

# BUREAU OF WATER

South Carolina Department of Health and Environmental Control

## Source Water Assessment

A Technical Report for Public Water Systems

Water System: **HILTON HEAD NO 1 PUBLIC SERVICE  
DIS**

**0720006**

**Beaufort County**

Water Source: **G07122, G07123, G07125, G07378**



May 31, 2006



South Carolina Department of Health  
and Environmental Control

[www.scdhec.net/water](http://www.scdhec.net/water)

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## **SUMMARY**

This report contains the completed groundwater susceptibility assessment for the HILTON HEAD NO 1 PUBLIC SERVICE DIS, System No. 0720006. The system includes public supply wells: G07122, G07123, G07125, G07378. The system is located in Beaufort County, South Carolina and serves a primary population of approximately 11568. The system is located in Vulnerability Area 3 in the Lower Coastal Plain physiographic province. The source aquifer is confined. Of the 18 potential contaminant sources (PCSs) in this initial inventory, 13 PCSs had more than one category of contaminants. The inventory includes 11 PCSs with volatile organic compounds (VOCs); 11 PCSs with petroleum products; 10 PCSs with metals; 1 PCSs with nitrates; 5 PCSs with pesticides/herbicides; no PCSs with pathogens; no PCSs with radionuclides; and no PCSs with undetermined contaminants. The susceptibility analysis determined 0 PCSs with a high susceptibility ranking; 11 PCSs with a moderate susceptibility ranking; and 6 PCSs with a low susceptibility ranking.

## **INTRODUCTION**

The 1996 Amendments to the Safe Drinking Water Act required the States to develop Source Water Assessment and Protection Programs (U.S. Environmental Protection Agency, 1996). The program's goal is to provide added protection of both groundwater and surface water drinking water sources by conducting source water assessments and implementing protection measures. To meet this goal, SCDHEC is serving as the coordinating agency for the State's Source Water Assessment and Protection Program (SWAP) and has conducted assessments of the source water for all federally defined drinking water supply systems. A more detailed description of the program can be found in a Bureau of Water publication, *A Guide to Source Water Protection* (September 2002).

This report contains the completed assessment for the HILTON HEAD NO 1 PUBLIC SERVICE DIS, System No. 0720006, that includes drinking water well(s): G07122, G07123, G07125, G07378. Site-specific information for each susceptibility assessment was obtained from SCDHEC files, site inspections, and published reports on hydrogeology (Colquhoun and others, 1983) and aquifer tests (Aucott and Newcome, 1986; Newcome, 1993). A copy of this assessment report can be obtained by contacting the Bureau of Water in Columbia, South Carolina at (803) 898-4300 or on the web at <http://www.scdhec.net/water>.

## **WATER INTAKE INTEGRITY AND VULNERABILITY**

Sanitary surveys of public water supply systems are conducted periodically by the Department. Part of that inspection includes the evaluation of the physical integrity of the intake structure and identification of any potential threats to the intake. To get more information about the latest sanitary survey for System No. 0720006, call the Drinking & Recreational Waters Compliance Section of the SCDHEC in Columbia, South Carolina at (803) 898-3543.

The SCDHEC evaluated the relative vulnerability of regional aquifers on the basis of geographic/physiographic location within the state. The State's hydrogeology is divided into three geographic areas of relative vulnerability (Figure 1.) Aquifers in Area 1 are generally unconfined and are considered vulnerable to activities at land surface. Aquifers in Area 2 generally are semi-confined and are considered less vulnerable relative to aquifers in Area 1. Aquifers in Area 3 generally are confined and are considered the least vulnerable, relative to Areas 1 and 2.

## **DESCRIPTION OF SYSTEM AND SOURCE**

The HILTON HEAD NO 1 PUBLIC SERVICE DIS, System No. 0720006 is located in Beaufort County, South Carolina. The system serves a primary population of approximately 11568. The drinking water sources for the system is/are 4 drinking water supply well(s): G07122, G07123, G07125, G07378 (Table 1).

System No. 0720006 is located in Vulnerability Area 3 in the Lower Coastal Plain physiographic province. The source aquifer is confined.

