PREPARED IN COOPERATION WITH THE
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

WATER-RESOURCES INVESTIGATIONS REPORT 93-4061
Taylor, G.F., 1993, Inventory of Drainage Wells and Potential Sources of Contaminants to Drainage-Well Inflow in Southwest Orlando, Orange County, Florida

INTRODUCTION

There are estimated to be more than 400 drainage wells in Orange County, Fla., which receive inflow water from various sources and introduce this drainage into the Upper Floridan aquifer. Sources of inflow to these wells include overflow from lakes, and direct runoff from lawns, streets, parking lots, and rooftops. Inflow to drainage wells is of variable quality (Schiner and German, 1983) and can introduce contaminants to the Upper Floridan aquifer and possibly to the underlying Lower Floridan aquifer.

Historically, drainage wells were used to relieve or prevent flooding in topographically-closed basins and low areas. However, there are indications that in the early 1900's a few unspecified drainage wells were used for disposal of sewage effluent and manufacturing wastes (Telfair, 1948). The first documented use of a drainage well was in 1904 for the disposal of lake overflow from Lake Greenwood in southeast Orlando (Sellards and Gunter, 1910). Many drainage wells were drilled in Orlando during the unusually wet period from 1926 to 1928. Records of drainage wells before 1937 are scarce due to the lack of a regulatory permitting system for drainage wells before that year.

Many permits were issued for drainage wells during the wet periods of 1948, 1954, 1959, 1960, and 1964. However, there were no restrictions on the use of drainage wells until the 1960's. Drainage-well permits have not been issued since 1966 except for the repair or replacement of existing drainage wells.

Drainage wells in the Orlando area generally were not completed in the Lower Floridan aquifer, which is the sole source of public-supplied drinking water in the area, but were completed in the Upper Floridan aquifer at depths of 400 ft or less. However, one drainage well was reportedly drilled to a depth of 1,070 ft (Black, Crow, and Eidsness, Inc., 1968). Capacities of drainage wells to accept inflow differ and are related to well and aquifer characteristics. Inflow capacities of drainage wells in the Orlando area generally range from about 200 gal/min to as much as 9,200 gal/min, which was observed at a drainage well in southeast Orlando (Bradner, 1991).

Water quality in most supply wells completed in the Lower Floridan had not been affected by drainage-well inflow as recently as 1979 (Schiner and German, 1983). However, because of the potential for downward leakage from the Upper Floridan to the Lower Floridan aquifer, concerns have been raised since that time about the quality of water being introduced to the ground-water system through drainage wells, particularly in the southwest part of Orlando. To address these concerns, an assessment of existing drainage wells and sources of potential ground-water contamination associated with these wells was made by the U.S. Geological Survey (USGS), in cooperation with the South Florida Water Management District, during the latter part of 1990. As part of this assessment, drainage wells and public-supply wells in southwest Orlando were inventoried and data were collected on land use and potential sources of contamination in the basins contributing inflow to the drainage wells.

Purpose and Scope

This report provides a current inventory and description of drainage wells in southwest Orlando. Drainage-well and drainage-basin characteristics, potential sources of contaminants, and construction characteristics of public-supply wells in the area are described. The area of study was limited to a 14 mi^2 area in southwest Orlando (figs. 1 and 2). The study included compilation and field verification of existing data on drainage wells, collection (where possible) of additional data for existing drainage wells, and location of potential contaminant sources within drainage basins. The data were collected between October 1 and December 31, 1990.

Previous Investigations

Sellards and Gunter (1910) first described the use of drainage wells in the Orlando area in a report on the artesian water supply of eastern Florida. Early reports by Stringfield (1933), Unklesbay (1944), and Telfair (1948) documented more than 200 drainage wells in the Orlando area. Telfair's study focused on drainage wells receiving septic tank effluent and drainage wells receiving effluent from a citrus-processing plant and a brewery. Lichtler and others (1968) reported that the number of drainage wells in Orange County had increased to about 400 by 1960. Black, Crow, and Eidsness, Inc., (1968) indicated that citrus-processing effluent injected into a drainage well 1,070 ft deep was apparently affecting a supply well located about 2,500 ft away.

