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SOUTHWEST VILLAGE
SPECIFIC PLAN SEWER STUDY
IN THE CITY OF SAN DIEGO
PTS# 614791

December 19, 2024

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EXECUTIVE SUMMARY

This report defines the facilities needed to provide sewer service to the Southwest Village development proposed by Tri Pointe Homes and other landowners within the specific plan boundary. The Southwest Village Specific Plan (Specific Plan) provides a comprehensive policy framework intended to guide future development in Southwest Village, consistent with the Otay Mesa Community Plan (OMCP) and City of Villages Strategy. The Specific Plan encompasses approximately 487 acres, will allow up to 5,130 attached and detached residences, and will facilitate creation of a new village anchored by up to 175,000 square feet of commercial and retail uses in a Mixed-Use Village Core. The Specific Plan would provide public facilities including dedication of a new elementary school, approximately 36 acres of developed parks in addition to approximately 18 acres of trails, and 185 acres of natural open space and habitat conservation. Access to the Specific Plan area will be via two main access points, Caliente Avenue to the north and from an extension of Beyer Boulevard to the west, connecting the Specific Plan area to San Ysidro.

The purpose of this report is twofold:

1. Design Definition: Confirm the size, location, and constructability of the proposed sewer facilities necessary to provide service to the Southwest Village development.

2. EIR Support: Describe the sewer facilities in sufficient detail to support the Southwest Village Project Environmental Impact Report (EIR).

FACILITY OVERVIEW –SEWER/WASTEWATER SYSTEM

Sewer Facilities

The sewer facilities required for service mainly consist of an onsite collection system and lift stations whose forcemains will connect to the proposed gravity sewer system within the specific plan area. A more detailed description of existing City sewer facilities is included in Chapter 3 of this report. A summary map depicting these facilities is shown on Figure 3-1. The remaining Chapter 3 figures depict the offsite sewer improvements and gravity pipeline alignments as well as the required onsite sewer collection system and lift stations.

Based on projected demands and phasing considerations, the recommended offsite sewer facilities include:

- An extension of the master planned Otay Mesa Trunk Sewer (OMTS) in Beyer Boulevard.
- A gravity sewer line in the Beyer Boulevard extension west of the project.

Based on estimated sewage generation and phasing considerations, the recommended onsite sewer facilities include:

- Gravity sewer lines ranging from 8-inch to 18-inch diameter.
- A minimum of two future regional sewer lift stations with a potential for several future smaller lift stations throughout the project.
- Force mains ranging from 6-inch to 8-inch diameter conveying flow from the future onsite sewer lift stations to gravity collector sewers onsite within the project.

EIR DOCUMENTATION

Permitting requirements and descriptions associated with the construction of the Southwest Village Specific Plan sewer facilities are included in this report to support the EIR preparation efforts. The impacts associated with the offsite improvements will be analyzed in the EIR. Construction descriptions are based on typical construction methods for the sewer facilities identified in this report.

CHAPTER 1

INTRODUCTION

The Southwest Village Specific Plan project is pursuing development of 487 acres of property south of the intersection of Highway 905 and Caliente Avenue in the Otay Mesa area of the City of San Diego. The development/specific plan area, known as Southwest Village, will require new sewer service infrastructure. This report provides engineering analysis to assist Tri-Pointe Homes with planning of the sewer facilities for the Southwest Village Specific Plan development. A Location Map is shown on Figure 1-1.

PURPOSE AND OUTLINE

This report provides preliminary planning for the Southwest Village sewer facilities. The purpose of the report is twofold:

- Design Definition**:** Conduct sufficient research and analysis to confirm the size, location, and constructability of the sewer facilities needed to provide sewer service to the Southwest Village Specific Plan project.

- EIR Support**:** Describe facilities in sufficient detail to support a project-level EIR, including documentation of an alternative analysis process sufficient to comply with the California Environmental Quality Act (CEQA).

