10-413	14.6	5.4	25	4.62	40.2	<4.19	39.5	63.5
Boron	45	46,000	<10.5-123	32.3	22.0	6.55	<9.82	<9.53	<10.5	<9.39	<11.3
Bromide	NS	NS	<10-<10	<10	**	<10	**	<10	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.120	<0.120	<0.101	<0.098	<0.095	<0.105	<0.094	<0.113
Chromium	360,000	100,000	<0.5-123	10.2	3.6	8.07	3.14	12.7	<1.05	16.7	3.16
Cobalt	0.9	70	2.02-47.2	1.32	<1.20	2.82	1.18	6.0	<1.05	8.07	9.59
Lead	270	800	<0.5-18.8	7.46	4.2	7.77	5.5	4.67	<0.523	1.03	11.5
Manganese	65	5,200	56.6-449	28.9	47.1	90.5	42.0	219	<1.05	234	4.21
Mercury	1.0	3.1	<0.0005-0.862	2.65	**	0.942	**	<0.191	<0.209	<0.188	<0.226
Nickel	130	4,400	2.77-12	1.56	<1.20	1.72	<0.982	6.96	<1.05	9.95	3.50
Selenium	2.1	1,200	<0.1-2.47	<1.20	<1.20	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13
Silver	3.4	1,200	<0.5-<1.34	<1.20	<1.20	<1.01	<0.982	<0.953	<1.05	<0.939	<1.13
Sulfate	NS	NS	<100-<100	36.8	**	37.3	**	<25	<25	<25	<25
Titanium	NS	NS	46.1-1,020	62.2	22.9	47.2	13.4	357	<10.5	384	356
Vanadium	6.0	1,200	5.01-199	34.2	14.7	16.6	9.53	20.6	1.46	22.5	33.4
Zinc	1,200	70,000	27.3-124	11.4	19.9	6.56	7.76	34.9	2.83	26.2	32.3

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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Table L-3
SWMU-2 Past Inorganic Soil Sampling Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Parameter	IHSB Protection of Groundwater PSRG	IHSB Industrial PSRG	Range of Background Concentrations	SS-41 0 - 1' 2/17/00	SS-41 3' 2/17/00	SS-42 0 - 1' 2/17/00	SS-43 0 - 1' 2/17/00	SS-43 3' 2/17/00
Inorganics (mg/kg)								
Arsenic	5.8	3.0	<0.5-4.38	<1.08	<1.04	<0.971	<1.03	<1.11
Barium	580	44,000	<10-413	435	50.6	140	34.8	55.1
Boron	45	46,000	<10.5-123	<10.8	<10.4	13.0	<10.3	<11.1
Bromide	NS	NS	<10-<10	<10	<10	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.108	<0.104	<0.097	<0.103	<0.111
Chromium	360,000	100,000	<0.5-123	4.53	8.14	11.8	6.82	8.64
Cobalt	0.9	70	2.02-47.2	5.82	10.5	9.42	3.82	3.77
Lead	270	800	<0.5-18.8	44.6	20.5	239	16.8	32.7
Manganese	65	5,200	56.6-449	519	153	142	302	119
Mercury	1.0	3.1	<0.0005-0.862	0.307	<0.209	<0.194	<0.206	<0.221
Nickel	130	4,400	2.77-12	1.94	2.19	6.31	1.76	2.66
Selenium	2.1	1,200	<0.1-2.47	<1.08	<1.04	<0.971	<1.03	<1.11
Silver	3.4	1,200	<0.5-<1.34	<1.08	<1.04	<0.971	<1.03	<1.11
Sulfate	NS	NS	<100-<100	<25	<25	<25	<25	<25
Titanium	NS	NS	46.1-1,020	24.8	26.9	84.7	22.3	26.3
Vanadium	6.0	1,200	5.01-199	7.87	16.0	20.1	12.2	25.6
Zinc	1,200	70,000	27.3-124	390	78.8	258	21.2	9.60

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

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Table L-4
Background Soil Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / **Date Sampled** / **Sample Depth**	*Protection of Groundwater PSRG*	*Com/Ind PSRG*	*Range of Background Concentrations*	**B-1**	**B-1**	**B-2**	**B-3**	**HA-4**	**HA-5**	**HA-5A**	**HA-21**	**BG-1**	**BG-2**
Date Sampled				11/29/89	11/29/89	11/29/89	11/22/89	12/11/96	12/11/96	3/24/97	3/24/97	11/10/99	11/10/99
Sample Depth				2.5-4.0'	10-11.5'	2.5-4.0'	3.5-5.0'	NDS	NDS	NDS	NDS	0-1'	0-1'
Priority Pollutant Metals *(mg/kg)*													
Arsenic	5.8	3	<0.5-4.38	<0.5	<0.5	<0.5	<1.0	<1.134	<1.05	1.61	**4.38**	<1.18	<1.09
Barium	580	44,000	<10-413	<10	<10	<10	<10	163	48.4	52.4	413	19.2	43.12
Boron	45	46,000	<10.5-123	NA	NA	NA	NA	**51.5**	<10.5	<8.15	**123**	24.3	<10.9
Cadmium	3	200	<0.1-12.7	<0.1	<0.1	<0.1	<0.5	1.67	0.283	0.883	**12.7**	<0.118	<0.109
Chromium, total	360,000	100,000	<0.5-123	<0.5	<0.5	<0.5	<1.0	122	1.08	<0.815	123	11.5	6.76
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	**8.6**	**4.22**	**2.02**	**47.2**	**2**	**2.94**
Lead	270	800	<0.5-18.8	<0.5	<0.5	<0.5	<1.0	12.1	18.8	10.9	11.8	13.4	13.2
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	56.6	**353**	**118**	**449**	42.5	**123**
Mercury	1	3.1	<0.0005-0.862	<0.0005	<0.0005	<0.0005	<0.2	0.338	<0.211	<0.163	<0.202	5.54***	0.862
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	12	3.27	2.77	**137**	2.82	2.73
Selenium	2.1	1,200	<0.1-2.47	<0.1	<0.1	<0.1	<0.5	<1.34	<1.05	<0.463	<0.556	**2.47**	1.2
Silver	3.4	1,200	<0.5-<1.34	<0.5	<0.5	<0.5	<1.0	<1.34	<1.05	<0.815	<2.02	<1.18	<1.09
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	738	67.7	46.1	1,020	65.7	181
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	**187**	**7.03**	5.01	**199**	**45.2**	**27.6**
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	42.7	27.3	16.5	80.8	149	124

Notes:

Result Exceeds Protection of Groundwater (PGW) PSRG

Result Exceeds Industrial PSRG

Result Exceeds PGW and Industrial PSRG

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
**** - Considered Statistical Outlier and not used in Sludge Pond Closure*
Metals analysis via Method 6010C and 7471B

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	1997 Closure Standard***	B-7	B-8	B-8	B-9	B-10	B-11	B-12	B-13	B-14
Date Sampled		11/24/89	11/27/89	11/27/89	11/27/89	11/28/89	11/28/89	11/28/89	11/28/89	11/28/89
Sample Depth		5.0-6.5'	7.5-9.0'	20-21'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron	227.61	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	49.32	<1.0	74	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Manganese	545.67	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	96.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Under Cap		Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes**