## **DELINEATION OF SOURCE WATER PROTECTION AREAS**

Source Water Protection Areas (SWPAs) or Wellhead Protection Areas (WHPAs) were delineated for the 4 water supply well(s) in System No. 0720006. For wells in the Piedmont or rock wells, a volumetric equation incorporating pumping rate and recharge rate was used to calculate an area of contribution. The area of contribution is equal to the SWPA for the well. For wells in the Coastal Plain, RESSQC – a U. S. Environmental Protection Agency computer code - was used to estimate time of travel (TOT) in the source aquifer and to delineate TOT zones around each well. (U. S. Environmental Protection Agency, 1993). The outer edge of the 10-year TOT zone delineates the SWPA for each well. Site-specific well construction and aquifer hydraulic properties used to calculate the 1-, 5-, and 10-year time of travel zones surrounding each well area summarized in Table 1.

## **POTENTIAL CONTAMINANTS OF INTEREST AND THE INVENTORY OF POTENTIAL CONTAMINANT SOURCES**

Eight categories of potential contaminants of interest were considered by the SCDHEC for susceptibility analysis. These eight categories include: volatile organic compounds (VOCs), petroleum products, metals, nitrates, pesticides/herbicides, pathogens, radionuclides, and undetermined.

Potential contaminant sources (PCSs) are defined by land-use or site-specific activities that could potentially release contaminants of interest within the SWPA. Examples of PCSs include gas stations, dry cleaners, agricultural areas, automobile repair shops, landfills, septic systems, and manufacturers, businesses, and facilities where potential contaminants of interest are used or stored.

The SCDHEC identified an initial inventory of the potential contaminants of interest at 18 PCSs in the SWPAs for System No. 0720006 (Appendix A). The inventory and location of each PCS was obtained from the SCDHEC databases and site inspections. The inventory was added to a GIS database and plotted relative to the SWPA around each well (Figure 2.).

## **SUSCEPTIBILITY ANALYSIS**

A susceptibility matrix is used to rank the susceptibility of source water to a potential contaminant source within a SWPA (Table 2.). The matrix assigns a ranking of high, moderate or low susceptibility to each PCS on the basis of location of the public supply system (Vulnerability Area 1, 2, or 3, Figure 1.) and the contaminant of interest.

System No. 0720006 had 11 PCSs with VOCs; 10 PCSs with metals; 5 PCSs with pesticides/herbicides; no PCSs with pathogens; no PCSs with radionuclides; no PCSs with undetermined; 11 PCSs with petroleum products; and 1 PCSs with nitrates (Appendix A). System No. 0720006 had 0 PCSs with a high susceptibility ranking; 11 PCSs with a moderate susceptibility ranking; and 6 PCSs with a low susceptibility ranking (Appendix B).

## **LOCAL PROTECTION PLANS**

The information provided in this report is intended to be the foundation of a local effort to provide better protection of our state's sources of drinking water. The initial inventory of PCSs and potential contaminants of interest presented in this report should be verified by the owners and managers of System No. 0720006 for accuracy and annually updated to reflect changes in land-use and site-specific activities within the SWPA.

## **SELECTED REFERENCES**

- Aucott, W.R., and Newcome, Roy, 1986, Selected aquifer-test information for the Coastal Plain aquifers of South Carolina: U.S. Geological Survey Water-Resources Investigations Report 86-4159.
- Colquhoun, D. J., Woollen, I. D., Van Nieuwenhuise, D. S., Padgett, G. G., Oldham, R. W., Boylan, D. C., Bishop, J. W., and Howell, P. D., 1983, Surface and Subsurface Stratigraphy, Structure and Aquifers of the South Carolina Coastal Plain.
- Newcome, R., Jr., 1993, Pumping Tests of the Coastal Plain Aquifers in South Carolina, With a Discussion of Aquifer and Well Characteristics: State of South Carolina Water Resources Commission Report 174.
- U. S. Environmental Protection Agency, 1993, RESSQC-WHPA Version 2.2.