The report is organized into four chapters as follows:

- Chapter 1 – Introduction (this chapter)
- Chapter 2 – Sewer Generation and Design Criteria Overview
- Chapter 3 – Sewer Facilities – Existing and Proposed
- Chapter 4 – Conclusions and Constructability

This report is an update of the previous "Southwest Village Specific Plan Sewer Study" dated June 14, 2024 and incorporates City comments that were previously issued. The specific City comments and responses (if any) are included in Appendix H of this report.

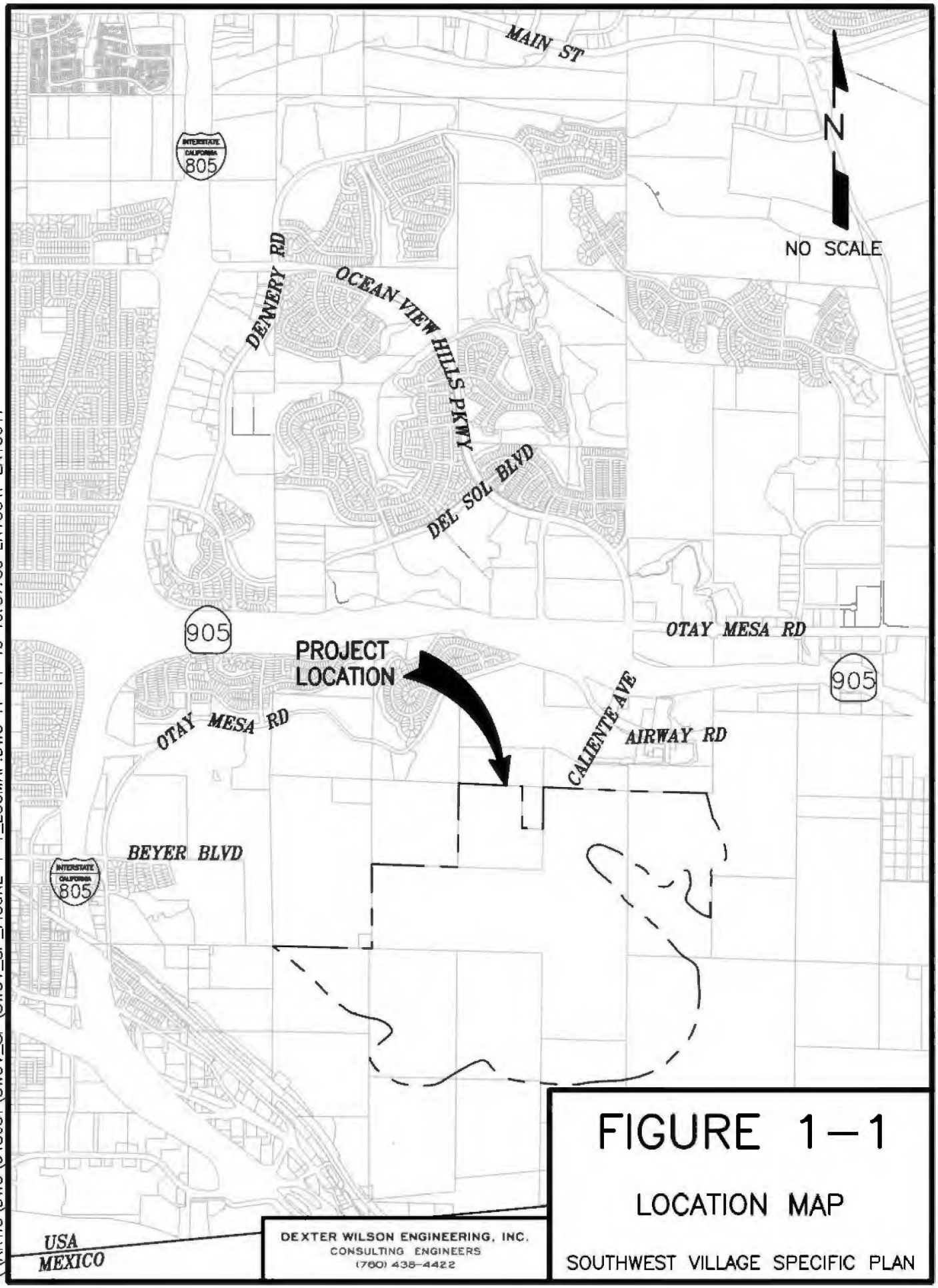

FIGURE 1–1

LOCATION MAP

SOUTHWEST VILLAGE SPECIFIC PLAN

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SEWER SERVICE BACKGROUND

The Southwest Village Specific Plan project is not within an area of the City where existing sewer service exists. Sewer service for the Southwest Village Specific Plan project will be provided by extending a gravity sewer trunk line to the proposed development area. The south and northeast portions of the development area will require pumping via future onsite sewer lift stations. The existing City of San Diego public sewer system is located west and north of the project area.

Previous reports and sewer studies prepared by the City of San Diego have not addressed this specific portion of the City's service area. This specific area has only been identified in the overall 2004 OMTS Master Plan, and 2009 Addendum, which originally had the Southwest Village project area labeled as "Phase 2C." The OMTS Master Plan identifies this area due to the future sewer flow that would originate from this area and ultimately flow into the OMTS. The OMTS Master Plan did not make any recommendations or analyze any proposed onsite facilities, however. Only the impacts due to the increased sewer flow to the OMTS was analyzed in the Master Plan.

A further discussion of how the Southwest Village project will fit into the OMTS master plan will be provided in Chapter 3 of this report. The appropriate sections of the current OMTS Master Plan referenced above is included in Appendix A. It must be noted that an updated draft of the OMTS Master Plan is currently in process; however, no draft report is available as of the preparation of this sewer study for the Southwest Village Specific Plan.

