Appendix P4 Supplemental Sewer Study

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

SUPPLEMENTAL SEWER STUDY FOR THE CARLTON OAKS DEVELOPMENT PROJECT IN THE CITY OF SANTEE

November 9, 2022

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

SUPPLEMENTAL SEWER STUDY FOR THE CARLTON OAKS DEVELOPMENT PROJECT IN THE CITY OF SANTEE

November 9, 2022



Prepared by: Dexter Wilson Engineering, Inc. 2234 Faraday Avenue Carlsbad, CA 92008 760-438-4422

Job No. 663-082

DEXTER S. WILSON, P.E. ANDREW M. OVEN, P.E. NATALIE J. FRASCHETTI, P.E. STEVEN J. HENDERSON, P.E. FERNANDO FREGOSO, P.E. KATHLEEN L. HEITT, P.E.

November 9, 2022

663-082

Lennar 16465 Via Esprillo, Suite 150 San Diego, CA 92127

Attention: David W. Shepherd, Director of Entitlements

Subject: Supplemental Sewer Study for the Carlton Oaks Development Project, City of Santee

Introduction

Lennar Homes and Carlton Oaks Golf Course, as joint project proponents, are proposing to redevelop the existing Carlton Oaks Country Club into a resort with residential accessory uses. The proposed project would include a redesign of the existing Carlton Oaks golf course which will include the following on approximately 169 acres: residential accessory uses consisting of two residential neighborhoods with open space areas; a hotel and associated cottages; an improved golf course clubhouse and pro shop, golf course and practice area, and learning center structure.

The proposed project includes the demolition of the existing Carlton Oaks golf course clubhouse, restaurant/bar, pro shop, hotel and hotel cottages, and surface parking lots; construction of new residential accessory uses and a resort facility; and redevelopment of the golf course. The proposed project would redesign the existing 145-acre, 18-hole golf course into a 104acre, 18-hole course. The length of the golf course would be reduced from approximately 7,300 yards to 6,450 yards. Currently the golf course has approximately 132 acres of turf irrigation; the new course design would have approximately 66 acres of turf irrigation.

In addition to the golf course, the Carlton Oaks Golf Course owner would develop several golf amenities including a pro shop, cart barn, and a cart waiting area on the eastern end of the golf course, northeast of the golf resort, as well as two practice areas. A golf learning center structure would also be developed northeast of the pro shop. The existing maintenance buildings would remain on site in their current location.

The clubhouse and hotel would consist of 10 cottage-style hotel units, 42 hotel rooms, a restaurant, event space, and other accommodations on 6.02 acres. The outdoor space of the clubhouse would consist of an outdoor swimming pool and deck area, a patio, and a courtyard.

The proposed residential development would be clustered into two areas: PA-1 also called Residential West comprising 86 multi-family detached homes with a density of 9 DUs/acre, and PA-2 also called Residential North with 150 detached condominiums and six single family, single-story lots with an overall density of 8.0 DUs/acre. All residential development will be accessible through privately maintained internal streets.

Figure 1 presents a vicinity map for the Carlton Oaks project. An overall site plan of the Carlton Oaks project is included in Appendix A.

Purpose of Study

The purpose of this supplemental sewer study for the Carlton Oaks project is to demonstrate that the sewer system needed for the currently proposed Carlton Oaks project map is consistent with the sewer study previously prepared for the Carlton Oaks project by Dudek. This previous report was prepared for Padre Dam Municipal Water District and is titled, *Carlton Oaks PA-1, PA-2 and PA-3 Sewer Study*, dated April 2021, PDMWD Job No. 220009.

The April 2021 study analyzed 85 dwelling units for PA-1, 158 dwelling units for PA-2, and a 27-room hotel, 25 cottages, a restaurant, club house, and tournament hall for PA-3.



The current Carlton Oaks development plan includes 86 dwelling units for PA-1 (Residential West), 156 dwelling units for PA-2 (Residential North), and a 42-room hotel, 10 cottages, a restaurant, club house, pro shop, learning center, cart barn, and tournament hall for PA-3 (Resort Area). Thus, the proposed map for the Carlton Oaks development project is very consistent with the project which was analyzed by the Dudek study dated April 2021. Therefore, the conclusions and recommendations of the April 2021 Sewer Study are applicable. This supplemental sewer study will identify how the currently proposed Carlton Oaks development project comports with the April 2021 Sewer Study.

Figure 2 shows the Carlton Oaks project proposed onsite sewer system.

Sewer Flow Generation

Table 1 below shows the calculation of average dry weather flow for the proposed Carlton Oaks project. In PA-2 not all of the six single family lots will sewer through PA-2; one lot will be connected to the existing gravity sewer in Carlton Oaks Drive. However, all 156 dwelling units will be accounted for in the sewer flow generation. Total average sewage flow generated by the project will be 44,746 gpd.