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*1997 Closure Standard****	TP-1	TP-2	TP-3	TP-4	SB-1	SB-4	SB-5	SB-6	HA-1
Date Sampled		10/1/91	10/1/91	10/1/91	10/1/91	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96
Sample Depth		0-18'	0-18'	0-18'	0-18'	15'	10'	2.5'	2.5'	NDS
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	490	310	220	820	659	401	27.4	155	294
Boron	227.61	53	130	200	240	426	90.8	127	104	60.8
Lead	49.32	1,600	3,100	3,900	4,000	1,090	17,400	20.1	19.7	501
Manganese	545.67	NA	NA	NA	NA	44.5	43.5	273	29.2	307
Zinc	96.8	2,400	2,000	2,700	6,100	4,900	3,080	45.5	33.7	1,430
Under Cap		Yes	Yes	Yes	Yes	Yes	Yes	Yes**	Yes	Yes**

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*1997 Closure Standard****	**HA-2**	**HA-3**	**HA-6**	**HA-7**	**HA-8**	**HA-9***	**HA-10***	**HA-11**	**HA-12**
		12/10/96	12/11/96	3/25/97	3/25/97	3/24/97	3/25/97	3/24/97	3/24/97	3/24/97
		NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	67.7	176	107	329	415	402	72.8	69.3	34.9
Boron	227.61	59.4	<11	25.9	43.6	128	44.4	73.2	44.6	51.6
Lead	49.32	55	7.54	86.2	288	2,260	1,370	31.4	16.5	5.58
Manganese	545.67	589	15.4	143	388	58	313	708	265	58.2
Zinc	96.8	104	22.5	1,270	1,560	2,350	1,990	78.8	74.0	13.1
Under Cap		Yes	Yes**	Yes	No	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / **Date Sampled** / **Sample Depth**	*1997 Closure Standard****	**HA-13**	**HA-14**	**HA-15**	**HA-16**	**HA-17**	**HA-18**	**TP-1A**	**TP-1B**	**TP-1C**
		3/24/97	3/24/97	3/24/97	3/24/97	3/25/97	3/24/97	3/25/97	3/25/97	3/25/97
		NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	54	32.8	40.3	66.9	14.9	34.4	NA	NA	NA
Boron	227.61	145	29	20	70	19.6	25.9	10.3	35.9	37.9
Lead	49.32	13.3	26.4	23.2	11.2	14.8	12.7	8.1	15.9	33.6
Manganese	545.67	1,300	109	114	437	89.4	65.2	NA	NA	NA
Zinc	96.8	29.1	45.2	84.0	27.6	23.1	6.1	NA	NA	NA
Under Cap		Yes**	Yes**	Yes**	Yes	Yes	Yes	Yes**	Yes	Yes

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*1997 Closure Standard****	TP-1D	TP-1E	TP-1F	2HA-22	2HA-23	2HA-35	2HA-38	2HA-40	2HA-42
Date Sampled		3/25/97	3/25/97	3/25/97	4/24/97	4/24/97	4/23/97	4/23/97	4/23/97	4/23/97
Sample Depth		NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	NA	NA	NA	NA	231	NA	24.8	25.2	23.9
Boron	227.61	92.5	178	118	53.9	NA	51.8	10.8	33.2	25.2
Lead	49.32	711	1,050	1,410	NA	458	NA	11.5	11.5	9.98
Manganese	545.67	NA	NA	NA	NA	NA	91	NA	133	NA
Zinc	96.8	NA	NA	NA	NA	NA	30.7	NA	31.2	NA
Under Cap		Yes	Yes	Yes	Yes**	No	Yes	Yes	Yes	Yes

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*1997 Closure Standard****	**2HA-43**	**2-HA-44**	**2HA-46**	**4HA-46**	**4HA-46-2**	**4HA-47**	**4HA-47-2**	**4HA-48***	**4-HA-49**
Date Sampled		4/24/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97
Sample Depth		NDS	NDS	NDS	NDS	2'	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Barium	276.42	2,810	86.8	22.5	NA	NA	NA	NA	NA	88.7
Boron	227.61	42.6	87	48	NA	NA	NA	NA	NA	24.4
Lead	49.32	12,700	8.26	NA	49.2	49.2	2,720	2,040	5,140	180
Manganese	545.67	NA	281	260	NA	NA	NA	NA	NA	409
Zinc	96.8	NA	56	34.9	NA	NA	NA	NA	NA	9.8
Under Cap		Yes**	No	Yes	Yes	Yes	Yes	Yes	Yes	No

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-5
SWMU-3 Past Inorganic Soil Analytical Results Versus 1997 Soil Closure Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*1997 Closure Standard*** *	**MS-1**	**MS-2**	**MS-3**	**MS-4**	**MS-5**	**MS-6**
Date Sampled		5/2/97	5/2/97	5/2/97	5/2/97	5/2/97	5/2/97
Sample Depth		1.66'	1.0'	1.0'	1.2'	1.33'	1.33'
Priority Pollutant Metals *(mg/kg)*							
Barium	276.42	NA	NA	NA	NA	NA	NA
Boron	227.61	31.6	115	47.8	37	98.7	115
Lead	49.32	179	10	46.3	7.6	407	22
Manganese	545.67	NA	NA	NA	NA	NA	NA
Zinc	96.8	NA	NA	NA	NA	NA	NA
Under Cap		Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds 1997 Closure Standard

NA = Not Analyzed

NDS = No Depth Specified

Metals analysis via Method 6010C and 7471B

*- The area around HA-9, HA-10 and 4-HA-48 was removed and placed on tile pile prior to closure