**Table 1. Parameters Used to Calculate Time-of-Travel  
Zones for Each Well and Delineate the Source Water Protection Area.**

**TABLE 1: Parameters used to calculate time-of-travel zones for each well and delineate the source water protection area.**

**HILTON HEAD NO 1 PUBLIC SERVICE DISTRICT**

**System 0720006**

<i>Well Number</i>	<i>Well Depth (feet)</i>	<i>Aquifer</i>	<i>Screened Length (feet)</i>	<i>Pumping Rate (gpm)</i>	<i>Transmissivity (ft<sup>2</sup>/d)</i>	<i>Hydraulic Gradient</i>	<i>Regional Flow Direction</i>
G07122	200		80	1132	59976	0.000238	255
G07125	200		85	1252	59976	0.000238	255
G07396	200	FLORIDAN	80	1250	41694	0.000238	255

**Table 2. Groundwater Susceptibility Matrix**



**Table 2**  
**Groundwater Susceptibility Matrix**

Type of Contaminant	Vulnerability Area 1	Vulnerability Area 2	Vulnerability Area 3
Volatile Organic Compounds (VOCs)	HS	HS	MS
Petroleum Products	HS	MS	LS
Metals	HS	MS	LS
Nitrates	HS	MS	LS
Pesticides/Herbicides	HS	MS	LS
Pathogens	HS	LS	LS
Radionuclides	HS	MS	LS
Undetermined	HS	MS	MS

