UNIVERSITY OAKS MOBILE HOME PARK

LEVY COUNTY, FLORIDA

WATER SUPPLY FACILITIES WORK PLAN

Prepared By:

Ryan Asmus, P.E.

Levy County Staff Engineer

Executive Summary

The purpose of this water supply work plan is to identify and plan for water supply sources and facilities to serve existing and new development within the University Oaks area. The Suwannee River Water Management District (SRWMD) sent notice to Levy County of their inclusion in the Western Water Supply Plan (WWSP) and requirements necessary to comply with Florida Statute Chapter 163 Section 3177.

The statue indicates, “each local government within the WWSP is required to amend its comprehensive plan by adopting an updated Water Supply Facilities Work Plan (WSFWP) within 18 months of governing board approval of the 2024 WWSP, pursuant to Section 163.3177(6)c)4, F.S.”. The SRWMD notice indicates updated WSFWPs and related comprehensive plan amendments should be adopted by September 12, 2025.
The WWSP identified a single water conservation (WC) project within Levy County: University Oaks Phase 4. The project is currently listed as an infrastructure replacement project targeted at reducing water loss within the system. The conclusion of the WWSP indicates that fresh groundwater may be able to provide some, but not all the projected water demand increases across the region highlighting a need for continued conservation and alternative water supply research.

This report’s intent is to identify current water demands within University Oaks, project future water demands, and identify ways to conserve, reduce, or alternatively supply water to support future growth and demands within University Oaks through a 10-year planning horizon.

System Background

1. Potable Water Service Area

The University Oaks is located approximately 4.5 miles northeast of Bronson along State Road 24 (Figure 1). It was initially developed with a private water treatment plant and water distribution system serving surrounding parcels within the development. Eventually, the water treatment plant and distribution system were taken over by the Levy County Board of County Commissioners (BOCC), who maintain and run the system.

Figure 2 below highlights the approximate service area of the development. It should be noted that the service area shown is based on historical recordings and was not field verified during this study. Therefore, the location should be considered approximate.
The highlighted service area in the figure covers approximately 350 parcels. However, in a recent Florida Rural Water Association (FRWA) rate study it was determined that there are 160 service connections attached to the water distribution system. This indicates that more than half of the parcels in the development are either undeveloped or not connected to the system.