Several investigations were conducted because of concern about water quality during the late 1970's and early 1980's. Reports by Kimrey (1978), Schiner and German (1983), and Kimrey and Fayard (1984) indicated that drainage wells were causing little adverse effect on the quality of water in the Upper Floridan aquifer. German (1989) documented sporadic occurrences of volatile and polycyclic-organic hydrocarbons at low concentrations in drainage-well inflow and in nearby ground water. Tibbals (1990) quantified the hydraulic effects of drainage wells on the areal ground-water flow system. Bradner (1991) compared water quality of the Upper Floridan aquifer in two background areas (one having a low density of drainage wells and one having no drainage wells) to that in a highly-developed urban area having a high density of drainage wells. She detected organic hydrocarbons in several Upper Floridan drainage wells in the urban Orlando area.

Acknowledgments

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METHODS OF INVESTIGATION

Information pertaining to drainage wells within the study area and information associated with those wells and their drainage basins were obtained from USGS files and from agencies of the State of Florida, Orange County, and the city of Orlando. These data were compiled to produce a current inventory of drainage wells in the study area. Data on the three public-supply wells were obtained from the city of Orlando.

Boundaries of areas that have the potential to contribute surface inflow to a drainage well, or to a group of drainage wells, were determined based on topography and information obtained from design plans for storm-sewer networks. Land-use types were identified from zoning maps, and field reconnaissance of basins were made to determine land-use activities that could be potential sources of contamination to drainage-well inflow. Drainage wells were field-checked to verify their existence, operational status, condition, well characteristics, source and frequency of inflow, and where possible, to collect additional information on the well. Depths of wells and casing were determined using a casing-depth indicator.

PUBLIC-SUPPLY WELLS

In areas where drainage wells are prevalent, public-supply wells are cased through the Upper Floridan and tap the Lower Floridan aquifer to depths of 1,100 to 1,500 ft. The Upper Floridan aquifer, however, is used for public supply in almost all areas of Orange County outside the city of Orlando (Tibbals, 1990).

Three public-supply wells are located within the study area (fig. 2). These supply wells range from 1,346 to 1,402 ft deep with a minimum of 982 ft of casing, and are open only to the Lower Floridan aquifer (table 1). These wells each produce about 3,500 gal/min (5 Mgal/d). The zone of the Lower Floridan aquifer tapped by these public-supply wells is about 200 ft below the deepest drainage well in the study area. In the immediate area of the public-supply wells, there is about 500 ft of vertical separation between the zone tapped by the public-supply wells and the zone tapped by the closest drainage well of known depth.

DRAINAGE WELL AND BASIN CHARACTERISTICS

Thirty-eight drainage wells are described in this report. Thirty-six drainage wells were identified from existing records. Two additional wells were located by FDER north of L.B. McLeod Road (wells 37 and 38, table 2). These wells were located subsequent to the original inventory of 36 wells and have been included in this report. These additional wells could be wells 8 and 9 (not located by USGS, table 2), however, data are insufficient to provide positive identification. They are included as wells 37 and 38 (table 2). These 38 wells potentially drain 17 separate drainage basins (fig. 2) that comprise a total of about 8,800 acres. Some of the 17 drainage basins are larger than those that would be delineated solely on the basis of topography because some storm sewers and lift stations route stormwater from otherwise unconnected basins.

Two numbering systems are used to identify wells in this report. The first system uses a map reference number to identify wells in figure 2 and tables 1 and 2. The second system uses a well identification number that is used for storage and retrieval of data from the USGS data management system, the National Water Data Storage and Retrieval (WATSTORE) System. The identification number for the WATSTORE System consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude; the next 7 digits denote the degrees, minutes, and seconds of longitude; and the last 2 digits (assigned sequentially) identify the wells within a 1-second grid.

Casing depths of drainage wells in the study area range from 68 to 280 ft, based on existing data. For several of the drainage wells, measured casing depths differ from reported casing depths. The largest difference was at well 19, which has 10 ft more casing than was reported. Most measured casing depths are within 5 ft of their reported depths.

Well depths were measured in 14 of the drainage wells. Measured well depths ranged from 133 to 777 ft and differences between reported and measured well depths ranged from 506 ft shallower to 71 ft deeper. Well 35 is 506 ft shallower than previously reported and well 15 is 71 ft deeper than reported. Well depths that were shallower than reported could be due to filling with silt and debris or collapse of part of the open-hole interval of the well. Well depths greater than previously reported indicate that some of the wells either were drilled deeper than the depths reported or, possibly, were deepened at a later date. All drainage wells within the study area with measured or reported well depths were determined to be in the Upper Floridan aquifer, based on depths to the top of the Floridan aquifer system reported by Lichtler and others (1968).