PLANNED LAND USE

The Southwest Village Specific Plan land use plan proposes a variety of different housing types and uses. The plan also proposes a commercial center, parks, and a site for an elementary school. The project's 32 Land Use Areas as outlined by the Specific Plan are summarized in Table 1-1. The buildout land use analysis map from the Specific Plan itself is attached to this report as Appendix B.

TABLE 1-1
SOUTHWEST VILLAGE LAND USE SUMMARY

Planning Area	Specific Plan Land Use	Gross Acreage	Net Acreage	Maximum Dwelling Units[1]	Net Density[1]
1	Medium Density	6.9	5.5	160	29.0
2	Park	5.0	4.0	0	0.0
3	Park	2.1	1.7	0	0.0
4	Medium Density	9.1	7.3	211	29.0
5	Medium Density	26.2	21.0	608	29.0
6	Medium Density	4.5	3.6	104	28.9
7	Medium Density	6.9	5.5	160	29.0
8	Medium-High Density	8.0	6.4	282	44.1
9	Medium Density	4.6	3.7	107	29.1
10	Medium-Low Density	12.8	10.2	225	22.0
11	Medium Density	8.2	6.6	190	29.0
12	Medium-Low Density	7.8	6.2	137	22.0
13	Medium Density	8.3	6.6	193	29.1
14	Medium-Low Density	10.3	8.2	181	22.0
15	Medium-Low Density	13.8	11.0	243	22.0
16	School	6.2	5.0	0	0.0
17	Park	10.5	8.4	0	0.0
18	Medium-Low Density	13.5	10.8	238	22.0
19	Medium Density	10.2	8.2	237	29.0
20	Medium-Low Density	7.6	6.1	134	22.0
21	Medium-Low Density	15.1	12.1	266	22.0
22	Medium Density	11.5	9.2	267	29.0
23	Open Space/VPHCP	7.8	6.2	0	0
24	Residential Mixed-Use	7.7	6.2	352	56.8
25	Residential Mixed-Use	8.0	6.4	365	57.0
26	Residential Mixed-Use	5.5	4.4	251	56.8
27	Residential Mixed-Use	4.8	3.8	219	57.6
28	Open Space	128.1	102.5	0	0.0
29	Open Space/MHPA	3.2	2.6	0	0.0
30	VPHCP	51.6	41.3	0	0.0
31	VPHCP (Pump Station)	4.6	3.7	0	0.0
32	Streets	57.0	45.6	0	0.0
TOTAL		**487.4**	**389.9**	**5,130**	**13.2**

[1] Residential Only

PROJECT PLANNING AND ENVIRONMENTAL DOCUMENTATION

The sewer facilities described in this report will be evaluated in a Project EIR for the Southwest Village Specific Plan development. The impacts associated with the offsite improvements will be analyzed in the EIR. This report serves as a technical reference for the Project EIR. The Southwest Village Project EIR will be used by the City of San Diego for its review of the Southwest Village Specific Plan project.

