

land use in the FLUMs is residential, which comprises nearly 75% of the future land use in the basin. Protected Resources make up the next largest category, although this land use makes up only 10 of the future land use in the basin.

Land Use/Cover	Acres	%
Single Family Residential	28,618	64.2
Multi-family Residential	2,279	5.1
Rural Residential	6,408	14.4
Commercial	1,267	2.8
Industrial	993	2.2
Mining	0	0
Agricultural	519	1.2
Wetlands	0	0
Protected Resource	4,524	10.1
<b>TOTAL</b>	<b>44,607</b>	<b>100.0</b>

#### **5.1.4 Surface Water Hydrology and Water Management Practices**

There are no USGS streamflow gages in the Lemon Bay Basin. Several creeks, including Alligator Creek, Forked Creek, Gottfried Creek, Rock Creek, Oyster Creek, and Buck Creek, drain to the eastern shore of Lemon Bay and contribute small quantities of fresh water to the bay. Coral Creek discharges to Gasparilla Sound south of Lemon Bay. Tributary discharges correspond to rainfall.

The Lemon Bay Basin is that portion of the Charlotte Harbor Watershed west of the Charlotte Harbor Proper Basin, extending westward to the Gulf of Mexico, and including Manasota Key and Don Pedro Island. Within the Lemon Bay Basin, dominant land uses are range lands (24%), forested uplands (20%), open saltwater (14%), and medium density residential (13%) (Table 5-2). This basin includes portions of northwestern Charlotte County and southwestern Sarasota County.

##### **5.1.4.1 Urban Management Practices**

The urbanized areas of the Lemon Bay Basin are found along the Gulf Coast and in the southern portions of the basin. Englewood is on the Gulf Coast in the northern part of the basin, across Lemon Bay from Manasota Key, and Grove City is south of Englewood, opposite the southern end

of Manasota Key. Further inland, east of Buck Creek and north of the east branch of Coral Creek, is the Rotonda development.

### Water Use

Urban water uses include public water supply, mining facilities, industrial operations, and recreational uses. Discussion of water use is limited to facilities with an average permitted quantity greater than 0.5 million gallons per day (MGD). All water use information for those parts of the Charlotte Harbor NEP study area within the borders of the Southwest Florida Water Management District (SWFWMD), including the entire Lemon Bay Basin, is from SWFWMD (1997) and SWFWMD (1992).

#### - Public Supply

Table 5-4 lists the public water supply facilities in the Lemon Bay Basin with permitted withdrawals of more than 0.5 MGD, as well as the withdrawal sources for the facilities. A discussion of the populations served by each plan, withdrawal amounts, and withdrawal methods follows.

Facility	Permitted Average Withdrawal (MGD)	Source
Gasparilla Island Water Assoc., Inc.	1.70	Surficial, Intermediate aquifers, PRMRWSA
Rotonda West Utility Corp.	1.66	Surficial, Intermediate aquifers
Sarasota County Utility System	2.08	Sorrento Wellfield - Intermediate aquifer

The Gasparilla Island Water Association, Inc., is a private utility which operates 32 wells withdrawing from the surficial aquifer. The wells average 30 feet deep, and withdraw the permitted average of 0.43 MGD from the surficial aquifer. The utility also may purchase up to 1.4 MGD from the PRMRWSA. The Gasparilla Island Water Association also has four wells which withdraw from the Intermediate aquifer, producing a finished water capacity of 0.75 MGD. The total permitted average withdrawal for the utility is 1.7 MGD. During 1990, the utility served approximately 4,350 people with an average demand of 1.0 MGD. Of this, 0.87 MGD was from the utility's wellfields and 0.30 MGD was from the Peace River Facility (SWFWMD, 1992).

The Rotonda West Utility Corporation is a private utility serving the 23,000-acre Rotonda development. Its water supply system is via 29 wells from the surficial aquifer which average 30 feet deep, and via four wells from the Intermediate aquifer which average 145 feet deep. Permitted average withdrawals from both sources is 1.66 MGD, of which 0.35 MGD is from the surficial and

1.31 MGD is from the Intermediate aquifer. This facility provided potable water supply to a population of 4,808, with use of 0.52 MGD, during 1990 (SWFWMD, 1992).