The overall condition of each drainage well inventoried during this study was assessed to the extent possible. Many wells had severely rusted casings and some had jagged casing edges visible at the surface. At least two wells had breaches in the casing below the water table of the surficial aquifer system. One well had deteriorated and bricks from the manhole housing the wellhead were collapsing around and into the well.

The ability of the wells to accept runoff varies with the operational status of the wells. Sixteen of the drainage wells listed in table 2 are classified as active (capable of readily accepting surface runoff). Three wells are partially blocked by obstructions, two are temporarily blocked, and three are filled with debris. Two wells are capped and six wells are plugged. Eleven wells could not be located, so their operational status is unknown.

The primary source of inflow to each well is listed in table 2. Of the 38 drainage wells listed in table 2, 18 were designed to receive lake overflow. The remaining wells were designed to receive street runoff, recharge from the surficial aquifer system, or air-conditioning return flow or process wastewater. Street runoff is the primary source of inflow for 11 wells; seepage from the surficial aquifer system is the source of inflow for 6 wells; and wastewater is the source of inflow for 3 wells. The original design for well 1 was lake overflow and for well 5 was surface runoff. However, leakage from the surficial aquifer system was observed as subsurface inflow through deteriorated casings at both wells.

The frequency of inflow to drainage wells depends on the source of the inflow water. Lake overflow and seepage from the surficial aquifer system tend to be relatively continuous and steady at low flow rates for long periods of time. However, drought conditions, which lower the lake levels and the water table in the surficial aquifer system, can result in long periods of no inflow. If lake levels are at or near the overflow (drainage-well inflow-control) elevation, periodic inflow can occur as a result of small amounts of rainfall in the basin. Street runoff tends to produce sudden, large periodic inflows. During extremely wet periods, high lake levels can flood adjacent drainage-well basins which normally receive only street runoff. The frequency of inflow of process-wastewater depends on the process which produces the wastewater.

Of the 16 wells classified as active, 12 receive long-term inflow; the other 4 receive periodic inflow. Of the remaining 22 wells classified as inactive or unknown, inflow frequency at 14 wells is unknown, and the remaining 8 are capped or plugged. The frequency of inflow listed in table 2 differs from the design frequency for certain wells receiving street runoff. Inflow to some wells designed to periodically drain street runoff was observed during the drought of December 1990, when no storm runoff was present. One possible source of this inflow could be water from lawn irrigation entering storm sewers which lead to these drainage wells.

Based on the basin boundaries shown in figure 2, the drainage wells in the study area potentially accept inflow from about 8,800 acres. Basin 14 (wells 6 and 7) is the largest potential contributing area, about 2,600 acres. The smallest potential contributing area for an active drainage well is basin 10 (wells 15 and 16), about 43 acres.

Many of the basins contain more than one well. The drainage areas of the basins are reported as acres per total number of wells (table 2) because it is difficult to delineate contributing areas to each well. The greatest number of wells in any one basin is four. Basin 17, for example, contains drainage wells 1, 2, and 3, which collectively drain 602 acres. Multiple drainage wells in a basin allow more rapid drainage of surface runoff; however, some wells in some basins are inactive.

Many drainage wells in the study area no longer accept inflow because of flow diversion or because the wells have been capped. Wells 30, 31, 32, and 33 in basin 1, for example, have all been replaced by a lift station that pumps the water from the Lake Venus basin into a canal leading directly to Shingle Creek. Well 30 has been capped, well 33 is known to be plugged, and wells 31 and 32 were not located, but are believed to be plugged. Thus, there are no known active drainage wells in the Lake Venus basin. Well 16 in the Lake Beardall basin (basin 10) has been plugged. Drainage from the Lake Beardall basin is now diverted into the Clear Lake basin (basin 7), which discharges through a canal into Shingle Creek. Well 13, originally intended to drain the Clear Lake basin, is now blocked. Of the approximately 8,800 acres originally served by drainage wells in the study area, the drainage from about 2,650 acres is now diverted to Shingle Creek. Thus, only about 6,150 acres are now drained by "active" wells.

Some basin boundaries have been altered by manmade changes in the surface drainage system. For example, in the Clear Lake basin (basin 7) the potential drainage area approximately doubled when storm sewers from the east and west sides of U.S. Highway 441 were connected. Some basins are interconnected to allow excess surface runoff to enter adjacent basins during extreme hydrologic events.