CHAPTER 2

SEWER GENERATION AND DESIGN CRITERIA OVERVIEW

This report estimates sewer generation directly from the planned land uses within the Southwest Village Specific Plan project and employs sewer generation factors (design criteria) specific to each land use. Land use is summarized in Table 1-1 and sewer generation factors are described below.

Sewer Generation Factors

This report has assigned sewer generation factors to each of the different land use categories based on City of San Diego Design Criteria. Specifically, the source is the City of San Diego Sewer Design Guide, May 2015 (Sewer Design Guide) included in Appendix C for reference.

Sewage generation estimates were developed in accordance with the Sewer Design Guide and are based on population. Table 1-1 from the Sewer Design Guide was used and interpolated to estimate the population for the Southwest Village Specific Plan project. Section 1.3.2.2 of the Sewer Design Guide uses a generation rate of 80 gallons per capita per day (gpcpd) to determine average dry weather flow (ADWF).

For residential and mixed-use land use areas, unit density and dwelling unit information was used to estimate population. For the school site, net area and equivalent population factors were used to estimate population. The population estimates and the generation rate of 80 gpcpd were used to estimate the ADWF for each of these planning areas.

Sewage generation for the community park was estimated using a similar approach as described above for the commercial and school site. Net area was used together with the School/Park Zone category from the City's Design Guide. The net area for the community parks was estimated to be approximately ten percent of the gross area of the parks. This estimate will be refined in the future as the park facilities are better defined. It is likely that not all community parks will have facilities that generate sewage flow such as restrooms and concession stands.

The sewer generation factors assigned are shown in Table 2-1 and a summary of the design criteria from the Sewer Design Guide is presented in Table 2-2.

TABLE 2-1
SOUTHWEST VILLAGE PROJECT
AVERAGE DRY WEATHER FLOWS

Planning Area	Net Area, ac	Net Density[1]	Equivalent Population, Pop./Net ac	Total Population	Average Dry Weather Flow, gpd
1-Residential	5.5	29.0	87	480	38,419
2-Park[2]	4.0	0.0	31	12	992
3-Park[2]	1.7	0.0	31	5	417
4-Residential	7.3	29.0	87	633	50,669
5-Residential	21.0	29.0	87	1,824	145,882
6-Residential	3.6	28.9	87	313	25,056
7-Residential	5.5	29.0	87	480	38,419
8-Residential	6.4	44.1	112	717	57,344
9-Residential	3.7	29.1	87	320	25,613
10-Residential	10.2	22.0	66	676	54,067
11-Residential	6.6	29.0	87	571	45,658
12-Residential	6.2	22.0	66	412	32,947
13-Residential	6.6	29.1	87	578	46,214
14-Residential	8.2	22.0	66	544	43,507
15-Residential	11.0	22.0	66	729	58,291
16-School	5.0	0.0	31	154	12,301
17-Park[2]	8.4	0.0	31	26	2,083
18-Residential	10.8	22.0	66	713	57,021
19-Residential	8.2	29.0	87	710	56,794
20-Residential	6.1	22.0	66	401	32,102
21-Residential	12.1	22.0	66	797	63,782
22-Residential	9.2	29.0	87	800	64,032
23-Open Space	6.2	0	0	0	0
24-Mixed Use	6.2	56.8	130	806	64,480
25-Mixed Use	6.4	57.0	130	832	66,560
26-Mixed Use	4.4	56.8	130	572	45,760
27-Mixed Use	3.8	57.6	130	494	39,520
28-Open Space	102.5	0.0	0	0	0
29-Open Space	2.6	0.0	0.0	0	0
30-VPHCP	41.3	0.0	0.0	0	0
31-Pump Station	3.7	0.0	0.0	0	0
32-Streets	45.6	0.0	0.0	0	0
TOTAL	**389.9**	**13.2**		**14,599**	**1,167,930 (4,172 EDUs[3])**