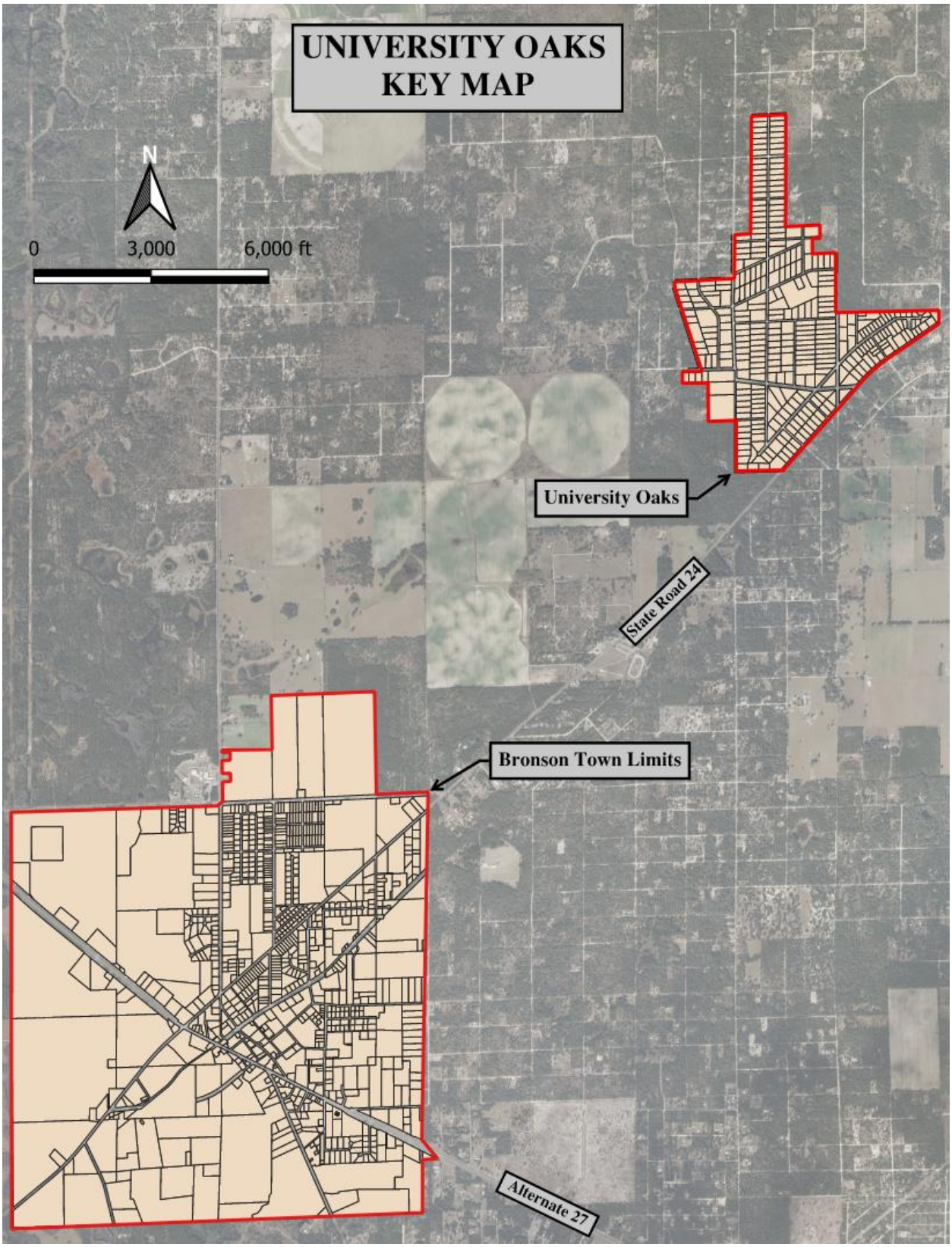


Figure 1: University Oaks Key Map

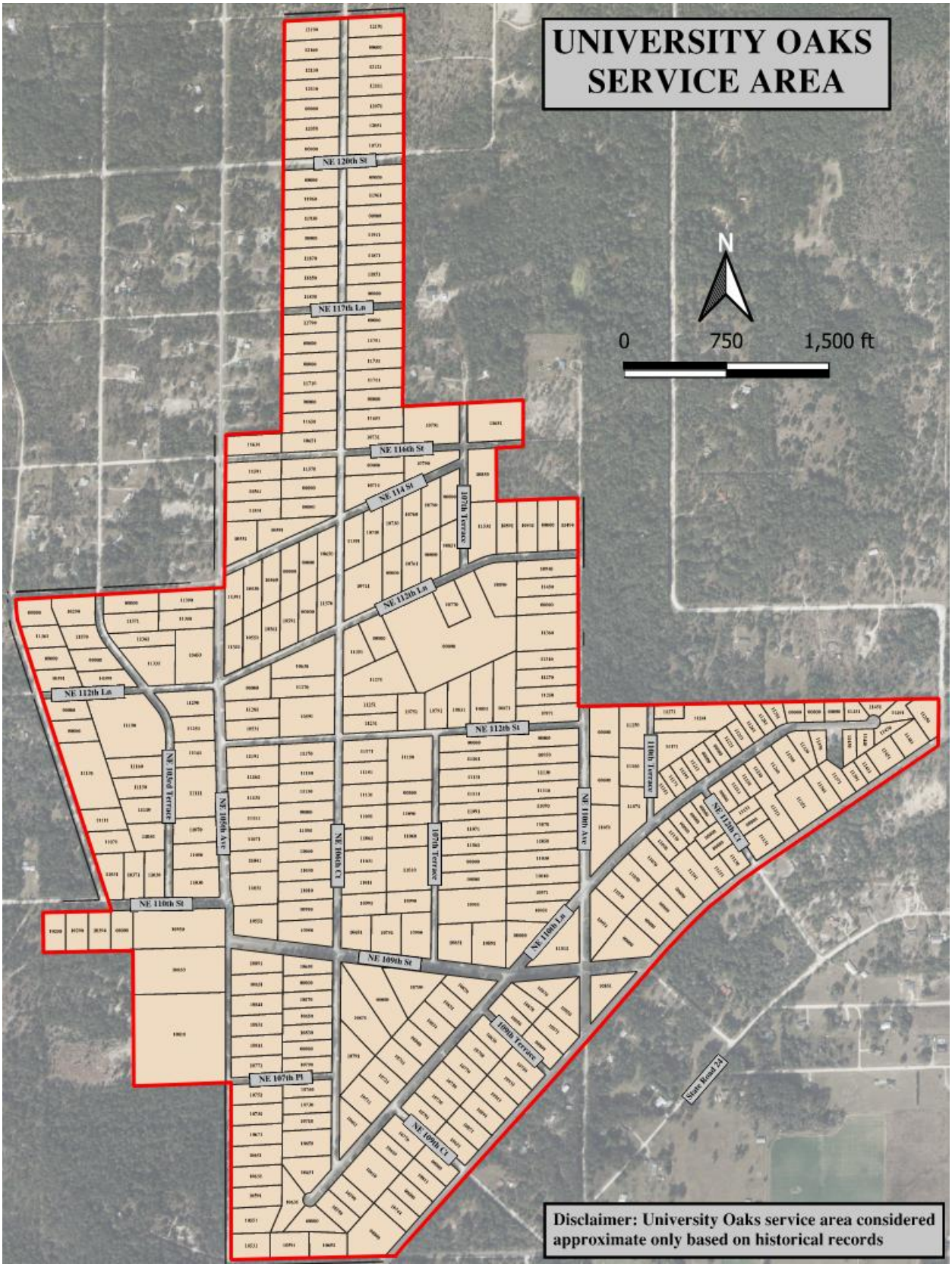
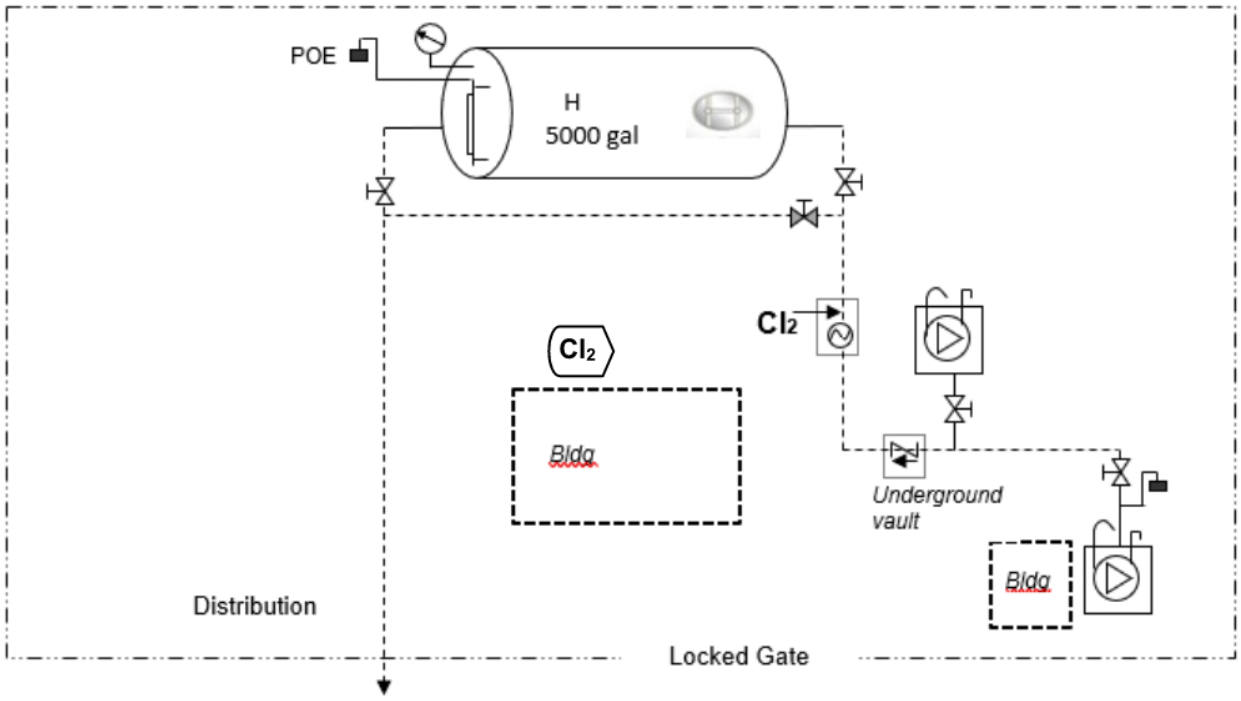