POTENTIAL SOURCES OF CONTAMINANTS

The potential sources of contaminants in the study area are closely related to land use. For example, runoff from agricultural and residential areas commonly contains nutrients (associated with fertilizers) and organic pesticides. Runoff from areas of manufacturing and industrial activities commonly contain various types of solvents, and runoff from urban streets can contain organic compounds and trace elements such as lead associated with automobile emissions.

Land use in southwest Orlando is primarily residential, consisting of single family homes with a mixture of multifamily apartment complexes interspersed with small businesses and some light industries. The heaviest concentrations of commercial and industrial areas lie along State Road 50 in the northern part of the area; along U.S. Highway 441 near the eastern boundary of the study area; and in the commerce parks concentrated in the southwestern part of the study area. The western part of the study area is the least developed and includes a mixture of low-density housing and open fields, but this area is rapidly being developed.

Potential contaminants associated with the various land uses are classified into five types based on contaminant listings in the National Primary Drinking Water Regulations (Florida Department of State, 1989, and U.S. Environmental Protection Agency, 1986). These five types are: suspended solids, inorganic chemicals, organic chemicals, microbiological matter, and radiation. Field inspection of the study area confirmed some potential point sources of contamination (fig. 2). The types of contaminants identified with these sources are classified as inorganic, organic, or microbiological. No sources that could produce radioactive contamination were observed in the study area.

Suspended solids contribute to turbidity by interfering with the passage of light through water. Velocities in runoff water generally are high enough to suspend and transport solids. Therefore, suspended solids are a potential contaminant in all drainage wells receiving inflow from surface runoff.

Inorganic constituents and organic compounds used in various manufacturing or cleaning processes are potential contaminants in many areas of light industry. Inorganic and organic contaminants including lubricants, lead, copper, and cadmium are common in runoff from paved surfaces. Runoff from residential lands can contain inorganic and organic contaminants associated with fertilizers and pesticides, and microbiological contaminants. Contaminants from product residue and from cleaning fluids and other solvents commonly are generated in areas of commercial land use.

Microbiological contamination (bacteria) is possible in street runoff and lake overflow to drainage wells. Schiner and German (1983) reported that in some places the upper producing zone of the Floridan aquifer system might be contaminated with bacteria because of drainage-well recharge, particularly where drainage wells receive direct street runoff. Wells in 13 of the 17 basins in the study area receive large volumes of lake-overflow water and much smaller volumes of inflow from street runoff and other sources. For the purposes of this report, lake overflow is considered the primary source of water and potential source of microbiological matter to drainage wells (fig. 2), though some of the microbiological matter in the lakes may originate from terrestrial sources.

Inorganic contaminants in runoff from fertilized agricultural areas, streets and paved areas, and commercial and industrial areas (fig. 2), are common constituents in drainage-well inflow in the study area. Large areas of agricultural land in the study area are fertilized and the volume of vehicle traffic on the streets and highways is large. The potential for the introduction of inorganic contaminants from nonpoint sources to drainage-well inflow exists in all basins and potential sources of these contaminants from point sources exists in 11 of the 17 basins. Fourteen potential point sources for inorganic contaminants were identified; they included plant nurseries, parking lots, and plating companies.

Activities producing or using pesticides and petroleum-based cleaning products and fuels are potential sources of organic chemical contaminants to drainage-well inflow throughout much of the study area. Seventy-four activities, which use organic chemicals and are potential point sources for organic contaminants were located near wells in 10 of the 17 basins. These activities include manufacturing plants, gas stations, and automotive repair and salvage shops, all of which use cleaning fluids such as trichloroethylene. These types of activities generally are concentrated in small areas in the more commercial parts of the study area. Although a large number of potential sources for organic contaminants exist in these basins, a literature search indicated that there is no evidence that these contaminants are reaching any of the public-supply wells tapping the Lower Floridan aquifer.

SUMMARY

Land uses and activities within a 14 square-mile area in southwest Orlando were inventoried between October and December 1990 to identify potential sources of contamination to drainage-well inflow. This inventory was made to address concerns about the effect that drainage wells might have on the quality of water from the Lower Floridan aquifer which is the source for public water supplies in the area.

Thirty-eight individual drainage wells and three public-supply wells were identified within the study area. The wells are located in 17 basins totaling about 8,800 acres. All drainage wells within the study area were determined to be completed in the Upper Floridan aquifer.

The overall condition of the 38 drainage wells also was determined. Many wells have deteriorated casings and two wells have breaches in the casings below the water table. Sixteen wells were determined to be active. Three wells were reported as blocked, 2 wells are capped, 6 wells are plugged, and the status of 11 wells is unknown because they could not be located.