**- This area capped with soil cap only

***- 1997 Closure Standard was 3 times average of detected background levels

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**B-7**	**B-8**	**B-8**	**B-9**	**B-10**	**B-11**	**B-12**	**B-13**	**B-14**
Date Sampled				11/24/89	11/27/89	11/27/89	11/27/89	11/28/89	11/28/89	11/28/89	11/28/89	11/28/89
Sample Depth				5.0-6.5'	7.5-9.0'	20-21'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'	2.5-4.0'
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	580	44,000	<10-413	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron	45	46,000	<10.5-123	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	3	200	<0.1-12.7	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, total	360,000	100,000	<0.5-123	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	<1.0	74	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	1	3	<0.0005-0.862	<0.2	<0.2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	3.4	1,200	<0.5-<1.34	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	<1.1	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	<1.2	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	<1.3	NA	NA	NA
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	NA	<1.4	NA	NA	NA
Under Cap				Yes	Yes	Yes	Yes	Yes	<1.5	No	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	TP-1	TP-2	TP-3	TP-4	SB-1	SB-4	SB-5	SB-6	HA-1
Date Sampled				10/1/91	10/1/91	10/1/91	10/1/91	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96
Sample Depth				0-18	0-18	0-18	0-18	15'	10'	2.5	2.5	NDS
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	17,000	19,000	18,000	22,000	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	<2	<2	<2	<2	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	<1.03	<1.1	<1.16	<1.34	<1.48
Barium	580	44,000	<10-413	490	310	220	820	659	401	27.4	155	294
Boron	45	46,000	<10.5-123	53	130	200	240	426	90.8	127	104	60.8
Cadmium	3	200	<0.1-12.7	NA	NA	NA	NA	0.905	1.84	4.6	4.18	2.32
Chromium, total	360,000	100,000	<0.5-123	4.9	6.4	5.9	4.2	4.46	4.5	20.8	29	31.2
Cobalt	0.9	70	2.02-47.2	12	26	13	23	14.5	9.84	7.9	1.88	17.7
Iron	150	100,000	NA	3,900	2,000	1,300	1,200	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	1,600	3,100	3,900	4,000	1,090	17,400	20.1	19.7	501
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	44.5	43.5	273	29.2	307
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	<0.206	<0.221	<0.232	<0.268	<0.296
Nickel	130	4,400	2.77-12	8.3	18	<4.0	12	14.3	2.1	6.14	2.95	7.98
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	<1.03	<1.1	<1.16	<1.134	<1.148
Silver	3.4	1,200	<0.5-<1.34	<4.0	<4.0	<4.0	14	<1.03	<1.1	<1.16	<1.134	<1.148
Tin	10,000	100,000	NA	<5.0	<5.0	<5.0	<5.0	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	100	110	110	100	120	77.2	418	19.1	312
Vanadium	6.0	1,200	5.01-199	10	7.3	8.5	9.7	15.8	11.2	131	736	59.3
Zinc	1,200	70,000	27.3-124	2,400	2,000	2,700	6,100	4,900	3,080	45.5	33.7	1,430
Under Cap				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	HA-2	HA-3	HA-6	HA-7	HA-8	HA-9*	HA-10	HA-11	HA-12
Date Sampled				12/10/96	12/11/96	3/25/97	3/25/97	3/24/97	3/25/97	3/24/97	3/24/97	3/24/97
Sample Depth				NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	<1.12	<1.10	2.54	3.2	3.04	2.53	3.61	2.01	<0.91
Barium	580	44,000	<10-413	67.7	176	107	329	415	402	72.8	69.3	34.9
Boron	45	46,000	<10.5-123	59.4	<11	25.9	43.6	128	44.4	73.2	44.6	51.6
Cadmium	3	200	<0.1-12.7	2.71	<0.221	3.44	5.75	1.6	6.99	10.6	6.52	0.839
Chromium, total	360,000	100,000	<0.5-123	55.1	9.12	4.66	13.1	3.48	31.6	76.6	23.2	3.95
Cobalt	0.9	70	2.02-47.2	17.1	5.5	4.76	16.4	9.13	20.2	22.3	17.1	1.42
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	55	7.54	86.2	288	2,260	1,370	31.4	16.5	5.58
Manganese	65	5,200	56.6-449	589	15.4	143	388	58	313	708	265	58.2
Mercury	1	3	<0.0005-0.862	<0.224	<0.221	<0.157	<0.191	<0.173	<0.191	22.5	<0.171	<0.182
Nickel	130	4,400	2.77-12	5.94	2.64	3.93	8.3	4.67	20.4	6.42	7.85	<0.910
Selenium	2.1	1,200	<0.1-2.47	<1.112	<1.10	<0.504	<0.444	<0.540	<0.564	<0.489	<0.535	<0.465
Silver	3.4	1,200	<0.5-<1.34	<1.112	<1.10	<0.787	<0.954	<0.865	<0.921	<0.880	<0.853	<0.910
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	232	33.8	93.3	254	164	613	315	266	59.7
Vanadium	6.0	1,200	5.01-199	79.5	29.7	15.2	40.6	15.1	56.9	94.6	60	14.2
Zinc	1,200	70,000	27.3-124	104	22.5	1,270	1,560	2,350	1,990	78.8	74.0	13.1
Under Cap				Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**HA-13**	**HA-14**	**HA-15**	**HA-16**	**HA-17**	**HA-18**	**TP-1A**	**TP-1B**	**TP-1C**
Date Sampled				3/24/97	3/24/97	3/24/97	3/24/97	3/25/97	3/24/97	3/25/97	3/25/97	3/25/97
Sample Depth				NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	1.73	1.29	2.23	3.42	1.5	2.84	NA	NA	NA
Barium	580	44,000	<10-413	54	32.8	40.3	66.9	14.9	34.4	NA	NA	NA
Boron	45	46,000	<10.5-123	145	29	20	70	19.6	25.9	10.3	35.9	37.9
Cadmium	3	200	<0.1-12.7	6.1	1.16	1.88	9.46	1.96	2.42	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	19.5	5.06	5.63	13.7	5.27	11.6	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	9.54	2.0	2.19	6.86	1.68	2.67	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	13.3	26.4	23.2	11.2	14.8	12.7	8.1	15.9	33.6
Manganese	65	5,200	56.6-449	1,300	109	114	437	89.4	65.2	NA	NA	NA
Mercury	1	3	<0.0005-0.862	<0.189	<0.162	<0.175	<0.181	<0.179	<0.172	NA	NA	NA
Nickel	130	4,400	2.77-12	4.4	1.22	1.4	4.53	<0.894	1.38	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	<0.585	<0.429	<0.468	<0.539	<0.552	<0.426	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	<1.02	<0.811	<0.873	<0.904	<0.894	<0.858	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	258	77.4	49.9	233	101	78.3	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	77.2	10.8	17.5	56.4	15.9	21.6	NA	NA	NA
Zinc	1,200	70,000	27.3-124	29.1	45.2	84.0	27.6	23.1	6.1	NA	NA	NA
Under Cap				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	TP-1D	TP-1E	TP-1F	2HA-22	2HA-35	2HA-38	2HA-40	2HA-42	2HA-43
				3/25/97	3/25/97	3/25/97	4/24/97	4/23/97	4/23/97	4/23/97	4/23/97	4/24/97
				NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	NA	NA	22.8	24.8	25.2	23.9	2,810
Boron	45	46,000	<10.5-123	92.5	178	118	53.9	51.8	10.8	33.2	25.2	42.6
Cadmium	3	200	<0.1-12.7	NA	NA	NA	NA	2.13	NA	3.72	NA	NA
Chromium, total	360,000	100,000	<0.5-123	NA	NA	NA	NA	5.43	NA	10.4	NA	NA
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	<0.975	NA	<0.844	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	711	1,050	1,410	NA	16.8	11.5	11.5	9.98	12,700
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	90.6	NA	133	NA	NA
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	30.7	NA	31.2	NA	NA
Under Cap				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	2-HA-44	2-HA-44	2HA-46	3-B60-1	3-B61-1	3-B62-1	3-B63-1	3-B64-1	3HA-1
Date Sampled				4/24/97	5/30/97	5/30/97	5/14/97	5/14/97	5/14/97	5/14/97	5/14/97	5/14/97
Sample Depth				NDS	NDS	NDS	1'	1'	1'	1'	1'	NDS
***Priority Pollutant Metals** (mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	22.5	NA	NA	NA	NA	NA	NA
Boron	45	46,000	<10.5-123	87	87	48	NA	NA	NA	NA	NA	NA
Cadmium	3	200	<0.1-12.7	5.58	5.58	5.13	NA	NA	NA	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	28.6	3.07	3.07	NA	NA	NA	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	217	5.51	5.51	NA	NA	NA	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	NA	8.26	NA	16.0	6.5	105	7.4	6.6	17.6
Manganese	65	5,200	56.6-449	281	281	260	NA	NA	NA	NA	NA	NA
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	56	56	34.9	NA	NA	NA	NA	NA	NA
Under Cap				No	No	Yes	Yes	Yes	Yes	Yes	Yes	No