Figure 2: University Oaks approximate service area

2. Potable Water Supply Facility

The potable water treatment plant (WTP) is highlighted in Figure 4 at the southern end of the development. System information collected from FDEP's Oculus Database indicates that the WTP receives it's water supply via two ground water wells. The wells were drilled in 1973 and 1975 and are both 6" cased with 10 horsepower 26 GPM submersible pumps. The groundwater is injected with chlorine after being pumped and is transferred to a 5,000-gallon hydropneumatic tank where it is pressurized and meets its chlorine contact time. Figure 3 below identifies a process flow diagram of the facility.



SCHEMATIC KEY	
well head and casing well w/Turbine pump	chlorine injection point Cl2
check valve	flow meter
threadless (smoothbore) tap	pressure gauge
threaded tap w/ HBVB point of entry tap POE	gate valve - open, closed
well vent	

Figure 3: Process flow diagram of University Oaks WTP

3. Distribution System

The University Oaks distribution system is shown in Figure 4. The system contains approximately 8.8 miles of water line varying in size and material. Levy County was not the original developer of University Oaks and information about the originally installed system is largely unknown.

Historical records acquired from FDEP's Oculus database indicate that the original system is primarily composed of ductile iron pipe (DIP) ranging from 2"- 6". In recent years, the system has been upgraded to 6" C900 PVC in a phased approach. Phase 4 of the upgrades were recently identified in the WWSP and will be discussed in more detail later in this report.

It should be noted that while much of the water system located centrally in the distribution system is looped, as the distribution system extends out several dead-end lines exist. The dead-end lines are observed in Figure 4 and will be discussed in greater detail later in the report.

University Oaks Water Treatment Plant Pictures can be found in Appendix 1 at the end of this report.

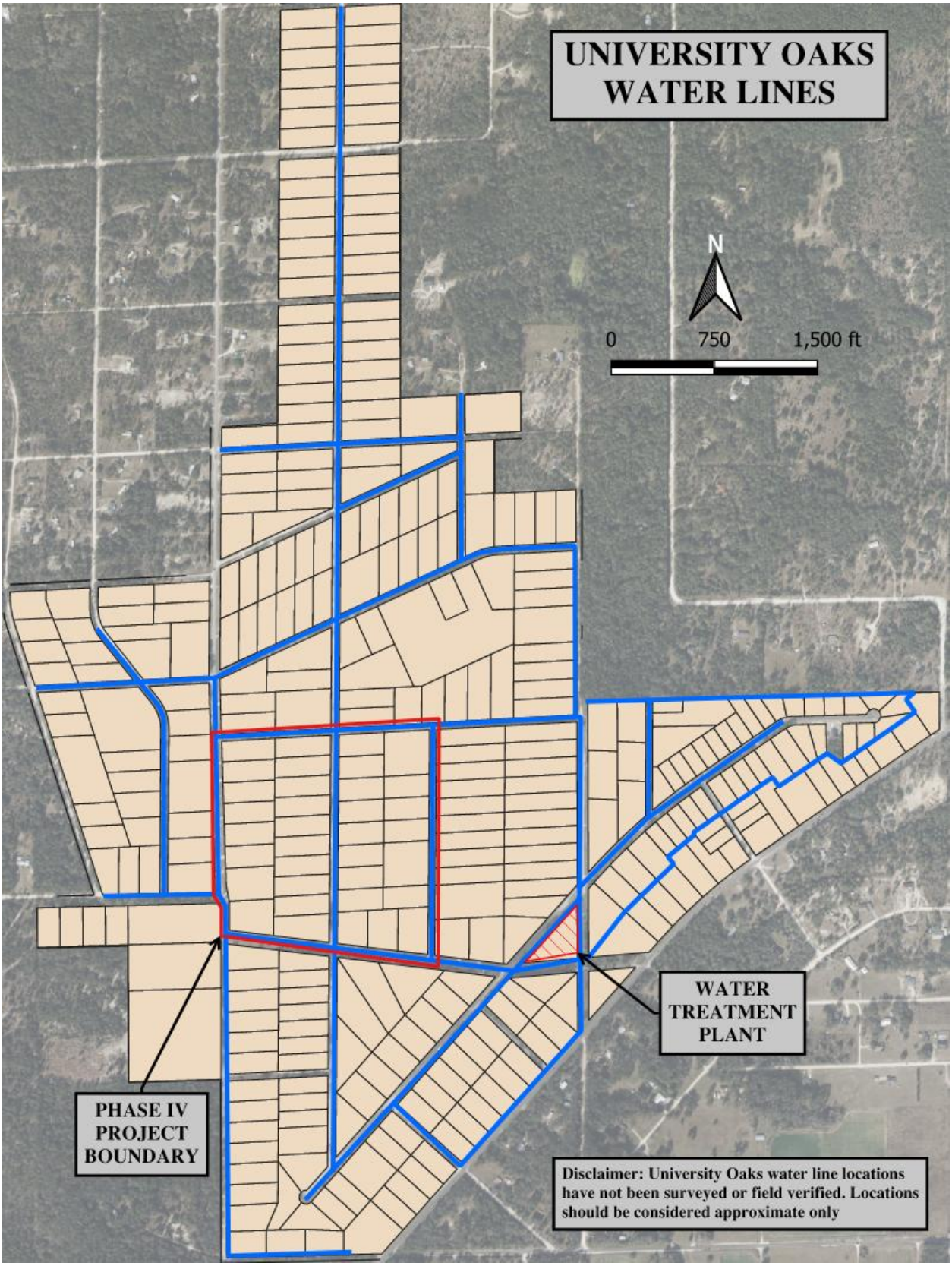


Figure 4: University Oaks Distribution System

4. **Wells and Water Treatment Plant**

As previously discussed, the water treatment plant consists of two groundwater wells that were drilled in 1973 and 1975. Each of the wells have 6" casing and are powered by 10 horsepower 26 GPM submersible well pumps. Do we know what the depth of the wells are? The pumped water is treated using hypochlorination: a process involving the injection of chlorine into the water stream. Chlorination is commonly used to provide the disinfection of water mandated by FDEP for public water supply systems. The chlorinated water continues to a 5,000-gallon hydrotank where it sits for contact time while also being simultaneously pressurized for distribution. The hydrotank operates between 40 – 60 psi. A full schematic of the WTP was previously presented in Figure 3 outlining the WTP treatment process.