Drainage wells in the study area currently drain about 6,150 acres of the 8,800 acres in the study area because some inflow previously entering drainage wells has been diverted to streams. Many of the basins contain more than one drainage well, although some of these wells may be inactive. Basin 14 (wells 6 and 7) has the largest potential contributing area, about 2,600 acres. Stormwater-management practices have approximately doubled the potential drainage area of the Clear Lake basin by connecting storm sewers on the east and west sides of U.S. Highway 441. Some basins are interconnected to allow excess surface runoff to enter adjacent basins during extreme hydrologic conditions.

The primary sources of inflow to the 38 drainage wells within the study area are lake overflow (18 wells), street runoff (11 wells), water from the surficial aquifer system (6 wells), and wastewater (3 wells).

Measured casing depths of drainage wells in the area ranged from 70 to 279 feet (ft), and generally were within 5 ft of reported depths. Measured drainage-well depths ranged from 72 to 292 ft and were from 506 ft shallower to 71 ft deeper than reported depths.

The three public-supply wells within the basin for drainage wells 6 and 7 have between 982 and 1,045 ft of casing and are open only to the Lower Floridan aquifer. The zone of the Floridan aquifer system tapped by these public-supply wells and the zone tapped by drainage wells 6 and 7 are vertically separated by about 500 ft.

City and county zoning classifications were used to classify land use within the study area (based on the potential to produce a contaminant hazard) into five groups: residential, commercial, undeveloped, paved, and industrial. Field inspection of the study area confirmed the existence of four possible contamination hazards: inorganic chemicals, organic chemicals, and microbiological matter. Suspended sediments are a potential contaminant in all basins.

The potential exists for microbiological contamination in drainage-well inflow, particularly in the 13 basins where drainage wells receive large volumes of lake-overflow water. The potential exists in all basins for inorganic contaminants in runoff from nonpoint sources such as fertilized areas, paved areas, and commercial industrial areas to enter drainage wells. Fourteen potential point sources for inorganic contaminants were located within 11 of the 17 basins. The potential sources include plant nurseries, parking lots, and plating companies.

Seventy-four activities which use organic chemicals and are potential point sources of organic contaminants to drainage-well inflow were located near wells in 10 of the 17 basins. These activities include automotive repair shops, gasoline stations, manufacturing plants, and salvage yards, which use petroleum fuels and cleaning solvents such as trichloroethylene.

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CONVERSION FACTORS, VERTICAL DATUM, ABBREVIATIONS, AND ACRONYMS

Multiply	By	To obtain
Length		
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
Area		
acre	0.4047	hectare
square mile (mi^2)	2.590	square kilometer
Volume		
million gallons (Mgal)	3,785	cubic meter
Flow		
gallon per minute (gal/min)	0.06309	liter per second
million gallons per day (Mgal/d)	0.04381	cubic meter per second
Transmissivity		
cubic foot per day per square foot times foot of aquifer thickness $[(ft^3d)/ft^2]ft$	0.0929	cubic meter per day per square meter times meter of aquifer thickness

Equations for temperature conversion between degrees Celsius (°C) and degrees Fahrenheit (°F):

$$°C = 5/9\ (°F - 32)$$
$$°F = (9/5°C) + 32$$

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Altitude, as used in this report, refers to distance above or below sea level.

Additional abbreviations

in/h — inches per hour

Acronyms

FDER — Florida Department of Environmental Regulation
USGS — U.S. Geological Survey
WATSTORE — U.S. Geological Survey's National Water Data Storage and Retrieval System

