S&ME

July 8, 1999

SCDHEC
Groundwater Quality Section
Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201-1708

Attention: Ms. Lori Murtaugh, Hydrogeologist

Reference: **SITE ASSESSMENT REPORT**
Marsh Lumber Company
Pamplico, South Carolina Facility
S&ME Project No. 1584-98-146

17343

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Dear Ms. Murtaugh:

S&ME, Inc. (S&ME), has completed the authorized site assessment services of the above-referenced property. Groundwater analytical data collected during this assessment has defined the horizontal extent of the dissolved phase plume. With the exception of Tentatively Identified Compounds, pentachlorophenol was the sole semi-volatile organic compound detected during the recent groundwater monitoring events.

The stratigraphic data collected evidenced the presence a clay rich layer beneath portions of the site. Based upon the analytical data collected during this investigation, the clay layer appears to be limiting the vertical migration of the dissolved phase pentachlorophenol in the groundwater. The apparent dip of this clay layer may also be responsible for controlling the lateral migration of the dissolved phase contaminant plume.

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The historic groundwater analytical data suggests that the detected concentrations of pentachlorophenol in the groundwater monitoring wells have decreased significantly over time. This data provides indirect evidence, which indicates and supports natural attenuation as a viable contaminant reduction mechanism for the subject site. Current research and literature tend to support in-situ biodegradation of pentachlorophenol as a viable option. This form of non-active remediation (e.g. biodegradation) should be protective of human health and the environment.

The installation of additional monitoring wells is proposed to monitor the proposed natural attenuation of the pentachlorophenol. Annual groundwater monitoring is proposed to monitor the progress and success of this proposal.

Marsh Furniture Company and S&ME request a meeting to discuss this report and the proposed monitoring program. We suggest a meeting during the 1st or 2nd week of August 1999. Please contact Bruce Braswell with Marsh Furniture Company at (336) 819-4035 to schedule a specific meeting data and time.

If you have any questions or comments, please contact Bruce Braswell at Marsh Furniture Company or S&ME Inc. at 336-288-7180. We appreciate your assistance and management of this incident.

Sincerely,

S&ME, Inc.

Edmund Q.B. Henriques, P.G.
Project Manager

Wayne H. Watterson, P.E.
Environmental Department Manager

cc. Bruce Braswell, Marsh Furniture Company

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SITE ASSESSMENT REPORT
MARSH LUMBER COMPANY FACILITY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Prepared For:

Marsh Furniture Company
P.O. Box 870
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Prepared By:

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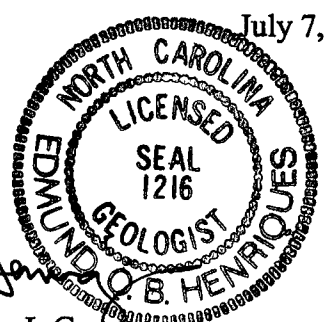
July 7, 1999



Edmund Q.B. Henriques, L.G.
Project Manager

Wayne H. Watterson, P.E.
Environmental Department Manager

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1.0 BACKGROUND

1.1 SITE HISTORY

The Marsh Lumber Company facility, located in Pamplico, South Carolina, consists of approximately 15 acres and contains a sawmill operation with approximately 75,000 square feet of enclosed space. Operations include lumber handling and storage, drying kilns, saw and dimension mills, and lumber treating and drying areas.

The lumber treating and drying includes the use of a dip tank and drip pad (e.g. Green Chain Area) used to treat green lumber freshly cut from logs. Reportedly, the Green Chain Area operations previously used a product containing sodium pentachlorophenol to treat the freshly cut lumber.

During 1992, Law Engineering completed a "Preliminary Site Contamination Assessment" at the subject site. Analytical results from the 1992 assessment indicated the existence of soil and groundwater contamination in the Green Chain Area. Pentachlorophenol represented the primary contaminant of concern. The detected concentrations of pentachlorophenol exceed the Maximum Contaminant Levels (MCLs) established by EPA and the South Carolina Department of Health and Environment Control (SCDHEC).

As a result of the detection of pentachlorophenol in the groundwater beneath the site, Law Engineering, as authorized by Marsh Lumber Company, completed additional site investigations during 1993, 1994, and 1998. A total of eight (8) shallow monitoring wells and one vertical extent monitoring well were installed by Law Engineering to assess the extent of the groundwater contaminant plume in the Green Chain Area. Groundwater analytical data collected by Law Engineering roughly defined the horizontal extent of the plume in all directions except toward the west. Although a vertical extent monitoring well was installed, the well was reportedly dry and never sampled. Therefore, an estimate of the vertical extent of the groundwater impacts could not

be determined.

S&ME conducted additional groundwater investigations during early 1999.

The following provides a summary of all previous site assessment reports:

- "Report of a Preliminary Site Contamination Assessment, Marsh Lumber Company, Pamplico, South Carolina," Law Engineering, March 11, 1992.

- "Report of Assessment Activities, Marsh Lumber Facility, Pamplico, South Carolina," Law Engineering, March 25, 1993.

- "Report of Additional Site Assessment Activities, Green Chain Area, Marsh Lumber Facility, Pamplico, South Carolina," Law Engineering, January 3, 1994.

- "Report of Ground-Water Sampling and Chemical Analysis, Marsh Lumber Company, Pamplico, South Carolina," Law Engineering, August 27, 1998.

- "Additional Site Assessment, Marsh Lumber Company Facility, Pamplico, South Carolina," S&ME Inc., February 24, 1999.

1.2 CONTAMINANT OF CONCERN

As previously mentioned, lumber treating and drying operations includes the use of a dip tank and drip pad in the Green Chain Area to treat green lumber freshly cut from logs. Freshly cut lumber is moved from the sawmill into the Green Chain Area by conveyor. The chain conveyor moves the lumber through a dip tank were the lumber is temporarily submerged, brought above the chemical bath, and allowed to drip dry. There is greater than 100 feet of conveyor chain drying area. The

treated lumber is then manually removed from the chain conveyor and stacked on a concrete pad adjacent to the conveyor.

Reportedly, the Green Chain Area operations previously used Permatox 10-S and Kop-Coat Inc. NP-1 in the wood treatment process. Permatox 10-S reportedly contains 25% to 35% (by weight), sodium pentachlorophenol which is classified as a hazardous waste by the Environmental Protection Agency (EPA Hazardous Waste Code = F027). Manufacture's Safety Data Sheets (MSDS) for Permatox 10-S indicated sodium tetraborax (borax) and aliphatic hydrocarbon solvents (mineral spirits) as additional constituents of potential concern.

Analytical results from the previous site investigation detected pentachlorophenol and several Tentatively Identified Compounds (TIC's) in the soil and groundwater beneath the subject site. The following provides a summary of several physical and chemical characteristics of pentachlorophenol.

- Specific gravity = 1.98[1] (which makes pure pentachlorophenol heavier than water, which has a specific gravity of 1.00)
- Solubility = 0.001% (relatively insoluble)
- Pentachlorophenol is a biodegradable compound that has a reported half-life of weeks to months[2].

A dissolved-phase pentachlorophenol groundwater contaminant plume could migrate with the natural flow of the groundwater beneath the site. However, since pentachlorophenol has a density greater than water, any free-phase or dissolved phase pentachlorophenol could migrate vertically and/or laterally, dependent upon subsurface stratigraphy and the orientation of the stratigraphic units, rather than following the direction of natural groundwater flow.

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1 NIOSH Pocket Guide to Chemical Hazards, DHHS (NIOSH) Publication No. 94-116, pp. 226.
2 Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Philip H. Howard, Volume III – Pesticides, pp. 559-567.

1.3 ABATEMENT MEASURES

Initial abatement measures completed to date include the following:

1. According to Laverne Ard, Marsh Lumber Company, Plant Manager, use of pentachlorophenol at the facility was discontinued sometime around 1986. The current wood-treatment process products do not contain pentachlorophenol and are reportedly biodegradable.

2. According to Laverne Ard, Marsh Lumber Company, Plant Manager, a concrete pad was constructed beneath the "Green Chain Area" conveyor and temporary wood drying and storage area sometime around 1987 to 1988 (see **Figure 2**). The concrete was reportedly designed to channel any residual chemicals to a sump pump where excess chemicals are pumped back into a storage unit in the dip tank area. These improvements helped to reduce the potential for future releases of dip tank wood treatment chemicals to the subsurface.

Abatement efforts such as in-situ soil remediation and/or soil removal actions were not initiated due to the relative absence of detectable concentrations of pentachlorophenol in soil samples collected by Law Engineering, within the Green-Chain area (source area).

1.4 SCOPE OF ADDITIONAL INVESTIGATIONS

On October 15, 1998, Marsh Furniture Company issued a Request For Proposal (RFP) to conduct additional site investigations aimed at furthering the assessment of the extent of the groundwater impacts and refining the understanding of the Pamplico site's subsurface geology/hydrogeology. S&ME Inc. complete the outlined scope of work during January and February 1999. The result of this investigation provided evidenced of a previously unrecognized clay rich layer beneath the site. Based upon the analytical data collected during this early phase of the investigation, the clay layer appears to be limiting the vertical migration of the dissolved phase pentachlorophenol in the

groundwater beneath the site. The dip of the clay layer surface may also be responsible for controlling the lateral migration of the dissolved phase contaminant plume. Groundwater analytical data suggests that the horizontal extent of the dissolved phase groundwater contaminant plume has been generally defined to the north, east and west. However, additional investigations were needed to evaluated the relatively high concentration of pentachlorophenol detected at probe location GP-1 located approximately 320 feet south, southeast of the suspect source area, the Green Chain.

The following provides a generalized summary of the scope of work completed by S&ME Inc. to complete an assessment of the extent of the groundwater impacts.

- The Geoprobe™ Macro Core direct-push sampling tool was used to collect soil core samples for geologic descriptions at 32 probe locations, GP-1 through GP-33. A Licensed Geologist prepared geologic logs for each boring. Each soil core was placed in core boxes, labeled, and retained by Marsh Furniture Company for future reference.

- The Geoprobe™ discrete interval sampling tool was used to collect groundwater samples at 21 geoprobe sample locations, at selected depth intervals.

- Select sample intervals at locations GP-1 and GP-6 were resampled on January 28, 1999, and submitted for laboratory analyses, in an effort to confirm select sample analytical results received for the January 5, 1999, sampling event.

- Groundwater samples were collected from monitoring wells MW-1, MW-3, MW-8, MW9, MW-10, and MW-11 and submitted for laboratory analysis.

- Except where noted, all of the collected groundwater samples were submitted for laboratory analyses according to SW-846 Method 8270 (acid extractable) using the Priority Pollutant List.

Scope of Work (continued)

- Groundwater samples were collected from monitoring wells MW-3 and MW-10, and at geoprobe location GP-8-20. These samples were submitted for laboratory analysis according to SW-846 Method 8270 plus a library search in an effort to detect the presence of potential pentachlorophenol aerobic degradation compounds.

- The location of each Geoprobe™ boring was surveyed to provide the ground elevation and location of the sampling points relative to an artificial benchmark.

- All down-hole equipment was properly decontaminated prior to and following use. The decontamination water was contained and placed in 55-gallon 17H drums and labeled for subsequent disposal. A sample of the decontamination water stored in the drum was collected and submitted for laboratory analysis according to SW-846 Method 8270 (acid extractable) using the Priority Pollutant List.

- All boreholes were properly abandoned with bentonite grout upon the completion of each boring.

Appendix A contains a copy of the RFP developed by Marsh Furniture Company. The scope of work outlined in the RFP and the subsequently proposed additional investigations were submitted to the South Carolina Department of Health and Environmental Control (SCDEHC). The scopes of work were approved and identified as SCDHEC Monitoring Well Installation Approval No. 318. The Geoprobe/drilling services completed for this phase of the investigation were provide by Troxler Geologic Services, Inc., a South Carolina Certified Well Contractor (Registration No. 1841) and South Carolina Certified Well Driller (Registration No. 1436).

2.0 POTENTIAL RECEPTORS

2.1 WATER SUPPLY WELLS

On February 9, 1993, Law Engineering personnel reportedly conducted a water supply well survey. Their survey consisted of "a vehicular reconnaissance to locate potential environmental receptors (water supply wells) within approximately 1500 feet radius of the site." Law Engineering's survey identified the municipal well for the Town of Pamplico, located near the intersection of Third Avenue and Trade Street (see **Figure 1**), as the only supply well identified. Law Engineering's interview with Mr. Lamar Johnson, maintenance supervisor for the Town of Pamplico, indicated that the area is served by water from the town's well. Mr. Johnson stated that he believed that the town's well was the only well in the vicinity of the site.

On July 6, 1999, Laverne Ard, Marsh Lumber Company, Plant Manager, was interview regarding his knowledge of water wells in the Town of Pamplico. Mr. Ard indicated that the Town of Pamplico has three wells. The supply wells mentioned include (1) a well located at Third Avenue and Trade street, (2) a well located at Trade and Coleman Street, and (3) a newer well located approximately 2 tenths of a mile out of town on River Road. Reportedly, the two wells located along Trade Street are no longer in use. The well located off River Street, just outside of town is currently in use. **Figure 1** illustrates the approximate well locations.

S&ME's investigation identified an active water supply well located at the subject site. According to Laverne Ard, Marsh Lumber Company, Plant Manager, the well is used solely to provide water for the facility's boiler and to provide water used to spray on stored logs to maintain moisture prior to processing the logs in the saw mill. As indicated in **Figure 2**, the well is located adjacent to the boiler room, which is located upgradient relative to the Green Chain Area.

The on-site well was sampled on April 13, 1999 and the sample designated as LW#-1. The sample was collected from a spigot located at the well head. A new pair of disposable vinyl gloves were utilized at each location to minimize the potential for cross-contamination of the samples. The sample containers were labeled with the project name and number, the time and date of sample collection, the analyses to be performed, and the presence or absence of preservative. The sample containers were then placed on ice and cooled to approximately 4° C. The chain-of-custody was initiated and the cooler was shipped to Specialized Assays, Inc. located in Nashville, Tennessee. The sample was submitted for laboratory analysis according to SW-846 Method 8270 (acid extractable) using the Priority Pollutant List.

The analytical results for the on-site water well sample evidenced no detectable concentrations of any of the compounds on the Method 8270, acid extractable, Priority Pollutant List. A copy of the analytical report is contained in **Appendix B.**

2.2 SURFACE WATERS

A small creek is located along the western portion of the subject site. This creek flows in general to the north then west into an unnamed tributary to the "Big Swamp." Based upon groundwater elevation data collected to date, it appears that the portion of this creek, which runs along the west side of the subject site, could be a potential discharge point for the shallow aquifer beneath the site.

Reportedly, a small creek flowing generally east to west historically crossed the subject site. During site development, the creek was re-routed through concrete pipes which now channel the water beneath the site. The piped portion of the creek discharges into the small creek which borders the western portion of the site. A portion of the stormwater pipe's pathway is shown in **Figure 2.**

3.0 GEOLOGY/HYDROGEOLOGY

3.1 REGIONAL GEOLOGY/HYDOGEOLOGY

The subject site is located within the Atlantic Coastal Plain Physiographic Province. The Coastal Plain is a gently rolling flat region underlain by a wedge of unconsolidated to semi-consolidated, predominantly clastic sedimentary rocks that range in age from Cretaceous to Holocene. The sedimentary package thickens seaward from a feather edge at their updip limit.

Soils in this region are generally interbedded silts, sands, and clays that have been deposited during successive advances and retreats of the ocean over the past several million years. The marine deposits located near rivers and creeks have been eroded and may be overlain by alluvial deposits.

As stated in Law Engineering's prior site assessment reports, " The town of Pamplico lies on one of a series of nearly level beach terraces formed in the relatively recent geologic past. These terraces have been extensively mapped and are generally identified on the basis of surface elevation. Downtown Pamplico and the surrounding area are mapped as part of the Wicomico Terrace. Terrace deposits are typically 40 to 50 feet in thickness and overlie more ancient, overconsolidated or lithified strata below. The terraces soils are typically characterized by relatively sandy soils near the southeast margin of the terrace. The soils become increasingly clayey in composition proceeding to the northeast, toward the upper margin of the terrace, reflecting an archaic *back-bay* depositional deposit."

A water table aquifer is commonly the first aquifer encountered underlying the upper portion of the Coastal Plain. The water table aquifer generally consists of sand, silt, and some gravel, at depths typically 50 feet or less. The groundwater originates as recharge from precipitation in aquifer outcrop areas. Topography is a major influence on regional flow in Coastal Plain aquifers. The elevation of recharge areas, the degree of incisement of streams, and the location and extent of lowland areas largely determines the groundwater flow patterns. Streams and swampy lowland areas are places where groundwater discharges either as base flow or diffuse upward leakage. In general, groundwater flow is anticipated to mimic topography, flowing down dip, perpendicular to topographic contour lines

3.2 SITE GEOLOGY

S&ME utilized the direct push probe technology to complete thirty-four (34) soil probes through the vadose zone soils and into the underlying water table aquifer (see **Figure 2**). Continuous core samples from the ground surface to the boring termination depth were collected at select probe location. During later portions of the investigation, select intervals were Macro-cored in an effort to confirm the elevation of a suspect confining clay layer. Following the collection of each macro-core soil sample, the cores were logged by a geologist. **Appendix C** contains copies of the geologic descriptions prepared for each probe location.

Based upon the stratigraphic information collected during this assessment and the prior site assessments, three geologic cross-section maps were prepared. As indicated in **Figures 3, 4, and 5** the upper most stratigraphic units encountered consist primarily of a mixture of silts, clays, clayey silts, sandy silts, and silty sands. The lithologic descriptions do not suggest any distinct lateral continuity of the upper most lithologies, between the investigated boring locations. A review of Law Engineering's soil investigation drilling logs for the Green Chain Area, suggests a similar lack of lateral continuity within the near surface lithologic units.

The uppermost lithologies do, however, appear to overlie a relatively continuous clay unit, which overlies a distinct gray semi-consolidated, calcareous, fossiliferous, silty sand unit. This unit was detected across at boring locations completed across the site. Law Engineering's drilling logs describe a similar fossiliferous unit in monitoring well MW-8, at a similar elevation, however; an overlying clay layer was not reported (see **Figures 3 and 4**). This suspect relatively continuous clay layer was generally encountered at depths of plus or minus 18 feet below grade. The probe sample location survey data combined with the calculated depth to the top of this clayey unit, suggest that this unit locally dips slightly downward toward the west.

3.3 SITE HYDROGEOLOGY

Topography is a major influence on regional groundwater flow in Coastal Plain aquifers. Groundwater originates as recharge from precipitation in aquifer outcrop areas. The elevation of recharge areas, the degree of incisement of streams, and the location and extent of lowland areas largely determines the groundwater flow patterns. Streams and swampy lowland areas are places where groundwater discharges either as base flow or diffuse upward leakage. Based upon the topography of the subject site, groundwater flow is anticipated to mimic topography, flowing down dip, perpendicular to topographic contour lines. On this basis, the direction of groundwater within the study area is anticipated to flow west, toward the adjacent unnamed tributary of Big Swamp.

During November 1993, Law engineering collected depth to groundwater data at several monitoring wells. The depth to groundwater data and top of casing elevation data were used to calculate the groundwater elevations at the monitoring wells. **Table 2** provides a summary of the groundwater elevation data collected during the site assessment activities by Law Engineering and S&ME Inc.. **Figure 6** provides a groundwater contour map excerpted from Law Engineering's "Report of Additional Assessment Activities, Green Chain Area, Marsh Lumber Company, Pamplico, South Carolina," dated January 3, 1994. As indicated by **Figure 6**, shallow groundwater

flow beneath the site is generally toward the west-southwest. Although data was collected at fewer monitoring points, S&ME's recent groundwater elevation data suggests a similar flow direction.

3.3.1 Contaminant Migration

As a results of Law Engineering's site investigations, they reported the following aquifer parameters:

- Hydraulic Gradient (average) = 0.011 feet/foot .
- Hydraulic Conductivity = 0.0021 cm/second (e.g. slug test date @ MW-2)
- Groundwater velocity (lateral) = 13 feet per year (Law's calculations assumed the above stated values and an effective porosity of value of 19%)

This aquifer parameter data coupled with the shallow groundwater flow direction suggest that the shallow groundwater beneath the site is migrating laterally toward the west south west at approximately 13 feet per year. The rate of dissolved phase contaminant migration may be different than the groundwater migration rate. A dissolved-phase pentachlorophenol groundwater contaminant plume could migrate with the natural flow of the groundwater beneath the site. However, since pentachlorophenol has a density greater than water, any free-phase or dissolved phase pentachlorophenol could migrate vertically and/or laterally. Subsurface stratigraphy and the orientation of the stratigraphic units, rather than following the direction of natural groundwater flow may affect the migration.

S&ME hypothesized that the clay rich layer detected beneath the site could act as an aquitard or aquiclude, thus it could impede any potential vertical migration of the pentachlorophenol in the groundwater. As such, the groundwater sampling and analyses plan for S&ME assessment activities included the collection of groundwater samples at or just above this relatively continuous clay rich layer, and the collection of groundwater samples from below the clay rich layer for

comparison. This sampling strategy permitted a limited evaluation of the effectiveness of this suspect aquitard against the vertical migration of the targeted groundwater contaminants. Based upon the groundwater analytical data discussed in Section 5.3, pentachlorophenol has not been detected beneath the laterally continuous clay layer identified beneath the site.

Figure 7, provides a contour map of the surface of the top of the clay layer, hypothesized to be an aquitard or aquiclude. This map was prepared using the boring location survey data and the depths to the top of the clay layer, which are summarized in **Table 1**.

As indicated in **Figure 7** the southern most portion of the Green Chain Area is located along a top of clay surface, topographic high, which appears to form a ridge, which extends out toward probe location GP-23. Based upon the data point distribution, it is not possible to determine if this ridge like feature is generally flat topped, crowned, or peaked. To the north of this ridge, the clay layer surface appears to dip downward toward the northwest. South of this ridge, the clay layer surface appears to dip downward to the south into a bowl-like feature then rise upward again further to the south. A subtle rise is also suggested along the properties western boundary in the vicinity of probes GP-5, GP-15, GP-16 and GP-21.

Assuming the dip tank as the primary source area and that contaminant migration does follow the clay layer surface, the groundwater contaminants should migrate toward the lowest points which should be to the northwest or the south (e.g. the bowl-like feature), dependent upon the migration path along and off the ridge (see **Figure 7**).

4.0 SOIL SAMPLING (LAW ENGINEERING)

4.1 SOIL SAMPLE COLLECTION

During January 1992, Law Engineering completed four hollow-stem auger borings (B-1, B-2, B-3 and B-4) and four shallow hand-auger boring (e.g. SS-1, SS-2, SS-3, and SS-4) to initiate an investigation into potential soil impacts. Law Engineering reported "minimal PID measurements were recorded for soil samples collected from boring B-1 through B-4, and shallow soil samples SS-1 through SS-4, performed in the vicinity of the Green Chain Conveyor Area."

During October 1993, Law Engineering completed four additional hand-augered soil boring (e.g. AS-5, AS-6, AS-7 & AS-8) in the Green Chain Area, "to obtain soil samples for chemical analyses to aid in the delineation of the source area for groundwater contamination." Soil samples from one foot below grade were collected and submitted for laboratory analyses according to Method 8270 for semi-volatile organics and for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury) from a depth of 1 foot below ground surface. **Figure 2** depicts Law Engineering's soil sample locations.

4.2 SOIL SAMPLE ANALYTICAL RESULTS

Table 3 provides a summary of the analytical results for sample samples collected by Law Engineering and also contains a summary of the analytical results for a groundwater sample collected from boring B-3. As indicated in **Table 3**, pentachlorophenol was not detected in the soil at any of the selected sample locations. Several tentatively identified compounds were reported for several sample locations. The detected compounds could represent contaminants stemming from the aliphatic hydrocarbon solvents (mineral spirits) which were additional constituents of the former wood treatment chemicals

Table 3 also provides a summary of the analytical results for select samples submitted for analyses for the 8-RCRA Metals (totals). Based upon the MSDS sheets for the former wood treatment products, none of the targeted metals are listed as constituents of the products. Based upon the available information regarding the wood treatment processes and the analytical results, S&ME agrees with Law Engineering's suggestion that the detected total metal concentrations likely represent natural soil background levels.

5.0 GROUNDWATER SAMPLING

In an effort to define the extent of the groundwater impacts, groundwater samples were collected using the Geoprobe's discrete interval sampling tool and from existing monitoring wells. The use of the discrete interval sampling tool permitted the collection of numerous groundwater quality samples within relatively short periods of time. The tool permits the collection of groundwater quality samples representative of discrete 4-foot intervals. Due to the potential for pentachlorophenol to sink in water, the Geoprobe groundwater quality sampling strategy targeted the collection of samples just above or just below the suspect aquitard clay layer. In contrast, the site's shallow monitoring well samples are most likely representative of the entire well water column, and therefore, the resulting analytical data may exhibit some biases due to mixing affects.