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**3HA-7**	**3-HA10-1**	**3-HA10-2**	**4HA-46**	**4HA-46-2**	**4HA-47**	**4HA-47-2**	**4HA-48***	**4-HA-49**
Date Sampled				5/15/97	5/15/97	5/15/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97
Sample Depth				NDS	1'	1'	NDS	2'	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*												
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	NA	NA	NA	NA	NA	NA	88.7
Boron	45	46,000	<10.5-123	NA	NA	NA	NA	NA	NA	NA	NA	24.4
Cadmium	3	200	<0.1-12.7	NA	NA	NA	NA	NA	NA	NA	NA	2.40
Chromium, total	360,000	100,000	<0.5-123	NA	NA	NA	NA	NA	NA	NA	NA	7.38
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	NA	NA	NA	NA	12.60
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	1,230	NA	NA	49.2	49.2	2,720	2,040	5,140	180
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	NA	NA	NA	NA	409
Mercury	1	3	<0.0005-0.862	NA	<0.219	<0.226	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	NA	NA	NA	NA	9.8
Under Cap				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-6
SWMU-3 Historic Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility, Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	MS-1	MS-2	MS-3	MS-4	MS-5	MS-6
Date Sampled				5/2/97	5/2/97	5/2/97	5/2/97	5/2/97	5/2/97
Sample Depth				1.66'	1.0'	1.0'	1.2'	1.33'	1.33'
Priority Pollutant Metals *(mg/kg)*									
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	NA	NA	NA	NA
Boron	45	46,000	<10.5-123	31.6	115	47.8	37	98.7	115
Cadmium	3	200	<0.1-12.7	NA	NA	NA	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	NA	NA	NA	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	NA	NA	NA	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	179	10	46.3	7.6	407	22
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	NA	NA
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	NA	NA	NA	NA	NA	NA
Under Cap				Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
Metals analysis via Method 6010C and 7471B

**- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.*
***- past holding time*
****- considered statistical outlier- not used*

Table L-7
SWMU-3 Past Soil TCLP Analytical Results Summary
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*USEPA Threshold*	TP-1	TP-2	TP-3	TP-4	SB-13-40	Comp-1	2HA-1	2HA-2	2HA-7	2HA-9	2HA-10
Date Sampled		10/1/91	10/1/91	10/1/91	10/1/91	9/1/92	12/10/96	4/24/97	4/24/97	4/24/97	4/24/97	4/24/97
Sample Depth		0-18'	0-18'	0-18'	0-18'	NDS	NDS	NDS	NDS	NDS	NDS	NDS
TCLP RCRA Primary Metals *(mg/L)*												
Arsenic	5	<0.52	<0.52	<0.52	<0.52	<0.29	<0.01	NA	NA	NA	NA	NA
Barium	100	6.7	3.4	2.2	4.6	<0.52	1,87	NA	NA	NA	NA	NA
Cadmium	1.0	<0.11	<0.11	<0.11	<0.11	<0.05	0.011	NA	NA	NA	NA	NA
Chromium, total	5.0	<0.56	<0.56	<0.56	<0.56	<0.33	0.025	NA	NA	NA	NA	NA
Lead	5.0	**47**	**51**	**63**	**130**	<0.34	**187**	**7.57**	<0.01	0.641	**15.5**	<0.01
Mercury	0.2	<0.017	<0.017	<0.017	<0.017	<0.018	<0.0004	NA	NA	NA	NA	NA
Selenium	1.0	<0.3	<0.3	<0.3	<0.3	<0.049	<0.01	NA	NA	NA	NA	NA
Silver	5.0	<0.83	<0.83	<0.83	<0.83	<0.12	<0.01	NA	NA	NA	NA	NA

Notes:

NA = Not Analyzed

NDS = No Depth Specified

Results are above USEPA threshold for characteristic hazardous waste (40 CFR 261.24- Table 1)

Table L-7
SWMU-3 Past Soil TCLP Analytical Results Summary
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*USEPA Threshold*	2HA-23	2TPI-C	MS-1	MS-3	MS-5	4HA-47	4HA-47-2	4HA-48
Date Sampled		4/24/97	4/24/97	5/2/97	5/2/97	5/2/97	5/30/97	5/30/97	5/30/97
Sample Depth		NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
TCLP RCRA Primary Metals *(mg/L)*									
Arsenic	5	NA	NA	NA	NA	NA	NA	NA	NA
Barium	100	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, total	5.0	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5.0	2.73	0.042	1.13	2.63	**17.9**	**91**	**93.5**	**60.8**
Mercury	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Silver	5.0	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA = Not Analyzed

NDS = No Depth Specified

Results are above USEPA threshold for characteristic hazardous waste (40 CFR 261.24- Table 1)

Table L-8
SWMU-3 Past VOC, SVOC and Other Compounds Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Industrial PSRG*	**B-1**	**B-2**	**B-3**	**B-4**	**EX-1**	**EX-2**	**EX-3**	**EX-4**	**SB-1**
Date Sampled			3/1/92	3/1/92	3/1/92	3/1/92	9/1/92	9/1/92	9/1/92	9/1/92	12/10/96
Sample Depth			22-24.5'	22-24.5'	22-24.5'	22-24.5'	18'	20'	16'	21'	15'
Volatile Organic Compounds (VOCs) (mg/kg)											
Methylene Chloride	0.023	640	0.85	0.82	0.86	0.85	ND	ND	ND	ND	NA
Semivolatile Organic Compounds (SVOCs) (mg/kg)											
Bis(2-ethylhexyl) phthalate	7.2	160	4.6	1.9	5.3	3.5	ND	ND	ND	ND	NA
Other Organics (mg/kg)											
Formaldehyde	2.4	32,000	<1.1	<1.1	<1.1	<1.1	ND	ND	ND	ND	NA
Phenols	0.23	50,000	NA	NA	NA	NA	NA	NA	NA	NA	<0.112

Notes:

NA = Not Analyzed — *Result Exceeds Protection of Groundwater PSRG* (orange-outlined box)

ND = Non-Detect — *Result Exceeds Industrial PSRG* (black-outlined grey box)

NDS = No Depth Specified — *Result Exceeds Protection of Groundwater PSRG and Industrial PSRG* (orange-outlined grey box)

Table L-8
SWMU-3 Past VOC, SVOC and Other Compounds Analytical Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID / Date Sampled / Sample Depth	*Protection of Groundwater PSRG*	*Industrial PSRG*	**SB-4**	**SB-5**	**SB-6**	**HA-1**	**HA-2**	**HA-3**	**HA-4**
Date Sampled			12/10/96	12/10/96	12/10/96	12/11/96	12/10/96	12/11/96	12/11/96
Sample Depth			10'	2.5'	2.5'	NDS	NDS	NDS	NDS
Volatile Organic Compounds (VOCs) (mg/kg)									
Methylene Chloride	0.023	640	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs) (mg/kg)									
Bis(2-ethylhexyl) phthalate	7.2	160	NA	NA	NA	NA	NA	NA	NA
Other Organics (mg/kg)									
Formaldehyde	2.4	32,000	NA	NA	NA	NA	NA	NA	NA
Phenols	0.23	50,000	<0.112	<0.122	<0.146	<0.161	<0.122	<0.119	<0.146