The Sarasota County Utility System operates the Sorrento Wellfield. The Sorrento Wellfield was formerly privately owned, and is just west of US 41 between Sarasota and Venice. The three wells withdrawing from the wellfield are permitted for an average of 2.08 MGD, and average 350 feet deep. Withdrawals are from the Intermediate aquifer (SWFWMD, 1992).

#### - Mining

There are 286 acres of mining land use within the Lemon Bay Basin, making up approximately 0.6% of the basin. Two mining facilities are found within the basin which have water uses greater than 0.5 MGD. Table 5-5 lists the mining operations, their permitted average withdrawals, and withdrawal source.

The Handy Phio, Inc., mining operation used 1.40 MGD in 1994, almost twice its permitted maximum withdrawal, and nearly three times its permitted average withdrawal. The Ajax Paving Industries, Inc., mine used its entire permitted average withdrawal of 2.46 MGD in 1994, and has a permitted maximum withdrawal of 2.95 MGD (WUSE&P, 1997).

Company	Permitted Average Withdrawal (MGD)	Permitted Maximum Withdrawal (MGD)	Source
Handy Phio, Inc.	0.54	0.72	Surface water
Ajax Paving Industries, Inc.	2.46	2.95	Surface water

#### - Industrial

The Lemon Bay Basin contains only 154 acres of industrial land use, as determined from the 1990 SWFWMD land use coverage. No industrial water uses of greater than 0.5 MGD were found for this basin.

#### - Recreational

Recreational water use for Charlotte and Sarasota counties was previously described in the Myakka River Basin recreational water use section of this report.

## Water Discharge and Reuse

There are no major domestic waste water treatment plants in the Lemon Bay Basin.

### 5.1.4.2 Agricultural Management Practices

Agricultural land use estimates for all major crops for 1990 in Charlotte County are listed in Table 5-6, as well as estimates of irrigated acreages for each of these crops and estimated water use. Sarasota County estimates for 1990 agricultural land use, irrigation type, and estimated water use are shown in Table 5-7.

Crop	Acreage	Irrigation Type -	Acreage	Water Use (MGD)
Agronomic	200	Seepage	200	0.2
Row/Field Crops	3,100	Seepage	3,100	9.1
Citrus	1,800	Low Volume Seepage	1,530 180	3.2
Nursery	220	Overhead	220	1.5
Sod	5,000	Seepage	5,000	10.0
Irrigated Pasture	555	Seepage	555	0.9
TOTALS	10,875	Low Volume Seepage	1,530 9,035	24.9

Crop	Acreage	Irrigation Type -	Acreage	Water Use (MGD)
Row/Field Crops	1,500	Seepage	1,500	4.4
Citrus	10,500	Low Volume Seepage	8,925 1,050	13.6
Nursery	215	Overhead	215	1.4
Sod	1,200	Seepage	1,200	2.9

**Table 5-7. 1990 estimated crop acreages, irrigation types, and water use in Charlotte County.**

Crop	Acreage	Irrigation Type - Acreage	Water Use (MGD)
Irrigated Pasture	150	Seepage 150	0.3
Totals	13,565	Overhead 215 Low Volume 8,925 Seepage 3,900	22.6

## 5.2 Water Quality Conditions

No comprehensive data bases were identified which allowed a comprehensive assessment of long-term and current water quality conditions either during the development of the "Compendium of Existing Information" or while compiling background data for this subsequent "Synthesis of Existing Information".

## 5.3 Estimation of Pollution Potential

Nonpoint source loading of runoff, total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) was estimated for each subbasin by computing nonpoint source pollution loads based on estimated rainfall, land use, and soil cover. The pollution load potential was estimated in order to prioritize major basins or subbasins. Thus, the method development was focused on estimating relative loads in a consistent manner among subbasins to avoid biasing the major basin or subbasin evaluation.

The detailed rainfall, 1988 SFWMD land cover, SWFWMD 1990 land cover, and USDA soil data were used to estimate relative runoff discharge rates for the subbasins. Using a surface-fitting approach, rainfall values for each month were computed for the years 1970 to 1996. Runoff was calculated by multiplying the rainfall estimate by a literature-based runoff coefficient value for each parcel in the land cover and soil database. Runoff coefficients used for these analyses were specific for south Florida, varied by land use/cover and hydrologic soil group, and were adjusted for wet or dry season conditions. Hydrologic loadings were estimated on an "off the land" basis, and it was assumed that all runoff entered the estuary, regardless of whether pumps or gravity flow was used to discharge it from the subbasin.