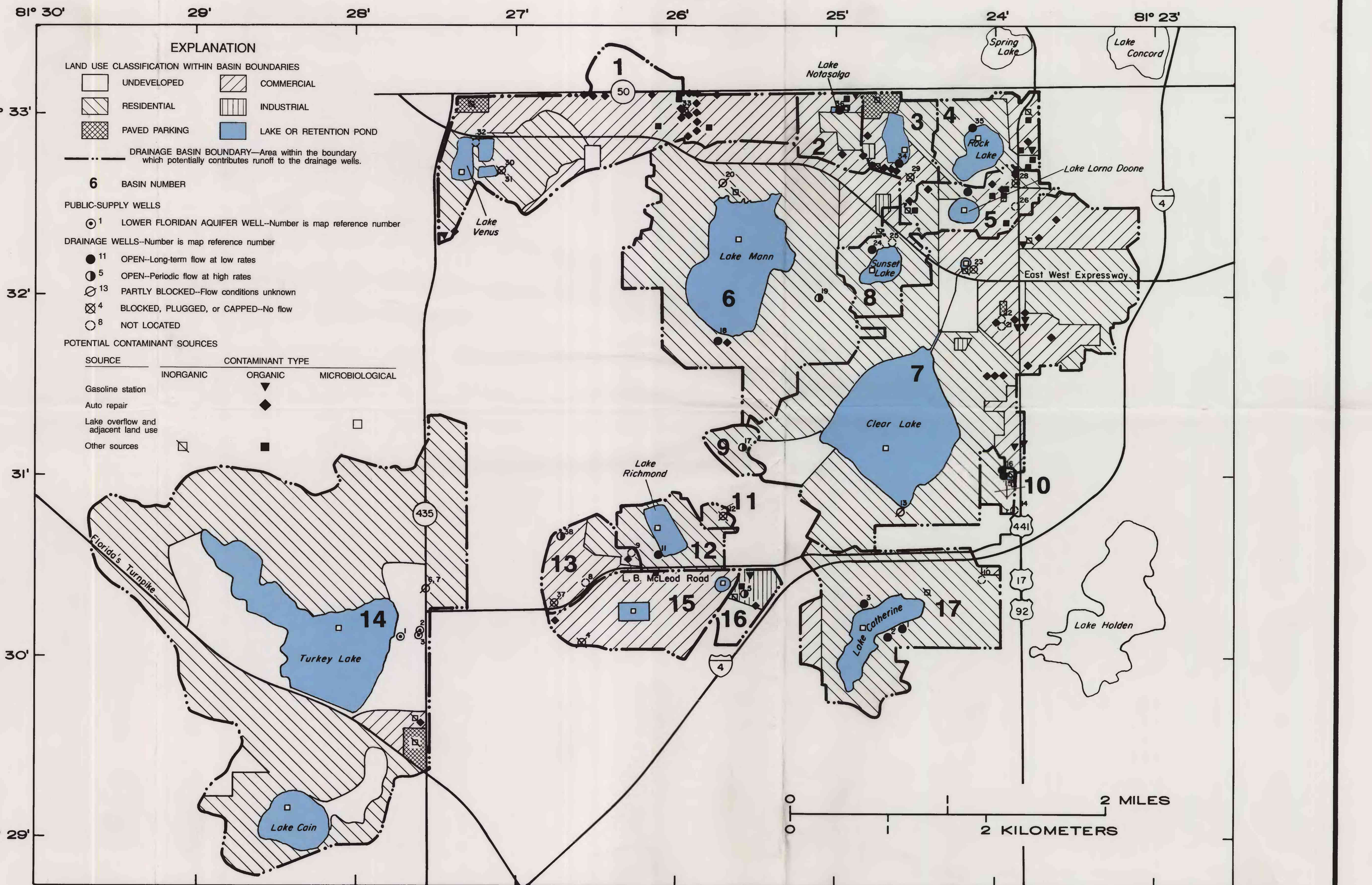

Figure 2. Land-use, basin boundaries, public-supply wells, drainage wells, and potential contaminant sources.