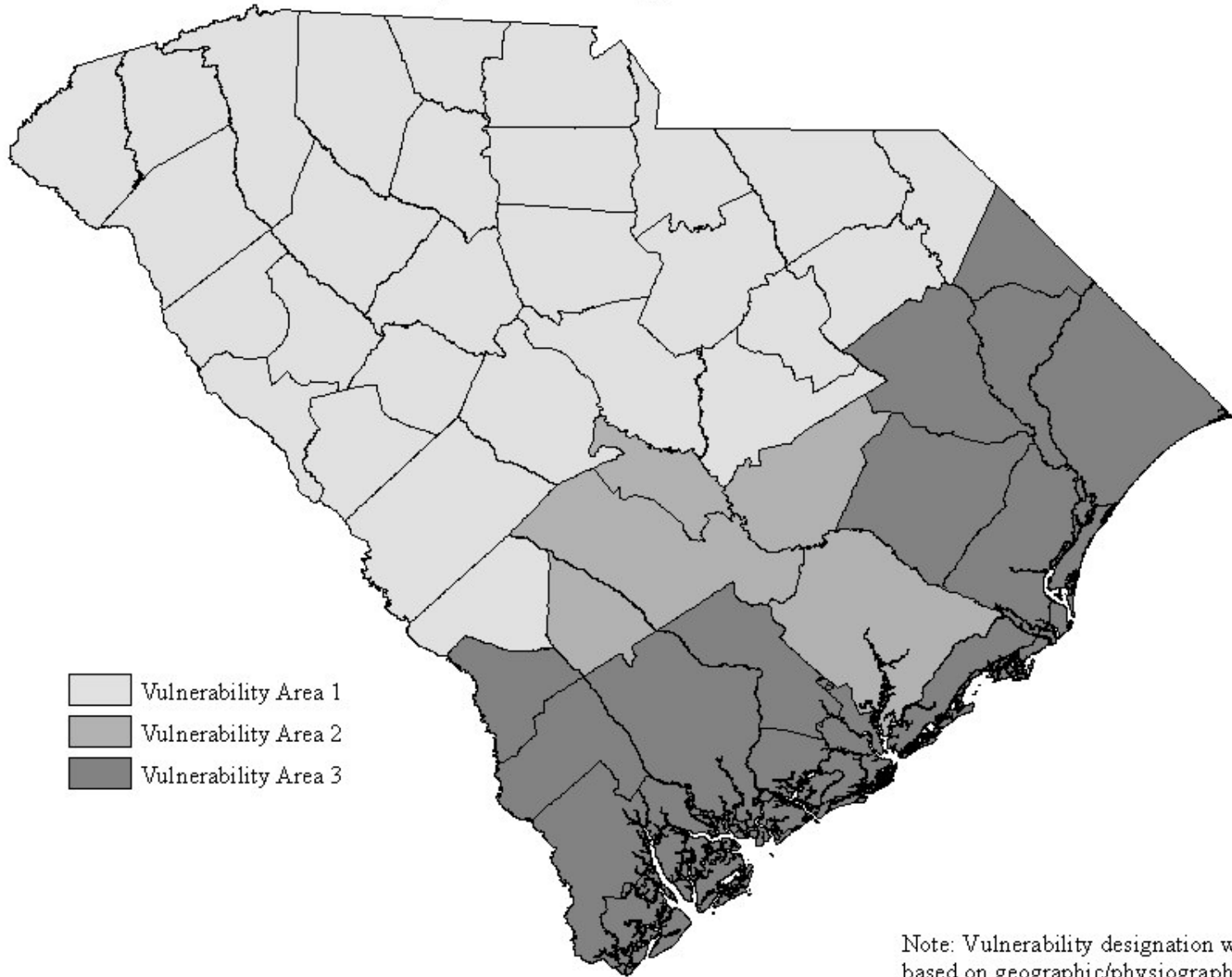
HS = High Susceptibility

MS = Moderate Susceptibility

LS = Low Susceptibility

**Figure 1. Vulnerability Designations for the State**

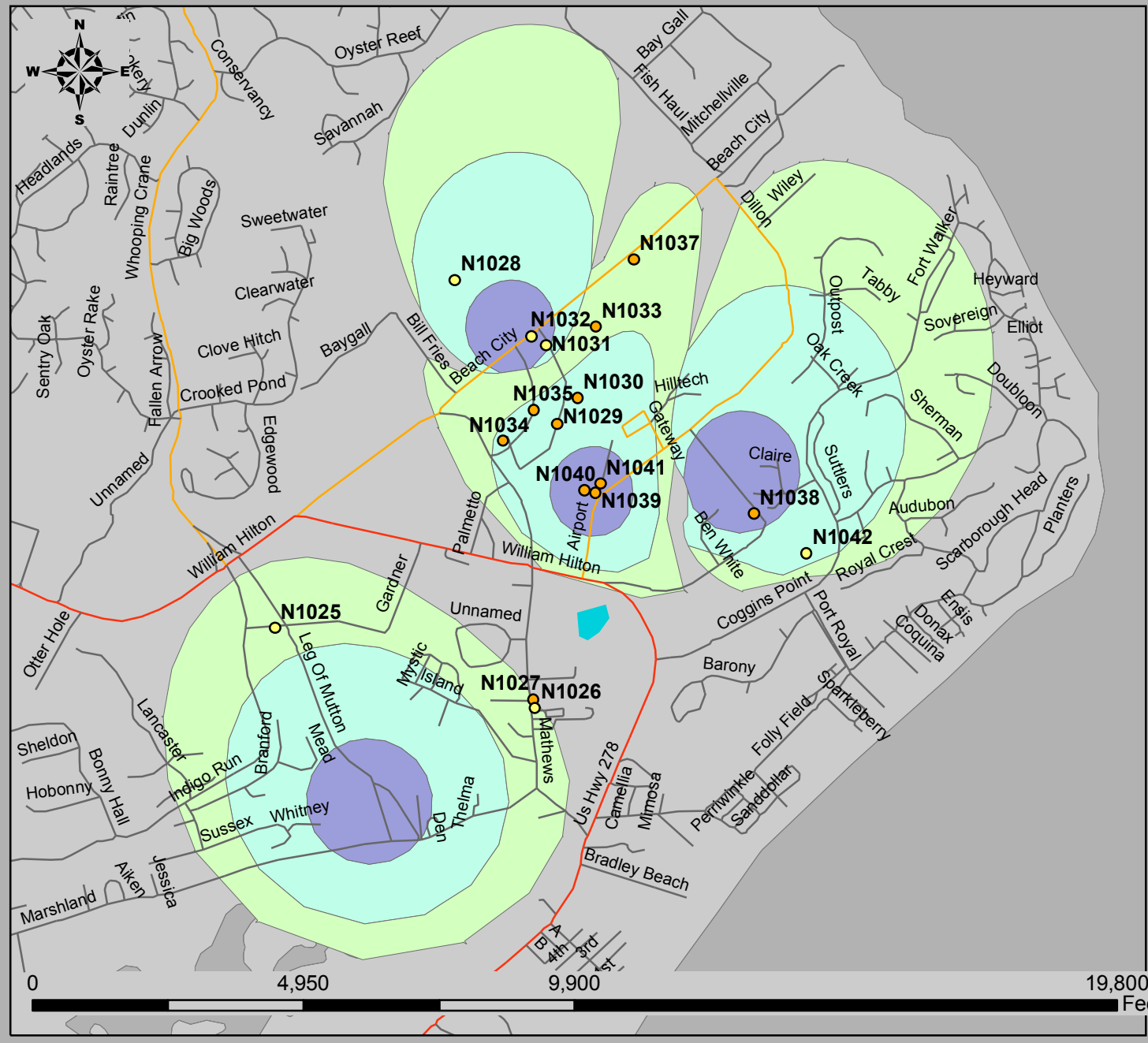
## Vulnerability Area Designations for the State