In the event of power failure at the WTP due to inclement weather or any other source, the treatment plant is equipped with a backup generator that can supply power to the system and keep the plant operational until power is restored.

5. **Water Storage Facilities**

The University Oaks WTP does not have any designated water storage facilities. The only storage within the system is contained within the hydro tank. The storage capacity is conventionally considered half the hydrotank volume. Therefore, the available water stored within the system is 2,500 gallons

6. **Pumping Facilities**

University Oaks WTP does not contain any designated pumping facilities. The system is pressurized by the 5,000-gallon hydrotank to operate between 40 and 60 psi.

7. **Water Use Permit**

SRWMD has given the University Oaks WTP a general water use permit (WUP) designation of 10,000 gpd to < 2,000,000 GPD. This broad range indicates that the University Oaks WTP

is not permitted to draw more than 2 MGD of water on a given day. More specifically, DEP has permitted the facility for a plant design capacity of 228,171 GPD.

8. **Water Quality**

The University Oaks System recently passed their most recent DEP sanitary survey in April 2025 (Appendix 2). DEP's notice indicated that "the system (University Oaks MHP) was determined to be in compliance with the department's drinking water rules and regulations." DEP's acceptance indicates water quality is within drinking water requirements and acceptable for public consumption.

Drinking water testing at the water treatment plant is conducted regularly to ensure that the water being treated at the plant is within compliance of the DEP chlorination disinfection guidelines. DEP outlines that the free chlorine residual within the system must be between 0.2 mg/L and 4.0 mg/L throughout the distribution system. Testing must be conducted at the extents of the distribution system regularly to ensure this range is maintained.

9. **Conservation Practices**

While the University Oaks development does not have any offer of conservation education programs presently, there are conservation education outreach programs within this area provided by SRWMD.

Additionally, University Oaks has maintained a consistent effort to continue upgrading the University Oaks distribution system. Upgrades to the system promote conservation by reducing the amount of water lost to a leaky distribution system or inaccurate meters.

Additional conservation suggestions are introduced later in this report to further conserve the existing water supply generated by the water treatment plant.

Future Water Supply

1. Population Trends

The University Oaks development is in an unincorporated area of Levy County. To gain an understanding of the population trends within Levy County the University of Florida's Bureau of Economic and Business Research (BEBR) website was utilized. BEBR tracks census data and projects population growth used around the state. Table 1 outlines population trends from the 2010 and 2020 census and the BEBR estimation for population 2024. Note these values are for the unincorporated portions of Levy County and does not consider growth incorporated areas or the county.

Table 1

LEVY COUNTY UNINCORPORATED POPULATION TRENDS

2010 Population	2020 Population	2024 Population	2010 - 2020		2020 - 2024	
			% Change	Annual Growth %	% Change	Annual Growth %
31,526	32,920	35,600	12.9	0.92	8.1	2.02

**Note: All data population data shown in Table 1 acquired from BEBR.*

2. Population Projections

Observing historic growth trends allows the development of future population projections. These projections assume that the growth rates observed in the unincorporated areas of Levy County will be consistent for the University Oaks development.

As previously mentioned, a recent FRWA study determined that there were 160 connections to the University Oaks distribution system. BEBR study data indicated that the average household size in Levy County is 2.39 persons per household. Assuming this value is accurate for the University Oaks subdivision, the population presently receiving water from system is approximately 383 people.

Observation of the population trends identified in Table 1 indicate that the overall trend of the unincorporated population in Levy County is increasing. Across the 14-year time span the average increase is 0.92% annually if making a linear growth assumption. However, within the past 4 years it was observed that the population in unincorporated Levy County increased at a faster rate: 2.02% annual growth.

Because these rates are significantly different two population projections were formed. The first projection, considered the low-end growth projection, assumes that the population increases linearly at 0.92% each year over the 10-year planning horizon. The second projection considered the high-end growth projection assumes a 2.02% yearly annual growth rate across the planning horizon. Table 2 identifies the projection results of 5 years and 10 years into the two planning horizons.

Table 2

LEVY COUNTY UNINCORPORATED POPULATION PROJECTIONS

Projection	2024 Population	2029 Projection	2034 Projection
Low-end	383	401	418
High-end	383	422	460

As identified in Table 2 the low-end projection using the 0.92% annual growth rate identifies a population change of 35 people. Dividing this value by the average household size of 2.39 persons per household indicates an increase of approximately 15 new households or potentially 15 new service connections within the University Oaks subdivision.

Performing the same analysis for the high-end population projection of 2.02% per year indicates a population change of 77 people or approximately 32 new households within the University Oaks subdivision at the end of the 10-year forecasting period.

3. **Water Demand – Surpluses & Deficiencies**

The recently conducted FRWA study outlined that current water demand within the University Oaks Subdivision is approximately 44,665 GPD. When divided by 160 connections to the system this indicates that, on average, the residents in University Oaks are using approximately 280 gallons of water per day per household. This value is on par with typical daily water consumption for a residential unit of 250-350 GPD.

Examining the low-end 10-year projections the expected water demand is 49,000 GPD (determined by multiplying a total of 175 connections by 280 GPD of consumption). The same calculation applied to the high-end projections yields 53,760 GPD.

As previously determined, SRWMD set the University Oaks consumptive use permit (CUP) between 10,000 – 2,000,000 GPD of use and DEP permitted the plant to have a daily capacity of 228,171 GPD. These capacities are well over the expected water demand determined in the high-end water projections. Therefore, the current University Oaks WTP is adequately sized to handle 10-year forecasted water demands without any deficiencies.

