

Section 4 – Local Surface Water Resources

The City of Tarpon Springs is bordered by several separate and distinctive bodies of water that were reviewed as potential sources for potable water supply. These waters include the Anclote River, Lake Tarpon, Salt Lake, Paradise Lake and the Gulf of Mexico

A key factor in the ultimate feasibility of a surface water source as a water supply is the amount of sustainable withdrawal that can be permitted for such a source. A management tool available for water and related natural resource protection is through the SWFWMD's minimum flows and levels (MFLs) program. Maintaining minimum flows and levels is a significant statutory charge for Florida's water management districts. SWFWMD programs for minimum flows and levels originate in Chapter 373.042, F.S. Such activities will also serve to balance water withdrawals for human needs with protection of surface water levels for navigation, recreation and related functions.

Once established, MFLs are implemented through a variety of means. Most prevalent is the application of these flows and levels to the District's water use permitting program. As directed by Chapter 373.042, F.S., the District may restrict withdrawals of water which would cause flows and levels to drop below their established minimums and which would be significantly harmful to the water resources or ecology of an area.

4.1 Anclote River

The headwaters of the Anclote River consist of numerous fresh water sources that flow in a southwestern direction. These sources are located in northwest Hillsborough County and eastern Pasco County. The first section of the River basin is approx 50' wide from the headwaters to the East of US 19. A transition zone creates brackish conditions upstream from Alternate 19 until the waters become salty at the Alt 19 area and flow into the Gulf of Mexico.

4.1.1 Water Quality

At the headwaters of the river (north of Pasco county line) fresh water conditions exist with low Chloride (Cl⁻) levels ranging from 20-50 mg/l. These conditions are conducive to source water quality requiring minimal treatment prior to distribution. There is a transition zone (from the Pasco county line to Alternate 19) where brackish conditions exist due to freshwater mixing with tidal seawater from the Gulf of Mexico. In this zone, Cl⁻ levels vary from 250 mg/l to 10,000 mg/l. From Alternate 19 to the mouth of the River, Cl⁻ levels are greater than 10,000 mg/l. Sample analysis results indicated that the Anclote River has very low nutrient levels in its headwaters. Field analyses of nitrate-nitrite nitrogen, although low at all sites, increased in concentration down stream, likely due to stormwater runoff from developed land. Elevated turbidity readings detected at the downstream sites may also be evidence of urban runoff, (USGS.1990).

4.1.2 Flow Data

Several sources of information were reviewed regarding the Anclote River including the USGS Study entitled "Surface Water Hydrology of the Anclote River estuary report #89-4046" (USGS, 1990). This report presented flow data from 1947-1985. The Anclote River has several influential factors including seasonal rainfall variations, stormwater recharge in contributing areas, and well field pumping in Pasco and Hillsborough Counties

control the flow rates of the River. The Annual Average Daily Flow (AADF) of the Anclote River is approx 8.0 Million Gallons Daily (MGD).

A minimum flow of 2 cfs, or 1.3 mgd was recorded in May of 1986. Additionally, the average monthly stream flow at the Elfers station was 70 cfs, or 45 mgd. Assuming that the SWFWMD 10% diversion rule was applied to this number, this leaves less than 5 mgd on an average basis available for raw water supply. This relatively low water availability raises a point of concern on the permissibility of this supply as a sustainable year-round source of water for the City.

4.2 Salt Lake

Salt Lake is located south of the Anclote River and east of US 19. The water quality of Salt Lake is ~500 mg/l Cl⁻, as verified by field sampling in December 2002. The lake level is controlled by recharge from the Anclote River and other hydrologic factors affecting stream flow. Due to these varying factors, water quality potentially could be affected by outside influences such as storm water runoff, seasonal precipitation deficits and demands on groundwater sources located near the Anclote River drainage basin. This lake also relies on the Anclote River for recharge and thus has the same potential capacity limitations as the river.

4.3 Paradise Lake

This water body is located south of Salt Lake and is fed by a freshwater source with low levels of Cl⁻ and TDS. This water quality would require minimal treatment prior to distribution. This is an unprotected water body subject to the same influences as Salt Lake. Minimal recharge of this water body and its relatively small volume would significantly limit its ability to be a source for potable water.

4.4 Lake Tarpon

Lake Tarpon is the largest lake in Pinellas County and has a surface area of approximately 4 square miles. The lake is approximately five miles long and 0.75 to 1 mile wide. The average lake depth is 7.3 feet with a maximum depth of 14 feet. The lake volume has been estimated to be about 1 billion cubic feet with a mean hydraulic retention time of 189 days (US EPA 1977).

The lake was used for local water supply for a four-year period between March 1926 and May 1930. However, its use as a public water supply was abandoned due to the frequent inflow of saline water through the Lake Tarpon Sink.

Of particular hydrologic significance is the Lake Tarpon Sink, located on the northwest shoreline. This sink, which is 118 feet in depth, was hydrologically connected to Lake Tarpon. Dye studies conducted in 1946 and 1949 confirmed a hydrologic connection between the Lake Tarpon Sink and Spring Bayou in Tarpon Springs (Taylor 1953). The sink acted as both an outflow and inflow depending upon the tide and the water level in the lake. Inflows from the sink resulted in increased salinity concentrations in the lake. An earthen berm was constructed around the sink in May 1969 by the District to prevent the exchange of water between the sink and the lake. The Lake Tarpon Outfall Canal was constructed by the US Army Corps of Engineers to provide flood control for Lake Tarpon. The Outfall Canal located at the southern most end of the lake was completed in 1967

Historically, Lake Tarpon was considered to have excellent water quality. The primary concern with regard to water quality in Lake Tarpon is increasing productivity as measured by the amount of algae (chlorophyll-a) in the water. This condition results from an increase in nutrients entering the lake and from the recycling of these nutrients once they have entered the lake. These impacts and low rainfall have resulted in a decline in the average annual flow of the contributory creeks since 1961 (SWFWMD, 2000).

A large algae bloom erupted in 1987, covering 80% of the lake's surface. An algae bloom is a sign of an imbalance in the nutrient levels of the body of water and is detrimental to the health of the lake. Several studies were initiated culminating in the adoption of the Lake Tarpon Drainage Basin Management Plan in 1999. SWFWMD also designated Lake Tarpon a SWIM priority water body.

Loads of total nitrogen (TN) and total phosphorus (TP) from modeled sub-basins in the Lake Tarpon watershed equals to 6.32 and 0.73 tons per year, respectively. This equates to 11.2 percent and 12.5 percent of the total loading of the two nutrients. Stormwater retrofit projects are designed to provide treatment for stormwater from previously untreated urban areas. (SWFWMD, 2000)

Minimum levels have been set for several lakes in northwest Hillsborough, which are part of the headwaters of Brooker Creek, the primary surface water flow to Lake Tarpon. A Minimum Flow is anticipated to be established for Brooker Creek during the 2006-2010 time frame based on the 1998 MFL Priority List and Schedule approved by the District Governing Board in October 1998.

Because of limited recharge, past water quality issues, and close regulatory involvement of the Lake Tarpon watershed, Lake Tarpon is not considered a viable primary water supply source.