5.1 GEOPROBE GROUNDWATER SAMPLE COLLECTION

S&ME utilized the Geoprobe's discrete interval sampling tool to collect groundwater samples at 22 probe test locations, during a total of (4) four separate phases of investigation. Select intervals were chosen for groundwater sample collection and analysis based upon the observed stratigraphic sequences, applying the hypothesis that pentachlorophenol should sink in within the upper aquifer and preferably migrate down dip along the tops of the more restrictive stratigraphic units.

Select groundwater sample intervals at probe locations GP-1 and GP-6 were resampled on January 28, 1999. Groundwater samples ML-A and ML-B collected on January 28, 1999 were obtained from approximately the same locations and depth intervals as samples GP-1-15 and GP-6-17, respectively, collected on January 5, 1999. The sample locations were re-sampled and analyzed in an effort of confirm the analytical results received for the January 5, 1999, sampling event. Of particular concern was the detection of pentachlorophenol at location GP-1-15, a location originally anticipated to produce a non-detectable concentration of pentachlorophenol, based on the results from prior site investigations. **Table 4** provides a summary of the groundwater intervals sampled at

each probe location, and the sample position relative to the suspect aquitard clay layer.

Each groundwater sample was placed in laboratory-prepared containers. A new pair of disposable vinyl gloves were utilized at each location to minimize the potential for cross-contamination of the samples. Each sample container was labeled with the project name and number, the time and date of sample collection, the analyses to be performed, and the presence or absence of preservative. The sample containers were then placed on ice and cooled to approximately 4° C. The chain-of-custody was initiated and the cooler was shipped to Specialized Assays, Inc. located in Nashville, Tennessee. The samples were analyzed according to SW-846 Method 8270 (acid extractable) using the Priority Pollutant List.

5.2 MONITORING WELL GROUNDWATER SAMPLE COLLECTION

Groundwater samples were collected from monitoring wells MW-1, MW-3, MW-8, MW9, MW-10, and MW-11 on January 5, 1999. Prior to sample collection, the volume of water in each well was determined. Using new disposable Teflon ™ bailers at each well location, a minimum 3 well casing volumes were purged from each well, prior to sample collection. Following the purging, groundwater samples were collected with the disposal Teflon ™ bailer and placed in laboratory-prepared containers. A new pair of disposable vinyl gloves were utilized at each location to minimize the potential for cross-contamination of the samples. Each sample container was labeled with the project name and number, the time and date of sample collection, the analyses to be performed, and the presence or absence of preservative. The sample containers were then placed on ice and cooled to approximately 4° C. The chain-of-custody was initiated and the cooler was shipped to Specialized Assays, Inc. located in Nashville, Tennessee. The samples were analyzed according to SW-846 Method 8270 (acid extractable) using the Priority Pollutant List.

5.3 NATURAL ATTENUATION INDICATORS

Research into potential biodegradation of pentachlorophenol revealed several references, all of which suggest that pentachlorophenol is biodegradable. **Appendix D** contains a copy of the "Pentachlorophenol Family Pathway Map" prepared by Dr. Larry Wackett, University of Minnesota. Dr. Wackett states "that bacteria have been identified that are resistant to relatively high PCP (pentachlorophenol) concentrations and can metabolize it to carbon dioxide and chloride. Bacteria have been used successfully in PCP bioremediation." The pathway identified by Dr. Wackett was evaluated and it was determined that (2) two of the reported pentachlorophenol biodegradation compounds exists as target compounds for Method 8270, and that (5) five other reported pentachlorophenol biodegradation compounds could be identified as Tentatively Identified Compounds (TICs) using the same test method.

Based upon this information, groundwater samples from Geoprobe location GP-8-20 and monitoring wells MW3 and MW-10 were collected on April 27, 199, and submitted for laboratory analyses according to according to SW-846 Method 8270 plus a library search for Tentatively Identified Compounds (TICs) using the Priority Pollutant List. The presence or absence of the biodegradation compounds at these locations may provide some insight into any existing biodegradation activity at the subject site. **Tables 4 & 5** provide a summary of the groundwater analytical data.

In addition to the testing discussed above, groundwater dissolved oxygen and temperature data was also collected on April 27, 1999, in an effort to initiate an assessment of select water quality parameters necessary to support natural attenuation (e.g. biodegradation). In-situ dissolved oxygen concentrations and temperature readings were collected at monitoring wells MW-1, MW-3, MW-9, MW-10, and MW-11. These data are summarized in **Table 6**.

5.4 DISCUSSION OF GROUNDWATER ANALYTICAL RESULTS

5.4.1 Extent of Groundwater Impacts

Tables 4 and 5 provide a summary of the groundwater analytical results. With the exception of Tentatively Identified Compounds (TICs), pentachlorophenol is the sole semi-volatile organic compound detected during the recent groundwater monitoring events. **Figure 8** provides an isoconcentration plan map for the concentrations of pentachlorophenol detected during 1999. The detected concentrations of pentachlorophenol were plotted on Cross-Sections A- A', B-B', and C-C', to provide an estimate of the vertical extent of the groundwater impacts (see **Figures 9, 10, and 11**). Copies the groundwater analytical results area contained in **Appendix B**.

Historic groundwater analytical data indicated monitoring well MW-3 as the area of highest concentrations. Well MW-3 is located approximately 130 feet down-gradient of the Green Chain Area. However, the recent detection of 696 ug/l pentachlorophenol at probe location GP-1-15 (sampled interval = 11 to 15 feet below grade) now represents the relative greatest groundwater pentachlorophenol concentration detected. A similar concentration of 690 ug/l pentachlorophenol was detected above the clay layer at sample location GP-23-14. The detection of 74 ug/l pentachlorophenol above the clay layer at GP-3-19, suggests the existence of two hot spots of dissolved phase contamination (see **Figure 8**). However, it is also plausible that the comparatively low concentration of pentachlorophenol detected at GP-3-19 is an artifact of groundwater sampling and/or analytical data variability and that the two hot spots are actually just one cohesive unit.

Groundwater analytical data for sample collected above the clay layer at Geoprobe locations GP-2, GP-4, GP-5, GP-8, GP-9, GP-16, GP-22, GP-25, GP-28, and GP-30, and monitoring wells MW-9 and MW-11, define the horizontal extent of the dissolved phase plume. The geometry of the upper surface of the clay layer should hinder any potential off-site plume migration (see Figure 7).

Groundwater analytical data for samples GP-1-30, GP-2-24 and MW-8 define the vertical extent of the pentachlorophenol in the groundwater (see **Figures 9, 10, and 11**). The laterally continuous clay rich layer at depth is thought to reasonably restrict the vertical migration of the contaminant below this layer. This hypothesis is supported by the analytical data and was used in the preparation of the isoconcentration cross-sections.

5.4.2 Quality Control Data

Based upon the results of the prior site assessments and the sample location's physical distance from the suspect source area (approximately 320 feet), a relatively high concentration of pentachlorophenol was not predicted at GP-1-15. This sample location was resampled on January 28, 1999, in an effort to confirm the detected concentration. The resampling and analyses results for ML-A detected 270 ug/l. Although pentachlorophenol was detected during confirmation sampling and analyses, the concentration detected was not as high as the prior detection.

Since probe location GP-6-17 was in the area between the Green Chain and the nearest down gradient monitoring well MW-3, it was resampled and analyzed in an effort to confirm the presence and/or absence of pentachlorophenol in this area. Analytical results for the sample ML-B (e.g. equivalent sample location to GP-1-15) detected 100 micrograms per liter (ug/l) pentachlorophenol. In this case, the pentachlorophenol concentration detected during confirmation sampling and analyses was less than the prior detection.

The confirmation sample analyses data does suggest that some variability in the detected concentrations can be expected when using the Geoprobe sampling tools and methods. S&ME is of the opinion that the variability should be no greater than that which can be observed when comparing monitoring well groundwater analytical data from temporally discrete sampling events.

5.4.3 Indications of Natural Attenuation

The historic groundwater analytical data provides the strongest evidence in support of natural attenuation (e.g. biodegradation) of pentachlorophenol. As noted in **Table 5**, the concentrations of pentachlorophenol in monitoring wells have continuously declined since the early 1993. The recent Geoprobe groundwater analytical data does not suggest that the observed concentration reductions are due to vertical migration of the contaminant beneath the laterally continuous clay layer beneath the site. Therefore, it is hypothesized that the declining pentachlorophenol concentrations are due to some combination of biodegradation and diffusion.

Analytical results targeting potential pentachlorophenol biodegradation compounds detected 2,4,6-trichlorophenol at well MW-3 during 1993. This compound is reportedly produced in the third step of an eight (8) step (or more) process. The ratio of pentachlorophenol to 2,4,6-trichlorophenol in MW-3 is approximately 300:1. No other reported pentachlorophenol biodegradation compounds were detected. The absence of their detection may be attributed to the current relatively low pentachlorophenol concentrations and the detection limits for the biodegradation compounds. Information regarding degradation rates was not discovered.

According to current literature, the in-situ collected measurements of dissolved oxygen are relatively low for aerobic biodegradation. However, other site conditions such as the presence of other electron acceptors may be responsible for supporting the apparent biodegradation of the pentachlorophenol. Current literature also suggests that the recorded groundwater temperatures are within the acceptable range to support biodegradation.

6.0 PROPOSED CORRECTIVE MEASURES

6.1 NATURAL ATTENUATION OF SOIL IMPACTS

Based upon the lack of detectable pentachlorophenol soil impacts and the apparent downward trend of the dissolved phase groundwater pentachlorophenol concentrations, natural attenuation of any remaining soil impacts is recommended. As previously discussed, pentachlorophenol is known to be a naturally biodegradable compound. The site's analytical data suggests a relative absence of pentachlorophenol in the soil and an apparent decline in the dissolved phase pentachlorophenol groundwater concentrations. These data provide indirect evidence, which tends to support a natural attenuation hypothesis and a proposal for natural attenuation of any remaining soil impacts.

6.2 NATURAL ATTENUATION OF GROUNDWATER IMPACTS

The site's groundwater analytical data provides indirect evidence, which indicates and supports natural attenuation as an active and viable contaminant reduction mechanism for the subject site. This form of non-active remediation is also supported by, and considered protective of human health and the environment since:

- Potable water for the area provided by a well owned by the Town of Pamplico. The well is located approximately 1500 feet to the southeast of the site.
- Groundwater analytical data indicates that the dissolved phase pentachlorophenol is contained within the property boundaries for the subject property. Groundwater flow direction data and the surface of the clay layer data suggest a low potential for the groundwater contaminants to migrate off-site.
- A clay layer detected beneath the site at depths ranging form 13 feet to 23 feet, appears to be acting as an aquitard or aquiclude, limiting or preventing any vertical migration of the groundwater contaminant.

6.3 PROPOSED MONITORING PROGRAM

Based upon the estimated shallow groundwater flow direction, the surface topography of the discussed suspect confining clay layer, and the current distribution of pentachlorophenol in the groundwater, the following monitoring schedule and well network are proposed. The purpose of the monitoring program is to provide further documentation to demonstrate natural attenuation of the groundwater contaminants and to provide for monitoring needed to detect any potential further migration of the pentachlorophenol within the limits of the subject property and/or vertically beneath the suspect confining clay layer.

Figure 12 illustrates the proposed monitoring well network. All of the additional shallow monitoring wells proposed shall be constructed such that the bottom of each well shall be on top the aquitard clay layer. **Appendix E** provides an example construction detail for the proposed additional monitoring wells.

Proposed Monitoring Program and Schedule

- Install the proposed additional monitoring wells within 90 days of SCDEHC's approval of the proposed corrective measures.

Proposed Monitoring Program and Schedule (continued)

- Collect groundwater samples on an annual basis for laboratory analyses from wells MW-1, MW-2, MW-3, MW-8, MW-9, MW-10, MW-11, MW-13 (new), MW-14 (new), MW-15 (new), and MW-16 (new)[3].

- Collect a groundwater sample from the on-site water supply well on an annual basis.

- Analyze all groundwater samples according to Method 8270 (acid extractables) using the priority pollutants list.

- Prepare and submit an annual groundwater monitoring report to the SCDEHC, within 60 days of the receipt of the groundwater analytical results.

- Any indications of potential off-site contaminant migration shall be reported to SCDEHC immediately.

- If justified by the groundwater monitoring data, recommendations to eliminate certain monitoring wells from this monitoring program may be submitted to the SCDEHC for review.

3 Annual groundwater monitoring is proposed based upon the continuous decline of pentachlorophenol concentrations over time and the distance between the extent of the groundwater impacts and any potential receptors.

7.0 CONCLUSIONS

The stratigraphic data collected by S&ME Inc. evidenced the presence a clay rich layer beneath portions of the site. Select intervals were chosen for groundwater sample collection and analysis based upon the observed stratigraphic sequences, applying the hypothesis that pentachlorophenol should sink within the upper aquifer and preferably migrate down dip along the tops of the more restrictive stratigraphic units. Based upon the analytical data collected during this investigation, the clay layer appears to be limiting the vertical migration of the dissolved phase pentachlorophenol in the groundwater. The apparent dip of this clay layer may also be responsible for controlling the lateral migration of the dissolved phase contaminant plume.

With the exception of Tentatively Identified Compounds, pentachlorophenol was the sole semi-volatile organic compound detected during the recent groundwater monitoring events. Groundwater analytical data collected during this assessment has defined the horizontal extent of the dissolved phase plume. The geometry of the upper surface of the clay layer should hinder any potential off-site plume migration. Groundwater analytical data for samples GP-1-30, GP-2-24 and MW-8 define the vertical extent of the pentachlorophenol in the groundwater. The laterally continuous clay rich layer at depth is thought to reasonably restrict the vertical migration of the contaminant below this layer. This hypothesis is supported by analytical data.

The historic groundwater analytical data suggests that the detected concentrations of pentachlorophenol in the groundwater monitoring wells, have decreased significantly over time. This data provides indirect evidence, which indicates and supports natural attenuation as an active and viable contaminant reduction mechanism for the subject site. Current research and literature tend to support in-situ biodegradation of pentachlorophenol as a viable option.

Non-active remediation (e.g. biodegradation) is supported by, and considered protective of human health and the environment since:

- Potable water for the area provided by three wells owned by the Town of Pamplico. The well currently in use is located greater than 1,500 feet to the southeast of the site. The Town of Pamplico's two remaining inactive supply wells are located approximately 1,500 feet and 3,000 feet to the southeast of the site, respectively.

- Groundwater analytical data indicates that the dissolved phase pentachlorophenol is contained within the property boundaries for the subject property. Groundwater flow direction data and the surface of the clay layer data suggest a low potential for the groundwater contaminants to migrate off-site.

- A clay layer detected beneath the site at depths ranging form 13 feet to 23 feet, appears to be acting as an aquitard or aquiclude, limiting or preventing any vertical migration of the groundwater contaminant.

The installation of additional monitoring wells is proposed to monitor the proposed natural attenuation of the pentachlorophenol. Annual groundwater monitoring is proposed to monitor the progress and success of this proposal.

7.0 SOLE USE STATEMENT

All materials and information which will be obtained by S&ME on this project will be provided for the sole use of Marsh Furniture Company, Inc. for this project. Use of the report issued for this project by any third parties will be at such party's sole risk. S&ME disclaims liability for any use of or reliance on the report issued for this project by third parties.

TABLES

TABLE 1
TOP OF CLAY LAYER ELEVATIONS
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Sample Location	Ground Elevation (feet)	Depth to the Top of Clay (feet)	Top of Clay Elevation (feet)	Thickness of Clay Layer (feet)
GP-1	92.84	15.50	77.34	2.00
GP-2	90.81	15.25	75.56	2.25
GP-3	96.07	16.50	79.57	1.50
GP-4	94.56	18.25	76.31	2.50
GP-5	92.30	nd	nd	nd
GP-6	nd	nd	nd	nd
GP-7	98.27	18.50	79.77	1.50
GP-8	96.55	21.00	75.55	3.50
GP-9	93.99	15.75	78.24	1.75
GP-10	93.08	15.50	77.58	1.00
GP-11	91.30	13.00	78.30	2.25
GP-12	93.33	15.00	78.33	2.00
GP-14	98.79	22.50	76.29	2.00
GP-15	91.65	13.00	78.65	1.25
GP-16	94.04	16.50	77.54	1.75
GP-17	100.11	21.00	79.11	1.75
GP-18	100.05	21.00	79.05	3.00
GP-19	98.37	18.50	79.87	1.50
GP-20	94.34	18.00	76.34	2.00
GP-21	91.26	14.00	77.26	2.50
GP-22	94.12	16.00	78.12	1.00
GP-23	95.93	18.00	77.93	1.00
GP-24	100.61	nd	nd	nd
GP-25	93.57	23.00	70.57	1.00
GP-26	92.91	15.50	77.41	1.00
GP-27	92.41	13.25	79.16	1.00
GP-28	92.87	14.00	78.87	1.00
GP-29	98.45	18.00	80.45	1.50
GP-30	92.53	14.00	78.53	1.00
GP-31	92.41	13.75	78.66	1.25
GP-32	93.73	15.00	78.73	1.50
GP-33	95.38	18.25	77.13	1.25

TABLE 2
GROUNDWATER ELEVATION DATA SUMMARY
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Well Location	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Data Collected By
MW-1	1/6/93	100.39	6.73	93.66	LAW
	10/18/93	100.39	8.08	92.31	LAW
	11/11/93	100.39	7.92	92.47	LAW
	1/5/99	100.39	7.80	92.59	S&ME
MW-2	1/6/93	99.89	7.29	92.60	LAW
	10/18/93	99.89	8.54	91.35	LAW
	11/11/93	99.89	8.32	91.57	LAW
MW-3	1/6/93	99.13	7.88	91.25	LAW
	10/18/93	99.13	8.52	90.61	LAW
	11/11/93	99.13	8.47	90.66	LAW
	1/5/99	99.13	8.87	90.26	S&ME
MW-4	1/6/93	98.16	5.38	92.78	LAW
	10/18/93	98.16	6.59	91.57	LAW
	11/11/93	98.16	6.33	91.83	LAW
MW-5	1/6/93	98.57	1.77	96.80	LAW
	11/11/93	98.57	3.49	95.08	LAW
MW-6	1/6/93	99.81	2.34	97.47	LAW
	11/11/93	99.81	4.55	95.26	LAW
MW-7	1/6/93	99.59	1.85	97.74	LAW
MW-8	10/18/93	99.30	46.34	52.96	LAW
	11/11/93	99.30	42.01	57.29	LAW
	1/5/99	99.30	21.52	77.78	S&ME
MW-9	10/18/93	97.97	7.91	90.06	LAW
	11/11/93	97.97	7.86	90.11	LAW
	1/5/99	97.97	8.11	89.86	S&ME
MW-10	10/18/93	93.42	4.86	88.56	LAW
	11/11/93	93.42	4.98	88.44	LAW
	1/5/99	93.42	4.19	89.23	S&ME
MW-11	10/18/93	97.45	7.59	89.86	LAW
	11/11/93	97.45	7.43	90.02	LAW
	1/5/99	97.45	7.58	89.87	S&ME
MW-12	10/18/93	100.26	7.07	93.19	LAW
	11/11/93	100.26	6.8	93.46	LAW

1) Groundwater depths measured from the top of the PVC well casings

2) Elevations are referenced to an assumed site datum (southeast corner of the concrete slab at the Pre-Dryer Building = 100.00 feet)

3) LAW = Law Engineering

4) S&ME = S&ME Inc.

TABLE 3
LAW ENGINEERING'S SOIL SAMPLING ANALYTICAL DATA SUMMARY
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Sample ID	Sample Depth (feet below grade)	Detected Compounds (Method 8270 acid extractables)	Detected Concentration (ug/kg)	Tentatively Identified Compounds	Detected Concentration (ug/kg)
B-1	1 to 2.5	none	all BQL	unknown aromatic hydrocarbon 9-octadecenamid	**710** **1200**
B-1	3.5 to 5	none	all BQL	9-octadecenamid	**800**
B-2	1 to 2.5	none	all BQL	none	
B-2	3.5 to 5	none	all BQL	none	
B-3	4 to 6	none	all BQL	pentatriaconate tritetraconate octadecane 2,6,10,15-trimethylheptacecane	**1900** **1000** **920** **2100**
B-3	8.5-10	none	all BQL	none	
B-3	9.5	pentachlorophenol 4,6-dinitro-2-methylphenol	**110** **75**	2,3,4,5-tetrachlorophenol unknown aliphatic hydrocarbon	**24** **32**
B-4	1 to 2.5	none	all BQL	none	
B-4	6 to 7.5	none	all BQL	pentadecane tetradecane	**740** **700**
SS-1	0.5	none	all BQL	none	
SS-2	0.5	none	all BQL	none	
SS-3	0.5	none	all BQL	pentanamide	**350**
SS-4	0.5	none	all BQL	none	

all BQL = all compounds below the quantitation limits
ug/kg = micrograms per kilogram
**B3* = groundwater sample collected directly from soil boring B-3*

TABLE 3
LAW ENGINEERING'S SOIL SAMPLING ANALYTICAL DATA SUMMARY
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Sample Location	Sample Date	Sample Depth (feet)	Method 8270 (semi-volatiles) (ug/kg)	Total Metals				
				Barium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Silver (mg/kg)
AS-5	10/7/93	0.5 to 1.0	all parameters BQL	160	7.8	28	3.1	ND
AS-6	10/7/93	0.5 to 1.0	all parameters BQL	280	17	20	ND	ND
AS-7	10/7/93	0.5 to 1.0	all parameters BQL	36	82	9.4	ND	ND
AS-8	10/7/93	0.5 to 1.0	all parameters BQL	44	17	17	ND	ND
MW-8	10/7/93	49.5 to 50.0	all parameters BQL	22	43	9.5	ND	ND
MW-9	10/8/93	6.0 to 7.5	all parameters BQL	8	25	7	ND	ND
MW-10	10/8/93	3.5 to 7.5	all parameters BQL	3.4	6.5	4.1	ND	ND
MW-11	10/11/93	6.0 to 7.5	all parameters BQL	4	5.9	5.2	ND	16

all parameters BQL = all targeted parameter below the quantitation limits
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
ND = not detected

TABLE 4
GEOPROBE GROUNDWATER ANALYTICAL DATA SUMMARY
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Sample Location	Date Collected	Analytical Results Pentachlorophenol in ug/l	Sampled Interval in feet below grade	Stratigraphic Position Relative to the clay layer
GP-1-15	1/5/99	696	11 to 15	at and above the clay
*GP-1-15	1/28/99	270	11 to 15	at and above the clay
GP-1-30	1/5/99	nd	26 to 30	below the clay
GP-2-16	1/5/99	nd	12 to 16	at and above the clay
GP-2-24	1/5/99	nd	20 to 24	at and above the clay
GP-3-19	1/5/99	74	15 to 19	at and above the clay
GP-4-17	1/5/99	nd	13 to 17	at and above the clay
GP-5-15	1/5/99	nd	11 to 15	at and above the clay
GP-6-17	1/5/99	nd	13 to 17	at and above the clay
*GP-6-17	1/28/99	100	13 to 17	at and above the clay
GP-8-20	4/27/99	nd	16 to 20	at and above the clay
GP-9-15	4/27/99	nd	11 to 15	at and above the clay
GP-16-16	4/13/99	nd	12 to 16	at and above the clay
GP-20-16	4/13/99	246	12 to 16	at and above the clay
GP-21-14	4/26/99	nd	10 to 14	at and above the clay
GP-22-16	4/26/99	nd	12 to 16	at and above the clay
GP-23-14	4/26/99	690	10 to 14	at and above the clay
GP-24-20	4/26/99	10	16 to 20	at and above the clay
GP-25-22	4/27/99	nd	18 to 22	at and above the clay
GP-28-12	4/27/99	nd	8 to 12	at and above the clay
GP-30-12	4/27/99	nd	8 to 12	at and above the clay
Tentatively Identified Compounds				
GP-8-20	4/27/99	15 ug/l 2,3-dichlorobenzoic acid		

all concentrations reported in micrograms per liter (ug/l)
nd = not detected
** = Confirmation resampling analyses for select locations on 1/28/99. Sample location ML-A = GP-10-16 Sample location ML-B = GP-6-17. The "ML" prefix sample ID's were used during the resampling event as a quality control measure.*