4. **Prospective Conservation & Reuse Practices**

As previously determined, SRWMD conducts conservation education outreach in the University Oaks area. Additionally, Levy County has continued to seek funding for improvements to the University Oaks water distribution system. While both of these practices aid in conservation measures, some additional ideas have been proposed that could further propel this goal.

- Implement a tiered rate structure that applies an increased water rate as water usage increases. This approach would be developed in a way that does not impact average water users. It would impact the bill that high water users receive each month and encourage those users to reduce water usage to reduce their monthly bill.

- The County could consider providing resources and hosting classes to educate consumers on water conservation.
- As previously mentioned, to maintain water quality in a distribution system with dead-ends, system flushing is often required to maintain acceptable water quality. Limiting line and hydrant flushing to only what is necessary to maintain water quality and exercise critical equipment can help overall conservation efforts.
- A final suggestion to promote water conservation is ensuring that unauthorized water use is not occurring through securing fire hydrants and flushing valves so they can only be used by approved county staff and emergency responders.

5. Multi-Jurisdictional planning initiatives

Presently, there are no multi-jurisdictional initiatives in the area.

6. Capital Improvement Projects

The WWSP identified the fourth phase of the University Oaks distribution system upgrades as the most recently completed version of the plan. This project outlines the replacement of approximately 6,500 LF of 6" water main with new 6" diameter C900 PVC and several water meters (Figure 5).

New water mains will be installed alongside existing water mains and when the water mains are ready to be switched over the connections will be made to transfer from the old system to the new system to minimize service disruptions. Water meters will be replaced individually to avoid service disruptions.

The reason for the upgrade is due to the age of the existing water lines. The permit outlines that the existing water mains are substandard and deteriorating. The most recent estimate for the construction project is $900,000

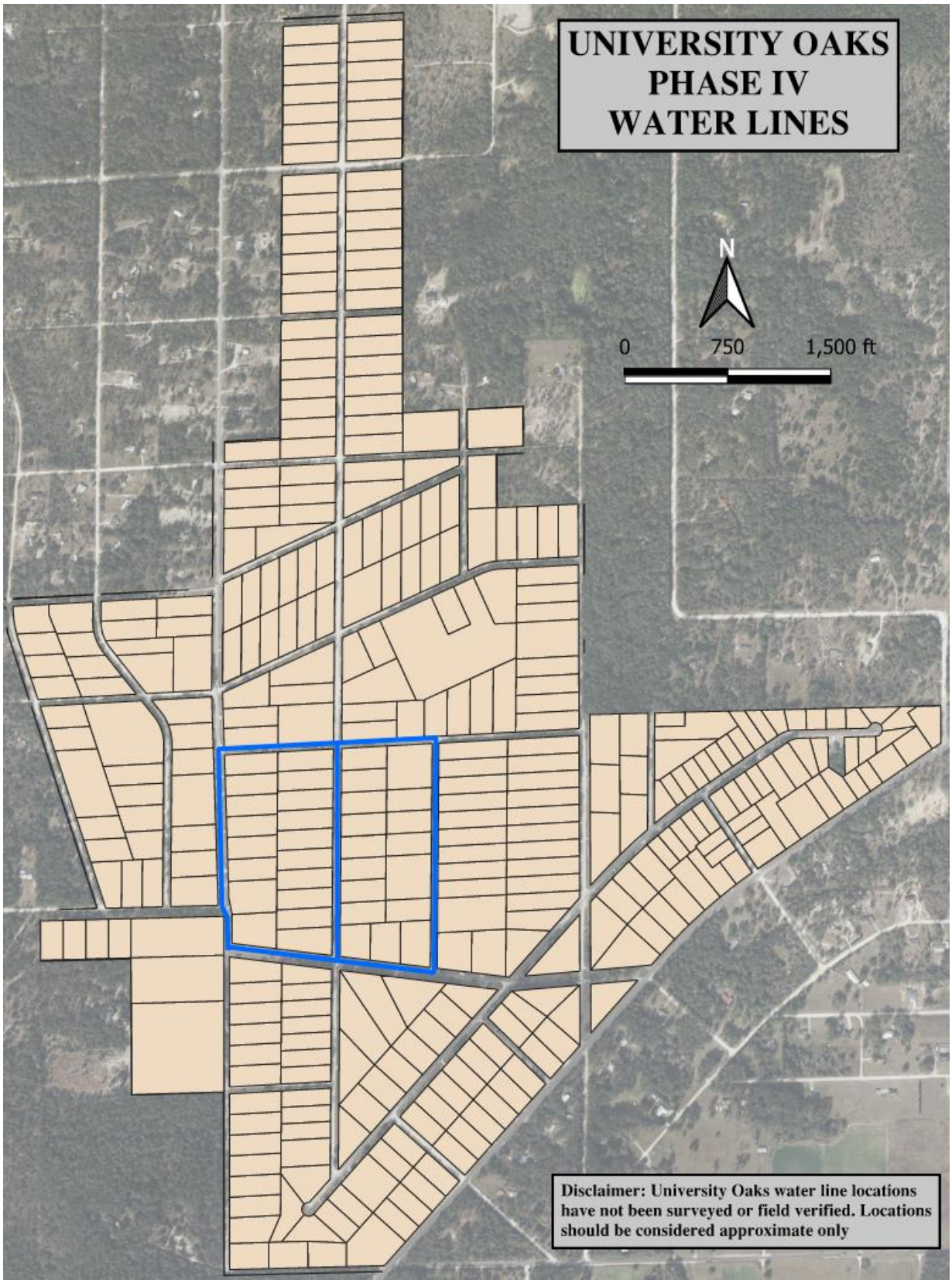


Figure 5: University Oaks Phase IV Water Lines

It has long been suspected that the University Oaks system experiences a significant amount of unaccounted water. Unaccounted water can be caused by old deteriorating systems that leak, inaccurate water flow meters at the water treatment plant, inaccurate customer meters, excess system flushing or even unauthorized use of fire hydrants that are not metered.