Notes:

NA = Not Analyzed — *Result Exceeds Protection of Groundwater PSRG*

ND = Non-Detect — *Result Exceeds Industrial PSRG*

NDS = No Depth Specified — *Result Exceeds Protection of Groundwater PSRG and Industrial PSRG*

Table L-9
SWMU-7 Past Surface Water Results Versus 2B and Risk Based Stnadards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*NCDENR 2B/EPA Screening Value*	**S-5 Onsite Up**	**S-7 Onsite Down**	**S-5 Onsite Up**	**S-7 Onsite Down**	**S-1**	**S-2**	**S-3**	**S-4**	**S-5 Onsite Up**	**S-6**	**S-7 Onsite Down**
Date Sampled		3/26/96	3/26/96	3/1/99	3/1/99	12/29/04	12/29/04	12/29/04	12/29/04	2/8/2005	2/8/2005	2/8/2005
Sample Depth		NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/L)*												
Arsenic	0.05*	NA	NA	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA
Barium	1.0**	NA	NA	0.059	0.127	NA	NA	NA	NA	NA	NA	NA
Boron	0.75***	0.084	1.93	BDL	1.06	BDL	BDL	BDL	0.223	0.104	BDL	2.89
Cadmium	0.002*	NA	NA	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA
Chromium, total	0.05*	NA	NA	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA
Copper	0.007*	NA	NA	0.01	0.11	NA	NA	NA	NA	NA	NA	NA
Cobalt	NS	NA	NA	<0.025	<0.025	NA	NA	NA	NA	NA	NA	NA
Iron	NS	NA	NA	1.34	2.58	NA	NA	NA	NA	NA	NA	NA
Lead	0.025*	NA	NA	<0.005	0.011	NA	NA	NA	NA	NA	NA	NA
Manganese	0.02**	NA	NA	0.109	0.23	NA	NA	NA	NA	NA	NA	NA
Mercury	0.012*	NA	NA	<0.0002	<0.0002	NA	NA	NA	NA	NA	NA	NA
Nickel	0.088*	NA	NA	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA
Selenium	0.005*	NA	NA	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA
Silver	0.00006*	NA	NA	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA
Tin	NS	NA	NA	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NA	NA	<0.1	<0.1	NA	NA	NA	NA	NA	NA	NA
Vanadium	NS	NA	NA	<0.02	<0.02	NA	NA	NA	NA	NA	NA	NA
Zinc	0.05*	NA	NA	0.035	0.142	NA	NA	NA	NA	NA	NA	NA

Notes:

Result Exceeds NCDENR 2B or EPA Screening Value

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified
** - Freshwater*
*** - Water Supply*
**** - EPA Screening Value*
Note- March 1999 Sampling included additional radionuclides and Secondary Parameters which have no 2B Standards

Table L-10
SWMU-7 Past Sediment Results Versus Current PSRG Standards
Former Porcelanite Facility
Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Com/Ind PSRG*	*Range of Background Concentrations*	**S-5 Onsite Up**	**S-7 Onsite Down**	**S-1**	**S-2**	**S-3**	**S-4**	**S-5 Onsite Up**	**S-6**	**S-7 Onsite Down**
Date Sampled				3/1/99	3/1/99	12/29/04	12/29/04	12/29/04	12/29/04	2/8/05	2/8/05	2/8/05
Sample Depth				NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)**												
Arsenic	5.8	3	<0.5-4.38	<1.54	<1.48	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	49.9	93.9	NA	NA	NA	NA	NA	NA	NA
Boron	45	46,000	<10.5-123	13.7	33	87.8	104	89.6	78.9	BDL	BDL	BDL
Cadmium	3	200	<0.1-12.7	0.486	0.716	NA	NA	NA	NA	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	12.9	20.7	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	4.46	9.76	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	48.6	125	NA	NA	NA	NA	NA	NA	NA
Manganese	65	5,200	56.6-449	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	1	3.1	<0.0005-0.862	<0.177	<0.171	NA	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	4.0	5.03	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	<1.54	<1.48	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	<1.54	<1.48	NA	NA	NA	NA	NA	NA	NA
Tin	NS	NS	46.1-1,020	<154	<157	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	93.2	163	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	39.4	54.3	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	121	365	NA	NA	NA	NA	NA	NA	NA

Notes:

Result Exceeds Protection of Groundwater (PGW) PSRG

Result Exceeds Industrial PSRG

Result Exceeds PGW and Industrial PSRG

**- mg/L denoted in sediment sample results versus mg/kg potentially due to high water content in the sample aliquot*

NA = Not Analyzed
NS = No Standard
NDS = No Depth Specified

Table L-11
AOC-1 Past Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility Lexington, North Carolina

Sample ID / **Date Sampled** / **Sample Depth**	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**HA-7**	**HA-9***	**2-HA-23**	**2-HA-24**	**2-HA-25**	**2-HA-26**	**2-HA-33**	**2-HA-34**
				3/25/97	3/25/97	4/24/97	4/24/97	4/24/97	4/24/97	4/24/97	4/24/97
				NDS	NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*											
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	3.2	2.53	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	329	402	231	38.7	NA	NA	29.7	27.2
Boron	45	46,000	<10.5-123	43.6	44.4	NA	NA	NA	NA	NA	NA
Cadmium	3	200	<0.1-12.7	5.75	6.99	NA	NA	NA	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	13.1	31.6	NA	NA	NA	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	16.4	20.2	NA	NA	NA	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	288	1,370	458	14.8	7.98	18.8	9.88	9.06
Manganese	65	5,200	56.6-449	388	313	NA	NA	NA	NA	NA	NA
Mercury	1	3	<0.0005-0.862	<0.191	<0.191	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	8.3	20.4	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	<0.444	<0.564	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	<0.954	<0.921	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	254	613	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	40.6	56.9	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	1,560	1,990	NA	NA	NA	NA	NA	NA
Under Cap				No	Yes	No	No	No	No	No	**

Note:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA- Not Analyzed
NS- No Standard
NDS- No Depth Specified
Metals analysis via Method 6010C and 7471B

*- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.

**- 2-HA-34 cound not be located on figure but is described as north of tile pile.

***-2HA-44 is under Ceramic Tile Pile Cap

Table L-11
AOC-1 Past Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility Lexington, North Carolina

Sample ID / **Date Sampled** / **Sample Depth**	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**2-HA-44**	**2-HA-44**	**4HA-48***	**4HA-49**	**4HA-49-2**	**4HA-50**	**4HA-50-2**
				4/24/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97
				NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	NA	88.7	NA	NA	NA
Boron	45	46,000	<10.5-123	87	87	NA	24.4	NA	NA	NA
Cadmium	3	200	<0.1-12.7	5.58	5.58	NA	2.40	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	28.6	3.07	NA	7.38	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	217	5.51	NA	12.60	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	NA	8.26	5,140	180	6.63	19.8	22.5
Manganese	65	5,200	56.6-449	281	281	NA	409	NA	NA	NA
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	56	56	NA	9.8	NA	NA	NA
Under Cap				No	No	Yes	No	No	No	No

Note:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA- Not Analyzed
NS- No Standard
NDS- No Depth Specified
Metals analysis via Method 6010C and 7471B

*- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.
**- 2-HA-34 cound not be located on figure but is described as north of tile pile.
***-2HA-44 is under Ceramic Tile Pile Cap