[1] Residential Only
[2] Net area for the parks is estimated to be 10 percent of total park acreage.
[3] Equivalent Dwelling Units (EDU) = 280 gpd

TABLE 2-2
CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
SEWER SYSTEM DESIGN CRITERIA

Criterion	Design Requirement	Design Guide Reference
Sewage Flow Generation	80 gallons per capita	1.3.2.2
Dry Weather Peaking Factor	Figure 1-1 based on population	1.3.2.2
Wet Weather Peaking Factor	Basin specific – determined by City	1.3.2.2
Gravity Flow Hydraulic Formula	Manning's Equation	1.3.3.1
Manning's 'n'	0.013	1.3.3.1
Desirable Gravity Flow Velocity	3 fps to 5 fps	1.3.3.1
Minimum Gravity Flow Velocity	2 fps	1.3.3.1
Where 2 fps is not achievable	Set min. slope at 1%	1.3.3.1
Maximum Gravity Flow Velocity	10 fps	1.3.3.1
Maximum Depth of Flow at Peak Wet Weather		
For New 15" Pipe and Smaller	d/D = 0.50	1.3.3.3
For New 18" Pipe and Larger	d/D = 0.75	1.3.3.3

The peaking factor for peak dry weather flow (PDWF) is dependent upon the equivalent population in the area upstream of, and including, the reach being analyzed. Figure 1-1 from the Sewer Design Guide was used to determine the peak dry weather peaking factor for each reach of pipe being analyzed for the Southwest Village Specific Plan project. The peaking factor for PDWF is the ratio of PDWF to ADWF. The dry weather peaking factor for the Southwest Village Specific Plan project is 1.74 based on a total project population of 14,599 people. The peak dry weather flow for the Southwest Village Specific Plan project is 2,030,137 gpd (1,410 gpm).

The peaking factor for peak wet weather flow (PWWF) for the Southwest Village Specific Plan project is 1.0 onsite and 1.85 offsite for the existing Otay Mesa Trunk Sewer area. The source of this PWWF factor is provided by other ancillary City of San Diego regional sewer studies within the Otay Mesa Trunk Sewer sub-basin. The peaking factor for PWWF is the ratio of PWWF to PDWF. The peak wet weather flow for the Southwest Village Specific Plan project is 3,755,754 gpd (2,608 gpm) for offsite analysis.

CHAPTER 3

SOUTHWEST VILLAGE SPECIFIC PLAN SEWER FACILITIES

This chapter will discuss the sewer system infrastructure needed to serve the Southwest Village Specific Plan project. The focus will be on the ultimate build-out sewer system needs.

The discussions in this chapter will involve backbone sewer collection piping system, onsite future sewer lift stations sizing for ultimate build-out as well as for initial phasing, required force mains to convey the pumped sewage flow onsite, and necessary offsite improvements to the OMTS to comply with the City of San Diego's OMTS Master Plan.

Figure 3-1 presents the existing City of San Diego sewer facilities in the Otay Mesa area.

OVERVIEW OF PROPOSED SEWER SERVICE

Onsite sewer facilities for the Southwest Village project are proposed to be a combination of public and private facilities. The backbone gravity sewer collection system is intended to be public. In-tract sewer collection systems may be public or private; this will be determined as individual maps are processed for development. This report will present recommended onsite backbone pipe sizes, pipe slopes, and lift stations.

Offsite sewer improvements will be public. The OMTS improvement section(s) will be constructed in existing public streets and/or rights-of-way.