Monthly-specific pollutant loading estimates for TN, TP, and TSS were computed for each individual parcel of designated land use and soil within a subbasin. Loadings were calculated using land use specific pollutant concentration estimates specific for south Florida. Pollutant concentrations reported in the literature have widely varying values, and this resulted in an increased

level of uncertainty in the absolute values of the load estimates. However, more intensively developed land uses such as medium and high density residential and intensive agriculture clearly have a higher potential for TSS, TN, and TP loading to the estuary, and the pollutant load prioritization of subbasins for this study reflects these load source patterns. Existing domestic and industrial point sources within the basin are also listed and their potential impacts discussed.

Unless otherwise indicated, the following estimates were rounded to the nearest 1 thousand acres, 1 million cubic meters of discharge, and ton of pollutant load. For purposes of discussion, urban land uses were operationally defined as residential, commercial, industrial, mining, institutional, transportation, and utilities. Agricultural land uses were operationally defined as pasture, groves, feedlots, row and field crops and nursery. Undeveloped land uses were defined as range lands, barren lands, and upland forests.

### 5.3.1 Load Estimates for the Lemon Bay Basin

The total estimated annual runoff discharge for the Lemon Bay Basin was 48 million cubic meters from a contributing area of 33,000 acres. The estimated annual pollutant loads were 134 tons of TN, 32 tons of TP, and 1,926 tons of TSS.

The largest sources of pollutant loads from runoff were urban land uses. The 12,000 acres of urban land uses in the subbasin were estimated to contribute 57 tons of TN, 9 tons of TP, and 1,150 tons of TSS. Table 5-8 presents the loads from runoff by land use for this subbasin. Residential lands were the primary urban land uses and were dominated by medium density residential parcels.

There were very few agricultural lands within this subbasin (1,000 acres). These lands were estimated to contribute a total of 1 million cubic meters of runoff, 3 tons of TN, 1 ton of TP, and 11 tons of TSS per year. These agricultural lands were primarily comprised of pasture and grove lands.

**Table 5-8. Total nitrogen, total phosphorus, total suspended solids, and hydrologic load by land use type within the Lemon Bay Basin.**

Land Use Type	TN		TP		TSS		Hydrological Load	
	tons/yr	% of subbasin	tons/yr	% of subbasin	tons/yr	% of subbasin	m <sup>3</sup>	% of subbasin
Low Density Residential	9	7%	1	4%	86	5%	4,322,976	9%
Medium Density Residential	29	22%	4	14%	440	23%	11,774,733	25%
High Density Residential	8	6%	1	5%	254	13%	3,576,918	7%
Commercial	6	5%	1	3%	247	13%	3,035,576	6%
Industrial	1	1%	0	1%	64	3%	618,042	1%
Mining	1	1%	0	1%	43	2%	785,015	2%
Institutional, Transport., Util.	2	1%	0	0%	15	1%	1,212,987	3%

**Table 5-8. Total nitrogen, total phosphorus, total suspended solids, and hydrologic load by land use type within the Lemon Bay Basin.**

Range Lands	33	25%	17	52%	169	9%	11,695,442	24%
Barren Lands	0	0%	0	0%	3	0%	256,962	1%
Pasture	2	2%	1	2%	7	0%	766,825	2%
Groves	0	0%	0	0%	2	0%	169,147	0%
Nursery	0	0%	0	0%	2	0%	28,512	0%
Upland Forests	41	31%	6	18%	595	31%	9,773,707	20%
<b>TOTAL</b>	<b>134</b>	<b>100%</b>	<b>32</b>	<b>100%</b>	<b>1,926</b>	<b>100%</b>	<b>48,016,841</b>	<b>100%</b>

### 5.3.2 Pollution Source Inventory

The purpose of this compilation of a point source inventory for the Lemon Bay Basin is to describe the numbers, locations, and discharge capacities of domestic and industrial point sources within the Lemon Bay Basin. The inventory provides a relative assessment of the pollution potential from point sources within the basin. Point source inventory information was obtained from the Florida Department of Environmental Protection (FDEP) databases for domestic and industrial point sources, as discussed previously.

Wastewater treatment plant discharges for those plants in the Lemon Bay Basin with greater than 1.0 MGD were previously described, using information from the SWFWMD (SWFWMD, 1992). The following discussion uses only the FDEP databases, as previously described.