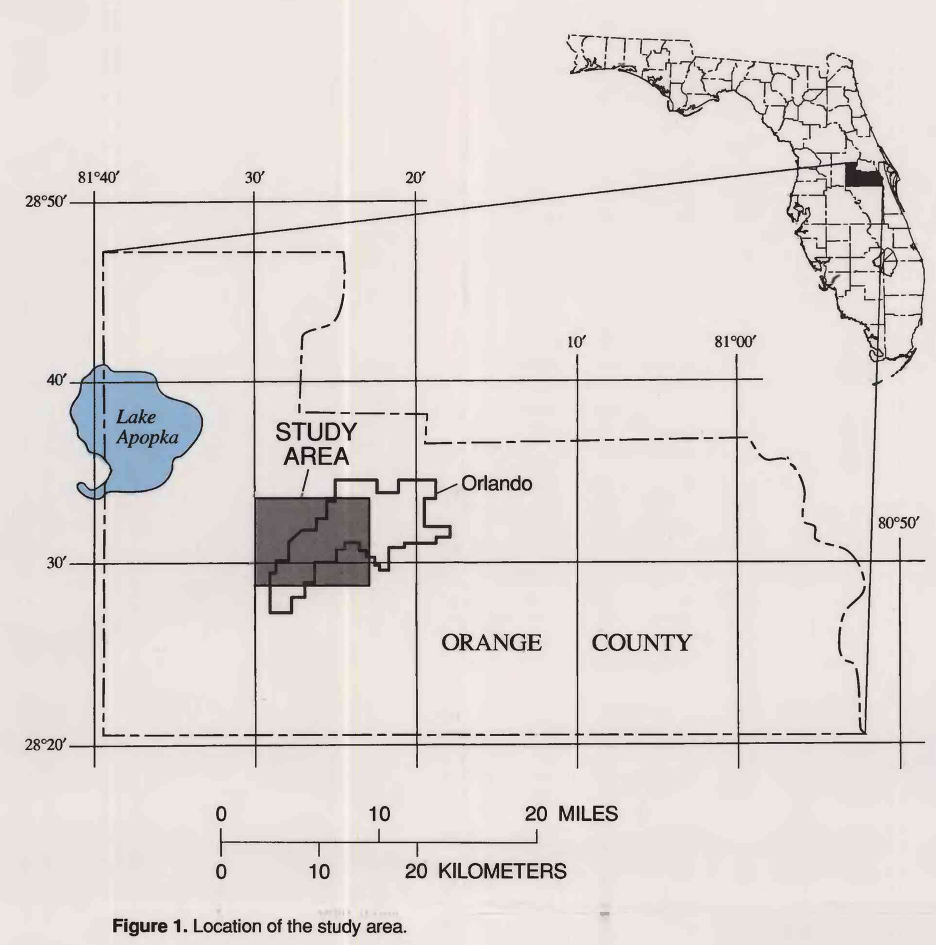

Figure 1. Location of the study area.

Table 1. Physical characteristics of public-supply wells

[All wells are completed in the Lower Floridan aquifer, owned by the city of Orlando, and located at the Kirkman Road water plant. All wells are currently (1993) being used, and each can produce as much as 5 million gallons per day]

Map reference number	U.S. Geological Survey site identification number	Local idenfication number	Well depth (feet)	Casing depth (feet)	Casing diameter (inches)
1	283006081273701	OUC-19	1,346	1,045	30
2	283007081273601	OUC-33	1,380	982	24
3	283007081274401	OUC-23	1,402	982	24

Table 2. Physical characteristics of drainage wells and drainage-well basins

[All wells are completed in the Upper Floridan aquifer. Operational status: A, active; B, blocked partially; C, capped; P, plugged; U, unknown. Primary inflow source: L, lake overflow; S, street runoff; T, inflow from surficial aquifer system; W, waste (air conditioning return or process waste disposal). Inflow frequency: M, long-term continuous; N, never; P, periodic; U, unknown. FDOT, Florida Department of Transportation; in., inch; ft, feet; NA, not available; --, no data]