Recently, DEP determined that the flow meter located at the WTP is accurate based on a calibration test result. However, it is possible that one, or a combination, of the previously mentioned instances could be happening to not properly account for the water. As mentioned earlier in the report, dead-end radials can often lead to decreased water quality if there are not enough connections using the supply so it can be replenished. This could lead to poor water quality and increased flushing of the lines to maintain proper water quality within the system.

To conserve as much of the water as possible it is recommended that Levy County continues to upgrade the University Oaks water distribution system to limit leaks, upgrades customer meters to ensure accurate water billing, and implement water conservation practices.

Conclusion

The University Oaks development should continue to have an adequate water supply across the 10-year planning horizon examined in this facilities report. While water usage is expected to increase during the planning horizon, the increase is projected to remain within the permitted capacity of the water treatment plant itself and the consumptive use permit.

It is recommended that Levy County continue working towards increased water conservation efforts to promote water conservation within the region globally. Additionally, continuing to pursue funding to improve the physical infrastructure and metering equipment associated with the University Oaks WTP and distribution system is recommended.

APPENDIX

1. University Oaks WTP Pictures

Figure 6: University Oaks WTP looking to the North

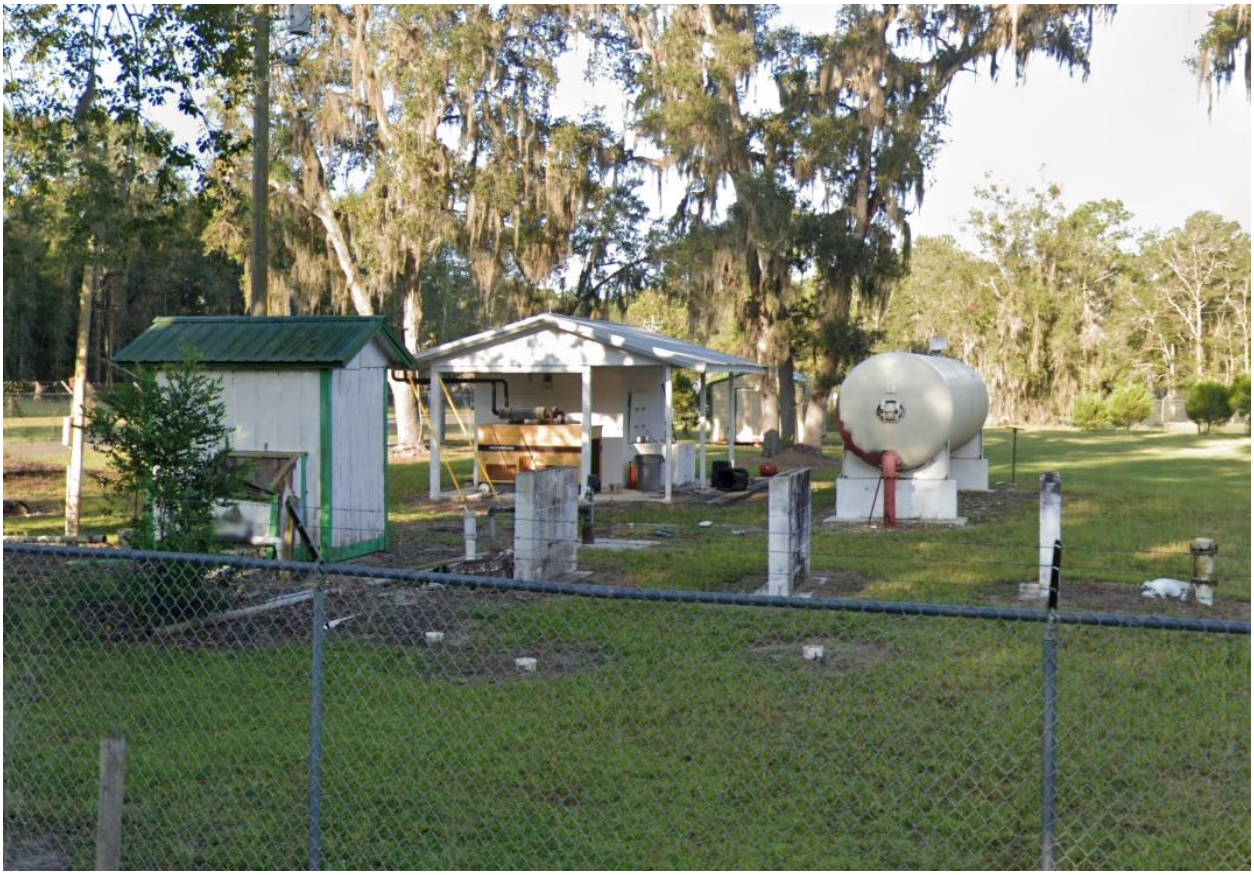


Figure 7: University Oaks WTP looking to the West

Figure 8: University Oaks WTP looking to the East

2. University Oaks – 2025 Sanitary Survey

FLORIDA DEPARTMENT OF
Environmental Protection

Northeast District
8800 Baymeadows Way West, Suite 100
Jacksonville, Florida 32256

Ron DeSantis
Governor

Alexis A. Lambert
Secretary

April 30, 2025

Mr. Jimmy Jones
Levy Board of County Commissioners
11011 NE 109 Street
Archer, FL, 32618
jones-jimmy@levycounty.org

Re: University Oaks MHP
PWS ID No. 2381208
Levy County – Drinking Water

Dear Mr. Jones:

Department personnel conducted a sanitary survey inspection of the above-referenced facility on March 3, 2025. Based on the information provided during and following the inspection, the system was determined to be in compliance with the Department's Drinking Water rules and regulations. A copy of the inspection report is attached for your records. Non-compliance identified in the inspection report has been corrected.

The Department appreciates your efforts to maintain this system in compliance with state and federal rules. Should you have any questions or comments, please contact Christopher Williams at (904) 256-1521, or via e-mail at Christopher.Williams@FloridaDEP.gov.