The FDEP databases list 37 domestic point sources and five industrial point sources within the basin (Tables 5-9 and 5-10). Nine of the domestic point sources are in Sarasota County, 27 are in Charlotte County, and one is listed as being in a county not in the Lemon Bay Basin. The industrial point sources are all in Charlotte County (Figure 5-7).

Domestic point sources discharge capacities total 3.66 MGD, with 2.86 MGD of this sent to reuse. Industrial point sources have a total discharge capacity of 1.10 MGD, 0.02 MGD of which is used for reuse, 0.04 MGD is injected to wells, and 0.67 is discharge to the East Branch of Coral Creek.

**Table 5-9. Domestic Point Sources in the Lemon Bay Basin.**

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
OAK GROVE MHP WWTP	Sarasota	0.02	
SHADY HAVEN TP	Sarasota	0.01	
DEER CREEK MHP	Sarasota	0.02	
ENGLEWOOD ISLES	Sarasota	0.4	
CARRIAGE HOUSE RESTAURANT	Sarasota	0.01	

**Table 5-9. Domestic Point Sources in the Lemon Bay Basin.**

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
POLYNESIAN VILLAGE MHP	Sarasota	0.04	Drainfield
HOLIDAY VENTURES AT ENGLEWOOD	Sarasota	0.08	
ENGLEWOOD UTILITIES WWTP FKA FOXWOOD CONDOMINIUM	Sarasota	0.16	
TANGERINE WOODS	Sarasota	0.1	
SANDALHAVEN UTILITIES W. W. T. P.	Charlotte	0.15	Percolation Ponds
BAYVIEW EAST CONDO.	Charlotte	0.01	Drainfield
ENGLEWOOD BEACH PLACE CONDO	Charlotte	0.01	Drainfield
PELICAN LANDING	Charlotte	0.02	Drainfield
LANDINGS ON LEMON BAY	Charlotte	0.04	Drainfield
CASTAWAYS CONDOMINIUM	Charlotte	0.01	Drainfield
LA COQUINA CONDO	Charlotte	0.02	Drainfield
OYSTER CREEK MOBILE HOME PARK	Charlotte	0.01	Drainfield
EL GALEON MOTEL	Charlotte	0.03	Drainfield
HIDEAWAY BAY BEACH CLUB CONDO ASSOCIATION, INC.	Charlotte	0.02	Absorption Fields
FANTASY ISLAND II	Charlotte	0.01	Drainfield
WATERS EDGE CONDO	Charlotte	0.03	Percolation Ponds
ENGLEWOOD HEALTH CARE CENTER	Charlotte	0.01	Percolation Ponds
LEMON BAY BREEZES	Charlotte	0.03	Drainfield
HOUSE OF CHAN	Charlotte	0.01	Drainfield
ADMIRALTY VILLAS, INC.	Charlotte	0.01	Drainfield
PARK POINTE VILLAS W. W. T. P.	Charlotte	0.01	Absorption Fields
KNIGHT ISLAND UTILITIES W. W. T. P.	Charlotte	0.06	Drainfield
ROTONDA WEST WWTP (OLD PLANT)	Charlotte	0.63	Percolation Ponds/ Spray Irrigation
EBCO WASTEWATER INC	Charlotte	0.03	Percolation Ponds
TIKI APARTMENTS	Charlotte	0.01	Spray Irrigation
ENGLEWOOD WATER DISTRICT NORTH	Charlotte	0.38	Percolation Ponds
FOREST PARK CONDO	Charlotte	0.04	Percolation Ponds
INDIGO ISLES MHP OWNERS ASSOC INC	Charlotte	0.02	Percolation Ponds <sup>1</sup>
MERCURY MARINE	Charlotte	0.01	Drainfield
OAKWATER COVE CONDO	Charlotte	0.01	Drainfield
ENGLEWOOD WATER DISTRICT SOUTH	Charlotte	1.2	Spray Irrigation
SHADY ACRES TRAVEL PARK, #2	Lee	0.04	Retention Pond