Table L-11
AOC-1 Past Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility Lexington, North Carolina

Sample ID	*Protection of Groundwater PSRG*	*Industrial PSRG*	*Range of Background Concentrations*	**2-HA-44**	**2-HA-44**	**4HA-48***	**4HA-49**	**4HA-49-2**	**4HA-50**	**4HA-50-2**
Date Sampled				4/24/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97	5/30/97
Sample Depth				NDS	NDS	NDS	NDS	NDS	NDS	NDS
Priority Pollutant Metals *(mg/kg)*										
Aluminum	NS	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	0.9	94	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	5.8	3	<0.5-4.38	NA	NA	NA	NA	NA	NA	NA
Barium	580	44,000	<10-413	NA	NA	NA	88.7	NA	NA	NA
Boron	45	46,000	<10.5-123	87	87	NA	24.4	NA	NA	NA
Cadmium	3	200	<0.1-12.7	5.58	5.58	NA	2.40	NA	NA	NA
Chromium, total	360,000	100,000	<0.5-123	28.6	3.07	NA	7.38	NA	NA	NA
Cobalt	0.9	70	2.02-47.2	217	5.51	NA	12.60	NA	NA	NA
Iron	150	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Lead	270	800	<0.5-18.8	NA	8.26	5,140	180	6.63	19.8	22.5
Manganese	65	5,200	56.6-449	281	281	NA	409	NA	NA	NA
Mercury	1	3	<0.0005-0.862	NA	NA	NA	NA	NA	NA	NA
Nickel	130	4,400	2.77-12	NA	NA	NA	NA	NA	NA	NA
Selenium	2.1	1,200	<0.1-2.47	NA	NA	NA	NA	NA	NA	NA
Silver	3.4	1,200	<0.5-<1.34	NA	NA	NA	NA	NA	NA	NA
Tin	10,000	100,000	NA	NA	NA	NA	NA	NA	NA	NA
Titanium	NS	NS	46.1-1,020	NA	NA	NA	NA	NA	NA	NA
Vanadium	6.0	1,200	5.01-199	NA	NA	NA	NA	NA	NA	NA
Zinc	1,200	70,000	27.3-124	56	56	NA	9.8	NA	NA	NA
Under Cap				No	No	Yes	No	No	No	No

Note:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds Range of Background Samples

Exceeds PGW PSRG and Range of Background Samples

Exceeds All PSRGs

NA- Not Analyzed
NS- No Standard
NDS- No Depth Specified
Metals analysis via Method 6010C and 7471B

*- The area around HA-9 and 4-HA-48 removed and placed on tile pile prior to closure.
**- 2-HA-34 cound not be located on figure but is described as north of tile pile.
***-2HA-44 is under Ceramic Tile Pile Cap

Table L-12
AOC-2 Past Inorganic Soil Sampling Results Versus Current PSRG Standards
Former Porcelanite Facility Lexington, NC

Parameter	Protection of Groundwater PSRG	Industrial PSRG	Range of Background Concentrations	SS-8 0 - 1' 5/27/94	SS-42 0 - 1' 2/17/00	SS-43 0 - 1' 2/17/00	SS-43 3' 2/17/00
Inorganics (mg/kg)							
Arsenic	5.8	3.0	<0.5-4.38	<3.73	<0.971	<1.03	<1.11
Barium	580	44,000	<10-413	186	140	34.8	55.1
Boron	45	46,000	<10.5-123	61.2	13.0	<10.3	<11.1
Bromide	NS	NS	<10-<10	<10	<10	<10	<10
Cadmium	3.0	200	<0.1-12.7	<0.746	<0.097	<0.103	<0.111
Chromium	360,000	100,000	<0.5-123	8.58	11.8	6.82	8.64
Cobalt	0.9	70	2.02-47.2	14	9.42	3.82	3.77
Lead	270	800	<0.5-18.8	996	239	16.8	32.7
Manganese	65	5,200	56.6-449	122	142	302	119
Mercury	1.0	3.1	<0.0005-0.862	<0.149	<0.194	<0.206	<0.221
Nickel	130	4,400	2.77-12	7.31	6.31	1.76	2.66
Selenium	2.1	1,200	<0.1-2.47	<1.49	<0.971	<1.03	<1.11
Silver	3.4	1,200	<0.5-<1.34	<0.746	<0.971	<1.03	<1.11
Sulfate	NS	NS	<100-<100	537	<25	<25	<25
Titanium	NS	NS	46.1-1,020	118	84.7	22.3	26.3
Vanadium	6.0	1,200	5.01-199	33.2	20.1	12.2	25.6
Zinc	1,200	70,000	27.3-124	5,230	258	21.2	9.60

Notes:

Exceeds PGW PSRG

Exceeds Industrial PSRG

Exceeds All PSRGs

NA = Not Analyzed

NS = No Standard

Part L Appendix

Appendix L-1- SWMU-1 and SWMU-11 2015 Investigation Results

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

March 5, 2015

Ms. Mary Siedlecki
NCDENR
217 West Jones Street
Raleigh, North Carolina 27603

Reference: SWMU #1 and #11 Initial & Interim Investigation Results
Former Condumex Facility
20 Victor Street
Lexington, North Carolina
Waters Edge Job No. R1-21
EPA ID #NCD 986 181 451

Dear Ms. Siedlecki:

Here is an additional interim site investigation report for the two (2) Solid Waste Management Units (SWMUs) at the facility in Lexington, North Carolina. As agreed, Waters Edge is assessing items for SWMU #1 and SWMU #11 according to the recommendations provided in the February 16, 2005 NCDENR *RCRA Facility Assessment Report* (RFAR) as described below:

- SWMU #1- Wastewater Pretreatment System- Conduct visual observations and collect four (4) wipe samples which would be analyzed for RCRA Primary Metals.
- SWMU #11- Spray Line Sumps- The RFAR recommended that the sumps be pumped out and the walls and floor observed for stains and integrity of the concrete for conditions reporting to NCDENR.

Based on these recommendations, below is a current account of the assessment:

- SWMU #1- Wastewater Pretreatment System- On January 23, 2015, four (4) wipe samples were collected from the surface of this SWMU with a hexane wipe and submitted to a laboratory according to EPA-approved methodologies. All four (4) samples were analyzed for RCRA Primary Metals according to Method 6010 and Method 7470 which are summarized in Table 1 and documented in Appendix A. We have forwarded these sample results to the NCDENR toxicologist in a February 12, 2015 Email to determine whether they would meet acceptable industrial settleable dust standards and a response has not been received as of the date of this report. Photodocumentation showing condition of foundation platforms is provided in Appendix B. The Photodocumentation explanation for this SWMU is as follows:
    - Photograph #1- Condition of WWT Floor at Wipe Sample #1
    - Photograph #2- Condition of WWT Floor at Wipe Sample #2
    - Photograph #3- Condition of WWT Floor at Wipe Sample #3
    - Photograph #4- Condition of WWT Floor at Wipe Sample #4

We are available to discuss these findings in making further determinations on this location.

