



## Technical Memorandum

To: Bruce H. Phillips, PE, PLS  
City of Belleview  
Public Works Dir./City Engineer  
SE Abshier Blvd. Belleview, FL 34420

From: Lewis Bryant, PE, Kimley-Horn  
Cara Elliott, E.I., Kimley-Horn

Date: December 17, 2020

RE: ***City of Belleview - Utility Capacity Evaluation***  
***Kimley-Horn Project No: 042223009***

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### Background

The City of Belleview requested that Kimley-Horn complete an updated evaluation of demand projections compared the existing water and wastewater treatment capacities for planning purposes. The most recent demand projections were compiled in March 2019 as part of the Utility Master Plan and Capacity Analysis Report. At that time, projected wastewater flows were not expected to exceed the capacity of the plant through 2027.

The City has recently experienced rapid growth with the buildup of Cobblestone North and the continued development in Summer Crest. Year 2020 has also experienced an average of over 20 new connections per month. With this increase in growth rate, updated demand projections will allow for the City to adjust their plant expansion plans accordingly.

Current City facilities include a wastewater treatment facility (WWTF) with a permitted capacity of 0.76 million gallons per day (MGD) annual average daily flow (AADF) and a water treatment system with a design capacity of 2.084 MGD maximum daily demand (MDD).

### Demand Projection Update

As of November 15, 2020, the City had 3,046 active utility connections. The additional growth not accounted for in the March 2019 projections is expected to include the following developments:

- Autumn Glen (304 lots)
- 484 Development (457 lots)
- SE 107th Street Apartments (234 units)
- Summer Crest (700 units)
- Diamond Ridge (207 units)

These developments and their respective build out rates were added to the 2019 demand projections as summarized in Table 1. This assumes 400 gpd/ERU for potable water service and 200 gpd/ERU for wastewater service, as specified in the Marion County Land Development Code.