Note: Vulnerability designation wells based on geographic/physiographic location within the state.

**Figure 2. Source Water Protection Area and  
Locations of Potential Contaminant Sources for HILTON HEAD NO 1  
PUBLIC SERVICE DIS.**

# Source Water Protection Area(s) and Location of Potential Contaminant Source(s) for Hilton Head No 1 PSD, System No. 0720006



Source Water Protection Area for the above system. This figure shows the PCSs for the system wells. PCSs are located in one of three time-of-travel (TOT) zones which define the Source Water Protection Area (SWPA). The area of the state where this SWPA is located is shown in the lower right-hand corner of the map. The level of susceptibility for PCSs is based on the area of the state where the system is located and the type of contaminants associated with the PCS.

## LEGEND

### Potential Contaminant Sources (PCS) and Susceptibility

- High Susceptibility
- Moderate Susceptibility
- Low Susceptibility
- Roads

### Source Water Protection Area (SWPA)

- 1 Year TOT
- 5 Year TOT
- 10 Year TOT



**APPENDIX A**  
**Inventory of Potential Contaminants of Interest for each**  
**Potential Contaminant Source for HILTON HEAD NO 1 PUBLIC SERVICE**  
**DIS.**

**APPENDIX A**

**HILTON HEAD NO 1 PUBLIC SERVICE DISTRICT**

System No. 0720006

<i>Site ID</i>	<i>Potential Contaminant Source</i>	<i>Address</i>	<i>Volatile Organic Compounds</i>	<i>Petroleum Products</i>	<i>Metals</i>	<i>Nitrates</i>	<i>Pesticides/Herbicides</i>	<i>Pathogens</i>	<i>Radionuclides</i>	<i>Undetermined</i>
N1035	ADVANCED AUTO BODY <i>AUTO/TRUCK/BUS BODY SHOP</i>	CARDINAL DR HILTON HEAD	Yes	No	Yes	No	No	No	No	No
N1027	CUSTOM CLEANERS <i>DRY CLEANER</i>	MATTHEWS DR HILTON HEAD	Yes	No	No	No	No	No	No	No
N1029	UNITED PARCEL SERVICE <i>AUTO/TRUCK/BUS REPAIR SHOP</i>	24 HUNTER RD HILTON HEAD	Yes	Yes	Yes	No	No	No	No	No
N1030	BEACHSIDE TIRE & AUTO <i>AUTO/TRUCK/BUS REPAIR SHOP</i>	HUNTER RD HILTON HEAD	Yes	Yes	Yes	No	No	No	No	No
N1034	ISLAND FUNERAL HOME <i>GRAVEYARDS/FUNERAL SERVICES</i>	4 CARDINAL RD HILTON HEAD	Yes	No	No	No	Yes	No	No	No
N1040	LOWCOUNTRY AIR <i>UST</i>	GATEWAY CIRCLE HILTON HEAD	Yes	Yes	No	No	No	No	No	No
N1037	SAVANNAH TIRE AND ALIGNMENT <i>AUTO/TRUCK/BUS REPAIR SHOP</i>	144 BEACH CITY RD HILTON HEAD	Yes	Yes	Yes	No	No	No	No	No
N1038	PORT ROYAL GOLF MAINTENANCE <i>GOLF COURSE</i>	69 UNION CEMETERY RD HILTON HEAD	Yes	Yes	Yes	Yes	Yes	No	No	No