- SWMU #11- Spray Line Sumps- On February 10, 2015, an environmental technician and vacuum truck were mobilized to the facility. Both sumps and trenches were cleaned of debris and also pumped out and then a squeegee was used to expose the floor of the sumps and trenches. The sump walls, the sumps, and the trenches were determined to be intact and there were no indications of cracking that would jeopardize the integrity of the unit. Photodocumentation is provided in Appendix B. The Photodocumentation explanation for this SWMU is as follows:
    - Photograph #5/#6- Surficial Condition of Spray Line Trench Area
    - Photograph #7/#8- Spray Line Sump Walls Depicting Non-Cracked Condition
    - Photograph #9/#10/#11- Non-Cracked Condition of Spray Line Sump Floor
    - Photograph #12/#13- Non-Cracked Condition of Spray Line Trench Bottom

As such, we are of the opinion that strong evidence exists to recommend that no further action should be required for SWMU #11.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip Rahn

Phillip L. Rahn, P.G.
President

15-015/PLR

cc Mr. Dave Kitts and Mr. Tony Shaw- Mannington
Mr. Alex Sanchex- Condumex

Tables

Table 1
Wipe Sample Analytical Results
Former Cundumex Facility
Lexington, North Carolina

Sample Identification		**WS-1**	**WS-2**	**WS-3**	**WS-4**
Sample Date:		1.23.2015	1.23.2015	1.23.2015	1.23.2015
Metalss *(Method 6010)*					
Arsenic	Total µg	ND	3.0	ND	**4.1**
Barium	Total µg	134	854	559	794
Cadmium	Total µg	1.2	7.8	1.3	0.83
Chromium	Total µg	14.0	38.5	21.6	23.8
Lead	Total µg	**262**	**2,000**	**1,640**	**708**
Selenium	Total µg	2.7	4.0	3.1	3.4
Silver	Total µg	ND	6.3	ND	ND
Mercury *(Method 7470)*					
Mercury	Total µg	ND	**5.6**	ND	ND

ND - Compound not above detection limits.

Appendix A

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

February 06, 2015

Mr. Phil Rahn
Waters Edge Environmental
4901 Water's Edge Drive
Suite 201
Raleigh, NC 27606

RE: Project: PORCELANITE R1-21
Pace Project No.: 92234894

Dear Mr. Rahn:

Enclosed are the analytical results for sample(s) received by the laboratory on January 26, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brittany L. Gibson

Brittany Gibson for
Terri Page
terri.page@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

CERTIFICATIONS

Project:	PORCELANITE R1-21
Pace Project No.:	92234894

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

SAMPLE SUMMARY

Project: PORCELANITE R1-21
Pace Project No.: 92234894

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92234894001	**WS-1**	Wipe	01/23/15 09:20	01/26/15 13:52
92234894002	**WS-2**	Wipe	01/23/15 09:30	01/26/15 13:52
92234894003	**WS-3**	Wipe	01/23/15 09:40	01/26/15 13:52
92234894004	**WS-4**	Wipe	01/23/15 09:50	01/26/15 13:52

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

SAMPLE ANALYTE COUNT

Project: PORCELANITE R1-21
Pace Project No.: 92234894

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92234894001	**WS-1**	EPA 6010	JMW	7	PASI-A
		EPA 7470	HVK	1	PASI-A
92234894002	**WS-2**	EPA 6010	JMW	7	PASI-A
		EPA 7470	HVK	1	PASI-A
92234894003	**WS-3**	EPA 6010	JMW	7	PASI-A
		EPA 7470	HVK	1	PASI-A
92234894004	**WS-4**	EPA 6010	JMW	7	PASI-A
		EPA 7470	HVK	1	PASI-A

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Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

ANALYTICAL RESULTS

Project: PORCELANITE R1-21
Pace Project No.: 92234894

Sample: WS-1 **Lab ID: 92234894001** Collected: 01/23/15 09:20 Received: 01/26/15 13:52 Matrix: Wipe

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Wipe	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	ND	Total ug	2.5	0.62	5	01/28/15 16:45	01/29/15 02:08	7440-38-2	
Barium	**134**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:08	7440-39-3	
Cadmium	**1.2**	Total ug	0.25	0.12	5	01/28/15 16:45	01/29/15 02:08	7440-43-9	
Chromium	**14.0**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:08	7440-47-3	
Lead	**262**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:08	7439-92-1	
Selenium	**2.7**	Total ug	2.5	1.2	5	01/28/15 16:45	01/29/15 02:08	7782-49-2	
Silver	ND	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:08	7440-22-4	
7470 Mercury, Wipe	Analytical Method: EPA 7470								
Mercury	ND	Total ug	1.6	1.6	1		02/03/15 16:15	7439-97-6	

Sample: WS-2 **Lab ID: 92234894002** Collected: 01/23/15 09:30 Received: 01/26/15 13:52 Matrix: Wipe

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Wipe	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3.0**	Total ug	2.5	0.62	5	01/28/15 16:45	01/29/15 02:20	7440-38-2	
Barium	**854**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:20	7440-39-3	
Cadmium	**7.8**	Total ug	0.25	0.12	5	01/28/15 16:45	01/29/15 02:20	7440-43-9	
Chromium	**38.5**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:20	7440-47-3	
Lead	**2000**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:20	7439-92-1	
Selenium	**4.0**	Total ug	2.5	1.2	5	01/28/15 16:45	01/29/15 02:20	7782-49-2	
Silver	**6.3**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:20	7440-22-4	
7470 Mercury, Wipe	Analytical Method: EPA 7470								
Mercury	**5.6**	Total ug	1.6	1.6	1		02/03/15 16:18	7439-97-6	

Sample: WS-3 **Lab ID: 92234894003** Collected: 01/23/15 09:40 Received: 01/26/15 13:52 Matrix: Wipe

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Wipe	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	ND	Total ug	2.5	0.62	5	01/28/15 16:45	01/29/15 02:23	7440-38-2	
Barium	**559**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:23	7440-39-3	
Cadmium	**1.3**	Total ug	0.25	0.12	5	01/28/15 16:45	01/29/15 02:23	7440-43-9	
Chromium	**21.6**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:23	7440-47-3	
Lead	**1640**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:23	7439-92-1	
Selenium	**3.1**	Total ug	2.5	1.2	5	01/28/15 16:45	01/29/15 02:23	7782-49-2	
Silver	ND	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:23	7440-22-4	
7470 Mercury, Wipe	Analytical Method: EPA 7470								
Mercury	ND	Total ug	1.6	1.6	1		02/03/15 16:21	7439-97-6	

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Eden, NC 27288
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ANALYTICAL RESULTS

Project: PORCELANITE R1-21
Pace Project No.: 92234894

Sample: WS-4 **Lab ID: 92234894004** Collected: 01/23/15 09:50 Received: 01/26/15 13:52 Matrix: Wipe

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Wipe	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.1**	Total ug	2.5	0.62	5	01/28/15 16:45	01/29/15 02:26	7440-38-2	
Barium	**794**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:26	7440-39-3	
Cadmium	**0.83**	Total ug	0.25	0.12	5	01/28/15 16:45	01/29/15 02:26	7440-43-9	
Chromium	**23.8**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:26	7440-47-3	
Lead	**708**	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:26	7439-92-1	
Selenium	**3.4**	Total ug	2.5	1.2	5	01/28/15 16:45	01/29/15 02:26	7782-49-2	
Silver	ND	Total ug	1.2	0.62	5	01/28/15 16:45	01/29/15 02:26	7440-22-4	
7470 Mercury, Wipe	Analytical Method: EPA 7470								
Mercury	ND	Total ug	1.6	1.6	1		02/03/15 16:23	7439-97-6	