TABLE 1. ERU, WATER, SANITARY SEWER DEMAND PROJECTIONS  
CITY OF BELLEVIEW

|                         | AREA                                       | 2020              |                              |                           | 2022              |                              |                           | 2027              |                              |                           | 2037              |                              |                           |
|-------------------------|--|-------------------|------------------------------|---------------------------|-------------------|------------------------------|---------------------------|-------------------|------------------------------|---------------------------|-------------------|------------------------------|---------------------------|
|                         |  | ERUs <sup>4</sup> | WATER ADD (GPD) <sup>2</sup> | WW ADD (GPD) <sup>3</sup> | ERUs <sup>4</sup> | WATER ADD (GPD) <sup>2</sup> | WW ADD (GPD) <sup>3</sup> | ERUs <sup>4</sup> | WATER ADD (GPD) <sup>2</sup> | WW ADD (GPD) <sup>3</sup> | ERUs <sup>4</sup> | WATER ADD (GPD) <sup>2</sup> | WW ADD (GPD) <sup>3</sup> |
| EXISTING                | Existing WTP/WRF Service Area <sup>1</sup> | 3,046             | 921,204                      | 448,333                   | 2,451             | 857,711                      | 428,856                   | 2,144             | 857,711                      | 428,856                   | 2,144             | 857,711                      | 428,856                   |
| INFILL                  | Infill                                     | 0                 | 0                            | 0                         | 104               | 41,412                       | 20,706                    | 241               | 96,349                       | 48,175                    | 462               | 184,794                      | 92,397                    |
|                         | <b>Subtotal</b>                            | <b>0</b>          | <b>0</b>                     | <b>0</b>                  | <b>104</b>        | <b>41,412</b>                | <b>20,706</b>             | <b>241</b>        | <b>96,349</b>                | <b>48,175</b>             | <b>462</b>        | <b>184,794</b>               | <b>92,397</b>             |
| EXPANSION & DEVELOPMENT | 132nd Street West <sup>6</sup>             | 0                 | 0                            | 0                         | 159               | 56,033                       | 28,016                    | 172               | 61,160                       | 30,580                    | 206               | 73,589                       | 36,794                    |
|                         | 132nd Street East <sup>6</sup>             | 0                 | 0                            | 0                         | 212               | 74,045                       | 37,022                    | 229               | 80,149                       | 40,074                    | 274               | 95,785                       | 47,892                    |
|                         | Autumn Glen Development <sup>7</sup>       | 0                 | 0                            | 0                         | 304               | 121,600                      | 60,800                    | 304               | 121,600                      | 60,800                    | 304               | 121,600                      | 60,800                    |
|                         | Summer Crest <sup>5</sup>                  | 0                 | 0                            | 0                         | 651               | 292,950                      | 30,000                    | 700               | 315,000                      | 80,001                    | 700               | 315,000                      | 125,000                   |
|                         | 484 Development <sup>8</sup>               | 0                 | 0                            | 0                         | 457               | 182,800                      | 91,400                    | 457               | 182,800                      | 91,400                    | 457               | 182,800                      | 91,400                    |
|                         | SE 107th Street Apartments <sup>8</sup>    | 0                 | 0                            | 0                         | 234               | 93,600                       | 46,800                    | 234               | 93,600                       | 46,800                    | 234               | 93,600                       | 46,800                    |
|                         | Diamond Ridge <sup>8</sup>                 | 0                 | 0                            | 0                         | 207               | 82,800                       | 41,400                    | 207               | 82,800                       | 41,400                    | 207               | 82,800                       | 41,400                    |
|                         | Water Only (Expansion)                     | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 90                | 36,090                       | 18,045                    |
|                         | <b>Subtotal</b>                            | <b>0</b>          | <b>0</b>                     | <b>0</b>                  | <b>2,224</b>      | <b>903,828</b>               | <b>335,439</b>            | <b>2,304</b>      | <b>937,108</b>               | <b>391,055</b>            | <b>2,472</b>      | <b>1,001,264</b>             | <b>468,132</b>            |
|                         | Septic to Sewer Region 1                   | 0                 | 0                            | 0                         | 214               | 85,489                       | 44,282                    | 249               | 99,418                       | 52,274                    | 309               | 123,717                      | 66,325                    |
|                         | Septic to Sewer Region 2                   | 0                 | 0                            | 0                         | 73                | 29,150                       | 14,787                    | 100               | 39,860                       | 20,284                    | 146               | 58,491                       | 29,862                    |
| SEPTIC TO SEWER         | Septic to Sewer Region 3                   | 0                 | 0                            | 0                         | 478               | 191,226                      | 96,532                    | 506               | 202,461                      | 102,765                   | 557               | 222,632                      | 113,988                   |
|                         | Septic to Sewer Region 4                   | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 5                 | 1,991                        | 15,516                    | 7                 | 2,844                        | 15,942                    |
|                         | Septic to Sewer Region 5                   | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 106               | 42,236                       | 49,978                    | 160               | 63,850                       | 62,973                    |
|                         | Septic to Sewer Region 6                   | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 233               | 93,091                       | 47,566                    | 251               | 100,326                      | 51,941                    |
|                         | Future Septic Region 7                     | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 64                | 25,450                       | 12,847                    |
|                         | Future Septic Region 8                     | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 423               | 169,147                      | 86,149                    |
|                         | Future Septic Region 9                     | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 1,554             | 621,513                      | 310,757                   |
|                         | Future Septic Region 10                    | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 466               | 186,287                      | 93,615                    |
|                         | Future Septic Region 11                    | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 0                 | 0                            | 0                         | 126               | 50,517                       | 25,475                    |
|                         | <b>Subtotal</b>                            | <b>0</b>          | <b>0</b>                     | <b>0</b>                  | <b>765</b>        | <b>305,865</b>               | <b>155,601</b>            | <b>1,198</b>      | <b>479,058</b>               | <b>288,383</b>            | <b>4,062</b>      | <b>1,624,775</b>             | <b>869,874</b>            |
|                         | <b>Total (No OSTDS)</b>                    | <b>3,046</b>      | <b>921,204</b>               | <b>448,333</b>            | <b>4,778</b>      | <b>1,802,951</b>             | <b>785,000</b>            | <b>4,689</b>      | <b>1,891,168</b>             | <b>868,085</b>            | <b>5,078</b>      | <b>2,043,769</b>             | <b>989,384</b>            |
|                         | <b>Total with OSTDS Region 1-6</b>         |                   |                              |                           | <b>5,543</b>      | <b>2,108,815</b>             | <b>940,602</b>            | <b>5,886</b>      | <b>2,370,226</b>             | <b>1,156,468</b>          | <b>6,508</b>      | <b>2,615,628</b>             | <b>1,330,415</b>          |
|                         | <b>Total with OSTDS Region 1-11</b>        |                   |                              |                           |                   |                              |                           |                   |                              |                           | <b>9,140</b>      | <b>3,668,543</b>             | <b>1,859,258</b>          |