TABLE 1 CARLTON OAKS SEWER GENERATION				
Area	Quantity	Units	Flow Factor	ADWF (gpd)
PA-1 (Residential West)	86	DUs	165 gpd/DU	14,190
PA-2 (Residential North)	150	DUs	165 gpd/DU	24,750
PA-3 (Resort Area)	6.02	Acres	800 gpd/AC	4,816
TOTAL				43,756

The April 2021 Sewer Study calculated an average dry weather flow of 46,839 gpd. The currently proposed Carlton Oaks project has a reduced sewer generation by 3,083 gpd.



PA-1 Proposed Private Sewer Layout

The sewer collection system for Carlton Oaks PA-1 is proposed to be a private sewer system. It will consist of 8" gravity sewer collection lines flowing to a private sewer lift station. Figure 3 shows the proposed system.

Based on a minimum gravity sewer line size of 8-inch, a minimum allowable slope of 0.40 percent, and the total peak flow for PA-1 of 49,665 gpd, the depth of flow in an 8-inch sewer line for the entire PA-1 development will be 0.2 d/D with a velocity of 1.6 fps. Where possible, the private gravity sewer collection system will be designed around 1 percent slope which will result in a sewer maximum depth of flow of 0.16 d/D and a velocity of 2.1 fps.

Sewer flow from PA-1 will be collected at a private sewer lift station site in the northwest corner of PA-1. The lift station force main will extend east from PA-1 all the way to the realigned 15-inch gravity sewer in PA-2. This is shown in Figure 3. This configuration was analyzed in the April 2021 Dudek Sewer Study and identified as an acceptable alternative in the April 2021 Sewer Study Conclusions and Recommendations.

The following section provides more detailed information about the private sewer lift station commensurate with the proposed Tentative Map submittal for the Carlton Oaks project. The final design of the private sewer lift station including detailed hydraulic calculations for proper pump selection and wet well sizing will be undertaken concurrently with the preparation of final engineering and improvement plans for the Carlton Oaks project. The private sewer lift station final design will be prepared for review and approval by the City of Santee Building Department as part of the building plan preparation process.

PA-1 Private Sewer Lift Station. The Carlton Oaks PA-1 private sewer lift station is expected to include two submersible sewage pumps in a precast concrete wet well. Each pump will be capable of pumping the total lift station design flow; thus, there will be 100 percent redundancy for the mechanical equipment. The lift station will have emergency power generation, emergency sewer storage, and emergency force main connections. Odor control equipment will include a chemical scrubber at the wet well with provisions for adding a more aggressive odor control system if determined to be necessary to prevent odor generation at the lift station.



Most of the lift station equipment will be below grade; the equipment which will be above grade includes the emergency power generator, the odor control equipment, the pump control panel, the electrical distribution panel, and the electric meter and power transformer.

The following paragraphs discuss the private sewer lift station components in more detail.

<u>Main Sewage Pumps and the Force Main.</u> The minimum recommended force main size to carry raw sewage is 4" diameter unless grinder pumps are used. Because of the volume of sewage generated by the PA-1, it is recommended that typical sewage solids-handling pumps be used for the proposed private lift station instead of grinder pumps. This will reduce the possibility of sewage clogging and also reduce the pump maintenance as grinder pumps are maintenance intensive.

For sewage pumping, the minimum recommended sewage flow velocity is three feet per second (fps). To achieve three feet per second sewage flow velocity in a 4-inch diameter force main, the private lift station pumping capacity must be at least 120 gpm. This pumping capacity is greater than the calculated peak sewage flow of 35 gpm from PA-1.

<u>Wet Well and Duplex Pumps.</u> The private lift station will consist of a pre-cast concrete wet well with two submersible, centrifugal, vortex impeller, sewage solids-handling pumps. Each pump will be capable of pumping 120 gpm which is greater than the design peak flow thereby providing 100 percent pumping capacity redundancy. A pump control panel will provide motor starters for the pumps and control the pump operation based on liquid level in the wet well.

<u>Valve Vault/Emergency Force Main Connection</u>. The private lift station will include a valve vault for individual check valves and shutoff valves for each sewage pump. In addition, in the valve vault will be located the emergency force main connection. This connection will enable the submersible pumps to be connected to temporary hoses so that sewage can be pumped into a truck in the event that the force main needs repair. In addition, if both the submersible pumps fail, a temporary pump can be brought to the site and connected to the force main piping so that sewage pumping can continue while the main sewage pumps are repaired.

Emergency Power. The private lift station will have an exterior concrete pad mounted emergency power generator to provide backup power in the event that commercial power goes out. Typically, a diesel engine driven generator is sized to operate both sewage pumps simultaneously plus peripheral power demands at the station. The emergency power generator will have a sound attenuated, weatherproof enclosure. The control panel will include an automatic transfer switch which will start the generator when commercial power fails.

Emergency Sewage Storage. Emergency sewage storage will be provided with an underground vault which will store up to six (6) hours of average sewage flow. This will provide time for a response to any problem at the lift station.