TABLE 5
MONITORING WELL GROUNDWATER ANALYTICAL DATA SUMMARY
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Sample Location	Date Collected	Target Compounds					Tentatively Identified Compounds		
		Pentachloro-phenol	bis-2-ethylhexyl phthalate	2,4-dichloro-phenol	2,4,6-Trichloro-phenol**	2,4,5-trichloro-phenol	1,2,3,4-tetrachloro-phenol	3,4,5-trichloro-phenol	styrene
MW-1	1/6/93	nd	29	nd	nd	nd	nt	nt	nt
	2/10/93	nd	nd	nd	nd	nd	nt	nt	nt
	10/18/93	nd	nd	nd	nd	nd	nt	nt	nt
	1/5/99	nd	nt	nd	nd	nd	nt	nt	nt
MW-2	1/6/93	nd	nd	nd	nd	nd	nt	nt	nt
	10/18/93	nd	nd	nd	nd	nd	nt	nt	nt
MW-3	1/6/93	4000	nd	13	14	380	nt	nt	nt
	2/10/93	4300	nd	11	15	290	nt	nt	nt
	10/18/93	3000	nd	nd	nd	170	nt	nt	nt
	7/24/98	215	nd	nd	nd	nd	nt	nt	nt
	1/5/99	271	nt	nd	nd	nd	nt	nt	nt
	4/27/99	145	nd	nd	nd	nd	17	15	55
MW-4	1/6/93	nd	nd	nd	nd	nd	nt	nt	nt
	10/18/93	nd	nd	nd	nd	nd	nt	nt	nt
MW-9	10/18/93	nd	21	nd	nd	nd	nt	nt	nt
	1/5/99	nd	nt	nd	nd	nd	nt	nt	nt
MW-10	10/18/93	62	18	nd	nd	nd	nt	nt	nt
	7/24/98	76	nd	nd	nd	nd	nt	nt	nt
	1/5/99	58	nt	nd	nd	nd	nt	nt	nt
	4/27/99	35	nd	nd	nd	nd	nd	nd	nd
MW-11	10/18/93	nd	14	nd	nd	nd	nt	nt	nt
	1/5/99	nd	nt	nd	nd	nd	nt	nt	nt
MW-12	10/18/93	nd	22	nd	nd	nd	nt	nt	nt
	7/24/98	nd	nd	nd	nd	nd	nt	nt	nt

all concentrations reported in micrograms per liter (ug/l)

nd = not detected

nt = not tested

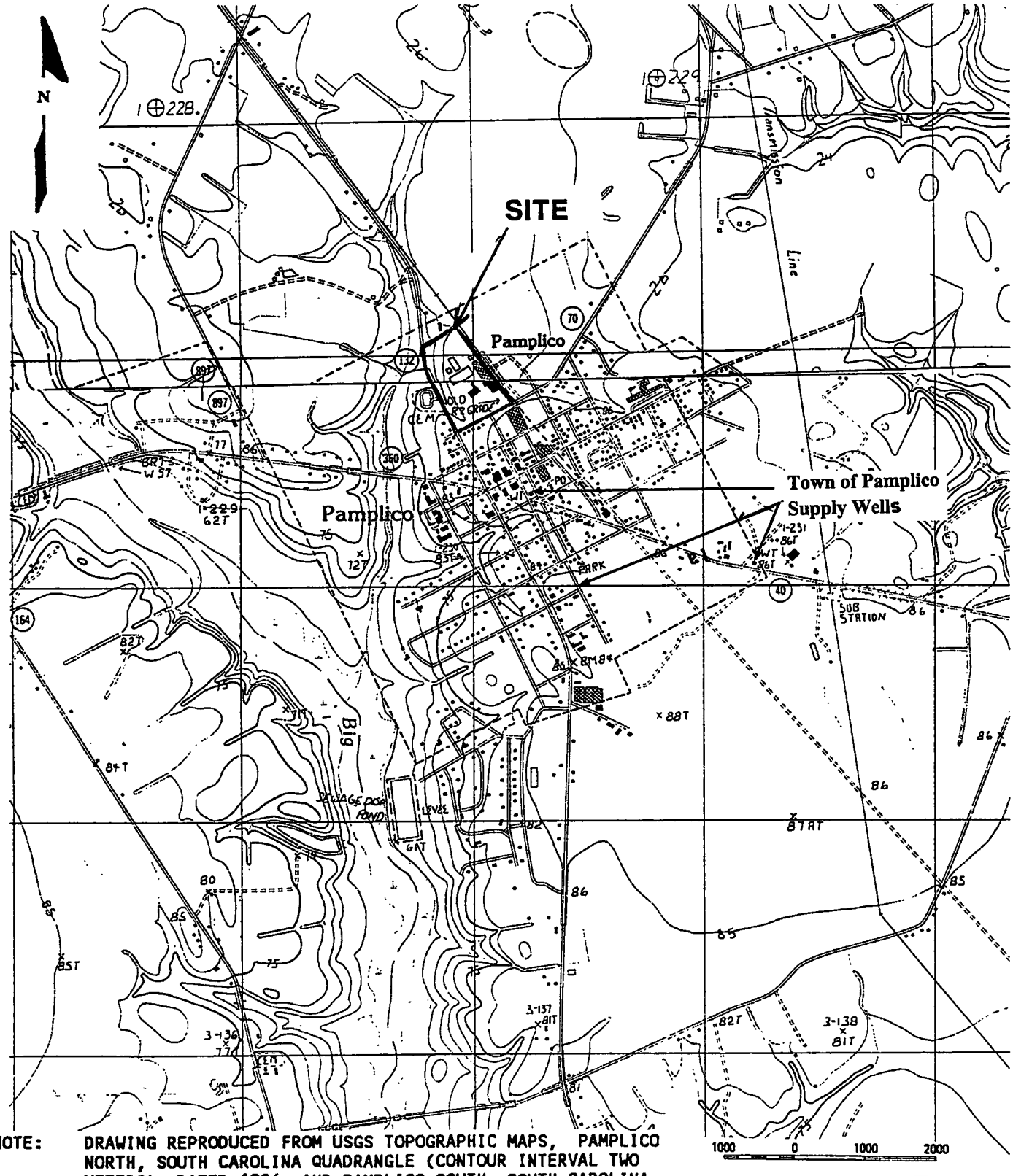
*** = Reported pentachlorophenol biodegradation compounds*

TABLE 6
MONITORING WELL FIELD DATA
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA
S&ME PROJECT NO. 1584-98-146

Well Location	Total Well Depth (feet)	T.O.C. Elevation (feet)	DTGW (feet)	Groundwater Elevation (feet)	*Dissolved Oxygen (mg/l)	*Groundwater Temperature (degrees Celsius)
MW-1						
1/5/99	15.2	100.39	7.80	92.59	nd	nd
4/27/99	15.2	100.39	8.10	92.29	0.31	17.5
MW-3						
1/5/99	15.0	99.13	8.78	90.35	nd	nd
4/27/99	15.0	99.13	8.89	90.24	0.26	17.7
MW-8						
1/5/99	49.4	99.30	21.52	77.78	nd	nd
MW-9						
1/5/99	18.0	97.97	8.11	89.86	nd	nd
4/27/99	18.0	97.97	8.23	89.74	0.32	18.6
MW-10						
1/5/99	15.5	93.42	4.19	89.23	nd	nd
4/27/99	15.5	93.42	4.25	89.17	0.25	17.6
MW-11						
1/5/99	15.5	97.45	7.58	89.87	nd	nd
4/27/99	15.5	97.45	7.67	89.78	0.33	18.8

nd = no data
T.O.C. = Top of well Casing
DTGW = Depth To Groundwater
** groundwater parameters measured in-situ (within the monitoring wells)*

FIGURES



NOTE: DRAWING REPRODUCED FROM USGS TOPOGRAPHIC MAPS, PAMPLICO NORTH, SOUTH CAROLINA QUADRANGLE (CONTOUR INTERVAL TWO METERS), DATED 1986; AND PAMPLICO SOUTH, SOUTH CAROLINA QUADRANGLE, (CONTOUR INTERVAL FIVE FEET), DATED 1990.

SCALE:	1" = 1000'
CHECKED BY:	eqh
DRAWN BY:	eqh
DATE:	2/19/98

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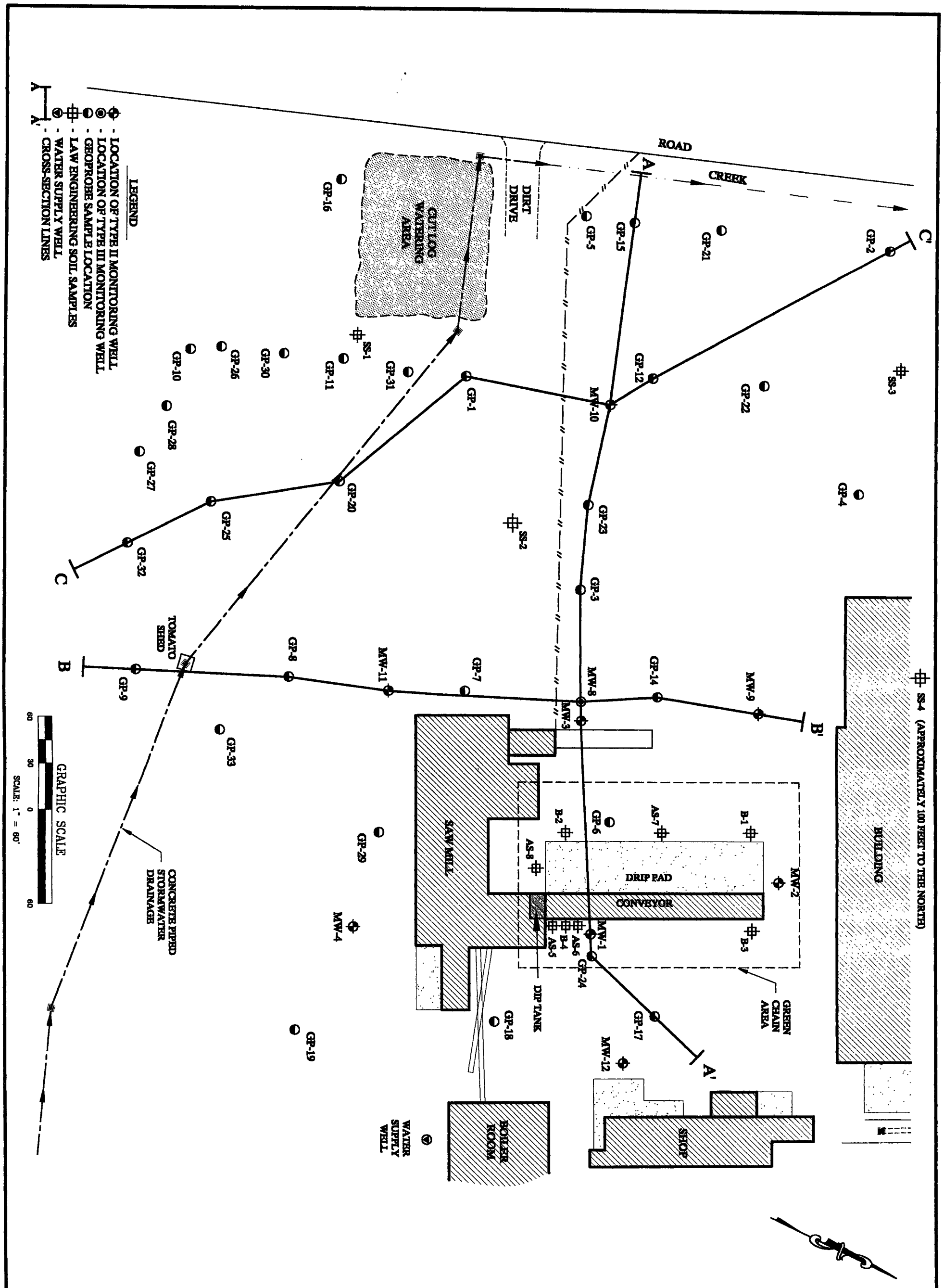
SITE LOCATION MAP
Marsh Lumber Company
Pamplico, South Carolina

JOB NO. 1584-98-146

FIGURE NO. 1



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SITE PLAN

MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE:	DRAWN BY:	CHECKED BY:
AS SHOWN	RDM	EQBH
JOB NO.	DATE:	FIGURE NO.
1584-98-146	JUNE, 1999	2

A

A'

ELEV. (FT.)

ELEV. (FT.)

GP-15 MW-10 GP-23 GP-3 MW-3 MW-8 GP-6 MW-1

100

90

80

70

60

CREEK

NO DATA

NO DATA

NO DATA

NO DATA

?

?

?

?

?

?

F

F

F

TO 60' DEPTH

- CLAY
- SANDY
- SILTY
- SANDY SILT OR SILTY SAND
- F - CALCAREOUS, FOSSILIFEROUS SILTY SAND
- CLAYEY SILT OR SILTY CLAY
- SANDY CLAY OR CLAYEY SAND
- SILTY, CLAYEY SAND OR SANDY, CLAYEY SILT
- QUARTZ VEIN
- SURFACE OF WATER TABLE ON 1/5/99

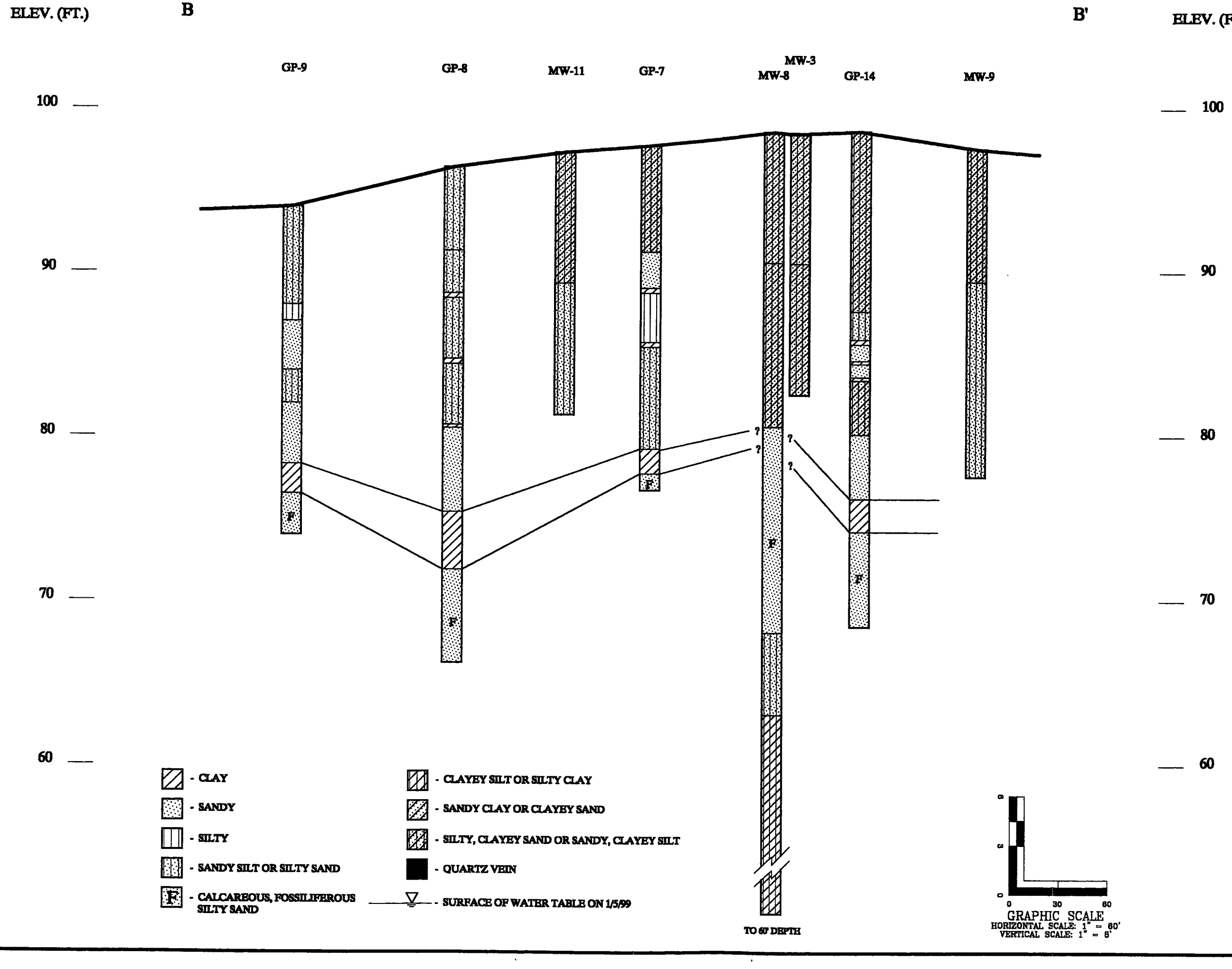
0 30 60

GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 60'
VERTICAL SCALE: 1" = 6'

CROSS-SECTION A-A'
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN
JOB NO. 1584-98-146
DRAWN BY: RDM
DATE: JULY, 1999
CHECKED BY: EQBH
FIGURE NO. 3

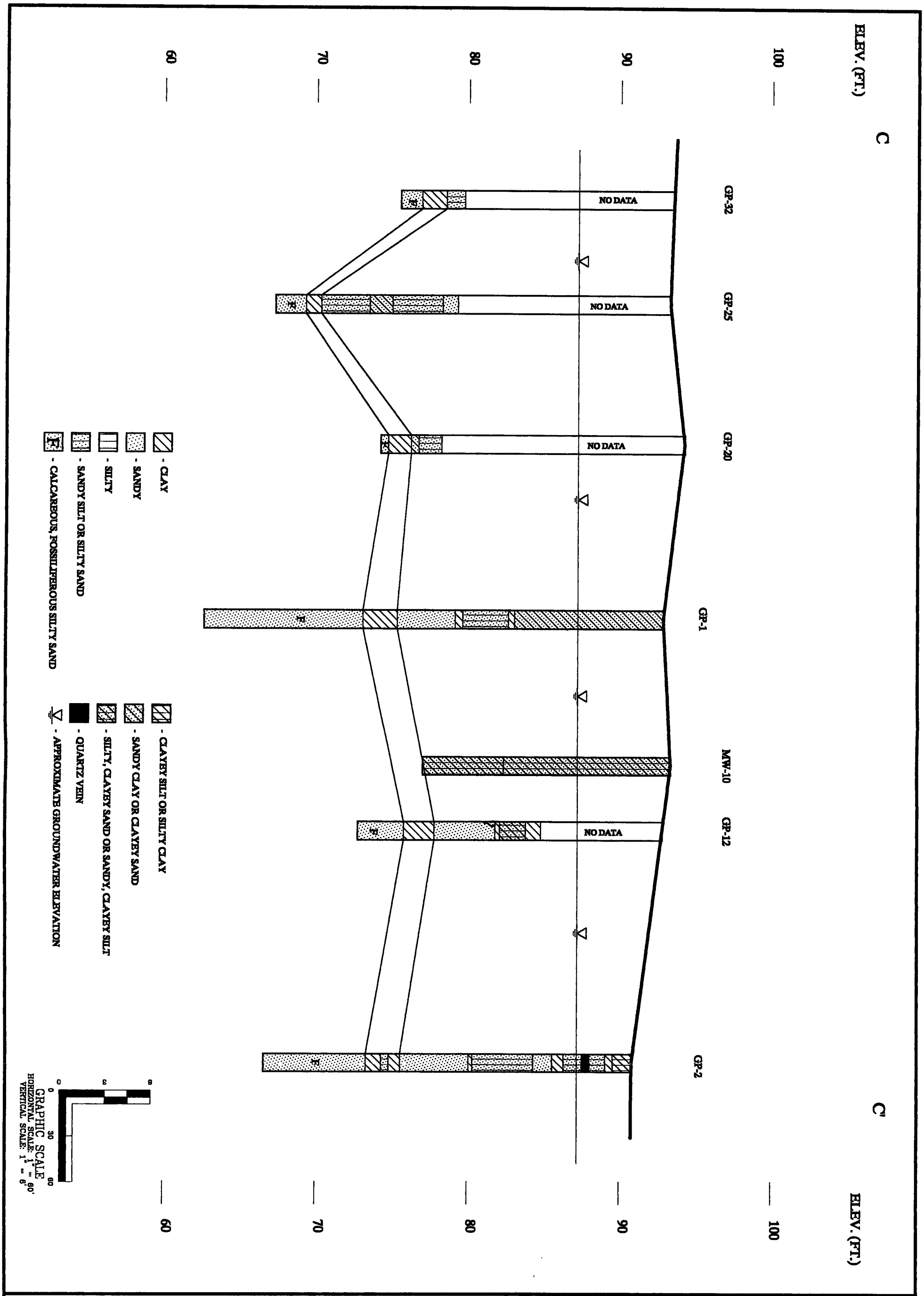
S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING



CROSS-SECTION B-B'
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE:	AS SHOWN
JOB NO.	1584-98-146
DRAWN BY:	RDM
DATE:	JULY, 1999
CHECKED BY:	BOBH
FIGURE NO.	4

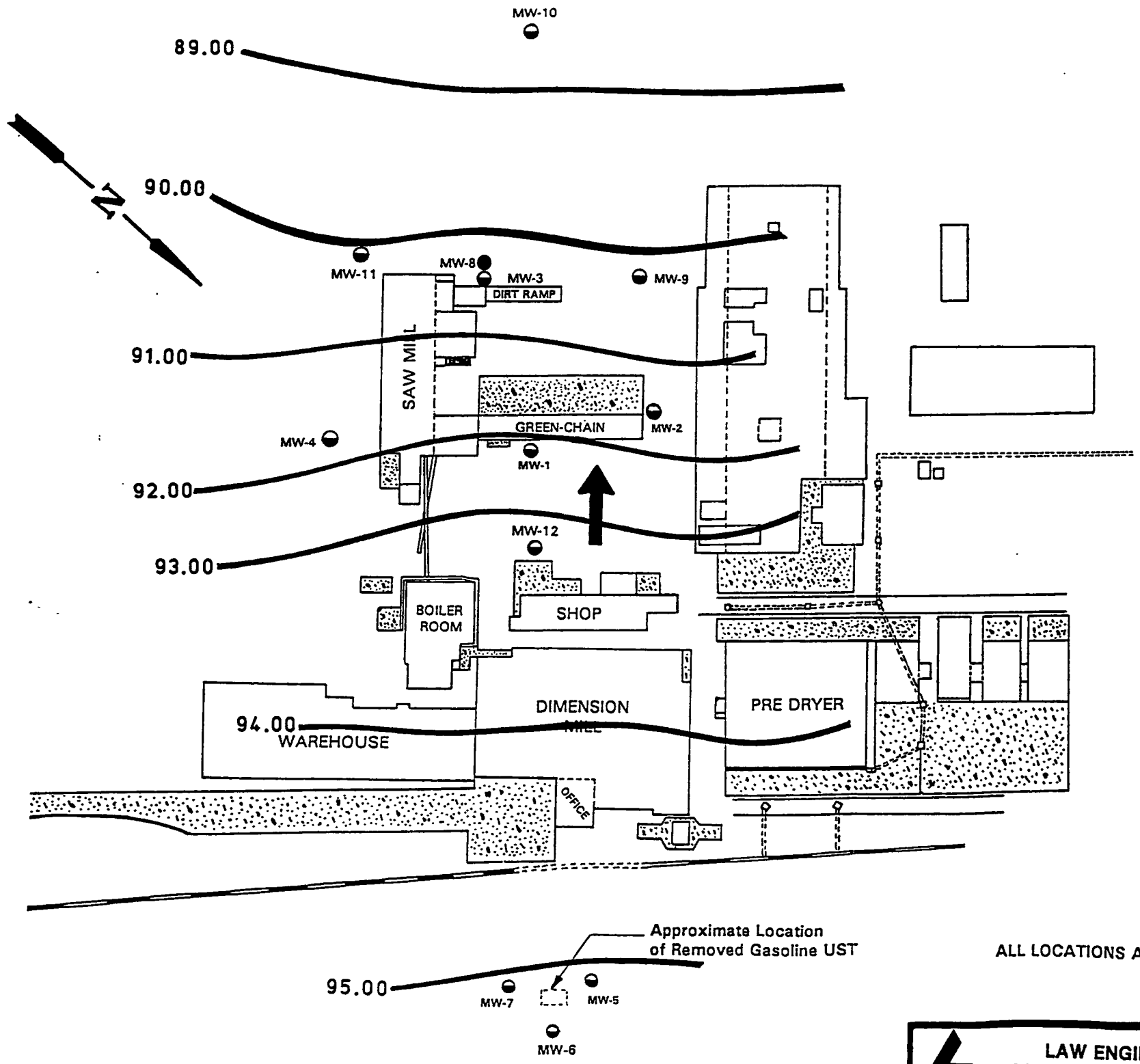
S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING



S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

CROSS-SECTION C-C'
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: EQBH
JOB NO. 1584-98-146	DATE: JULY, 1999	FIGURE NO. 5



REFERENCE: As-Built Survey of Marsh Lumber Co. updated 9-28-91.

LEGEND

- Pavement
- Location of Type II Monitoring Well
- Location of Type III Monitoring Well
- 93.00 Ground-Water Elevation Contour (in feet)
- Generalized Ground-Water Flow Direction

NOTES:

1) Ground-water elevation contours constructed using "Surfer" by Golden Graphics and modified by Law Engineering Personnel. Contours are based on water level measurements obtained from Monitoring Wells on November 11, 1993.
2) Elevations are referenced to an assumed site datum.
3) Contour Interval = 1.00 Feet
4) Water level data from wells MW-7 and MW-8 not used in preparation of this drawing.