Sincerely,

Shane Tierney
Environmental Manager
Compliance Assurance Program

Enclosures: Sanitary Survey Inspection Report

ec: FDEP: Chris Azcuy, Madison White, Shane Tierney, Christopher Williams
c: LevyWater@levycounty.org
Two Fold Water Engineering, twofoldwater@gmail.com
Ross Bogert, Operator, twofoldross@gmail.com

Florida Department of Environmental Protection

Northeast District Public Water System Sanitary Survey Inspection Report

Water system: University Oaks MHP	**System PWS #: 2381208**		**Survey date: 03/03/2025**
Facility type class: **Community** - (5D)	Source type: Ground		4-Log approved: No
Facility address: 11011 NE 109th St. , Bronson, FL 32621			
Facility phone(s): (352) 486-5376	Facility email/fax: levywater@levycounty.org		
Facility contact: Mr. Jim Jones	Facility contact phone(s): (352) 486-5376		
Facility contact email/fax: levywater@levycounty.org			
Owner name: Mr. Jim Jones	Company name: Levy Board of County Commissioners		
Owner/Corp address: 310 School Street	City: Bronson	State: FL	Zip: 32621
Owner/Corp phone(s): (352) 486-5376	Owner e-contact(s): jones-jimmy@levycounty.org		
Operator name: Mr. Ross Bogert	Certification: C-18962		
Operator phone(s): (352) 475-2248	Operator email/fax: twofoldwater@gmail.com		
On-site Rep: Mr. Ross Bogert	**Immediate Action Required?**: Yes		Inspection recap given? Yes

SERVICE AREA CHARACTERISTICS

Subdivision

Food Service: ☐ Yes ☐ No ☒ N/A

GENERAL INFORMATION

Number of Service Connections 123
Population Served 369 Basis County Records
Plant Design Capacity 228,171 gpd
Basis Historical data from 2007
Average Day (from MORs) 33,750 gpd
Max. Day (from MORs) 41,000 gpd
Total Storage Capacity 2,500 gallons
Comments storage = 1/2 H tanks

LOCATION

Latitude 29° 29' 33.6074" North
Longitude 82° 35' 24.7707" West
GPS: No Date: DPHO 10/13/2006
Directions Take I-10 W to I-75 S. Exit I-75 at SR 24 (Exit 284) Travel approx. 15 mi. Turn right onto NEW 109th St. Turn right onto NE 110th Ave. WTP is ~ 66 ft ahead on the left.

OPERATION & MAINTENANCE

Certified Operator: ☒ Yes ☐ No ☐ Not required
Plant visits conducted by: Mr. Ross Bogert
O&M Log: ☒Yes ☐No O&M Manual: ☒Yes ☐No
Visitation Frequency
Hrs/day: *Required* N/A *Actual* N/A
Hrs/wk: *Required* 0.3 *Actual* 0.9
Days/wk: *Required* 3 *Actual* 3
Non-consecutive Days? ☒ Yes ☐ No ☐ N/A
MORs submitted regularly? ☒ Yes ☐ No ☐ N/A
Data missing from MORs? ☒ No ☐ Yes ☐ N/A
N/A

RAW WATER SOURCE

☒ GROUND; Number of Wells 2
☐ SURFACE/UDI; Source
☐ PURCHASED from PWS ID #
☐ Emergency Water Source
Emergency Water Capacity

AUXILIARY POWER SOURCE

☒ Yes ☐ None ☐ Not Required
Source Ringpower Olympian
Capacity of Standby (kW) 175
Switchover: ☒ Automatic ☐ Manual
Standby Plan: ☒ Yes ☐ No
Hrs Operated Under Load 15 mins/wk.
What equipment does it operate?
☒ Well pumps 1
☐ High Service Pumps
☒ Treatment Equipment Chlorinator
Satisfy 1/2 max-day demand? ☒Yes ☐No ☐Unk
Comments Levy County employees run the generator weekly.

TREATMENT PROCESSES IN USE

Hypochlorination for disinfection

Is additional treatment needed? ☐ Yes ☒ No
If so, for control of what deficiencies?
N/A

DISTRIBUTION SYSTEM

Flow Measuring Device Flow Meter
Meter Size & Type 6" Water Specialities
Meter tested w/i 5 yrs? ☒ Yes ☐ No ☐ Unk ☐ N/A
Backflow Prevention :☒ Yes ☐ No
Cross-connections two HBVB installed
Cross-connection Control Program: ☒Yes ☐No ☐N/A
Coliform Sampling Plan: ☒ Yes ☐ No
Stage 2 DBPs Sampling Plan: ☒ Yes ☐ No ☐N/A
Lead & Copper Sampling Plan: ☒Yes ☐ No ☐N/A
Comments Flow meter checked March 2025.

University Oaks MHP

PWS ID # 2381208
Survey Date 03/03/2025

GROUND WATER SOURCE

Well Number (PWS Identification)		1	2	
Well Name (System Identification)		Well #1	Well #2	
Year Drilled		1973	1975	
Depth Drilled		Unk	Unk	
Latitude		29° 29' 33.4291" N	29° 29' 33.4881" N	
Longitude		82° 35' 24.6644" W	82° 35' 24.8876" W	
GPS (Y or N) / Date (if applicable)		Y-10/25/1996	Y- 10/25/1996	
Florida Well ID		AAC2763	AAC2764	
Static Water Level		Unk	Unk	
Normal Yield (if different than rated capacity)		Unk	Unk	
Strainer		Unk	Unk	
Length (outside casing)		Unk	84'	
Diameter (outside casing)		6"	6"	
Material (outside casing)		Galvanized	Galvanized	
Well Contamination History		August 2021	None	
Is inundation of well possible?		Not likely	Not likely	
6' X 6' X 4" Concrete Pad		Ok	Ok	
SET BACKS	Septic Tank	9 tanks > 200'	9 tanks >200'	
	Reuse Water	N/A	N/A	
	WW Plumbing	>200'	>200'	
	Other Sanitary Hazard	None seen	None seen	
PUMP	Type	Submersible	Submersible	
	Manufacturer Name	Unk	Franklin Electric	
	Model Number	Unk	2366029020	
	Rated Capacity (gpm)	26	26	
	Motor Horsepower	10	10	
Well casing 12" above grade?		OK	OK	
Well Casing Sanitary Seal		OK	OK	
Raw Water Sampling Tap		OK	OK	
Above Ground Check Valve		OK	OK	
Fence/Housing		Locked fence	Locked fence	
Well Vent Protection		OK	OK	

COMMENTS Well 1 - EC positive August 18, 2021. 5 repeats showed negative results.
Well #2 check valve was leaking at the time of the inspection but corrected per photo documentation on 3/19/25.