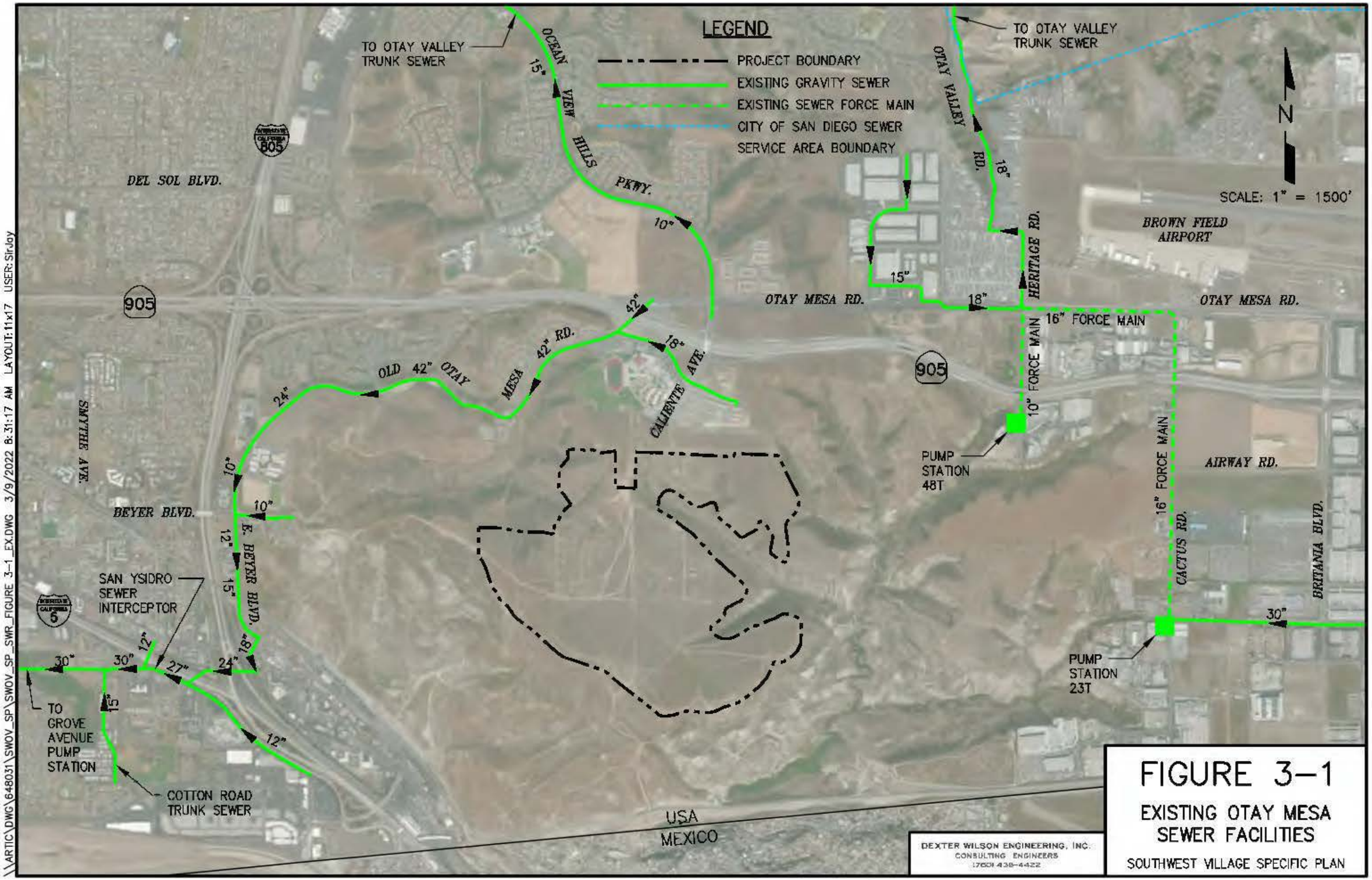

FIGURE 3–1

EXISTING OTAY MESA SEWER FACILITIES

SOUTHWEST VILLAGE SPECIFIC PLAN

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Onsite Sewer System

Figure 3-2 presents the proposed sewer system configuration and pipe sizing for the onsite sewer system to serve the Southwest Village Specific Plan project. The project's onsite sewer system will be composed of 8-inch, 10-inch, 12-inch, 15-inch, and 18-inch gravity sewer piping. The 18-inch gravity sewer piping is necessary for select segments on the western end of proposed Beyer Boulevard due to velocities being greater than 10 fps. The City requires SDR 18 PVC for gravity sewer segments where velocities exceed 10 fps and SDR 18 PVC is not available in 15-inch diameter but is available as 18-inch diameter.