ALL LOCATIONS ARE APPROXIMATE

APPROXIMATE SCALE

0 100' 200'

1 Inch = 100 Feet

GROUNDWATER FLOW DIRECTION MAP
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: EQBH	
JOB NO. 1584-98-146	DATE: JUNE, 1999	FIGURE NO. 6	

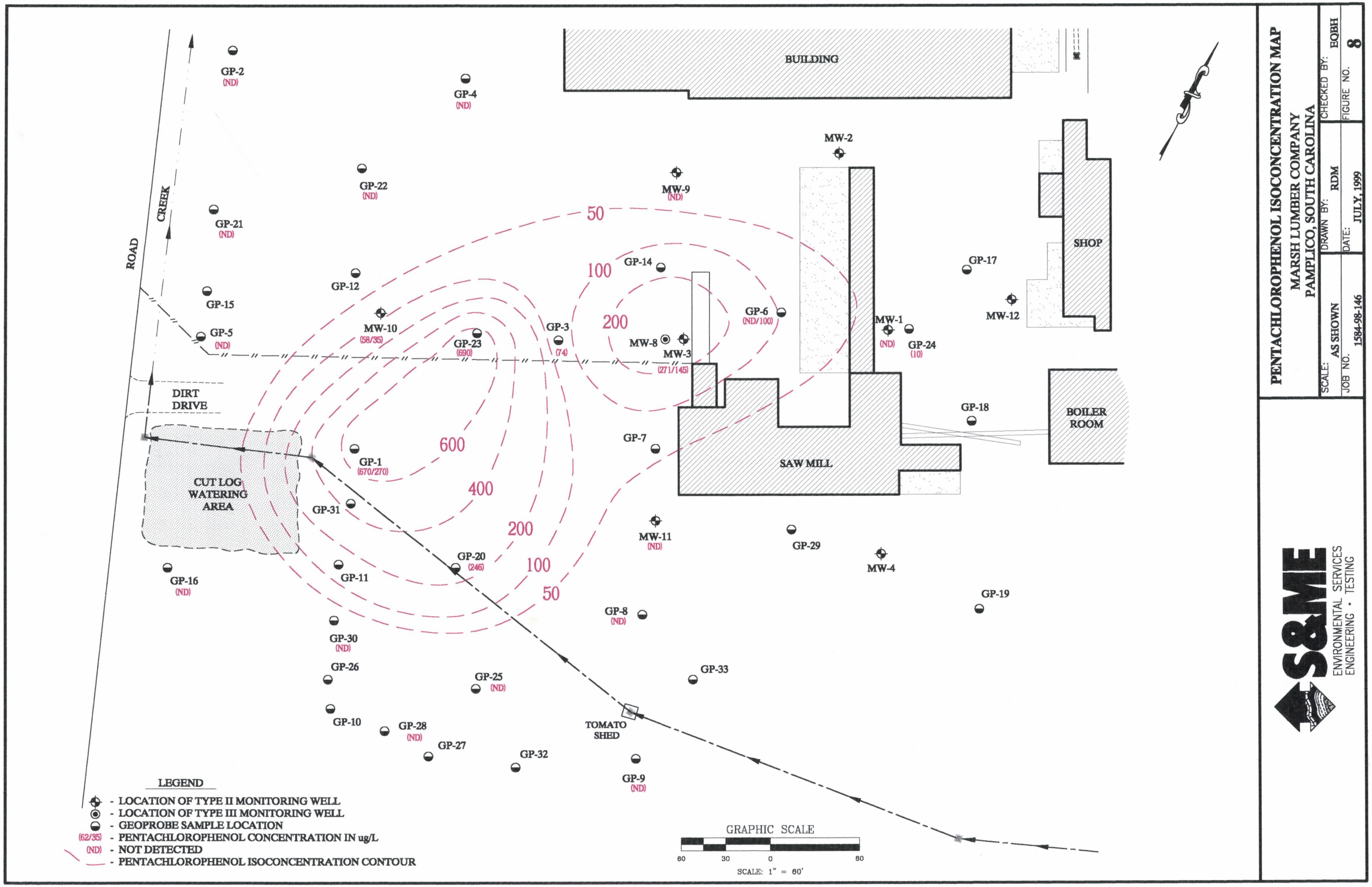
S&ME ENVIRONMENTAL SERVICES ENGINEERING • TESTING

LAW ENGINEERING
COLUMBIA, SOUTH CAROLINA

Marsh Furniture Company
High Point, North Carolina
Law Engineering Project No. 499-2-4352-40

Ground-Water Contour Map
Marsh Lumber Company
Pamplico, South Carolina

DWN. BY	DJD	12/93	SCALE: As shown
CKD. BY	BTS	12/93	FIGURE 2
APPR'D.	BEC	12/93	



PENTACHLOROPHENOL ISOCONCENTRATION MAP
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: EQBH	
JOB NO. 1584-98-146	DATE: JULY, 1999	FIGURE NO. 8	

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

A

A'

ELEV. (FT.)

ELEV. (FT.)

GP-15 MW-10 GP-23 GP-3 MW-3 MW-8 GP-6 MW-1/GP-24*

100 90 80 70 60

CREEK

NO DATA

NOT TESTED

NO DATA

NO DATA

NO DATA

50 100 200 300 400

(58)

(690)

(74)

100 200 300 400

100 200

(271)

200

(100)

100

50

10*

? ? ? ? ? ? ? ?

F F F F F

TO 60' DEPTH

- CLAY
- SANDY
- SILTY
- SANDY SILT OR SILTY SAND
- F - CALCAREOUS, FOSSILIFEROUS SILTY SAND
- (ND) - NOT DETECTED
- (ND) - GROUNDWATER INTERVAL SAMPLED
- CLAYEY SILT OR SILTY CLAY
- SANDY CLAY OR CLAYEY SAND
- SILTY, CLAYEY SAND OR SANDY, CLAYEY SILT
- QUARTZ VEIN
- SURFACE OF WATER TABLE ON 1/5/99
- LINES OF PENTACHLOROPHENOL ISOCONCENTRATION
- NOT TESTED - NO GROUNDWATER ANALYTICAL DATA COLLECTED

0 3 6

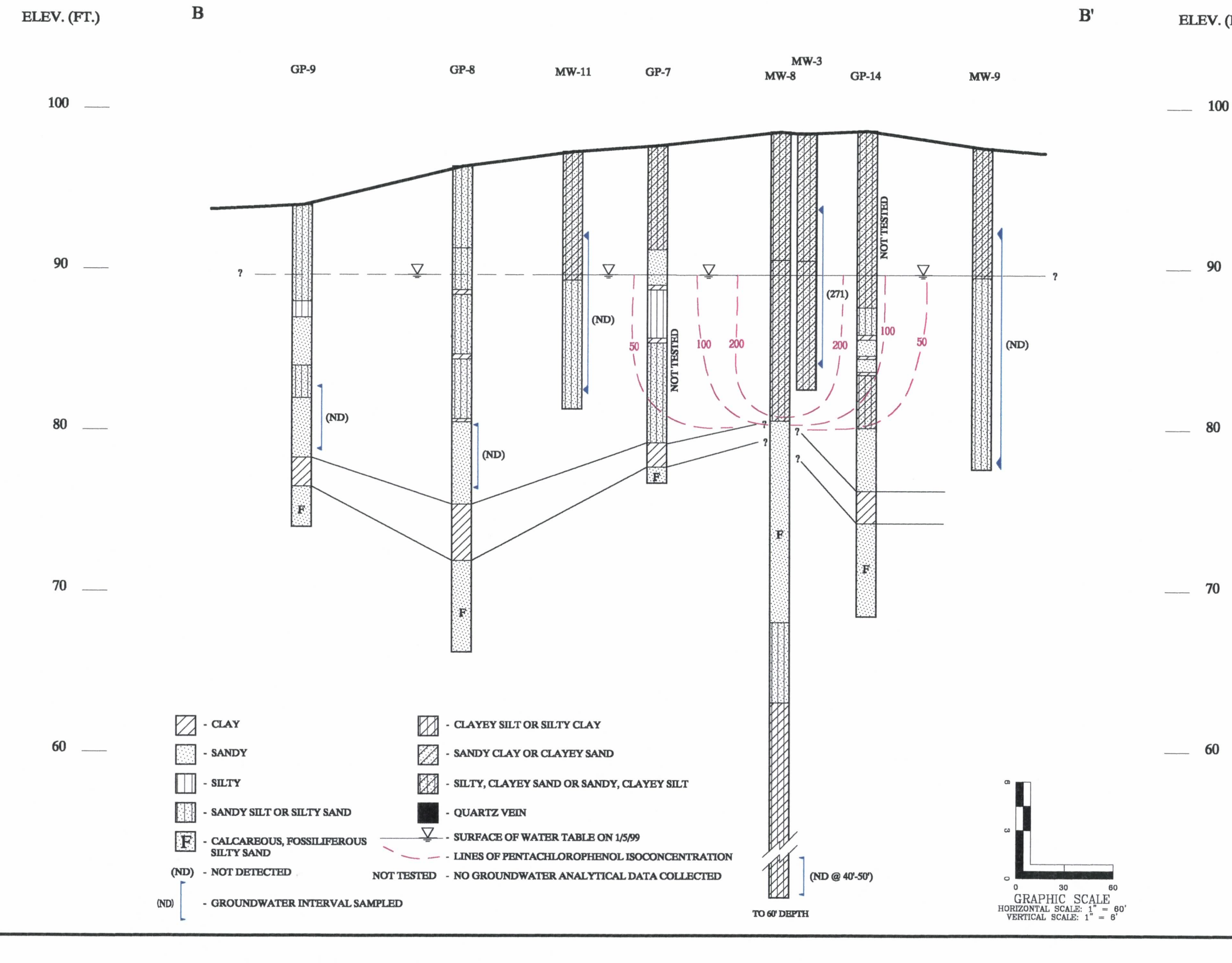
0 30 60

GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 60'
VERTICAL SCALE: 1" = 6'

CROSS-SECTION A-A'WITH ISOCONCENTRATION CONTOURS
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN
DRAWN BY: RDM
CHECKED BY: EQBH
JOB NO. 1584-98-146
DATE: JULY, 1999
FIGURE NO. 9

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING



CROSS-SECTION B-B' WITH ISOCONCENTRATION CONTOURS
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: EQBH	
JOB NO. 1584-98-146	DATE: JULY, 1999	FIGURE NO.	10

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

C

C'

ELEV. (FT.)

ELEV. (FT.)

100

90

80

70

60

GP-32 GP-25 GP-20 GP-1 MW-10 GP-12 GP-2

NO DATA

NOT TESTED

50 100 200 400 600

(246) (696) (58) (ND)

F

- CLAY
- SANDY
- SILTY
- SANDY SILT OR SILTY SAND
- F - CALCAREOUS, FOSSILIFEROUS SILTY SAND
- (ND) - NOT DETECTED
- (ND) - GROUNDWATER INTERVAL SAMPLED
- CLAYEY SILT OR SILTY CLAY
- SANDY CLAY OR CLAYEY SAND
- SILTY, CLAYEY SAND OR SANDY, CLAYEY SILT
- QUARTZ VEIN
- SURFACE OF WATER TABLE ON 1/5/99
- LINES OF PENTACHLOROPHENOL ISOCONCENTRATION
- NOT TESTED - NO GROUNDWATER ANALYTICAL DATA COLLECTED

0 3 6

0 30 60

GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 60'
VERTICAL SCALE: 1" = 6'

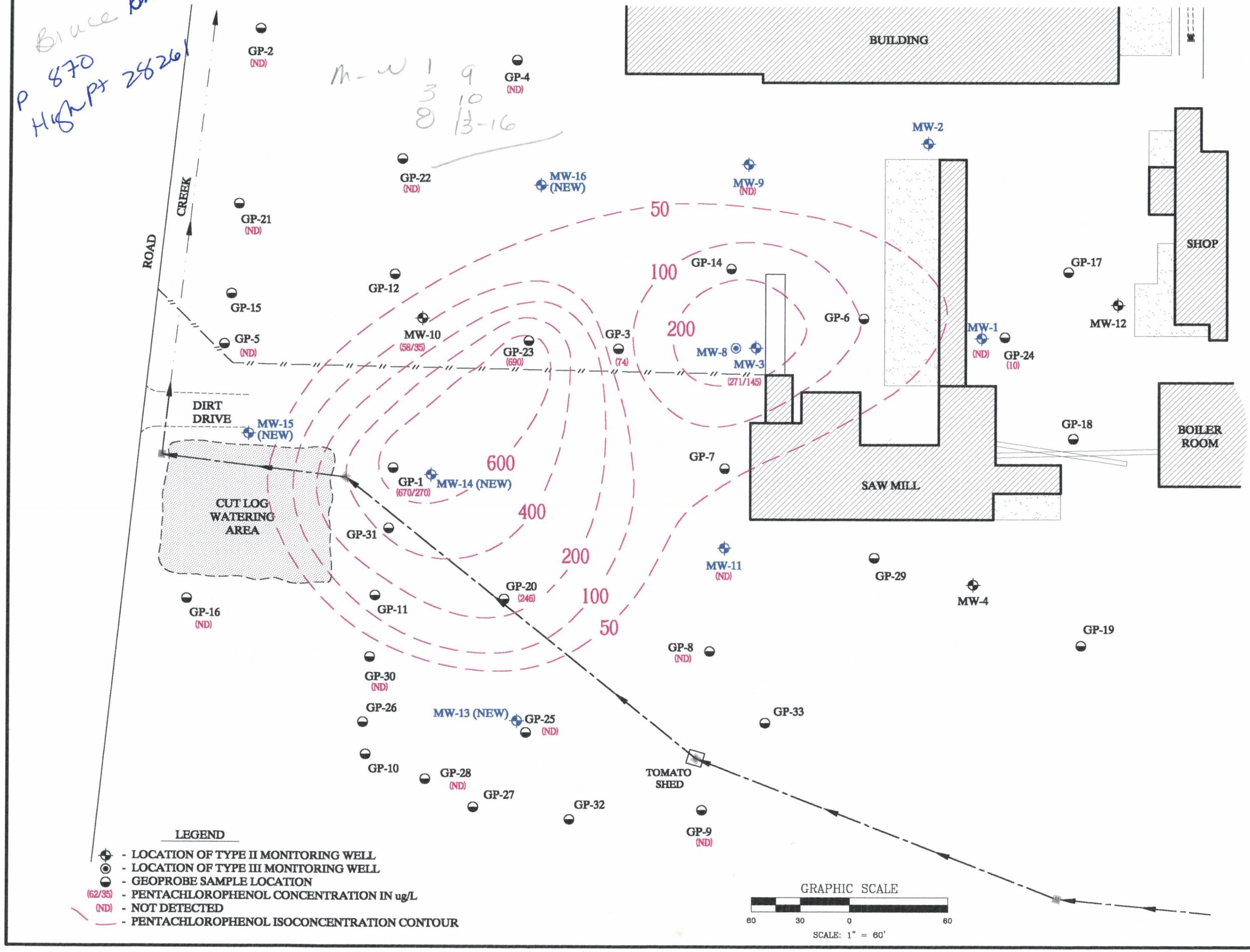
CROSS-SECTION C-C' WITH ISOCONCENTRATION CONTOURS
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN
DRAWN BY: RDM
CHECKED BY: EQBH
JOB NO. 1584-98-146
DATE: JULY, 1999
FIGURE NO. 11

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

Bruce Braswell
P 870
High Pt 28261

m-w 1 9
3 10
8 13-16



PROPOSED MONITORING WELL NETWORK MAP
MARSH LUMBER COMPANY
PAMPLICO, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: RDM	CHECKED BY: EQBH	
JOB NO. 1584-98-146	DATE: JULY, 1999	FIGURE NO. 12	

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

APPENDIX A

MARSH FURNITURE RFP

Marsh Furniture Company

Request For Proposal

Facility Identification:

Marsh Lumber Company
Pamplico, South Carolina

October 15, 1998

Introduction

Marsh Furniture Company has assembled this fixed bid request for proposal for distribution to potential bidders to continue the assessment of a groundwater incident at the Marsh Lumber Company facility located in Pamplico, South Carolina. Interested bidders should have bids prepared and submitted to Bruce Braswell at Marsh Furniture Company in High Point, North Carolina. Bids can be faxed to (336) 884-0883. The due date for the bid is October 23, 1998. Questions regarding this bid specification can be directed to Bruce Braswell at Marsh Furniture Company at (336) 819-4035.

The Marsh Lumber Company facility, located in Pamplico, South Carolina, has a dip tank and drip pad (Green Chain Area) for green lumber freshly cut from logs. The Green Chain operation previously used pentachlorophenol. Assessment conducted previously at the Marsh Lumber Company facility indicated the presence of pentachlorophenol in groundwater. The constituent was detected in two monitoring wells (MW-3 & MW-10) hydraulically downgradient of the Green Chain Area (see **Figure 1**).

Scope of Work

Marsh Furniture Company is requesting proposals to conduct an additional assessment of the pentachlorophenol plume to determine the vertical and lateral extent of the groundwater impact. Data generated previously by Law Environmental indicates there is a potential aquatard/aquaclude located at approximately 30' in depth below grade. To perform this next assessment phase, Marsh Furniture Company is specifying the following details for the Scope of Work:

- The contractor shall use a geoprobe equipped with a Macro Core sampling tube to advance borings at the facility while obtaining continuous cores. Detailed stratigraphic logs shall be prepared from descriptions made in the field by a licensed geologist. Soil descriptions shall be made using AGI data sheets (NRCS for soils) and geologic units shall be described using AAPG protocol. Detailed descriptions shall be made and recorded of grain sizes and distribution, grain composition, matrix composition, and details regarding any evidence of biological activity (fossils, root zones, etc.). Close attention shall be paid to stratigraphic details (such as an underclay and/or the presence of clay rich layering) that may prevent the downward migration of pentachlorophenol to 30' below grade. Upon removal from the Macro Core, recovered soil/lithologic core sleeve's are to be labeled, using an indelible black marker, with an arrow indicating the stratigraphic upwards position. The cores are then to be placed in a waxed cardboard "core box" for description and storage. The contractor representative can use a razor knife or other sharp instrument to split the sleeves to allow description. It is the responsibility of the contractor to assure that 1/2 of the sleeve remains intact for future reference. Upon completion of the descriptions, the core box is to be labeled with the boring identification, date, total depth and any other pertinent information. The core boxes are the property of Marsh Furniture Company and are to be left on site at the completion of the project with a representative designated by Marsh Furniture Company.

- If a potential aquatard or aquaclude is encountered above 30' below grade, immediately following groundwater sampling at the borehole terminal depth, the geoprobe boring shall be tremmie grouted with a slurry of Portland cement and bentonite powder mixed 50/50. If the geoprobe borings do not encounter lithologic evidence that indicates the potential presence of an aquatard/aquaclude, the boring can be filled with 1/4" bentonite pellets to grade. Care is to be taken when backfilling with bentonite pellets to minimize bridging of the borehole.

- The contractor shall obtain groundwater samples using the geoprobe unit at depths of 15' below grade level and at 30' below grade (or on top of the "very stiff gray fine to coarse sandy silt" described by Law Environmental as being present at 30.50 feet below grade at the position of MW-8) at each proposed boring location shown in **Figure 2**. A minimum of three liters of groundwater are to be purged at each sampling interval prior to acquisition of groundwater samples. Purge water shall be contained and placed in a drum (17H) labeled as purge water for subsequent disposal.

- The contractor is expected to use care with the probe and sampling equipment to prevent cross-contamination. Accordingly, all reusable downhole equipment shall be steam cleaned and then decontaminated using the following procedures:

  Wash with an Alconox solution
  Rinse with distilled water
  Rinse with isopropyl alcohol
  Rinse with distilled water
  Rinse with a 10% nitric acid solution
  Rinse with distilled water

- All decon water shall be contained and placed in a separate 17H drum and labeled as decon water for subsequent disposal.

- Following completion of the last borehole, the contractor shall survey the ground elevations and locations of the sampling points relative to an artificial benchmark established at a permanent structure (building corner etc.). In addition, the contractor shall survey the locations and top of casing elevations of MW-1, MW-3, MW-8, MW-9, MW-10 and MW-11, relative to the benchmark. Marsh Furniture Company will provide a person to assist with the survey and groundwater sampling.

Groundwater Sampling & Analytical Testing

In addition to the groundwater samples specified above, the contractor shall use disposable Teflon bailers (one for each well) to sample the following monitoring wells: MW-1, MW-3, MW-8, MW-9, MW-10 and MW-11. Samples are also to be obtained from the decon water drum and the purge water drum for disposal profiling. Groundwater samples obtained from monitoring wells, storage drums and the geoprobe assessment are to be analyzed at a laboratory licensed to conduct business in the state of South Carolina using EPA approved methodology. All groundwater samples are to be analyzed using

EPA Method 8270 (acid extractable) using the Priority Pollutant list. The contractor shall specify in the comments section of the Chain of Custody that pentachlorophenol is suspected. The laboratory chosen by the contractor shall assure that lowest possible detection limits indicated by SW-846 are maintained. If the detection limits are not achievable, the laboratory is to indicate the reason why in the laboratory test report.

All groundwater samples obtained from the Marsh Lumber Company facility are to be labeled, immediately placed on ice, and maintained at 4° C until delivered to the laboratory. The laboratory chosen by the contractor shall note the temperature of the samples at the time of delivery on the Chain of Custody.

Reporting

Upon receipt of the analytical test report from the laboratory, the contractor shall fax a copy of the results to the attention of Bruce Braswell at Marsh Furniture Company at (336) 884-0883. Within ten days of receiving the analytical test report from the laboratory, the contractor shall deliver to Marsh Furniture Company a draft copy of the assessment report for review. Marsh Furniture Company will review the draft report and comment to the contractor on any potential changes. Within ten days of the draft review, the contractor shall deliver to Marsh Furniture Company three final copies of the report for distribution.

At a minimum, the report shall have an introduction, discussion and conclusion. Assessment data shall be presented in the following form: two orthogonal geologic cross-sections that demonstrate stratigraphic relationships at the facility as determined by the lithologic descriptions made during the geoprobe investigation. The report shall contain isoconcentration contour maps that depict the lateral extent of the plume drawn on the plan view base map and the vertical extent of the plume superimposed on the geologic cross sections. Recommendations are to be submitted under a separate cover.

Insurance

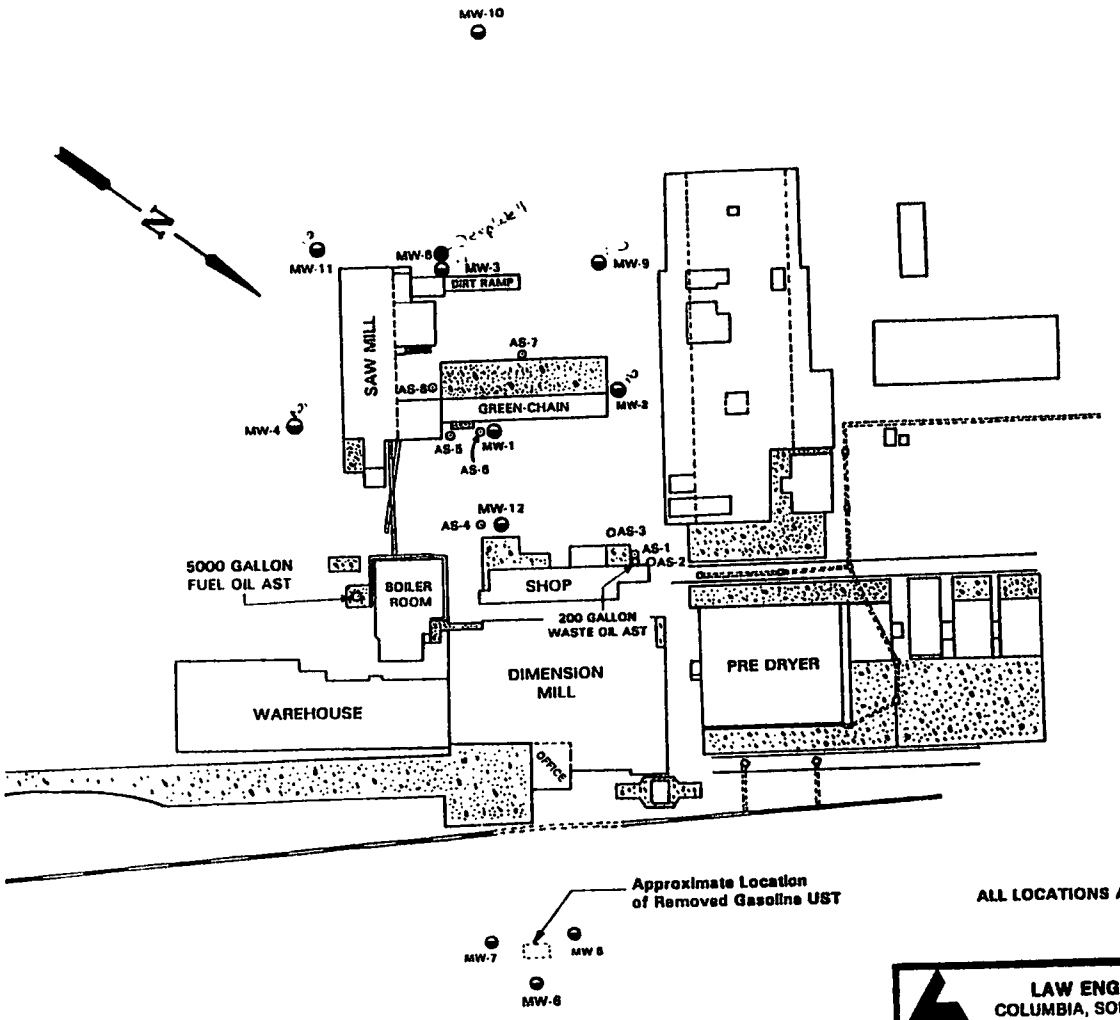
The contractor shall maintain the following insurance, limits of liability, and name Marsh Furniture Company and Marsh Lumber Company as additionally insured. Certificates of insurance indicating Marsh Furniture Company and Marsh Lumber Company as additionally insured shall be provided to Marsh Furniture Company prior to initiating the project. The limits of liability to be maintained are:

General Liability -	$1,000,000.00
Pollution Liability -	$1,000,000.00
Errors and Omissions -	$1,000,000.00
Automobile General Liability -	$1,000,000.00

Fixed Bid Form

Field Work			
Description	**Units**	**Unit Rate**	**Extension**
Mobilization			
Geoprobe - Day Rate			
Geoprobe Disposables			
Core Boxes			
Geologist			
EPA Method 8270 - AE			
17H Drums			
Service Truck			
Mileage			
Sample Shipment			
Per Diem			
Survey			
Report Preparation			
Principal			
Geologist			
Drafting			
Clerical			
Lump Sum Fixed Bid Total_____			

All bidding contractors are required to submit their bids on this form. This bid is a fixed price bid for the specified work and units. Change Orders will be given for a change in the Scope of Work only or a change in the specified units and *only when previously executed in writing by Marsh Furniture Company.*



LEGEND

- Pavement
- Location of Type II Monitoring Well
- Location of Type III Monitoring Well
- Location of Hand Auger Boring

APPROXIMATE SCALE

0 100' 200'

1 Inch = 100 Feet

ALL LOCATIONS ARE APPROXIMATE

REFERENCE: As-Built Survey of Marsh Lumber Co. updated 9-28-91.

