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Why the Lake Water Level Fluctuates

Palm Beach Gardens, FL - December 18, 2006 – The Northern Palm Beach County Improvement District (Northern) receives numerous phone calls from residents of Mirasol during this time of year regarding the fluctuating lake levels. The lake system within the Mirasol development is primarily designed for **storm-water management and flood protection**. To begin, there are several agencies involved and various permit criteria that must be followed. The lake system within Mirasol was designed, permitted and constructed in accordance with criteria established by the South Florida Water Management District (SFWMD). This is a very complex system and is under the influence of many dynamic mechanisms.

The lake system within Mirasol is divided into two drainage basins, east and west. The east basin is located in close proximity to a Seacoast Utility production well-field. This production wellfield was in existence for many years prior to the Mirasol development. Seacoast Utility withdraws water from the shallow aquifer for the treatment and distribution of potable water to it's customers. The withdraw rate for the well-field is permitted by SFWMD and the effects of the well-field were taken into consideration during the initial design of the lake system for Mirasol.

The soils in the Mirasol development are typical of soils found in Southeast Florida and are composed of fine sand. This sand acts as a sponge with respect to ground water and provides a natural filtration process for storm-water as it percolates into the ground-water system. During dry weather periods individuals tend to use more water for irrigation than normal. Many rely on the potable water system for their irrigation which in turn creates additional demand on the treatment plant and thus higher withdraws from the well-field. As water is extracted from the wells, the ground water table is lowered within the well-field zone, this is referred to as, "draw-down". The ground water within areas that are closer to the well are affected more than those areas that are further away. The proximity of the wells to Mirasol is such that the draw-down has a direct effect on the lake water levels within the eastern drainage basin. The water level in the lakes is essentially the same elevation as the ground water table and is influenced by many factors such as rainfall, adjacent wetlands and or large water bodies.

In addition to the Seacoast well-fields, the lake water levels are also impacted by direct withdraw from the lakes for the irrigation of the golf courses. Typically, golf courses can utilize between one and two million gallons of water per day depending on the time of year. Other withdraws from the lakes for irrigation include common areas, roadway medians, parks and individual homeowners. When combined with extended dry season periods, these withdraws coupled with the affects from the well-field result in fluctuating lake water levels.

In an effort to reduce these impacts on the lake levels, certain recharge mechanisms were incorporated into the design of the storm-water management system. Recharge of the eastern basin is accomplished through the provision of up to 1.4 million gallons of reclaimed water, or Irrigation Quality (IQ) water per day from Seacoast Utilities. This recharge helps to off-set withdraws required for irrigation of the golf courses and other common areas which rely on the lakes for their water source. The western basin is equipped with an operable gate that allows water to enter the system from the C-18 canal via gravity as long as the water level of the C-18 is sufficiently high enough to accommodate the discharge. The Loxahatchee Slough recharges the C-18 basin which is located on the west side of Mirasol and provides water for re-hydrating ground water. There is also a pump station which is designed to pump water from the western basin to the eastern basin to further assist in the lake recharge. This will explain why, on occasion, the lakes in the western basin are higher than the lakes in the eastern basin.

All of the above parameters are programmed into a central computer at Northern which controls the recharge facilities. Theses controls are based on many factors which must all work in concert with each other in order to operate within the permitted guidelines set forth by the SFWMD. Many of the factors include rainfall, eastern basin lake levels, western basin lake levels, C-18 canal elevation and Irrigation Quality water availability from Seacoast Utilities.

Northern continues to work with SFWMD, Seacoast Utilities and the residents of Mirasol to provide flood protection and drainage and will endeavor to supply the highest level of service.

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The Northern Palm Beach County Improvement District is an independent special district created by the Florida Legislature in 1959. Its role is to provide services related to water management and infrastructure for properties in northern Palm Beach County.