University Oaks MHP

PWS ID # 2381208
Survey Date 03/03/2025

CHLORINATION (Disinfection)
Type: Hypo-Chlorination
Make Stenner 45MHP10 Capacity 10 gpd
Chlorine Feed Rate set at 7
Avg. Amount of Cl_2 gas used N/A
Chlorine Residuals: Plant 0.72 Remote 0.55
Remote tap location 11170 NE 106 Ct, road hydrant
DPD Test Kit: ☐ On-site ☒ With operator
☐ None ☐ Not Used Daily
Injection Points before H tank
Booster Pump Info N/A
Comments N/A

AERATION (Gases, Fe, & Mn Removal)
Type _____ Capacity _____
Aerator Condition _____
Bloodworm Presence _____
Visible Algae Growth _____
Protective Screen Condition _____
Comments _____

STORAGE FACILITIES
(B) Bladder (CW) Clearwell (C) Contact (E) Elevated
(G) Ground (H) Hydropneumatic (S.C.) See Comments

Tank Type/Number	H		
Capacity (gal)	5,000		
Material	steel		
By-pass Piping	Yes		
Gravity Drain	Yes		
PRV/ARV	PRV		
Protected Openings	Yes		
Access Padlocked	Yes		
Pressure Gauge	Yes		
On/Off Pressure	40/60		
Sight Glass or Level Indicator	S.G.		
Fittings for Sight Glass	Yes		
Height to Bottom of Elevated Tank	NA		
Height to Max. Water Level	NA		
Last Insp Done*	11/2021		
Next Insp Due*	11/2026		

Comments N/A

**FL PE 5-yr inspection of finished water storage tank with 11"x15" access manhole.*

HIGH SERVICE PUMPS

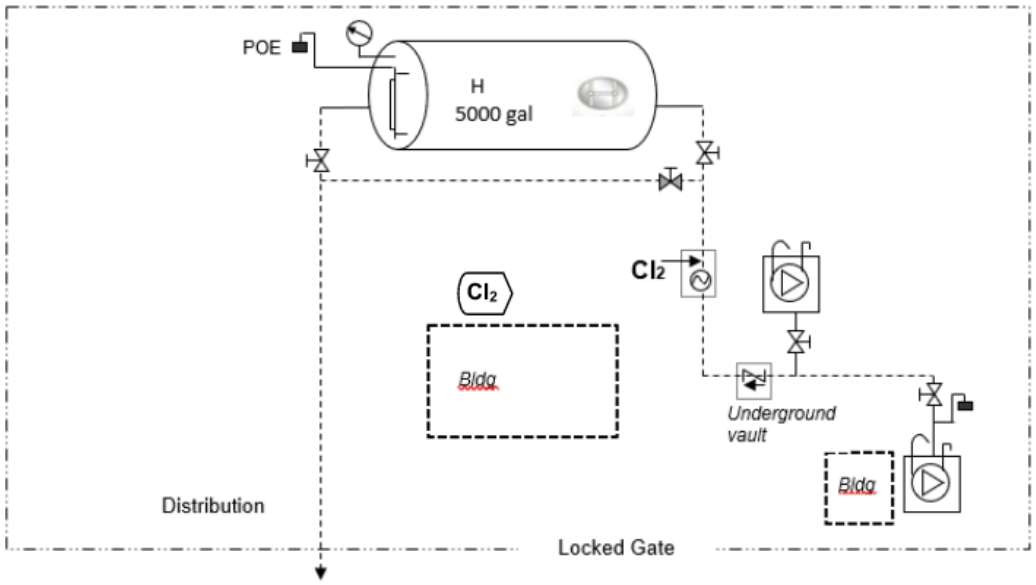
Pump Number			
Type			
Make			
Model			
Capacity (gpm)			
Motor HP			
Date Installed			
Maintenance			

Comments _____

University Oaks MHP

PWS ID # 2381208
Survey Date 03/03/2025

SCHEMATIC (not to scale):



SCHEMATIC KEY	
well head and casing well w/Turbine pump	chlorine injection point Cl2
check valve	flow meter
threadless (smoothbore) tap	pressure gauge
threaded tap w/ HBVB point of entry tap POE	gate valve - open, closed
well vent	

University Oaks MHP

PWS ID # 2381208
Survey Date 03/03/2025

Monitoring Schedule					
Chemical	**Next Due**	**Comments**	**Chemical**	**Next Due**	**Comments**
Bacteriologicals	2025 April	Monthly	VOCs	2027	Triennial
Disinfectant Levels	2025 April	with Bactis	SOCs	2027	Triennial
Nitrate & Nitrite	2025	Annual	Rads	2027	3 year
Inorganics	2027	Triennial	DBPs	2027	Triennial August
Asbestos	2030	9 year	Pb-Cu	2026	Triennial, June-Sept
Secondaries	2027	Triennial	WQPs	N/A	

**Sample locations vary. If you have any questions, please contact your inspector.*

MONITORING VIOLATIONS	MCL VIOLATIONS
N/A	N/A

MONITORING COMMENTS:

N/A

DEFICIENCIES:

#	Deficiency	Rule Reference	Corrective Action	Category	Severity	Corrected
1	No record that the calibration of the finished-drinking-water flow meter has been checked.	62-555.350(2)	The calibration of finished-drinking-water flow meters should be checked at least once every 5 years.	Treatment	MIN	YES RTC 3/18/25
2	Well #2 check valve was leaking.	62-555.350(2)	Repair or contact the Department if replacement is necessary.	Pumps	MIN	YES RTC 3/19/25

Any deficiency marked with an asterisk (*) is a repeat violation.

ADDITIONAL COMMENTS:

Met with Ross Bogert and the water plant is now in compliance at this time.

Inspector: _____
Christopher Williams, Environmental Specialist II (904) 256-1521 Christopher.Williams@FloridaDEP.gov

Approved by: _____
Madison White, Environmental Consultant