Map reference number	U.S. Geological Survey site identification number	Owner	Owner identification number	Operational status	Potential contributing area, in acres (number of wells)	Primary inflow source	Inflow frequency	Well depth: Reported (ft)	Well depth: Measured (ft)	Casing depth: Reported (ft)	Casing depth: Measured (ft)	Casing diameter (in.)	Location
1	283007081244001	Orange County	S-75	A	602 (3)	L	M	133	136	104	101	8	Lake Catherine at Tymberscan South.
2	283011081243601	Orange County	S-71	A	602 (3)	L	M	350	121	--	99	8	Lake Catherine at Tymberscan North.
3	283016081245001	Orange County	S-72	A	602 (3)	L	M	777	--	263	--	14	Lake Catherine at 33rd St Prison.
4	283007081263901	Unknown	--	C	324 (1)	T	N	450	--	125	--	12	Ditch behind Industrial Park.
5	283019081253501	Orange County	S-74	A	64 (1)	S	P	463	121	105	101	12	W of Rio Vista Ave.
6[1]	283022081273501	FDOT	575W20	B[2]	2,639 (2)	L	U	450	--	--	1	12	Kirkman Road N of L.B. McLeod Road.
7[1]	283022081273502	FDOT	--	U	2,639 (2)	L		--	--	--	--	--	Kirkman Road N of L.B. McLeod Road.
8[1]	283024081263501	Unknown	--	U	129 (4)	T	U	450	--	125	--	12	L.B. McLeod Road W of Willie Mays Blvd.
9[1]	283034081261701	Unknown	--	U	129 (4)	T	U	452	--	125	--	12	L.B. McLeod Road W of Willie Mays Blvd.
10[1]	283026081240701	Corporation	--	U	NA	W	U	330	--	102	--	12	Rio Grande Ave. at 33rd St.
11	283035081260301	City of Orlando	125	A	162 (1)	L	M	--	--	--	--	20	Lake Richmond at SW corner of the Lake.
12	283045081254201	Corporation	--	P[2]	24 (1)	T	N	470	--	106	--	12	Washington Park Cemetery.
13[1]	283049081243601	Orange County		B[2]	1,856 (2)	L	U	--	--	198	--	6	Clear Lake at the S end.
14[1]	283052081235201	Private	--	U	NA	W	U	250	--	150	--	4	Michigan Ave. at Orange Blossom Trail.
15	283101081235501	Orange County	S-62	A	43 (2)	S	M	350	421	--	122	12	Nashville Ave. at 24th in retention pond.
16	283101081235601	Orange County	S-63	A	43 (2)	S	M	156	145	91	101		Nashville Ave. at 24th at NE corner.
17	283107081253601	City of Orlando	124	A	51 (1)	S	P	460	--	94	--	8	Bruton 0.8 mile N of L.B. McLeod Road.
18	283144081254201	Orange County	S-57	A	1,260 (3)	L	M	400	256	137	140	16	Lake Mann at Florence Ave.
19	283157081250601	Orange County	S-58	A	1,260 (3)	P	141	72	74	72	8		Goldwyn at Spaulding Road (City #080).
20	283237081254201	Orange County	S-55	B[2]	1,260 (3)	L	U	240	110	68	70	12	Washinton Ave. at Branson St.
21[1]	283151081235801	City of Orlando	--	U	54 (2)	S	U	300	--	158	--	10	Gore Street E of Plymouth Ave.
22[1]	283152081235801	City of Orlando	081	U	54 (2)	S	U	300	--	158	--	10	Crystal Street at Jones High School.
23	283211081241001	City of Orlando	144	P	137 (1)	L	N	150	--	76	--	12	Lake Beardall at City Yard.
24	283216081244501	City of Orlando	079	A	145 (2)	L	M	213	165	80	88	12	Sunset Lake NW.
25[1]	283218081244101	City of Orlando	U 18	U	145 (2)	L	U	213	--	--	--	12	Sunset Lake NE.
26[1]	283230081235201	City of Orlando	C 3	U	NA	W	U	205	--	86	--	8	Central at Orange Blossom Trail.
27	283232081241201	City of Orlando	076	A	165 (2)	L	M	382	150	92	92	12	Wilbe Ave. N of Central Street.
28	283237081235201	City of Orlando	170	P	165 (2)	S.	N	348	--	90	--	12	Washington at Orange Blossom Trail.
29	283240081243101	City of Orlando	078	P	17 (1)	S	N	195	--	76	--	12	Washington at Coburn.
30	283242081270701	Orange County	S-53	C	794 (4)	L	N	380	--	156	--	4	Lake Venus at Westside Manor.
31[1]	283242081270702	Orange County	--	U	794 (4)	L	U	430	--	140	--	26	Westside Manor.
32	283251081271501	Orange County	S-53A	U	794 (4)	L	U	435	--	94	--	18	SE of East-West at Kirkman Road.
33	283303081255801	Orange County	S-54	P	794 (4)	S	N	420	--	103	--	12	Fairvilla Road S of State Road 50.
34	283244081243501	City of Orlando	134	A	126 (2)	S	M	479	292	280	279	20	Retention Pond, Washington E of Texas Ave.
35	283258081240901	City of Orlando	077	A	207 (1)	L	M	669	163	147	137	20	Rock Lake at Amelia Ave.
36	283302081245801	Orange County	S-54A	A	110 (1)	L	M	--	183	--	117	12	Lake Notasalga, W of Magruder Ave.
37	283020081264601	Private	--	P	129 (4)	T	U	--	--	--	--	12	N of L.B. McLeod, W of Willie Mays Blvd.
38	283043081264301	Private	--	A	129 (4)	T	P	--	164	--	--	12	N of L.B. McLeod, W of Willie Mays Blvd.

[1]Could not locate well in the field.
[2]Reported, but not verified.

INVENTORY OF DRAINAGE WELLS AND POTENTIAL SOURCES OF CONTAMINANTS TO DRAINAGE-WELL INFLOW IN SOUTHWEST ORLANDO, ORANGE COUNTY, FLORIDA

By G. Fred Taylor
1993

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