The entire project cannot be served by a gravity sewer system alone. Portions of the project are positioned topographically down gradient of existing and proposed sewer facilities; therefore onsite lift stations will be necessary. The future lift stations will comply with the City's Sewer Design Guide including appropriate emergency storage and odor control. Odor control will be designed to mitigate odors caused by organic biological activity though either chemical injection or air filtration through an activated carbon unit. Specific design at each future lift station will limit odors by reducing detention times in the proposed wet well. One hundred percent design reports will be completed for each future station during the final design process and prior to final engineering.

A summary of the proposed onsite future lift stations are listed in Table 3-1. The two future sewer lift stations and their respective service areas are shown graphically on Figure 3-2.

TABLE 3-1
SOUTHWEST VILLAGE SPECIFIC PLAN FUTURE SEWER LIFT STATIONS

Lift Station	EDUs Served	Average Flow, gpd	Peak Flow, gpm	Forcemain Diameter[1], in	Total Head[2], ft	Horsepower (Per Pump[3])
1	1,471	411,926	572	8	65	20
2	934	261,435	386	6	90	15

[1] City requires dual/redundant forcemains
[2] Total Head = Static + Dynamic Head
[3] Two duty pumps assumed

City ownership of the two proposed sewer lift stations is likely necessary due to the various property ownerships within the proposed sewer sub-basins; the exact status of the future lift stations will be determined as development progresses further. Chapter 4 describes and Figure 4-1 illustrates the various property ownerships in relation to the proposed ultimate sewer infrastructure.

905

EX.42"

OTAY MESA RD

EX.18"

905

CALIENTE AVE

AIRWAY RD

N

0 800 FEET

EX.42"

EX.24"

OTAY MESA RD

EXISTING OTAY MESA
TRUNK SEWER (OMTS)

SOUTH-WIND
PROJECT

PROPOSED PUBLIC SEWER
TO BE LOCATED IN 26' WIDE EASEMENT

EX.10"

VTM1

18"(SDR 18 PVC)

18"

EX.10"

BEYER BLVD.

15"

CENTRAL AVE

CALIENTE AVE

DUAL 6-INCH
FORCE MAINS

E. BEYER BLVD.

WEST AVE

EAST AVE

PROPOSED
FUTURE SEWER
LIFT STATION "2"

EX.24"

EX.27"

DUAL 8-INCH
FORCE MAINS

PROPOSED
FUTURE SEWER
LIFT STATION "1"

LEGEND

- PROJECT BOUNDARY
- SEWER SUB-BASIN BOUNDARY
- EXISTING GRAVITY SEWER
- PROPOSED PUBLIC GRAVITY SEWER
- PROPOSED PUBLIC SEWER FORCE MAIN
- (#) LAND USE AREA
- LIFT STATION "1" SUB-AREA
- LIFT STATION "2" SUB-AREA

FIGURE 3-2

PROPOSED PUBLIC SEWER FACILITIES

SOUTHWEST VILLAGE SPECIFIC PLAN

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Onsite Sewer System Slopes

For the Southwest Village Specific Plan project submittal, onsite gravity sewer line slopes have been estimated based on street elevations generated from the preliminary project grading concept plan. Therefore, the onsite analysis presented herein is subject to adjustment based on final street grades and lot configurations. Depth of onsite sewer lines is not known at this stage of the project design development.

Sewer depths and sewer pipe materials will conform to the Sewer Design Guide. Where deviations may be needed, such deviations will be addressed as part of the improvement plan design and review process for individual planning areas.