1. Based on 2017 FDEP MOR data

2. 400 gpd/ERU per the Marion County Land Development Code level of service for potable water

3. 200 gpd/ERU per the Marion County Land Development Code level of service for wastewater

4. Assumed 2.35 people per ERU

5. Assumed 450 gpd/ERU. Currently 75 lots occupied, to increase at 144 lots/year. Capped at 700 lots

6. 50% of buildout in 2037, 2% growth rate. Values used from Project No. 042417005 Abshier SE 132nd Utility Ext.

7. Assumed 304 lots in Autumn Glen, built out by 2022

8. Assumes built out by end of 2022

|                  |      |
|------------------|------|
| Peak Hour Factor | 4.5  |
| Max Day Factor   | 2.25 |

|                                    |       |      |
|------------------------------------|-------|------|
| ADD                                | MDD   | PHF  |
| Current Water System Capacity      | 0.547 | 1.23 |
| Current Wastewater System Capacity | 0.76  | 1.71 |



## Summary and Conclusions

As summarized in Table 1, the water treatment plant is expected to exceed the permitted max day capacity of 1.23 MGD in the third quarter of 2021, assuming continued linear growth. For this reason, it is recommended that the City begin design and permitting for an additional water treatment plant as identified in the 2019 Master Plan.

It is also expected that the wastewater treatment plant will exceed the permitted annual average day capacity of 0.76 MGD in the fourth quarter of 2022, assuming continued linear growth. At this time, it is recommended that the City move forward with rerating the wastewater treatment plant to 0.80 MGD, as described in the 2019 Master Plan. With a rerated capacity of 0.80 MGD, the City's wastewater treatment plant is still projected to exceed capacity by the fourth quarter of 2025. In accordance with Florida Administrative Code (FAC) 62-600.405, the City is required to begin the planning and preliminary design of an expansion. Therefore, it is further recommended that the City begin design and permitting of the next expansion phase to 1.2 MGD as outlined in the Master Plan. Should the City pursue future septic to sewer conversations this timeline is expected to change. A summary of 62-600.405 is provided below:

### Florida Administrative Code (FAC) 62-600.405 Planning for Wastewater Facility Expansion

- 3-month average daily use exceeds 50% permitted capacity, requires Capacity Analysis report to FDEP within 180 days of exceeding 50% capacity.
- Capacity not exceeded in 10 years, Capacity Report to FDEP every 5-years.
- Capacity equaled or exceeded in 10 years, annual report to FDEP
- Capacity equaled or exceeded in 5 years, planning and preliminary design on expansion shall have commenced.
- Capacity equaled or exceeded in 4 years, plans and specifications shall have commenced.
- Capacity equaled or exceeded in 3 years, completed application submitted to

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