LAW ENGINEERING
COLUMBIA, SOUTH CAROLINA

Marsh Furniture Company
High Point, North Carolina
Law Engineering Project No. 499-2-4352-40

Site Plan
Marsh Lumber Company
Pamplico, South Carolina

DWN. BY	DJD	12/93	SCALE: As Shown
CKD. BY	BTS	12/93	FIGURE 1
APPR'D.	BEC	12/93	

D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

Date of Issue: November 30, 1998
Approval No: 318

Monitoring Well Installation Approval

Approval is hereby granted to: Law Engineering
(on behalf of): Marsh Lumber
Site ID#: 14343
County: Florence

This approval is for the construction of monitoring wells designated GP-1 through GP-5 in accordance with the construction plans and technical specifications submitted to the Department on October 30, 1998. The well(s) are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well be submitted to within thirty (30) days of completion (of last well(s) installed).

2. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.

Verified esig Mathey 12/30/98

3. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Pee Dee District, EQC Office (843-661-4825). Gary Stowe

4. Please provide groundwater quality analytical data (chemical analyses and/or water level(s)) and associated measurements (i.e., *in-situ* field measurements) to Lori Murtaugh within thirty (30) days of receipt from laboratory.

5. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.

6. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification number.

7. Wells shall be abandoned per R.61-71.10.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by: _____
B. Thomas Knight, P.G., Manager
Groundwater Quality Section
Bureau of Water

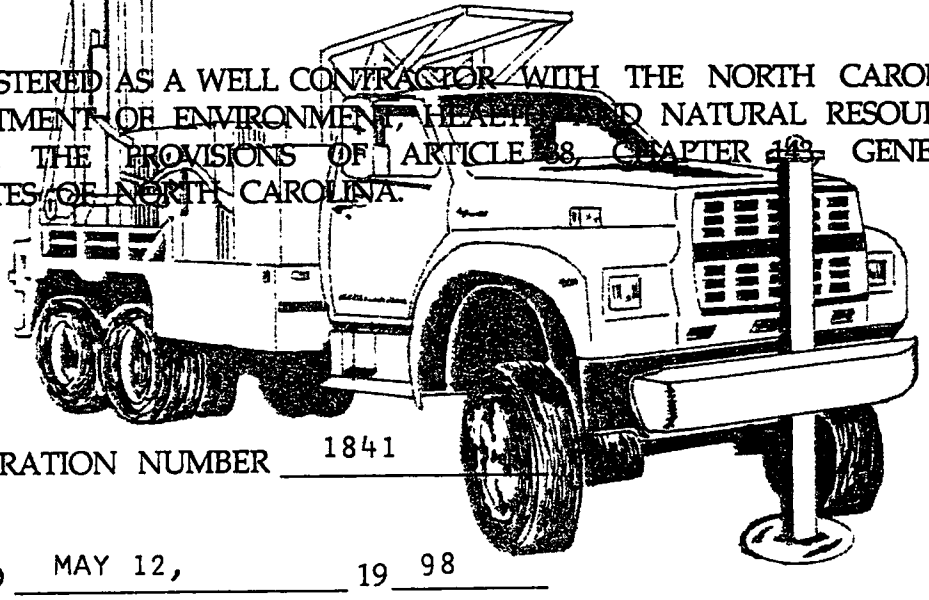
cc: Reggie Massey, Pee Dee District EQC
Bruce Braswell, Marsh Lumber

Certificate of Registration of Well Contractor

THIS IS TO CERTIFY THAT

TROXLER GEOLOGIC SERV., INC.

IS REGISTERED AS A WELL CONTRACTOR WITH THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES UNDER THE PROVISIONS OF ARTICLE 38, CHAPTER 143, GENERAL STATUTES OF NORTH CAROLINA.



REGISTRATION NUMBER 1841

ISSUED MAY 12, 19 98

EXPIRES DECEMBER 31, 19 98

CHIEF,

GROUNDWATER SECTION

The State of South Carolina Environmental Certification Board

This is to Certify that

Ben J. Troxler

having given satisfactory evidence of the necessary qualifications as required by Code of Laws of South Carolina has been duly certified as a

Well Driller

in the

State of South Carolina

and is entitled to the rights and privileges as provided by the State of South Carolina; and subject to the Powers of revocation as vested in said Board. In Testimony Witness the Signature of the Chairman and Administrator under Seal of the Board

the 28th *day of* August *19* 98

Number 1436

Thomas P. Bright *Chairman*

Wm. R. Hoover *Administrator*

APPENDIX B
ANALYTICAL REPORTS

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

& ME 6548

18 OLD BATTLEGROUND RD
EENSBORO, NC 27410

oject: 1584-98-146
Project Name: MARSH PAMPLICO
mpler: EDMUND HENRIQUES

Lab Number: 99-A53037
Sample ID: LW#1
Sample Type: Ground water
Site ID:

Date Collected: 4/13/99
Time Collected: 12:30
Date Received: 4/15/99
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
2-Chlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	4/17/99	23:20	M.Goodrich	8270C	204
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	4/17/99	23:20	M.Goodrich	8270C	204
2-Nitrophenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
4-Nitrophenol	ND	ug/l	25.	25.	1	4/17/99	23:20	M.Goodrich	8270C	204
Pentachlorophenol	ND	ug/l	25.	25.	1	4/17/99	23:20	M.Goodrich	8270C	204
Phenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	4/17/99	23:20	M.Goodrich	8270C	204
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:20	M.Goodrich	8270C	204

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	940. ml	1.0 ml	4/16/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	12.	10. - 100.
surr-2-Fluorophenol	24.	9. - 100.
surr-2,4,6-Tribromophenol	52.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A53037
Sample ID: LW#1

Report Approved By: _____ Report Date: 4/19/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548
C 18 OLD BATTLEGROUND RD
G EENSBORO, NC 27410

P oject: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EDMUND HENRIQUES

Lab Number: 99-A53038
Sample ID: GP16-16
Sample Type: Ground water
Site ID:

Date Collected: 4/13/99
Time Collected: 11:00
Date Received: 4/15/99
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
2-Chlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	4/17/99	23:57	M.Goodrich	8270C	204
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	4/17/99	23:57	M.Goodrich	8270C	204
2-Nitrophenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
4-Nitrophenol	ND	ug/l	25.	25.	1	4/17/99	23:57	M.Goodrich	8270C	204
Pentachlorophenol	ND	ug/l	25.	25.	1	4/17/99	23:57	M.Goodrich	8270C	204
Phenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	4/17/99	23:57	M.Goodrich	8270C	204
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	4/17/99	23:57	M.Goodrich	8270C	204

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	970. ml	1.0 ml	4/16/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	15.	10. - 100.
surr-2-Fluorophenol	25.	9. - 100.
surr-2,4,6-Tribromophenol	39.	15. - 134.

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A53038
Sample ID: GP16-16

Report Approved By: Michael A. Dunn Report Date: 4/19/99

Theodora J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548
18 OLD BATTLEGROUND RD
EENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EDMUND HENRIQUES

Lab Number: 99-A53039
Sample ID: GP20-16
Sample Type: Ground water
Site ID:

Date Collected: 4/13/99
Time Collected: 18:10
Date Received: 4/15/99
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
2-Chlorophenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	4/18/99	0:34	M.Goodrich	8270C	204
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	4/18/99	0:34	M.Goodrich	8270C	204
2-Nitrophenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
4-Nitrophenol	ND	ug/l	25.	25.	1	4/18/99	0:34	M.Goodrich	8270C	204
Pentachlorophenol	246.	ug/l	25.	25.	1	4/19/99	9:08	M.Goodrich	8270C	204
Phenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	4/18/99	0:34	M.Goodrich	8270C	204
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	4/18/99	0:34	M.Goodrich	8270C	204

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	960. ml	1.0 ml	4/16/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	10.	10. - 100.
surr-2-Fluorophenol	17.	9. - 100.
surr-2,4,6-Tribromophenol	50.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A53039
Sample ID: GP20-16

Report Approved By: _____ Report Date: 4/19/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 4

RECEIPT FOR SAMPLES FORM

RECEIPT FOR SAMPLES

05218

ENVIRONMENTAL SERVICES DIVISION
COLLEGE STATION ROAD
ATHENS, GEORGIA 30613

PROJ 1584
14
SAMF
Ed
Split S

EDMUND Q.B. HENRIQUES, P.G.
Project Manager

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING • TESTING

S&ME, Inc.
3718 Old Battleground Road
Greensboro, North Carolina 27410 • (910) 288-7180
Fax (910) 288-8980 • 1-800-849-2985

Printed on Recycled Paper

eclined

Name of Facility/Site: Marsh Lumber Pamplico, SC

Facility/Site Location:

STA NO	DATE	TIME	C	G	SAMPLES	TAG NUMBERS	STATION DESCRIPTION	NO OF CONTAINERS	REMARKS
LW#1	4/13/99	1230		X	NA	53037	Method 8270 Acid extractables *	1	~~625~~ EH
GP16-16	4/13/99	1100		X	NA	53038	" " " " *	1	~~625~~ EH
GP20-16	4/13/99	1810		X	NA	53039	" " " " *	1	~~625~~ EH
							*Pentachlorophenol is the suspect contaminant		

Transferred by: (Signature) Ed Hargrove
Date 4/14/99 to Fedex
Time 15:30

Received by: (Signature)
Title
Date
Telephone 4/15/99 830
Time

Distribution: Original to Coordinator Field Files Copy to Facility/Site Representative

NO. 1 0258

FAX TRANSMITTAL COVER SHEET

139107
53037-39

S&ME, Inc.
3718 Old Battleground Road
Greensboro, North Carolina 27410
(336) 288-7180
Fax (336) 288-8980

ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

TO: Cynthia

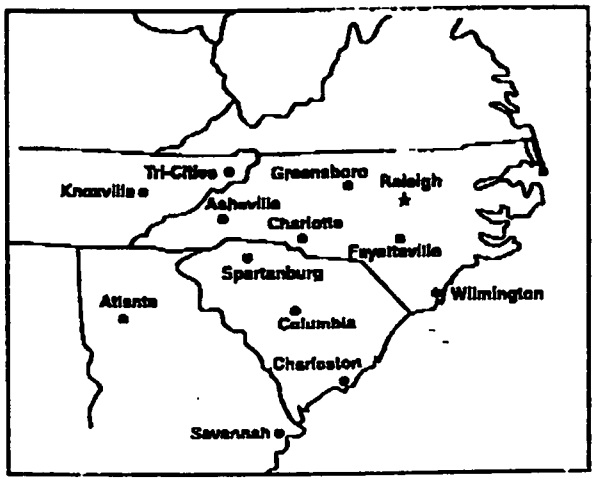
8590

FIRM: Specialized Assays

LOCATION: Nashville, TN

RECIPIENT FAX NUMBER: (615) 726-3404

FROM: Ed Henriques
GREENSBORO, NORTH CAROLINA



DATE: 4 / 16 / 99 TIME: 9:30 (am) pm

RETURN FAX NUMBER: (336) 288-8980

NUMBER OF PAGES INCLUDING COVER SHEET: 3
(If all pages not received, call (336) 288 7180)

COMMENTS:

Request for analytical results by 4/22/99 AM!

Samples IW#1, GP16-16, GP20-16

Tracking # 139107

I have attached a copy of the "sample reciept confirmation" and the "chain of Custody"

Please confirm your ability to meet this turn around time

Thanks
Ed Henriques

S&ME Project Number:

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

3 18 OLD BATTLEGROUND RD
G EENSBORO, NC 27410

F oject: 1584-98-146
F.oject Name: MARSH PAMPLICO SC
Sampler:

Lab Number: 99-A12226
Sample ID: ML-A
Sample Type: Ground water
Site ID:

Date Collected: 1/28/99
Time Collected: 10:15
Date Received: 1/29/99
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2-Chlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2-Nitrophenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
4-Nitrophenol	ND	ug/l	25.	25.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
Pentachlorophenol	270.	ug/l	250.	25.	10	2/ 6/99	11:34	M.Goodrich	8270C	414
Phenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	2/ 6/99	6:05	M.Goodrich	8270C	414
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	6:05	M.Goodrich	8270C	414

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	940. ml	1.0 ml	2/ 2/99	Fitzwater	3510

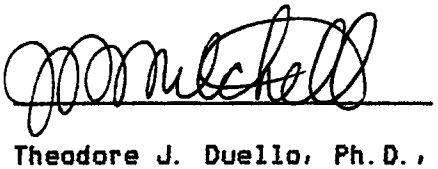
Surrogate	% Recovery	Target Range
surr-Phenol d5	37.	10. - 100.
surr-2-Fluorophenol	27.	9. - 100.
surr-2,4,6-Tribromophenol	60.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A12226
Sample ID: ML-A

Report Approved By:  Report Date: 2/ 6/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 84009

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548
C 18 OLD BATTLEGROUND RD
G EENSBORO, NC 27410

P oject: 1584-98-146
P oject Name: MARSH PAMPLICO SC
Sampler:

Lab Number: 99-A12227
Sample ID: ML-B
Sample Type: Ground water
Site ID:

Date Collected: 1/28/99
Time Collected: 11:45
Date Received: 1/29/99
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2-Chlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2-Nitrophenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
4-Nitrophenol	ND	ug/l	25.	25.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
Pentachlorophenol	100.	ug/l	25.	25.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
Phenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	2/ 6/99	7:55	M.Goodrich	8270C	414
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	2/ 6/99	7:55	M.Goodrich	8270C	414

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	940. ml	1.0 ml	2/ 2/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	21.	10. - 100.
surr-2-Fluorophenol	30.	9. - 100.
surr-2,4,6-Tribromophenol	64.	15. - 134.

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A12227
Sample ID: ML-B

Report Approved By: _____ Report Date: 2/ 6/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 84009

SPECIALIZED ASSAYS ENVIRONMENTAL

7A- 037245

2960 Foster Creighton Drive
Nashville, TN 37204
615-726-0177, 800-765-0980
FAX 615/726-3404

Specialized Assays: (800) 765-0980

REFERRING CLIENT

Account: 6548
S & ME

3718 Old Battleground Rd
Greensboro, NC 27410
Ph: 910-288-7180 Fax: 910-288-8980

ILLING CONTROL NUMBER (FOR LAB USE ONLY) 129188

PROJECT # 1584-98-146

P.O. # 8298

AI ERS (Signature-Please Print) Amy Simmons

PROJECT NAME Mash Pamplico SC.

R LAB USE ONLY ACC#	SAMPLE DESCRIPTION	DATE	TIME	COMP	GRAB	# OF CONT	ANALYSIS REQUESTED
12226	ML-A	1/28/99	10:15a		✓	2	8270 acid extractables
12227	ML-B	1/28/99	11:45a		✓	2	8270 ACID EXTRACTABLES

Relinquished by: (Signature)	Date / Time 1/28/99 12:30 PM	Received by: (Signature)	Received for Laboratory by: Date / Time 1/29/99 830
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Remarks: Method 8270 Acid Extractables, Priority Pollutants List Pentachlorophenol is suspected
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	SAI Project #:

For further assistance in completing the chain of custody form please refer to the instructions found on the opposite sic

FIELD REPORT

Geoprobe Groundwater Resampling
Marsh Lumber Co. - Pamplico South Carolina
S&ME Project No. 1584-98-146

Date of Field Work: 1/28/99 *Weather Conditions:* SUNNY / WARM

S&ME Representative: Gary Simcox LIGHT WIND 60°

Geoprobe Subcontractor: Troxler Geologic Services (Ben Troxler)

Original Sample Location: GP-1-15 (INT open 15'-11') *Sampler Initials:* A.S.

Resample I.D. # ML-A *Witness by:* BT

Sample Method: Geoprobe, discrete interval sampler

Sampled Interval: 11' - 15'

Sample Date: 1/28/99

Sample Time: 10:15A

Samplers Comments: THE WATER WAS MILKY / CLEAR

I FILLED 2 1L BOTTLES AND LABLED THEM BZ10 AND [illegible]

WE PLACED THE PROBE WITHIN 5' OF THE FIRST PROBE

Original Sample Location: GP-6-17 (INT open 17 - 13') *Sampler Initials:* A.S.

Resample I.D. # ML-B *Witness by:* BT

Sample Method: Geoprobe, discrete interval sampler

Sampled Interval: 13' - 17'

Sample Date: 1/28/99

Sample Time: 11:45 AM

Samplers Comments: THE WATER WAS CLEAR / IT HAD LITTLE OR NO ODOR

I FILLED 2 1 LT BOTTLES

S&ME

JOB NO. 1584-98-146
SHEET NO.
DATE 1/28/99

JOB NAME Marsh Lumber Company Pamplico, SC. COMPUTED BY G. Simcox
SUBJECT Groundwater Resampling w/ Geoprobe CHECKED BY

On site approx. 9:00 am. I checked in w/ Lovering Ard to let him know we were on site. While waiting on Ben Troxler, (Troxler Geologic Services), I located the previous probe locations as per ED's map.

GP-1 was located on the map in the right area, but the 200' distance from MW-10 was only 100'. We actually found the old flag from the original probe. We offset approx. 5' to the north & probed to 15'.

At the previous location, GP-6, we measured 35' over & 10' up from the concrete pad to get to this probe location. Ben felt like this was very close to the original location. Here we probed to 17' & took our samples.

The samples were labled, put on ice, & shipped via Fed-Ex shortly after being taken.

Note:

Probe rod & sampling screen were decontaminated as per ED's instructions before & after each location.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

: 18 OLD BATTLEGROUND RD
(EENSBORO, NC 27410

f oject: 1584-98-146
Project Name: MARSH PAMPLICO
S mpler: EQH

Lab Number: 99-A2257
Sample ID: GP-1-30
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 15:45
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/15/99	12:02	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/15/99	12:02	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/15/99	12:02	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:02	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	925. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	19.	10. - 100.
surr-2-Fluorophenol	32.	9. - 100.
surr-2,4,6-Tribromophenol	47.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2257
Sample ID: GP-1-30

Report Approved By: T. J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

5 & ME 6548

18 OLD BATTLEGROUND RD
EENSBORO, NC 27410

oject: 1584-98-146
Project Name: MARSH PAMPLICO
mpler: EGH

Lab Number: 99-A2258
Sample ID: GP-1-15
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 12:45
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/15/99	12:39	M.Goodrich	8270C	9292
Pentachlorophenol	696.	ug/l	250.	25.	10	1/17/99	20:24	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/15/99	12:39	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/15/99	12:39	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	950. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	24.	10. - 100.
surr-2-Fluorophenol	43.	9. - 100.
surr-2,4,6-Tribromophenol	70.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2258
Sample ID: GP-1-15

Report Approved By: T J Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

: 18 OLD BATTLEGROUND RD
(EENSBORO, NC 27410

F oject: 1584-98-146
Project Name: MARSH PAMPLICO
S mpler: EQH

Lab Number: 99-A2259
Sample ID: GP-2-16
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 17:45
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/15/99	13:15	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/15/99	13:15	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/15/99	13:15	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/15/99	13:15	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	26.	10. - 100.
surr-2-Fluorophenol	46.	9. - 100.
surr-2,4,6-Tribromophenol	65.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2259
Sample ID: GP-2-16

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

L & ME 6548

: 718 OLD BATTLEGROUND RD
(EENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EQH

Lab Number: 99-A2260
Sample ID: GP-2-24
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 19:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	28.	25.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	28.	25.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	28.	25.	1	1/15/99	13:52	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	28.	25.	1	1/15/99	13:52	M.Goodrich	8270C	9292
Phenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	28.	25.	1	1/15/99	13:52	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	11.	10.	1	1/15/99	13:52	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	900. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	24.	10. - 100.
surr-2-Fluorophenol	42.	9. - 100.
surr-2,4,6-Tribromophenol	57.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2260
Sample ID: GP-2-24

Report Approved By: T. J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

: 18 OLD BATTLEGROUND RD
(EENSBORO, NC 27410

F oject: 1584-98-146
Project Name: MARSH PAMPLICO
S mpler: EQH

Lab Number: 99-A2261
Sample ID: GP-3-19
Sample Type: Ground water
Site ID:

Date Collected: 1/ 6/99
Time Collected: 11:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	32.	25.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	32.	25.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	32.	25.	1	1/15/99	14:28	M.Goodrich	8270C	9292
Pentachlorophenol	74.	ug/l	32.	25.	1	1/15/99	14:28	M.Goodrich	8270C	9292
Phenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	32.	25.	1	1/15/99	14:28	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	13.	18.	1	1/15/99	14:28	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	780. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	32.	18. - 100.
surr-2-Fluorophenol	51.	9. - 100.
surr-2,4,6-Tribromophenol	65.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2261
Sample ID: GP-3-19

Report Approved By: T J Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

: 18 OLD BATTLEGROUND RD
(EENSBORO, NC 27410

I oject: 1584-98-146
Project Name: MARSH PAMPLICO
C mpler: EGH

Lab Number: 99-A2262
Sample ID: GP-4-17
Sample Type: Ground water
Site ID:

Date Collected: 1/ 6/99
Time Collected: 14:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/15/99	15:42	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/15/99	15:42	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/15/99	15:42	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/15/99	15:42	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	950. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	21.	10. - 100.
surr-2-Fluorophenol	37.	9. - 100.
surr-2,4,6-Tribromophenol	55.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2262
Sample ID: GP-4-17

Report Approved By: T. J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

C 18 OLD BATTLEGROUND RD
G EENSBORO, NC 27410

F oject: 1584-98-146
Project Name: MARSH PAMPLICO
S mpler: EQH

Lab Number: 99-A2263
Sample ID: GP-5-15
Sample Type: Ground water
Site ID:

Date Collected: 1/ 6/99
Time Collected: 16:00
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/16/99	3:48	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/16/99	3:48	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/16/99	3:48	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/16/99	3:48	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	24.	10. - 100.
surr-2-Fluorophenol	41.	9. - 100.
surr-2,4,6-Tribromophenol	61.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2263
Sample ID: GP-5-15

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

: 18 OLD BATTLEGROUND RD
G..EENSBORO, NC 27410

I oject: 1584-98-146
Project Name: MARSH PAMPLICO
S mpler: EGH

Lab Number: 99-A2264
Sample ID: GP-6-17
Sample Type: Ground water
Site ID:

Date Collected: 1/ 6/99
Time Collected: 17:00
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/16/99	4:24	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/16/99	4:24	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/16/99	4:24	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/16/99	4:24	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	980. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol 45	22.	10. - 100.
surr-2-Fluorophenol	33.	9. - 100.
surr-2,4,6-Tribromophenol	57.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2264
Sample ID: GP-6-17

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

& ME 6548

718 OLD BATTLEGROUND RD
REENSBORO, NC 27410

oject: 1584-98-146
Project Name: MARSH PAMPLICO
ampler: EQH

Lab Number: 99-A2265
Sample ID: PURGE/DECON
Sample Type: Ground water
Site ID:

Date Collected: 1/ 6/99
Time Collected: 18:00
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/16/99	5:01	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/16/99	5:01	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/16/99	5:01	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:01	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	980. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	16.	10. - 100.
surr-2-Fluorophenol	22.	9. - 100.
surr-2,4,6-Tribromophenol	76.	15. - 134.