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QUALITY CONTROL DATA

Project: PORCELANITE R1-21
Pace Project No.: 92234894

QC Batch: MERC/7238 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury Wipe
Associated Lab Samples: 92234894001, 92234894002, 92234894003, 92234894004

METHOD BLANK: 1383056 Matrix: Wipe
Associated Lab Samples: 92234894001, 92234894002, 92234894003, 92234894004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	Total ug	ND	1.6	02/03/15 16:26	

LABORATORY CONTROL SAMPLE & LCSD: 1383057 1383058

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury	Total ug	60	56.6	59.0	94	98	80-120	4		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PORCELANITE R1-21
Pace Project No.: 92234894

QC Batch: MPRP/17797 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET Wipes
Associated Lab Samples: 92234894001, 92234894002, 92234894003, 92234894004

METHOD BLANK: 1379624 Matrix: Wipe
Associated Lab Samples: 92234894001, 92234894002, 92234894003, 92234894004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	Total ug	ND	0.50	01/29/15 01:59	
Barium	Total ug	ND	0.25	01/29/15 01:59	
Cadmium	Total ug	ND	0.050	01/29/15 01:59	
Chromium	Total ug	ND	0.25	01/29/15 01:59	
Lead	Total ug	ND	0.25	01/29/15 01:59	
Selenium	Total ug	ND	0.50	01/29/15 01:59	
Silver	Total ug	ND	0.25	01/29/15 01:59	

LABORATORY CONTROL SAMPLE & LCSD: 1379625 1379626

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Arsenic	Total ug	25	23.9	23.7	96	95	80-120	1	20	
Barium	Total ug	25	24.3	24.4	97	98	80-120	0	20	
Cadmium	Total ug	25	24.6	24.5	98	98	80-120	1	20	
Chromium	Total ug	25	24.1	24.2	96	97	80-120	1	20	
Lead	Total ug	25	24.9	24.8	99	99	80-120	0	20	
Selenium	Total ug	25	24.9	24.8	99	99	80-120	0	20	
Silver	Total ug	12.5	12.0	12.1	96	97	80-120	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project:	PORCELANITE R1-21
Pace Project No.:	92234894

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PORCELANITE R1-21
Pace Project No.: 92234894

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92234894001	**WS-1**	EPA 3050	MPRP/17797	EPA 6010	ICP/16015
92234894002	**WS-2**	EPA 3050	MPRP/17797	EPA 6010	ICP/16015
92234894003	**WS-3**	EPA 3050	MPRP/17797	EPA 6010	ICP/16015
92234894004	**WS-4**	EPA 3050	MPRP/17797	EPA 6010	ICP/16015
92234894001	**WS-1**	EPA 7470	MERC/7238		
92234894002	**WS-2**	EPA 7470	MERC/7238		
92234894003	**WS-3**	EPA 7470	MERC/7238		
92234894004	**WS-4**	EPA 7470	MERC/7238		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1885063

Section A Required Client Information:

Company:	WATERS EDGE ENV.
Address:	Raleigh, N.C
Email To:	Phil Rahn
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Phil Rahn
Copy To:	"
Purchase Order No.:	RI-21
Project Name:	Porcelanite
Project Number:	RI-21

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER ______

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other HEXAVE Prep	Analysis Test Y/N	RCRA METALS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92234894
1	WS-1	WP	G	1/23/15	0920				1								✓		✓		
2	WS-2	WP	G	1/23/15	0930				1								✓		✓		
3	WS-3	WP	G	1/23/15	0940				1								✓		✓		
4	WS-4	WP	G	1/23/15	0950				1								✓		✓		
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature]	1/26/15	1352	Denise Pierce	1/26/15	1352	H	Y	N	Y

SAMPLE CONDITIONS

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Thomas Haynes

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 1/23/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

1885063

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WATERS EDGE ENV.	Report To:	Phil Rahn	Attention:	
Address:	Raleigh N.C.	Copy To:	〃	Company Name:	
				Address:	
Email To:	Phil Rahn	Purchase Order No.:	R1-21	Pace Quote Reference:	
Phone: / Fax:		Project Name:	Porcelanite	Pace Project Manager:	
Requested Due Date/TAT:		Project Number:	R1-21	Pace Profile #:	

REGULATORY AGENCY

- ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
- ☐ UST ☐ RCRA ☒ OTHER ______

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other HEXANE Rep	Analysis Test Y/N	RCCA METALS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WS-1	WP	G	1/23/15	0920				1								✓		✓		92234894
2	WS-2	WP	G	1/23/15	0930				1								✓		✓		
3	WS-3	WP	G	1/23/15	0940				1								✓		✓		
4	WS-4	WP	G	1/23/15	0950				1								✓		✓		
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	T. Haynes	1/26/15	1352	Denise Pierce	1/26/15	1352	H	Y	N	Y

SAMPLE CONDITIONS

2

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Thomas Haynes

SIGNATURE of SAMPLER: T. Haynes DATE Signed (MM/DD/YY): 1/23/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: March 13, 2013 Page 1 of 2
	Document No.: F-EDN-CS-003-rev.09	Issuing Authorities: Pace Eden Quality Office

Client Name: Waters Edge Env.

Where Received: ☐ Huntersville ☐ Asheville ☑ Eden ☐ Raleigh

Courier (circle): Fed Ex UPS USPS **Client** Commercial Pace Other________

Custody Seal on Cooler/Box Present: ☐yes ☑no Seals intact: ☐ yes ☐ no

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☑None ☐ Other________

Thermometer Used: IR Gun ED007 **Type of Ice:** Wet Blue None ☐ Samples on ice, cooling process has begun

Temp Correction Factor: Add / Subtract +.4 C

Corrected Cooler Temp.: .4 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 1-26-15 dp

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ~~☑N/A~~ dp	8.
Correct Containers Used:	☐Yes ☐No ☑N/A	9.
-Pace Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WP		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	Initial when completed dp
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):________		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ____________________ Date/Time: ____________

Comments/ Resolution: ______________________________

SCURF Review:	BLG	**Date:**	1/26/15
SRF Review:	JHP	**Date:**	1/26/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Place label here

OR

Handwrite project number (if no label available)

Appendix B

Photograph #1- SWMU #1- WWT System Floor Area and Wipe Sample #1

Photograph #2- SWMU #1- WWT System Floor Area and Wipe Sample #2

Photograph #3- SWMU #1- WWT System Floor Secondary Containment Area and Wipe Sample #3

Photograph #4- SWMU #1- WWT System Floor Area and Wipe Sample #4

Photograph #5- SWMU #11- Spray Line South Trench Area

Photograph #6- SWMU #11- Spray Line North Trench Area

Photograph #7- SWMU #11- Spray Line Sump Walls

Photograph #8- SWMU #11- Spray Line Sump Walls

Photograph #9- SWMU #11- North Spray Line Sump Floor

Photograph #10- SWMU #11- North Spray Line Sump Floor

Photograph #11- SWMU #11- South Spray Line Sump Floor

Photograph #12- SWMU #11- North Spray Line Trench Bottom

Photograph #13- SWMU #11- South Spray Line Trench Bottom