**Table 5-10. Industrial Point Sources in the Lemon Bay Basin.**

Facility Name	County	Discharge Capacity (MGD)	Receiving Waterbody
GASPARILLA ISLAND WATER ASSOC	Charlotte	0.67	East Branch, Coral Creek
GASPARILLA PINES RO WATER PLT	Charlotte	0.25	
LITTLE GASPARILLA UTILITY, INC.	Charlotte	0.04	Class V Wells
KNIGHT ISLAND UTILITIES, INC.	Charlotte	0.03	
BIZZY BUZZY'S COIN LAUNDRY	Charlotte	0.02	Drainfield

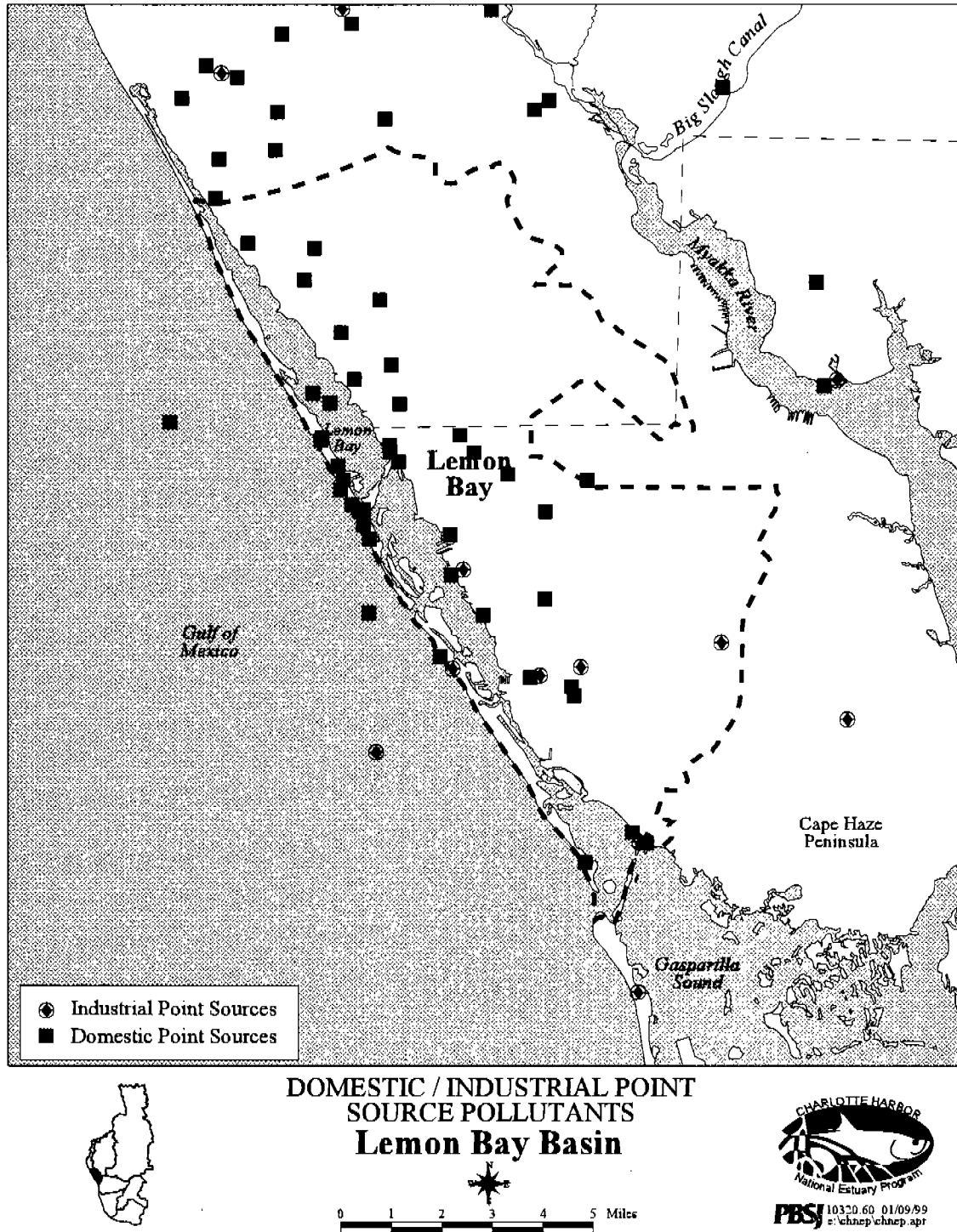


Figure 5-7. Location of domestic and industrial point sources in the Lemon Bay Basin.