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2960 Foster Creighton Dr.
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Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2265
Sample ID: PURGE/DECON

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

b & ME 6548

: '18 OLD BATTLEGROUND RD
(IEENSBORO, NC 27410

Lab Number: 99-A2266
Sample ID: MW-1
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 12:40
Date Received: 1/ 8/99
Time Received: 9:00

| oject: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EQH

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2-Chlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2-Nitrophenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
4-Nitrophenol	ND	ug/l	25.	25.	1	1/16/99	5:38	M.Goodrich	8270C	9292
Pentachlorophenol	ND	ug/l	25.	25.	1	1/16/99	5:38	M.Goodrich	8270C	9292
Phenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/16/99	5:38	M.Goodrich	8270C	9292
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/16/99	5:38	M.Goodrich	8270C	9292

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	950. ml	1.0 ml	1/12/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	29.	10. - 100.
surr-2-Fluorophenol	51.	9. - 100.
surr-2,4,6-Tribromophenol	71.	15. - 134.

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2266
Sample ID: MW-1

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EQH

Lab Number: 99-A2267
Sample ID: MW-3
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 15:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2-Chlorophenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2-Nitrophenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
4-Nitrophenol	ND	ug/l	25.	25.	1	1/12/99	4:33	M.Goodrich	8270C	8243
Pentachlorophenol	271.	ug/l	125.	25.	5	1/12/99	9:32	M.Goodrich	8270C	8243
Phenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/12/99	4:33	M.Goodrich	8270C	8243
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/12/99	4:33	M.Goodrich	8270C	8243

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	950. ml	1.0 ml	1/11/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	22.	10. - 100.
surr-2-Fluorophenol	34.	9. - 100.
surr-2,4,6-Tribromophenol	87.	15. - 134.

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2267
Sample ID: MW-3

Report Approved By: T. J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EQH

Lab Number: 99-A2268
Sample ID: MW-8
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 16:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2-Chlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2-Nitrophenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
4-Nitrophenol	ND	ug/l	25.	25.	1	1/12/99	5:10	M.Goodrich	8270C	8243
Pentachlorophenol	ND	ug/l	25.	25.	1	1/12/99	5:10	M.Goodrich	8270C	8243
Phenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/12/99	5:10	M.Goodrich	8270C	8243
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:10	M.Goodrich	8270C	8243

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	960. ml	1.0 ml	1/11/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	19.	10. - 100.
surr-2-Fluorophenol	30.	9. - 100.
surr-2,4,6-Tribromophenol	78.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2268
Sample ID: MW-8

Report Approved By: T. J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

18 OLD BATTLEGROUND RD
EENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EQH

Lab Number: 99-A2269
Sample ID: MW-9
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 15:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2-Chlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2-Nitrophenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
4-Nitrophenol	ND	ug/l	25.	25.	1	1/12/99	5:46	M.Goodrich	8270C	8243
Pentachlorophenol	ND	ug/l	25.	25.	1	1/12/99	5:46	M.Goodrich	8270C	8243
Phenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/12/99	5:46	M.Goodrich	8270C	8243
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/12/99	5:46	M.Goodrich	8270C	8243

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	940. ml	1.0 ml	1/11/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	21.	18. - 100.
surr-2-Fluorophenol	31.	9. - 100.
surr-2,4,6-Tribromophenol	80.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2269
Sample ID: MW-9

Report Approved By: _____ Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

5 & ME 6548

: '18 OLD BATTLEGROUND RD
' !EENSBORO, NC 27410

I 'oject: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EGH

Lab Number: 99-A2270
Sample ID: MW-10
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 17:30
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2-Chlorophenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2,4-Dichlorophenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2,4-Dimethylphenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
4,6-Dinitro-2-methylphenol	ND	ug/l	31.	25.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2,4-Dinitrophenol	ND	ug/l	31.	25.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2-Nitrophenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
4-Nitrophenol	ND	ug/l	31.	25.	1	1/12/99	6:22	M.Goodrich	8270C	8243
Pentachlorophenol	58.	ug/l	31.	25.	1	1/12/99	6:22	M.Goodrich	8270C	8243
Phenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2,4,5-Trichlorophenol	ND	ug/l	31.	25.	1	1/12/99	6:22	M.Goodrich	8270C	8243
2,4,6-Trichlorophenol	ND	ug/l	12.	10.	1	1/12/99	6:22	M.Goodrich	8270C	8243

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	810. ml	1.0 ml	1/11/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	28.	10. - 100.
surr-2-Fluorophenol	42.	9. - 100.
surr-2,4,6-Tribromophenol	92.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A2270
Sample ID: MW-10

Report Approved By: T-J Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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ANALYTICAL REPORT

& ME 6548

718 OLD BATTLEGROUND RD
EENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: EGH

Lab Number: 99-A2271
Sample ID: MW-11
Sample Type: Ground water
Site ID:

Date Collected: 1/ 5/99
Time Collected: 12:45
Date Received: 1/ 8/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2-Chlorophenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2-Nitrophenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
4-Nitrophenol	ND	ug/l	25.	25.	1	1/12/99	8:19	M.Goodrich	8270C	8243
Pentachlorophenol	ND	ug/l	25.	25.	1	1/12/99	8:19	M.Goodrich	8270C	8243
Phenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	1/12/99	8:19	M.Goodrich	8270C	8243
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	1/12/99	8:19	M.Goodrich	8270C	8243

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	930. ml	1.0 ml	1/11/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	21.	10. - 100.
surr-2-Fluorophenol	32.	9. - 100.
surr-2,4,6-Tribromophenol	93.	15. - 134.

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Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A2271
Sample ID: MW-11

Report Approved By: T.J. Duello Report Date: 1/18/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director

Laboratory Certification Number: 387

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S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

CHAIN OF CUSTODY

Project Number: 1584-98-146 | Sampler: EQM

Project Name: Marsh Pamplico | SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Analysis Requested: 8270 Acid Extractables
2257	GP1-30	1/5/99	1545	Aq	X		1	X
58	GP1-15	1/5/99	1245	Aq	X		1	X
59	GP2-16	1/5/99	1745	Aq	X		1	X
60	GP2-24	1/5/99	1930	Aq	X		1	X
61	GP3-19	1/6/99	1130	Aq	X		1	X
62	GP4-17	1/6/99	1430	Aq	X		1	X
63	GP5-15	1/6/99	1600	Aq	X		1	X
64	GP6-17	1/6/99	1800	Aq	X		1	X
2265	Purge/Decon	1/6/99	1800	Aq	X		1	X

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/
Ed Hennigan	1/7/99 1000	M. Beaty	1/8/99 9:00		—		
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/

Cooler Temperature When Received: 4°C

Laboratory Project Number: 126690

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:
Method 8270 Acid Extractables, Priority Pollutants Li
Pentachlorophenol is suspected

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P.O. Box 40566
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Phone 1-615-726-0177

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

CHAIN OF CUSTODY

Project Number: 1584-98-146 | Sampler: EQH

Project Name: Marsh Pamplico | SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Analysis Requested: 8270 acid extractables
2266	MW-1	1/5/99	1240	Aq	X		1	X
67	MW-3	1/5/99	1530	Aq	X		1	X
68	MW-8	1/5/99	1630	Aq	X		1	X
69	MW-9	1/5/99	1530	Aq	X		1	X
70	MW-10	1/5/99	1730	Aq	X		1	X
2271	MW-11	1/5/99	1245	Aq	X		1	X

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D
Ed Hennagan	1/7/99 1000	MB	1/8/99 9:00		—		
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:
Method 8270 Acid extractables, Priority Pollutants List
pentachlorophenol is suspected

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2960 Foster Creighton Dr.
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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60837
Sample ID: MW-3
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 15:25
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Acenaphthylene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Benzo(a)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Benzo(a)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Benzo(b)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Benzo(g,h,i)perylene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Benzo(k)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Bromophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Butylbenzylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Carbazole	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Chloroaniline	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Bis(2-chloroethoxy)methane	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Bis(2-chloroethyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Bis(2-chloroisopropyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Chloronaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Chlorophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Chrysene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Dibenzofuran	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Dibenz(a,h)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
1,2-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
1,3-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
1,4-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
3,3'-Dichlorobenzidine	ND	ug/l	20.	20.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Diethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Dimethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Di-n-Butylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4-dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,6-Dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Di-n-octylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A60837
Sample ID: MW-3

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
Fluorene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Hexachlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Hexachlorobutadiene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Hexachlorocyclopentadiene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Hexachloroethane	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Isophorone	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Methylnaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
3 and 4-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Naphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
3-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Nitrobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
N-Nitrosodiphenylamine	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Pentachlorophenol	145.	ug/l	125.	25.	5	5/ 2/99	16:46	M.Goodrich	8270C	8521
Phenanthrene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
1,2,4-Trichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:07	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	4/30/99	Fitzwater	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units

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ANALYTICAL REPORT

Laboratory Number: 99-A60837
Sample ID: MW-3

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
1,2,3,4-tetrachlorophenol	0.017	PPM
3,4,5-trichlorophenol	0.015	PPM
Stryene	0.055	PPM

Surrogate	% Recovery	Target Range
surr-Nitrobenzene-d5	60.	15. - 105.
surr-2-Fluorobiphenyl	61.	17. - 110.
surr-Terphenyl d14	49.	10. - 116.
surr-Phenol d5	22.	10. - 100.
surr-2-Fluorophenol	30.	9. - 100.
surr-2,4,6-Tribromophenol	78.	15. - 134.

Report Approved By: Michael A. Dunn Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60838
Sample ID: MW-10
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 16:07
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Acenaphthylene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Benzo(a)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Benzo(a)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Benzo(b)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Benzo(g,h,i)perylene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Benzo(k)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Bromophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Butylbenzylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Carbazole	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Chloroaniline	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Bis(2-chloroethoxy)methane	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Bis(2-chloroethyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Bis(2-chloroisopropyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Chloronaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Chlorophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Chrysene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Dibenzofuran	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Dibenz(a,h)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
1,2-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
1,3-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
1,4-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
3,3'-Dichlorobenzidine	ND	ug/l	20.	20.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Diethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Dimethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Di-n-Butylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4-dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,6-Dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Di-n-octylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521

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ANALYTICAL REPORT

Laboratory Number: 99-A60838
Sample ID: MW-10

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
Fluorene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Hexachlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Hexachlorobutadiene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Hexachlorocyclopentadiene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Hexachloroethane	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Isophorone	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Methylnaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
3 and 4-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Naphthalene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
3-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Nitrobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
N-Nitrosodiphenylamine	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Pentachlorophenol	35.	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Phenanthrene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Pyrene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
1,2,4-Trichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	7:44	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Nitrobenzene-d5	55.	15. - 105.
surr-2-Fluorobiphenyl	53.	17. - 110.
surr-Terphenyl d14	62.	10. - 116.

SPECIALIZED ASSAYS, INC.
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ANALYTICAL REPORT

Laboratory Number: 99-A60838
Sample ID: MW-10

Surrogate	% Recovery	Target Range
surr-Phenol d5	19.	10. - 100.
surr-2-Fluorophenol	28.	9. - 100.
surr-2,4,6-Tribromophenol	76.	15. - 134.

No semivolatile TICs found.

Report Approved By: Michael A. Dunn Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

SPECIALIZED ASSAYS, INC.
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Nashville, TN 37204-0566
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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60839
Sample ID: GP8-20
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 17:45
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Acenaphthylene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Anthracene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Benzo(a)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Benzo(a)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Benzo(b)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Benzo(g,h,i)perylene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Benzo(k)fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Bromophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Butylbenzylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Carbazole	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Chloroaniline	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Bis(2-chloroethoxy)methane	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Bis(2-chloroethyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Bis(2-chloroisopropyl)ether	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Chloronaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Chlorophenyl-phenylether	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Chrysene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Dibenzofuran	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Dibenz(a,h)anthracene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
1,2-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
1,3-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
1,4-Dichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
3,3'-Dichlorobenzidine	ND	ug/l	20.	20.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Diethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Dimethylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Di-n-Butylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4-dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,6-Dinitrotoluene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Di-n-octylphthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Fluoranthene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521

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ANALYTICAL REPORT

Laboratory Number: 99-A60839
Sample ID: GP8-20

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
Fluorene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Hexachlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Hexachlorobutadiene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Hexachlorocyclopentadiene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Hexachloroethane	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Isophorone	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Methylnaphthalene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
3 and 4-Methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Naphthalene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
3-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Nitroaniline	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Nitrobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
N-Nitrosodiphenylamine	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Phenanthrene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Pyrene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
1,2,4-Trichlorobenzene	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:21	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	940. ml	1.0 ml	4/30/99	Fitzwater	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units

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ANALYTICAL REPORT

Laboratory Number: 99-A60839
Sample ID: GP8-20

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
2,3-dichlorobenzoic acid	0.012	PPM

Surrogate	% Recovery	Target Range
surr-Nitrobenzene-d5	59.	15. - 105.
surr-2-Fluorobiphenyl	56.	17. - 110.
surr-Terphenyl d14	56.	10. - 116.
surr-Phenol d5	23.	10. - 100.
surr-2-Fluorophenol	32.	9. - 100.
surr-2,4,6-Tribromophenol	78.	15. - 134.

Report Approved By: Michael H. Dunn Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60840
Sample ID: GP9-15
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 9:30
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	8:57	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	980. ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	20.	10. - 100.
surr-2-Fluorophenol	29.	9. - 100.
surr-2,4,6-Tribromophenol	62.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A60840
Sample ID: GP9-15

Report Approved By: _____ Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
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Johnny A. Mitchell, Dir. Technical Services
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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60841
Sample ID: GP21-14
Sample Type: Ground water
Site ID:

Date Collected: 4/26/99
Time Collected: 11:30
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	9:34	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	22.	10. - 100.
surr-2-Fluorophenol	32.	9. - 100.
surr-2,4,6-Tribromophenol	81.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A60841
Sample ID: GP21-14

Report Approved By: _____ Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60842
Sample ID: GP22-16
Sample Type: Ground water
Site ID:

Date Collected: 4/26/99
Time Collected: 13:45
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	10:11	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	1000 ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	24.	10. - 100.
surr-2-Fluorophenol	34.	9. - 100.
surr-2,4,6-Tribromophenol	80.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A60842
Sample ID: GP22-16

Report Approved By: _____ Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
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Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60843
Sample ID: GP23-14
Sample Type: Ground water
Site ID:

Date Collected: 4/26/99
Time Collected: 15:30
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
Pentachlorophenol	690.	ug/l	250.	25.	10	5/ 2/99	17:23	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	11:24	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	990. ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	22.	10. - 100.
surr-2-Fluorophenol	32.	9. - 100.
surr-2,4,6-Tribromophenol	84.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A60843
Sample ID: GP23-14

Report Approved By: Michael H. Dunn Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60844
Sample ID: GP24-20
Sample Type: Ground water
Site ID:

Date Collected: 4/26/99
Time Collected: 18:00
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
Phenol	10.	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	12:01	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	980. ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	28.	10. - 100.
surr-2-Fluorophenol	40.	9. - 100.
surr-2,4,6-Tribromophenol	98.	15. - 134.

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ANALYTICAL REPORT

Laboratory Number: 99-A60844
Sample ID: GP24-20

Report Approved By: _____ Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60845
Sample ID: GP25-22
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 17:30
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	28.	25.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	28.	25.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	28.	25.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	28.	25.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
Phenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	28.	25.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	11.	10.	1	5/ 2/99	12:38	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	900. ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	25.	10. - 100.
surr-2-Fluorophenol	34.	9. - 100.
surr-2,4,6-Tribromophenol	76.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A60845
Sample ID: GP25-22

Report Approved By: Michael H. Dunn Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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Phone 1-615-726-0177

ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60846
Sample ID: GP28-12
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 16:50
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
Phenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 2/99	13:14	M.Goodrich	8270C	8521

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	990. ml	1.0 ml	4/30/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	22.	10. - 100.
surr-2-Fluorophenol	30.	9. - 100.
surr-2,4,6-Tribromophenol	81.	15. - 134.

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A60846
Sample ID: GP28-12

Report Approved By: Michael D. Russ Report Date: 5/10/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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ANALYTICAL REPORT

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

Project: 1584-98-146
Project Name: MARSH PAMPLICO
Sampler: E. H.

Lab Number: 99-A60847
Sample ID: GP30-12
Sample Type: Ground water
Site ID:

Date Collected: 4/27/99
Time Collected: 18:00
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
EXTRACTABLE ORGANICS										
4-Chloro-3-methylphenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2-Chlorophenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2,4-Dichlorophenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2,4-Dimethylphenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	25.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2,4-Dinitrophenol	ND	ug/l	25.	25.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2-Nitrophenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
4-Nitrophenol	ND	ug/l	25.	25.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
Pentachlorophenol	ND	ug/l	25.	25.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
Phenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2,4,5-Trichlorophenol	ND	ug/l	25.	25.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816
2,4,6-Trichlorophenol	ND	ug/l	10.	10.	1	5/ 4/99	23:30	M.Goodrich	8270C	9816

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
BNA's	990. ml	1.0 ml	5/ 4/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-Phenol d5	25.	10. - 100.
surr-2-Fluorophenol	35.	9. - 100.
surr-2,4,6-Tribromophenol	78.	15. - 134.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A50347
Sample ID: GP30-12

Report Approved By: _____ Report Date: 5/10/99

Theodore J Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 387

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Phone 1-615-726-0177

S & ME 6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

CHAIN OF CUSTODY

Project Number: 1584-98-146 | Sampler: EGBH

Project Name: Marsh Pamplico | SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Analysis Requested: 8270 Acid Ext.	8270 + TICs (1)
20837	MW-3	4-27-99	1525	Aq	X		2	X	X
38	MW-10	4-27-99	1607	Aq	X		2	X	X
39	GP8-20	4-27-99	1745	Aq	X		2	X	X
40	GP9-15	4/27/99	930	Aq	X		1	X	
41	GP21-14	4/26/99	1130	Aq	X		1	X	
42	GP22-16	4/26/99	1345	Aq	X		1	X	
43	GP23-14	4/26/99	1530	Aq	X		1	X	
20844	GP24-20	4/26/99	1800	Aq	X		1	X	

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Ed Jennings	4/28/99 1500	J Jacobs	4/29/99 900				
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T

Cooler Temperature When Received: 4°C

Laboratory Project Number: 141093

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:
8270 Acid Extractables, Pentachlorophenol is suspect contaminant
(1) 8270 Acid Extractables + TICs (Library Search) targeting PCP degradation compounds (see attached list)

COPY 1

SPECIALIZED ASSAYS, INC.
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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

S & ME -6548

3718 OLD BATTLEGROUND RD
GREENSBORO, NC 27410

CHAIN OF CUSTODY

Project Number: 1584-98-146 | Sampler: EQBH

Project Name: Marsh Pamplico | SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Analysis Requested: 8270 Acid Ext.
60845	GP25-22	4/27/99	1730	Aq	X			X
60846	GP28-12	4/27/99	1650	Aq	X			X
60847	GP30-12	4/27/99	1800	Aq	X			X

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D
Ed Hennig	4/28/99 1500	[signature]	4/29/99 900				
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D

Cooler Temperature When Received: 4°C

Laboratory Project Number: 141093

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:
8270 Acid Extractable, Pentachlorophenol is the suspect contaminant

COPY 1

3718 Old Battleground Road, Greensboro, NC 27410
Phone (336) 288-7180, Fax (336) 288-8980

S&ME, Inc.

Fax

Paul Lane

To: Mr. ~~Mike~~ Dunn **From:** Edmund Henriques

Fax: (615) 726-3404 **Pages:** ~~3~~ 5

Phone: (800) ~~895-2448~~ 765-0980 **Date:** ~~03/04/99~~ 3/11/99

Re: Request for Information **CC:** File

x **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

● **Comments:**

Specialized Assays has been providing me with analytical data for a groundwater assessment where pentachlorophenol is the contaminant. I now wish to look at the impacted groundwater to determine the presence or absence of aerobic biodegradation products. I have attached researched data regarding possible pentachlorophenol biodegradation mineralization products and bi-products. Please review the listed products and bi-products and provide me with suggested analytical method(s) for their detection. Are some of the compounds only detectable as Tentatively Identified Compounds (TICs)? If so, can additional standards be run to provide calibration for their detection and quantification?

Any assistance you may provide will be most help full.

Please feel free to call me at (336) 288-7180 if you have any questions

Best Regards

Edmund Henriques

Pentachlorophenol Family Pathway Map

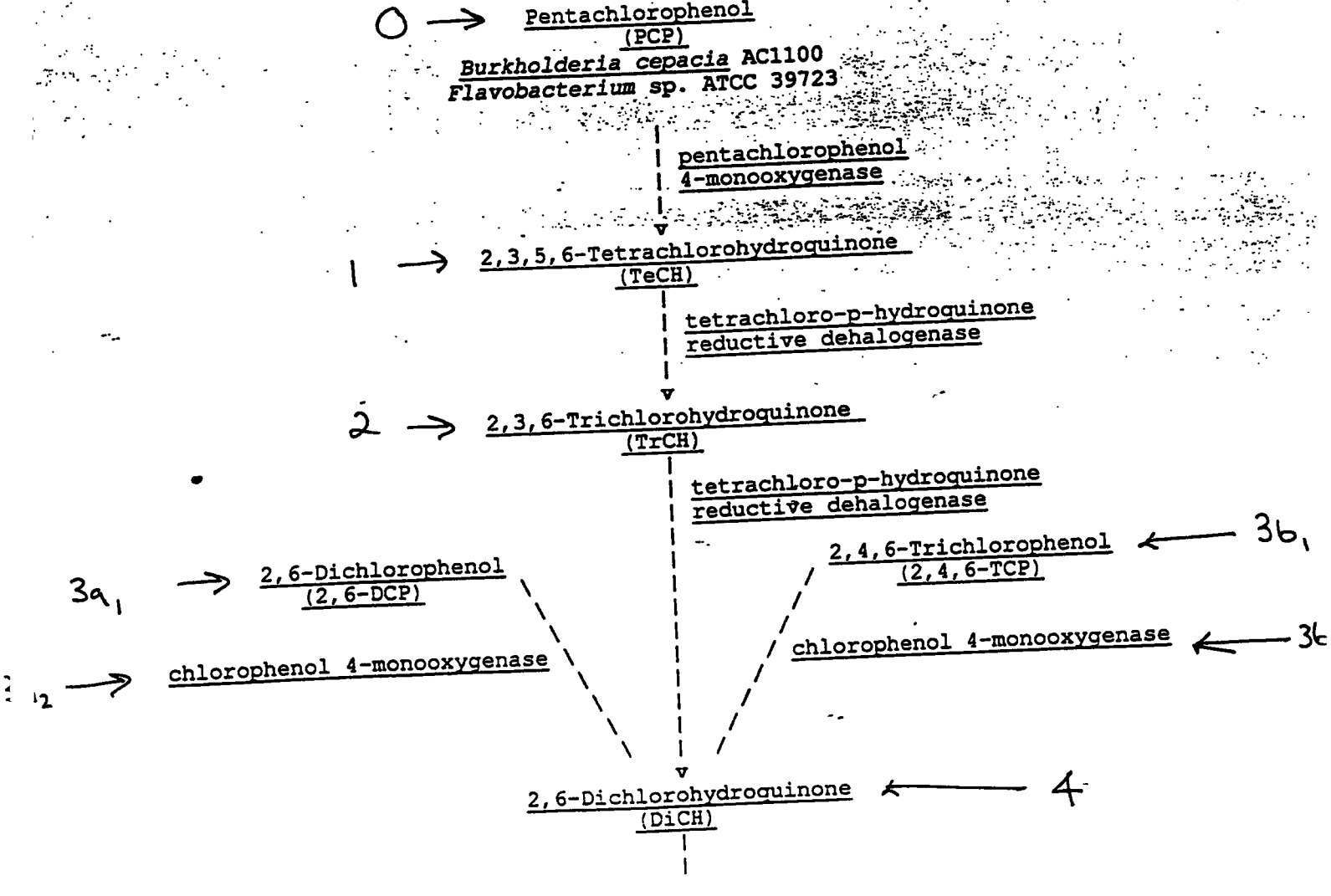
[Compounds and Reactions] [BBD Main Menu]

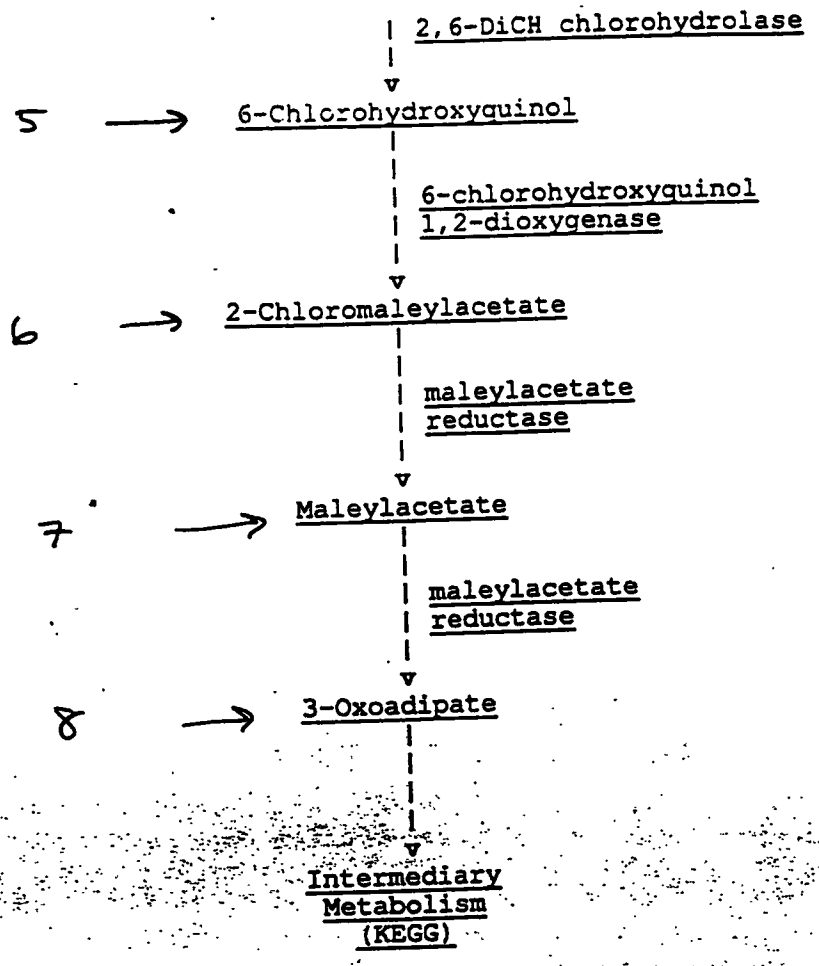
This pathway was contributed by **Dr. Larry Wackett**, University of Minnesota. The Pentachlorophenol Compound Page is a good example of a starting compound page. The Pentachlorophenol 4-Monooxygenase Reaction is a good example of a reaction page.