<i>Site ID</i>	<i>Potential Contaminant Source</i>	<i>Address</i>	<i>Volatile Organic Compounds</i>	<i>Petroleum Products</i>	<i>Metals</i>	<i>Nitrates</i>	<i>Pesticides/Herbicides</i>	<i>Pathogens</i>	<i>Radionuclides</i>	<i>Undetermined</i>
N1039	LOW COUNTRY ADVENTURES <i>AST</i>	UNION CEMETERY RD HILTON HEAD	Yes	Yes	No	No	No	No	No	No
N1041	BUDGET <i>AUTO/TRUCK/BUS REPAIR SHOP</i>	UNION CEMETERY RD HILTON HEAD	Yes	Yes	Yes	No	No	No	No	No
N1033	HILTON HEAD AIRPORT <i>AIRPORT</i>	HILTON HEAD	Yes	Yes	Yes	No	No	No	No	No
N1026	HILTON HEAD TEXACO <i>LUST SITE</i>	125 MATTHEWS DR HILTON HEAD IS	No	Yes	No	No	No	No	No	No
N1042	PORT ROYAL GOLF COURSE <i>GOLF COURSE</i>	PORT ROYAL DR HILTON HEAD	No	No	Yes	No	Yes	No	No	No
N1028	PALMETTO HALL GOLF COURSE <i>GOLF COURSE</i>	HILTON HEAD	No	No	Yes	No	Yes	No	No	No
N1031	AVIS <i>UST</i>	HUNTER RD HILTON HEAD	No	Yes	No	No	No	No	No	No
N1032	HILTON HEAD EXTERMINATORS <i>PESTICIDE/HERBICIDE/FERTILIZER S</i>	BEACH CITY RD HILTON HEAD	No	Yes	No	No	Yes	No	No	No
N1025	COASTAL CONCRETE <i>CONCRETE PLANT</i>	LEG O MUTTON DR HILTON HEAD	No	No	Yes	No	No	No	No	No



**APPENDIX B**  
**Potential Contaminant Source Susceptibility Analysis**  
**for HILTON HEAD NO 1 PUBLIC SERVICE DIS.**

**APPENDIX B**

**HILTON HEAD NO 1 PUBLIC SERVICE DISTRICT**

System No. 0720006

<b>*SUSCEPTIBILITY</b>	<b>SITE ID</b>	<b>SITE NAME</b>	<b>FACILITY DESCRIPTION</b>
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**LS**

N1025	Coastal Concrete	Concrete Plant
N1026	HILTON HEAD TEXACO	Gas Station
N1028	Palmetto Hall Golf Course	Golf Course
N1031	Avis	Car Rental
N1032	Hilton head Exterminators	Pest Control
N1042	Port Royal Golf Course	Golf Course

**Total Number of Sites with LS 6**

**MS**

N1027	Custom Cleaners	Dry Cleaners
N1029	United Parcel Service	Fleet Fueling and Maintenance
N1030	Beachside Tire & Auto	Auto Repair
N1033	Hilton Head Airport	Airport
N1034	ISLAND FUNERAL HOME	Funeral Home
N1035	Advanced Auto Body	Body Shop
N1037	Savannah Tire And Alignment	Auto repair
N1038	Port Royal Golf Maintenance	Golf Course maintenance
N1039	Low Country Adventures	Air Port Services
N1040	LOWCOUNTRY AIR	Air Services
N1041	Budget	Car/Truck Rental

**Total Number of Sites with MS 11**

**Total Number of Sites for System 0720006 is 17**

<p><b>* HS = High Susceptibility</b> <b>MS = Moderate Susceptibility</b> <b>LS = Low Susceptibility</b></p>
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**APPENDIX B**

**HILTON HEAD NO 1 PUBLIC SERVICE DI**

System No. 0720006

<b>*SUSCEPTIBILITY</b>	<b>SITE ID</b>	<b>SITE NAME</b>	<b>FACILITY DESCRIPTION</b>
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MS

N1040

LOWCOUNTRY  
AIR

Air Services

**Total Number of Sites with MS 11**

**Total Number of Sites for System 0720006 is 17**

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<p><b>* HS = High Susceptibility</b> <b>MS = Moderate Susceptibility</b> <b>LS = Low Susceptibility</b></p>
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