<u>Odor Control.</u> Odor control equipment will include a passive activated carbon scrubber on the wet well vent. Power and water service will be included at the lift station so that an active odor control system can be installed if in the future odor becomes a concern. Because of the low retention time between when the sewage is generated to when it gets pumped out any odors that do get generated will be mitigated by the carbon scrubber.

<u>Monitoring and Alarm System.</u> A control and monitoring system will be included as part of the pump control panel. This system will monitor wet well depth and start and stop the pumps at the correct operating levels. Wet well level and pump operation data will be accessible via an internet link. System alarms such as pump fail, high water level, and power fail will also be transmitted on the website. Alarms will also be communicated via cell phone to alert those designated to respond to any problems at the lift station.

PA-2 Proposed Private Sewer Layout

The sewer collection system for Carlton Oaks PA-2 is proposed to be a private sewer system. It will consist of 4" and 8" gravity sewer collection lines flowing to a public 15" gravity sewer line. The existing 15" gravity sewer flows north and east crossing Carlton Oaks Drive and discharges into the Influent Pump Station (see Figure 2). Figure 4 shows the proposed sewer system within Carlton Oaks PA-2.



As noted earlier in this report, there are six single family lots along Carlton Oaks Drive. The five westerly lots will sewer into the PA-2 private sewer system. The sixth lot will have a sewer lateral connected to the existing public gravity sewer in Carlton Oaks Drive.

Part of the Carlton Oaks PA-2 project improvements includes the relocation of the existing 15" gravity sewer which follows the south boundary of PA-2 as shown in Figure 4. This segment of 15" sewer will be relocated into the southerly private drive within PA-2. Because of the depth of the existing 15" sewer line, a parallel 8" private collector sewer will be installed to service the dwelling units within PA-2. The PA-2 private collector sewer system will make connections to the 15" public sewer at two points, one at the southwest corner of PA-2, and one at the southeast corner of PA-2. These connection points are shown on Figure 4.

Also shown on Figure 4 at the southwest end of PA-2 is the connection of the proposed private 4" sewer force main from the PA-1 private sewer lift station. The force main flow will discharge into the relocated 15" public gravity sewer. The existing and proposed flows in this segment of 15" public sewer were analyzed as part of the April 2021 Sewer Study; the 15" public sewer line was determined to have adequate capacity for all the flows.

PA-3 Proposed Private Sewer Layout

The sewer collection system for Carlton Oaks PA-3, the hotel, cottage, and associated amenities, is proposed to connect to the existing 24" gravity sewer which traverses PA-3 and flows north to the confluence of sewers upstream of the Influent Pump Station. The Influent Pump Station is an existing Padre Dam MWD sewer lift station located north of Carlton Oaks Drive. Its location is shown in Figure 2.

Figure 5 shows the proposed 8" private collector sewer for PA-3 connecting to the existing 24" public gravity sewer.



Conclusions and Recommendations

The following conclusions and recommendations are made relating to providing sewer service to the Carlton Oaks project.

- 1. The Carlton Oaks project will receive sewer service from the Padre Dam Municipal Water District.
- 2. The proposed sewer system configuration for the Carlton Oaks project is presented in Figure 2.
- 3. The onsite sewer system configuration for the Carlton Oaks project will be a private system.
- 4. A private sewer lift station will be installed on the west end of PA-1 (Residential West). The private force main for this lift station will extend east and discharge into the 15" public gravity sewer to be constructed within PA-2 (Residential North).
- 5. The development of PA-2 (Residential North) conflicts with an existing 15" public gravity sewer. This segment of 15" sewer will be relocated into the PA-2 private street as shown in Figure 4.
- 6. PA-2 (Residential North) will construct a 4" and 8" private collector sewer system and connect to the relocated 15" public sewer at two locations. No individual sewer lateral connections will be made to the relocated 15" public gravity sewer.
- 7. PA-3 (Resort Area) will construct a private collector sewer which will be connected to the existing 24" public gravity sewer which crosses PA-3.
- 8. The sewer system analyses conducted in the Dudek April 2021 Sewer Study indicate that the existing gravity sewer collection and pumping facilities can accommodate the wastewater flows from the Carlton Oaks project.
- 9. As per the conclusions of the Dudek April 2021 Sewer Study, no offsite sewer system improvements are needed by the Carlton Oaks project.

- Pipe material for the private onsite gravity sewer pipe is recommended to be PVC SDR 35; the private sewer force main is recommended to be either HDPE IPS DR11 Class 200 or PVC C900 DR18 Class 235.
- 11. Public sewer lines to be constructed by the Carlton Oaks project will be designed and constructed in accordance with the standards and specifications of the Padre Dam Municipal Water District.

Thank you for the opportunity to provide professional engineering services for the Carlton Oaks project. If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to call.

Dexter Wilson Engineering, Inc.

Andrew Oven, P.E.

AO:ah

cc: Marisa Lundstedt, Summit Planning Group Troy Burns, Hunsaker & Associates San Diego

APPENDIX A

CARLTON OAKS SITE PLAN



VICF

Ν

1:5,400

Figure XX Site Plan and Off-Site Improvements Carlton Oaks Country Club and Resort