Pentachlorophenol (PCP) is a chlorinated insecticide and fungicide. It is used primarily to protect timber from fungal rot and wood boring insects. PCP is significantly toxic to mammals, plants, and many microorganisms. Despite this, bacteria have been identified that are resistant to relatively high PCP concentrations and can metabolize it to carbon dioxide and chloride. Bacteria have been used successfully in PCP bioremediation.

The Japanese Database for Environmental Fate of Chemicals has information on the rates and pathways of Biodegradation of Chlorophenols and Chlorobenzenes in Sediments. For a comprehensive treatment of microbial PCP metabolism, see K.A. McAllister, H. Lee & J.T. Trevors (1996) Biodegradation 7:1-40.

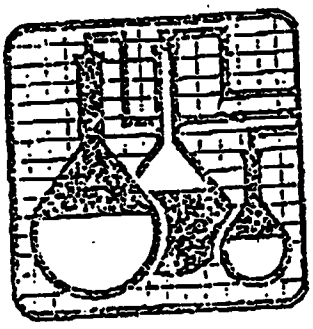
This is a text-format pentachlorophenol degradation pathway. Organisms which can initiate the pathway are given, but other organisms may also carry out later steps. Follow the links for more information on compounds or reactions. This map is also available in graphic (15k) format.





[Compounds and Reactions] [BBD Main Menu]

Page Author(s): Yuemo Zeng



Specialized Assays, Inc.
2960 Foster Creighton Drive
P.O. Box 40566
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-0954

Date: 3-5-99 Page 1 of 2

To: Edmund Henriques

From: mike Dunn

Reference: PCP degradation

Message:

yes, TFE's o/k

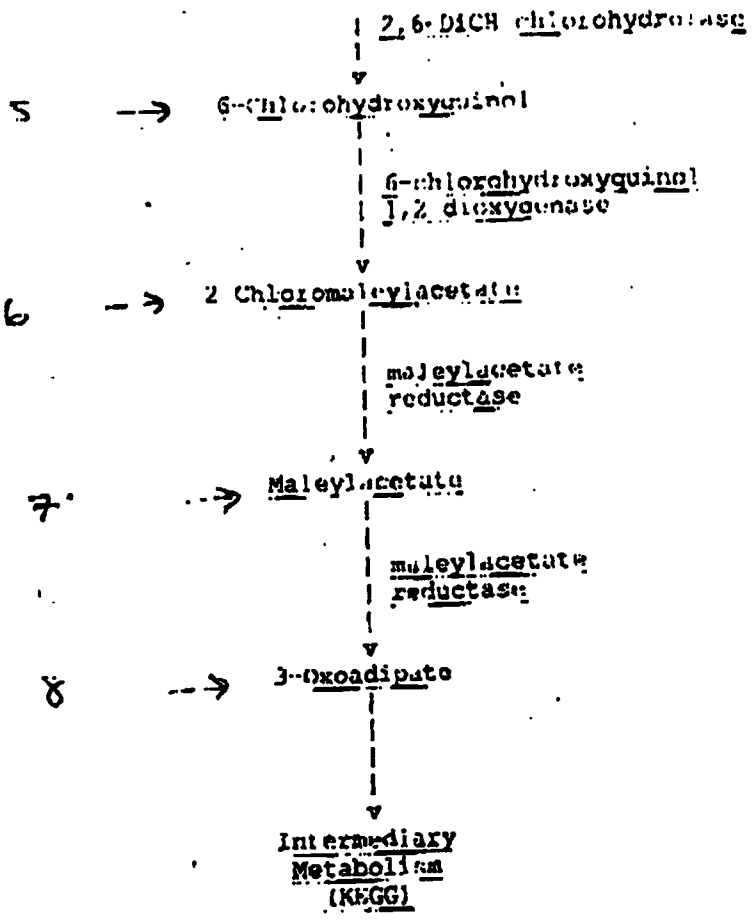
must find furniture std.

contact Paul Lane x144 for pricing

☐ Respond ASAP ☐ Hard Copy to Follow

☐ No Response Necessary ☐ Please Confirm Receipt

Thank you.



[Compounds and Reactions] [BBD Main Menu]

Page Author(s): Yuemo Zeng

1, 2, 4, 5, 6 – TICs by 8270, must find/purchase stds

3a, 3b – already 8270 targets

7, 8 – unknown

APPENDIX C
GEOLOGIC LOGS (FIELD)

FIELD DRILLING RECORD

BORING NUMBER GP-1 LOCATION Marsh Lumber, Pamplico, SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 28 foot DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	3'	Black silt fg sand w/ ~ 10% wood/bark organic matter with in the matrix. Wood fragments up to > 1/4". % wood fragments decrease with depth					
3'	8'	Wet brown silty well sorted fg sand with no visible organic matter. The matrix exhibits a lt. brown & gray color mottling at depth					
8'	9'	Wet gray-brown clayee fg sand (~ 10% clay)					
9'	9.75	Wet gray-brown silty fg sand (< 30% silt/clay)					
9.75'	10'	" " " clayee mg sand (well sorted)					
10'	11.75	Wet gray-brown fg sandy silt (~ 20% fg sand in a silt/clay matrix) color changes to gray-white w/ ↑ depth					
11.75'	13.5	Wet brown-orange silty fg sand (< 40% silt/clay)					
13.5'	14'	Wet brown silty-clay or clayee silt w/ ~ 10% fg-mg sand in matrix					
14'	15'	Wet brown silty well sorted vfg sand					
15'	16.25	transition to a gray silty vfg sand					
16.25	17.5	transition to a brown silty clay w/ accasional gray plastic clay stringers/lenses					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-1 LOCATION Marsh Lumber, Pamplico, SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 28 foot DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
17.5'	19	Gray-green silty clay (silt/clay 90%, sand 10%)					
		(possible restrictive horizon)					
19	19.5	Black firm clayee silt					
19.5	28	lt. gray calcareous silty to fg sand matrix					
		w/ 10-20% fossil / shell fragments.					
		Some portions semi-consolidated					
		shell / fossils ~ 40% @ 20-24'					
		" " ~ 20% @ 24-26'					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-2 LOCATION Marsh Lumber, Pamplico SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 24' DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	1	dry brown calcareous clayey silt w/ <20% vfg sand					
1	1.25	becomes black clay-silt w/ rare white clay varves / stringers					
1.25	2.25	Brown silty clay					
2.25	2.75	red-brown mottled silty vfg sand w/ occasional grey plastic clay stringers					
2.75	3	fracture grey – milky white Quartz vein fragment up to ~ 1/4"					
3	3.75	Brown silty well sorted vfg sand w/ <2% quartz grains up to ~1/4" throughout matrix					
3.75	4.25	tan-brown silty well sorted fg sand (~ 60-70% fg sand)					
4.25	5.5	Brown silty clay transitions into a silty vfg sand @ ~5'					
5.5	6.5	tan-white well sorted fg sand					
6.5	7.25	Brown sandy-silt w/ ~10% wood fragments (caving from above?)					
7.25	7.5	tan-white sandy silt (~20% fg sand in matrix)					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-2 LOCATION Marsh Lumber, Pamplico SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 24' DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
7.5	10.5	brown - dk brown sandy silt (~ 10-20% fg sand in matrix)					
		w/ ~ 10% wood fragments in the matrix					
10.5	10.75	Gray-black slightly plastic clay w/ ~ 2% vfg					
		sand & trace fiberous wood in matrix					
10.75	11.75	Gray silty well sorted vfg sand					
		▷ 1" layer @ ~11' bg w/ ~ 40% clay					
11.75	12.5	Gray-white fg - vfg well sorted sand w/					
		isolated wispy thin grey clay stringers.					
12.5	15.25	Gray vfg sand to silty sand					
15.25	16	Orange-brown sandy clay (w/ < 5% mg sand in matrix)					
16	16.5	Gray vfg sand to silty sand					
16.5	17.5	Brown slightly plastic clay w/ <5% mg sand in matrix					
17.5	24	Gray poorly sorted calcareous silty sand					
		matrix w/ 40% shell fragments up to ¼" dia					
		some portion partially consolidated					
		→ shell hash ~70% @ 20-22' bg					
		→ shell hash ~30% @ 22-24' bg					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP3 LOCATION Marsh Lumber, Pamplico SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Traxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 20' DEPTH OF CASING NA

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION (color, texture, structure, consistency, additional features, etc.)	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
0	3.75	Dry orange-brown firm clayee silt w/ 10-20% vfg sand in the matrix					
3.75	4.25	transition to an orange-brown silty clay					
4.25	5.75	mottled orange-red sand silt (<10% fg sand in matrix) with occasional grey clay stringers					
5.75	7.5	same A/A but mottled gray-brown coloration					
7.5	10.5	Transition to orange-brown-red mottled silty well sorted sand (~70% vfg sand)					
10.5	10.75	Grey plastic clay					
10.75	12.5	wet non-calcareous pink-brown-tan mottled silty vfg sand					
12.5	13	transition into a pink-red-brown vfg sandy clay w/ grey isolated clay stringers					
13	13.5	Pink-red-brown mottled clay w/~10% fg/mg sand in matrix					
13.5	16.0	orange-brown silty vfg sand (non-calc.) transition to ↓					
16.0	18.25	Brown silty well sorted fg 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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP3 LOCATION Marsh Lumber, Pamplico SC

DATE STARTED 1/5/99 DATE COMPLETED 1/5/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 20' DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
18.25	19.75	Brown slightly plastic clay w/ <10% vfg sand & shell fragment in the matrix					
19.75	20	Grey calcareous silty sand to fg sand w/ abundant broken shell fragments					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-4 LOCATION Marsh Lumber, Pamplico SC

DATE STARTED 1/6/99 DATE COMPLETED 1/6/99

GEOLOGIST E. Henriques DRILLER Troxler Geologic

METHOD OF DRILLING Geoprobe SAMPLING METHOD Macro-Core

DIAMETER OF BORING 2" DIAMETER OF CASING NA

TOTAL DEPTH 21' DEPTH OF CASING NA

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
		note: only (1) 4ft. macro-core soil sample collect from 17-20' bg. This step taken to confirm the elevation & presence of the targeted clay layer					
17	17.5	Orange-brown slightly calcareous sandy clay (~10% vfg sand in matrix)					
17.5	20	Orange-brown silty-clay to clay. w/ ~20% vfg sand in the matrix also ~1% vfg shell fragments in the matrix					
20	21	Brown-tan calcareous sand to silty sand matrix with ~40% shell hash, some shell fragments < 1/4". Some partially consolidated material in the matrix					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-7 LOCATION Pamplico, SC / Marsh

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST EQB4 DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	5'	0-5' Grey blk fg sand w/ organic trace lo					
		.5'- to brown mg- fg sand clay/silt. Sand = mg - fg					
		well sorted					
		to					
5'	9'	~~5'~~ 6' - 6.25 grey organic rich fg sand/silt					
		(possible cont. from above					
		6.25 mottled orange, brown, yellow slightly mod fg sand (well sorted) w/ ~20-30% silt,					
		occasional grey clay varves					
		@ 8.75-9.00' Grey sandy plastic clay zone					
		sand = fg ~ 10% of matrix					
9'	13'	(loss - 1' recovery)					
		~9'- 9.5 Brown-grey sandy clay (restrictive layer ?)					
		sand = fg ~ 10% matrix					
		9.5 - 12.5 grey-brown-yellow mottled ms-fg					
		sand (well sorted) w/ ~20% silt/clay matrix					
		12.5 - 12.75 grey plastic clay w/ trace fg sand					
		12.75 - 1 brown mg - fg 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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-7 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST DRILLER

METHOD OF DRILLING SAMPLING METHOD

DIAMETER OF BORING DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
13'	17	13-13.25 wet brown mg-fg sand (well sorted)					
		13.25 saturated very wet mg-fg sand w/ occ. grey clay layers					
		16.5 - 16.75 same as above ↑ clay					
		16.75 - densely comp. grey-brown well sort mg-fg sand ↓ A-A					
17'	21'	16.75 - 17.5					
		17.5 - 18.5 grey mg-fg sand / well sorted					
		18.5 - 19 Brown mg-fg sandy / clay ~ 10-20% mg-fg sand in clay matrix					
		19 - 20 - grey-brown ↑ clay content					
		20 - 21 - grey sandy fossile hash w/ up to 2" dia partially consolidated concrete					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-8 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST ECBM DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	4	0-2 dry dense brown clayey silt					
		2 - 5 dry mottled grey-brown-red clayey silt					
		w/ occ. clay veins					
4	7						
		5'-6 Brown well sorted ms-fs sand					
		6'-6.25 Red-brown mottled fs sand (dry-moist)					
		6.25-8 damp red-brown fs sand/silty clay					
7	11'						
		8-9 grey brown moist transition to fs sandy silt					
		to silty sand					
		9-11' grey moist saturated ms-fs well sorted Qtz sand					
11	16	(5' rock) 11-12 same A/A					
		12-12.25 grey plastic clay layer					
		12.25-15.75 grey & brown ms-fs sand w/ ~ 10-20% silt/clay matrix					
		15.75- grey clay w/ ~ 10% fs sand in matrix clay somewhat plastic					
16'	26'	Grey, slight Brown tint ms-Qtz sand (non-plastic)					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP8 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST ECBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
19	24	(5' drive) 19-21 grey-white my Qtz sand (non-cole)					
		21-21 dk grey ~~clayey~~ sandy clay w/ 20-30% sand & small shell frags in matrix					
		21-24' dk grey clay w/ <10% small shell frags in matrix (non-cole)					
24	28	21-24.5 dk grey clay some 1/4"					
		24.5-~~[redacted]~~'26' dk grey ~~silt~~ sandy silt w/ ~20% fg sand matrix (sand + fossil frags)					
		26'->28' lt. grey cole. fossiliferous sand w/ large frags of semi consolidate shell ~~debris~~					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-9 (near tomato house) LOCATION Marsh Pamplico SC

DATE STARTED 4/12/99 DATE COMPLETED 4/12/99

GEOLOGIST ECOR4 DRILLER Traxler

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 20 DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	5	0-2 gray ms sand w/ wood/bark frags					
		2-5 grey-black fg sand to sandy silt					
5	9	w/ large wood/bark fragments					
		-6					
		6'-7 saturated black silt w/ trace fg sand					
		7'-8.75 grey ms clear Qtz sand					
		8.75-9 grey fg sand mix w/a few dk grey matrix					
9	12	9-10 grey fg sand to silty sand (saturated					
		10-10.25 grey fg sand w/ dk clay matrix					
		10.25-11 grey ms-cg Qtz sand					
		11'- grey-green fg sand to silty sand w/ thin wispy clay veins					
12	16	12.-15.75 grey-white fg-ms Qtz sand mod. well sorted, occasional thin wispy clay layers					
16	20	15.75-16.25 grey/dk grey clay w/ trace Qtz & fossils in matrix					
		16.25-17.5 grey-white clay w/ increasing fossils frag content					
		17.5-20 grey white fossils fresh zone w/ large fossils frags and lg frags of semi-consolidated cocquina/shell					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-16 LOCATION Marsh Pamplico, SC

DATE STARTED 9/12/99 DATE COMPLETED

GEOLOGIST EGBH DRILLER Trotter

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	8	no cores collected					
8	12	8-9 brown & black mottled fg silty sand					
		w/ fibrous wood frags & (1) 3/4" red rx frag w/ calcite stringers					
		9-10 brown fg sand w/ 20% silt/clay matrix					
		10-10.5 grey/black sandy silt to sandy clay (<10% fg sand in matrix)					
		10.5-10.75 grey clay w/ <10% fg sand					
		10.75-11.5 grey fg sand 9% sand w/ occ. fibrous wood frags					
		11.5-12.5 gray-white fg sand					
12	16	12.5-13.5 grey fg sand w/ 40-50% clay matrix (plastic clay)					
		13.5-15 grey mg-fg sand (well sorted)					
		15-16 grey fg sand w/ 40%-50% clay matrix					
16	20	16-16.5 grey-blk clay w/ ↑ shell content in matrix					
		16.5-20 grey-white shell hash w/ large shell frags & large semi-consolidated shell fragments					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-11 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST EQ&H DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 16' DEPTH OF CASING

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION color, texture, structure, consistency, additional features, etc.	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
8	12	8-9 Black fg sand w/ ~40% silty matrix					
		9-9.75 brown saturated fg sand in a clay rich matrix					
		9.75-11 brown-grey mottled fg qtz sand (well sorted) (w/ 20 silt matrix)					
		11-13.5 grey-white fg qtz sand well sorted (w/ ~20-30% silty matrix)					
12	16	~~fine~~ w/ ↑ fine silt clay w/ ↑ depth					
		13.5-14 grey sandy clay w/ ~20% fg sand in matrix					
		14-15 grey black plastic clay w/ < 5% fg sand / shell frag's in matrix					
		15-15.25 grey white clay w/ 20% shell frag's in matrix					
		15.25-16 grey white cg fossiliferous shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-12 LOCATION Marsh Pamplico SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST EGBM DRILLER

METHOD OF DRILLING Geo probe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	8	No Core					
8	12	8-9 Brown marl sandy clay w/ ↑ sand w/ ↑ depth					
		~ 10-20% fs sand in matrix, clay - somewhat plastic					
		9-9.5 mottled red-brown-grey fs sand to silty sand (~ 10% silt in matrix)					
		9.5- same A/A but becomes saturated					
		11-11.25 sandy clay zone (↑ clay content mostly grey)					
		11.25-13 grey fs silty sand					
12	16	"					
		13-14 brown-grey fs sand w/ <10% silty clay matrix					
		14-15 brown fs sand as above ↑ clay/silt w/ ↑ depth					
		15-15.5 brown fs-ms sand w/ 20-30% clay matrix					
		15.5-17 Brown clay w/ <10-20% fs sand in matrix. Some grey clay varves					
16	20	"					
		17-17.5 Grey clayee shell hash w/ numerous small shell frags					
		17.5-TD Grey calc. shell hash w/ occ. semi-consolidated coquina zones					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-14 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST EOBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION color, texture, structure, consistency, additional features, etc.	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
0	8	no cores collected					
8	12	8-10 mg-fg sand in a dense silty clayey matrix (sand 30-40%.)					
		as a Vertical contact w/ grey dry fg sand w/ fiberous woody material					
		10-12 red-grey-brown mottled sandy clay (sand=fg well sorted ~ 20-30%)					
		12-12.75 red-yellow-brown fg sand w/ ~20% silty/clay matrix					
12	16						
C		12.75-13.25 red-grey brown mottled clay (plastic) w/ ~10% fg sand in matrix					
		clay content highest @ 13' & decrease before & after (transitional)					
		13.25-14 saturated fg sand w/ (20-30% silt-clay / red-brown-grey mottled					
C		14-14.25 same clay as @ 13'					
		14.25-14.5 saturated fg sand (see above)					
C		14.5-15.25 dense clay w/ 10-20% fg sand (mottled red-grey-yellow)					
		15.25-16.75 brown-red-yellow fg sand w/ w/ 20-30% silty (dense)					
16	20						
		16.75-17.5 grey-brown fg sand matrix w/ 50% silty / plastic clay matrix					
		17.5-18 grey-brown fg sand / silty sand					
		18-18.5 grey-brown fg sand w/ 50% silty / plastic clay matrix					
		18.5-20.5 brown dense fg sand w/ 10-20% silt					
20	24	20.5-22 brown mg-fg sand					
		22-22.5 brown mg-fg sand w/ 20-30% silt clay					
		22.5-24 Gray black plastic clay w/ 10% fg sand & fossil frag in matrix					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-14 page 2 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST GOBU DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 28 DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
24	28	24 - 24.5 grey/dk grey plastic clay w/ <10 % vfs sand / shell frags in matrix					
		24.5 - 24.75 lt. grey silty clay w/ 50% vfs white shell frags					
		24.75 - 26.75 dk grey shell hash zone most shell frags vfs, some semi-consolidated coquina frags					
		26.75 - TD lt. grey shell hash w/ larger shell frag & more frag of consolidated coquina rx					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP15 LOCATION Mash Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST EQB4 DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 16 DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	8	no cores collected					
8	12	8-9.25 Brown, moist, dense sandy clay/sandy silt w/ ~30 fg sand in matrix					
		9.25-13 Grey saturated well sorted fg sand w/ 20-30 silt/clay in matrix					
12	16						
		13-13.75 Brown sandy clay ~50% fg sand in clay matrix					
		13.75-14.25 Grey " " " " " "					
		14.25-15 Grey clay w/ < 10-20% fg sand & shell frag in matrix					
		15-15.5 lt. Grey clay w/ 50% shell frag					
		15.5-TD lt. brown-white shell hash zone					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP16 LOCATION Marsh Pamplico, SC

DATE STARTED 4/12/99 DATE COMPLETED

GEOLOGIST ECBM DRILLER Trackes

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 20' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	8	no cores collected					
8	12	8-8.5 moist red-brown mottled silty sand w/ fg sand (40%) silty clay 50%					
		w/ thin whispy grey plastic clay layers					
		8.5-9.5 fg well sorted QR sand w/ 20-30% fines					
		9.5 - Grey clay layer					
		9.5-11 mottled saturated grey white pink					
		fg-mg sand					
		11-13 grey-white-pink sat mg-fg sand					
12	16	(loss/reduce recovery ~1')					
		13-14 pink-grey mottled mg-fg sand w/ numerous					
		grey plastic clay layers/lenses					
		14-16.5 grey-brown mg-fg sand w/ 10-20% fines					
16	20						
		16.5-17.5 brown plastic clay w/ <10% fg sand + shell frags					
		17.5-18.25 grey plastic clay w/ " " "					
		18.25-18.5 trans grey white shell hash w/ 50% clay					
		18.5-TD grey white calc-shell hash w/ numerous fossil frags & semi-cons coquina					
		collect water sample 12-16' = GP-16-16					
		time = 11:00					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP17 LOCATION Marsh Pamplico, SC

DATE STARTED 4/13/99 DATE COMPLETED

GEOLOGIST ECBM DRILLER Trotter

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	12	no cores recovered					
12	16	12-13 brown-gray saturated silty sand = sand fg silt/cly	ws 60% 40%				
		13-14.25 mottled red-brown same A/A w/ varves / nodules of gray plastic clay					
		14.25-14.5 mottled red-brown-gray sandy (fg) clay					
		14.5-15.5 silty sand (same as 13-14.25)					
		15.5 brown-pink fg-vfg sand w/ 20% silt					
16	20	16-20 w/ 36" recovery					
		16-20 saturated brown-pink mg-fg sand w/ 3" thick clay zone high in clay varves / lenses under about 19' bg	20-30% fines				
20	29	20-21 same A/A w/ ↑ clay w/ depth					
		21-22 Brown-yellow/green mottled plastic clay w/ 20% fg sand					
		22-22.75 gray plastic clay w/ <10% fg sand & shell frags (vfg)					
		22.75-23.25 white gray fossil shark w/ large fossil (bracks					
		23.25-TD same as above w/ red FeOx staining					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP18 LOCATION Marsh Pamplico, SC

DATE STARTED 4/13/99 DATE COMPLETED 4/13/99

GEOLOGIST ECG3M DRILLER Traxler

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 28' DEPTH OF CASING

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION color, texture, structure, consistency, additional features, etc.	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
0	12	no cores recovered					
12	16	24" ~~core~~ recovery					
		~2' of red-brown - grey mottled fg sand to sandy silt					
		w/ occassional thin clay rich zones / clay varves					
16	20	36" recovery (likely lost soft sands @ bottom)					
		16-17 grey-red-pink mottled silty sand (50% vfg sand 50% silt clay)					
		w/ irregular thin clay varves / layers					
		17-19 grey-red-pink mottled fg sand - vfg sand w/ 20-30 Fines					
		19- yellow-brown soft fg sand well sorted					
20	24	26" recovery					
		20-22 loss recovery? soft sands as above?					
		22-22.5 brown mg-fg sand w/ 20-30% silt					
	→	22.5-23.5 brown sandy silt to sandy clay? (50% fg sand & plastic clay)					
		23.5-24.5 brown plastic clay w/ 30% sand & trace fossil frags					
24	28	30" recovery					
		24.5-25.5 brown plastic clay w/ 20% sand decreasing to 10% @ 25'					
		25.5-TD Grey shell hash zone					
		? shell hash zone compaction = apparent loss recovery?					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP19 LOCATION Marsh Pamplico, SC

DATE STARTED 4/13/99 DATE COMPLETED 4/10/99

GEOLOGIST ECOSH DRILLER Trexler

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 24' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
0	12	no cores collected					
12	16	12-16' grey-pink fs sand w/ 20-30% silt					
		occasional thin grey clay lenses? varved					
16	20	16-18 grey-brown fs-ms sand w/ 10-20% fines					
		18'-18.25' brown fs-ms sand w/ 20-30% clay					
		18.25-18.75 brown fs sand w/ 40-50% clay					
		18.75-19.00 grey fs clay w/ 20-30% fs sand					
		19- grey plastic clay w/ 10% fs sand & micro shell frag					
20	24	(36" recovery)					
		-20.25 same as A/A					
		20.25-20.75 trans to clay rich micro shell hash					
		20.75-~~22.00~~ white-grey calc shell horn					
		w/ brown oxidized zone @ ~23'					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP20 LOCATION Marsh Pamplico, SC

DATE STARTED 4/13/99 DATE COMPLETED 4/13/99

GEOLOGIST ECBH DRILLER Traxler

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 20' DEPTH OF CASING

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION color, texture, structure, consistency, additional features, etc.	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
0	16	no cores collected					
16	20	16-17' brown-grey ms-fs sand transition to silty sand w/ clay varves toward 17'					
		17'-17.5' grey fs sand / silty sand w/ clay varves					
		17.5'-18' grey clayee sand, sand w/ 50% clay, bit metrid					
		18'-19.5' grey plastic clay w/ <10% fs sand & micro shell frags					
		19.5-TD grey white shell hash/coquina					
		offset 4' and collect GW sample w/ DPT					
		@ 12'-16'					
		GP-20-16 @					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP8 Irepeat LOCATION Marsh Pamplico, SC

DATE STARTED 4/26/99 DATE COMPLETED

GEOLOGIST EQBM DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 28 DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
18	22	18-21' grey-brown sat. ms-fs sand					
		21'-22' grey clayey ms-fs sand (c/c) ↑ of depth					
22	26	22'-23' " "					
		23'-25' grey plastic clay w/ <5% shells & fs-ms sand					
		25-26' grey-white shell hash					
		DU water sample 16'-20' time 17:45					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP-21 LOCATION Marsh Pamplico, SC

DATE STARTED 4/26/99 DATE COMPLETED

GEOLOGIST EGBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 18' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
11	12.5	Grey m-fg sand					
12.5	14	Brown silty sand / clay at depth					
14	16	Brown clay at 20-30% m-fg sand					
16	16.5	Grey clay to sandy clay					
16.5	18	Shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP22 LOCATION Marsh Pamplico, SC

DATE STARTED 4/26/99 DATE COMPLETED

GEOLOGIST EQBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 18' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
14	18	29" recovery					
		~1' brown clayey sand (50-60% of well sorted)					
		w/ clay content ↑ w/ dpt ↓					
		~9" Grey-brown gumbo (plastic) clay w/ <10%					
		shells & fg sand					
		~3" shell hash					
		Wicker sample of DUE					
		16'-12'					
		time = 13:45					
		assume loss due to 2' lost sand					
		top of clay = -16'					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP23 LOCATION Marsh Pamplico, SC

DATE STARTED 4/26/99 DATE COMPLETED

GEOLOGIST EQBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
~~14~~	18	24" Recovery					
		1.5 grey-red sandy clay (~40% fg sand in matrix					
		.5' Brown-yellow fg-mg sand ~30-40% fines					
18	22'	1' Red-Brown sandy clay to clay					
		3' Grey shell hash					
		same as DU1 10'-14'					
		time = 15:30 ?					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP25 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST ECOB M DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 26 DEPTH OF CASING

DEPTH FROM	DEPTH TO	LITHOLOGIC DESCRIPTION color, texture, structure, consistency, additional features, etc.	PENETRATION TEST RESULTS DEPTH	RECOVERY	6"	12"	18"
14	18	14-15 brown mg-fg sand					
		15'-17' brown-grey vfg sand w/ 30-40% silt/clay					
		17'-18' brown vfg sand w/ 20-30 silt					
18	22	~~18~~-18.25 n/a					
		18.25-18.75 grey clayey sand					
		18.75-19.75 grey sandy clay w/ (40% fg sand)					
		19.75-20.5 grey silt sand					
		20.5-22.25 ~~fg~~ grey mg-fg sand w/ 10-20% fines					
22	26	22.25-22.75 grey ~~clayey~~ sandy clay					
		22.75-23.00 grey mg-fg sand					
		23.-24 grey plastic clay w/ <10% mg sand lenses					
		24- shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP26 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST ECOH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 16'-20' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
16'	20'	no probes prior to 16'-20'					
		16' shell hash w/ grey plastic clay, likely right below					
		the bottom of the clay layer					
		16 → TD shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP27 LOCATION Marsh Pamplico, SC

DATE STARTED 9/27/99 DATE COMPLETED

GEOLOGIST EQB M DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH 18' DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
14	18	~ 3" bottom of grey plastic clay					
		14.25 — TD dull hard					
		assume 1' thick clay => clay 13.25' bg					
		93.41 (GEO GP27) − 13.25 = 80.16					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP28 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST ECOB H DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
12	16	~ 30" Recovery					
		+1' ~~mg-fg sand~~ grey mg-fg sand w/ ↑ clay w/ depth					
		~1' grey plastic clay w/ <10% fg sand & shell frags					
		<1' grey white shell hash					
		Top of clay = GE - 13' = 92.87 - 13 = 79.87					
		DVI 8-12' (H_2O)					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP29 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST ECOBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
16	20	full / 100% recovery					
		16-17' brown mg sand w/ 10-20 fog					
		17'-18' brown mg-fg sand & clay					
		18'-18.5 grey clay w/ 20% sand					
		18.5-19.5 grey plastic clay					
		19.5 → TD shell beds					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP30 LOCATION Marsh Pamplico, SC

DATE STARTED 9/27/99 DATE COMPLETED

GEOLOGIST ECOSH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
12	16	48" recovery					
		12-13' grey silty sand					
		13-14' grey clayey sand w/ 40% fines/clay ↑ w/ depth					
		14'-15' grey → blk plastic clay w/ <10% fg sand & fossil frag.					
		15-16' shell hash					

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

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP31 LOCATION Marsh Pamplico, SC

DATE STARTED 9/27/99 DATE COMPLETED

GEOLOGIST EQBH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
12	16	~~full~~ 100% recovery					
		12 - 12.75 grey mg - fg sand w/ 20-30% fines/clay					
		12.75 - 13.75 mg-fg sand w/ 30-40% "					
		13.75 - 14 grey sandy clay					
		14 - 15 grey plastic clay w/ <10% fg sand & shell frag					
		15' - TD shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP32 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST EC/BH DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
14	18	100% recovery					
		14-15' - grey ms sand w/ ~20% fines					
		15-15.5 " " w/ 20-40% clay					
		15.5-16.5 grey plastic clay					
		16.5-TD shell hash					

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 _____

FM-FDR

FIELD DRILLING RECORD

BORING NUMBER GP33 LOCATION Marsh Pamplico, SC

DATE STARTED 4/27/99 DATE COMPLETED

GEOLOGIST ECOSM DRILLER

METHOD OF DRILLING Geoprobe SAMPLING METHOD

DIAMETER OF BORING 2" DIAMETER OF CASING

TOTAL DEPTH DEPTH OF CASING

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	color, texture, structure, consistency, additional features, etc.	DEPTH	RECOVERY	6"	12"	18"
16	20	16-18.5 Grey ms-fs sand w/ 20-30 fines & wl dept					
		18.5 grey sandy clay w/ 20-30% fs sand					
		18.25-19 grey plastic clay					
		19.-19.5 grey plastic clay w/ 10-20% shell frags					
		19.5-TD shell hash					

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

FM-FDR

APPENDIX D

PENTACHLOROPHENOL FAMILY PATHWAY MAP

Pentachlorophenol Family Pathway Map

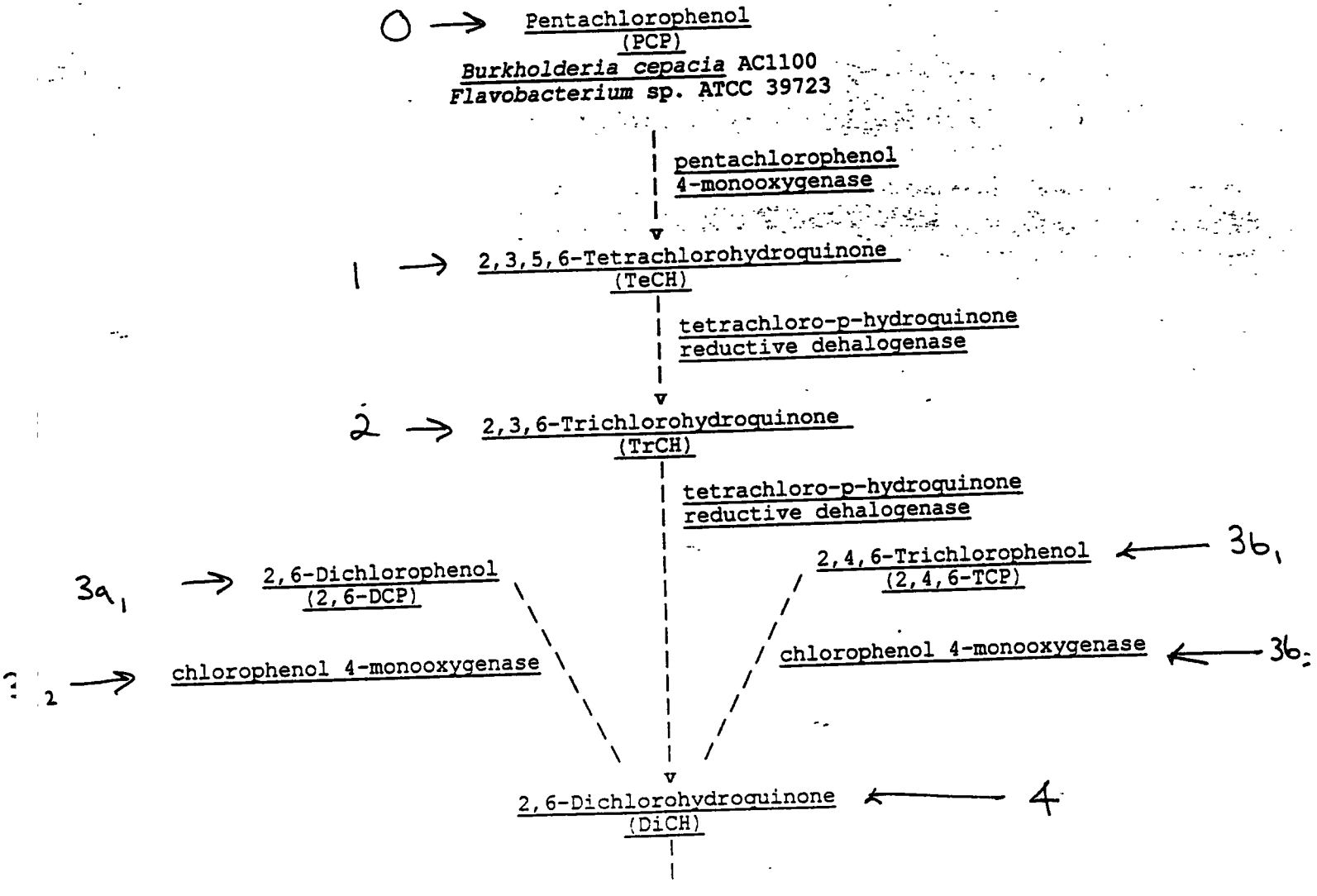
[Compounds and Reactions] [BBD Main Menu]

This pathway was contributed by **Dr. Larry Wackett**, University of Minnesota. The Pentachlorophenol Compound Page is a good example of a starting compound page. The Pentachlorophenol 4-Monooxygenase Reaction is a good example of a reaction page.

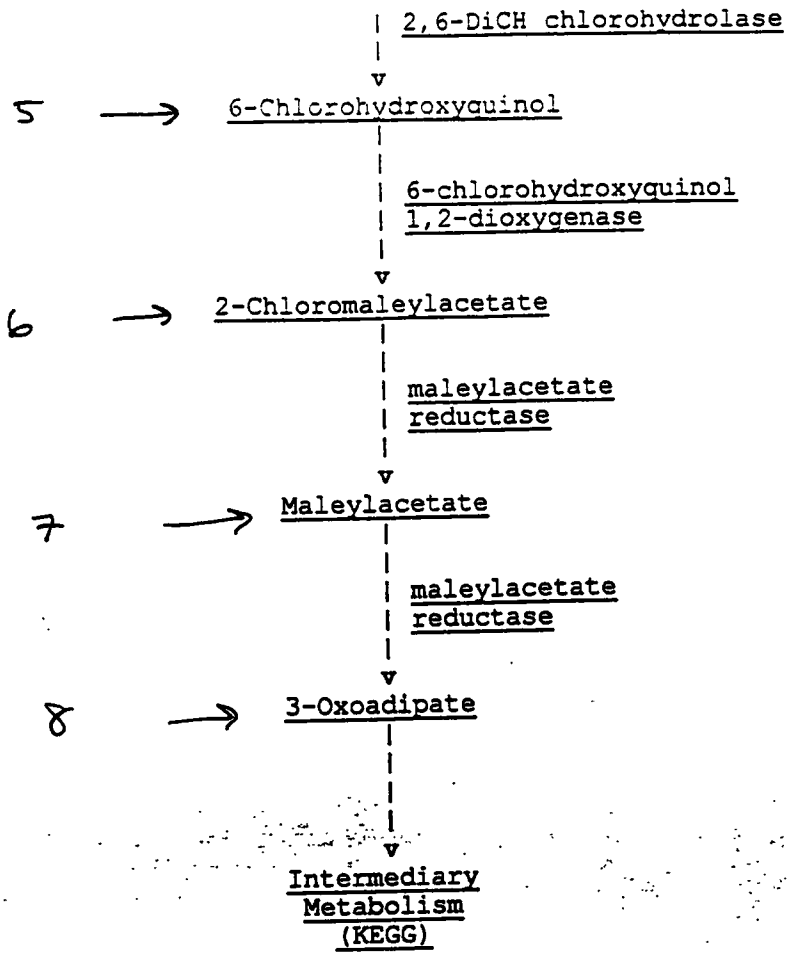
Pentachlorophenol (PCP) is a chlorinated insecticide and fungicide. It is used primarily to protect timber from fungal rot and wood boring insects. PCP is significantly toxic to mammals, plants, and many microorganisms. Despite this, bacteria have been identified that are resistant to relatively high PCP concentrations and can metabolize it to carbon dioxide and chloride. Bacteria have been used successfully in PCP bioremediation.

The Japanese Database for Environmental Fate of Chemicals has information on the rates and pathways of Biodegradation of Chlorophenols and Chlorobenzenes in Sediments. For a comprehensive treatment of microbial PCP metabolism, see K.A. McAllister, H. Lee & J.T. Trevors (1996) Biodegradation 7:1-40.

This is a text-format pentachlorophenol degradation pathway. Organisms which can initiate the pathway are given, but other organisms may also carry out later steps. Follow the links for more information on compounds or reactions. This map is also available in graphic (15k) format.



 Mika Dunn



[Compounds and Reactions] [BBD Main Menu]

Page Author(s): Yuemo Zeng

3718 Old Battleground Road, Greensboro, NC 27410
Phone (336) 288-7180, Fax (336) 288-8980

S&ME, Inc.

Fax

Paul Lane

To: Mr. ~~Mike Dunn~~ **From:** Edmund Henriques

Fax: (615) 726-3404 **Pages:** ~~3~~ 5

Phone: (800) ~~895-2448~~ 765-0980 **Date:** ~~03/04/99~~ 3/11/99

Re: Request for Information **CC:** File

x **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

- **Comments:**

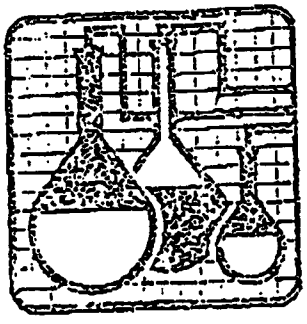
Specialized Assays has been providing me with analytical data for a groundwater assessment where pentachlorophenol is the contaminant. I now wish to look at the impacted groundwater to determine the presence or absence of aerobic biodegradation products. I have attached researched data regarding possible pentachlorophenol biodegradation mineralization products and bi-products. Please review the listed products and bi-products and provide me with suggested analytical method(s) for their detection. Are some of the compounds only detectable as Tentatively Identified Compounds (TICs)? If so, can additional standards be run to provide calibration for their detection and quantification?

Any assistance you may provide will be most help full.

Please feel free to call me at (336) 288-7180 if you have any questions

Best Regards

Edmund Henriques



Specialized Assays, Inc.
2960 Foster Creighton Drive
P.O. Box 40566
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-0954

Date: 3-5-99 Page 1 of 2

To: Edmund Henriques

From: mike Dunn

Reference: PCP degradation

Message:

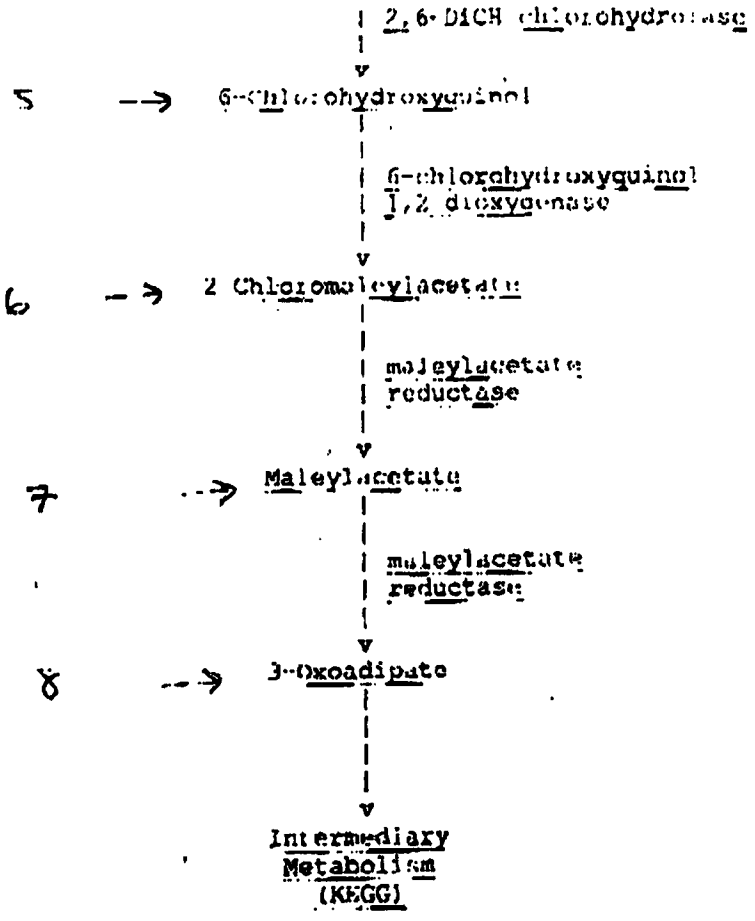
yes, TEC's o/k

must find furnace slot.

contact Paul Lane x144 for pricing

☐ Respond ASAP ☐ Hard Copy to Follow

☐ No Response Necessary ☐ Please Confirm Receipt



[Compounds and Reactions] [BBD Main Menu]

Page Author(s): Yuemo Zeng

1, 2, 4, 5, 6 – TIC's by 8270, must find/purchase stds

3a, 3b – already 8270 targets

7, 8 – unknown

APPENDIX E

PROPOSED WELL CONSTRUCTION DETAIL EXAMPLES

MONITORING WELL INSTALLATION SKETCH

PROJECT Marsh Lumber Co. PIEZOMETER NUMBER to be assigned

GROUND ELEVATION _____ DEPTH TO WATER LEVEL _____

BENCH MARK DATA _____ ELEVATION OF WATER LEVEL _____

ELEVATION OF TOP OF PIEZOMETER _____

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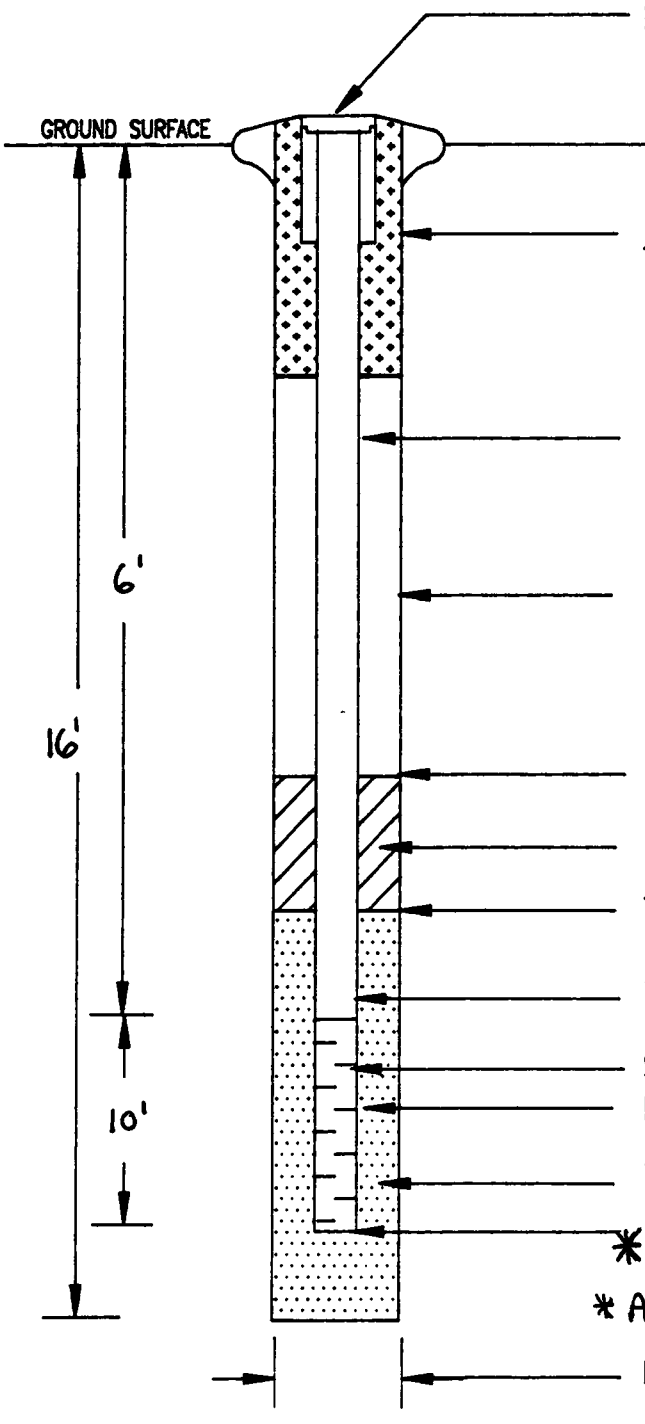
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING



THICKNESS OF SURFACE SEAL _____

TYPE OF SURFACE SEAL _____

I.D. OF RISER PIPE 2"

TYPE OF RISER PIPE PVC

TYPE OF BACKFILL Portland

ELEVATION OF TOP OF SEAL _____

TYPE OF SEAL Bentonite

TOP ELEVATION OF FILTER SAND 2' above sand

BOTTOM ELEVATION OF RISER _____

SIZE OF SCREEN OPENINGS 0.010

PIEZOMETER SCREEN DIAMETER 2 inch

TYPE OF FILTER SAND #2 sand

*BOTTOM ELEVATION OF PIEZOMETER 16' (estimated)

* At or just above the top of clay layer surface

DIAMETER OF BOREHOLE 8.25"