Onsite Public Sewer System Analysis

The onsite public sewer analysis consists of calculating peak flows within all segments of the proposed backbone onsite sewer for the Southwest Village Specific Plan project. As indicated earlier, gravity sewer slopes for the backbone onsite proposed sewers are estimated based on street elevations. Flow in each sewer segment is calculated using the land uses and average flow values generated in Table 2-1.

More detailed sewer analyses will be provided as part of the improvement plan preparation, submittal, and review process for the individual planning areas. At that time sewer slopes and depths will be refined and the corresponding sewer calculations can be provided to confirm conformance with the Sewer Design Guide requirements.

Onsite Analysis. The Southwest Village Specific Plan project backbone onsite sewer was analyzed using the flows calculated in Table 2-1. The sewer system analysis includes Southwest Village Specific Plan project onsite sewage gravity flow and pumped flow where applicable. Onsite sewer flows were converted from average flow to peak flow using Figure 1-1 of the Sewer Design Guide. The sewer analysis manhole numbers shown on Exhibit A correspond to the onsite sewer analysis presented in Appendix D.

Onsite Analysis Results. The onsite public sewer analysis includes calculations for the backbone gravity sewer within the Southwest Village Specific Plan project based on peak flows. The calculations were checked in order to be sure that design criteria for maximum allowable depth-to-diameter is being satisfied. Certain segments of sewer have been increased in size to maintain allowable sewer flow depths. The spreadsheet printout in Appendix D represents the recommended sewer line sizes to meet the depth of flow design criterion.

The maximum depth-to-diameter (d/D) ratio for any new 8-inch sewer line within the Southwest Village Specific Plan project is 0.34 d/D. For the new 10-inch sewer lines, the maximum d/D ratio is 0.41 d/D. New 12-inch sewer lines have a maximum d/D ratio of 0.44 d/D. New 15-inch sewer lines have a maximum d/D ratio of 0.54 d/D. New 18-inch sewer lines have a maximum d/D ratio of 0.24 d/D. These depth results are based on the slopes assumed in Appendix D.

If final design conditions dictate that slopes need to be reduced compared to the slopes identified in Appendix D then pipe sizes may need to be increased. Conversely, if sewer slopes can be increased, then it may be possible to reduce the sewer line sizes.

Flow velocities at PWWF in the Southwest Village Specific Plan sewer system range from 2.0 fps to 13.7 fps for onsite public gravity sewer piping.

Beyer Boulevard Extension

Beyer Boulevard is a major surface street in the San Ysidro area and currently terminates near Old Otay Mesa Road and Interstate 805 approximately 3,500 feet west of the project. Beyer Boulevard will be extended as part of the Southwest Village Specific Plan project. The extension will be built by the project concurrent with implementation of the initial vesting tentative maps.

A gravity sewer line in future Beyer Boulevard conveying the project's flow westward to the OMTS will serve as adequate conveyance for the Southwest Village Specific Plan build-out flows. Please refer to Figure 3-2 for an overview of the proposed Beyer Boulevard extension and gravity sewer line.

Offsite Sewer Flow from Adjacent Projects

The onsite sewer analysis was conducted with the potential additional flow of an adjacent project to the north of the Southwest Village Specific Plan. The Southwind project is planned for 75 units and the project was previously slated to pump wastewater flow northward to the existing OMTS. Southwest Village will construct an additional 8-inch diameter gravity sewer line through a new easement in Planning Area 8 so that the project can abandon its planned onsite lift station and instead gravity flow through the Southwest Village Specific Plan project. The sewer calculation which analyzes this condition is presented in Appendix D. All proposed gravity sewer segments remain within City design criteria with the addition of gravity flow from the Southwind project.

Offsite OMTS Improvement

The City is currently in the midst of a basin wide sewer improvement project which involves the construction of a new trunk sewer line (OMTS) to convey the current and future sewer flows in the Otay Mesa sewer sub-basin. Portions of this project have already been implemented and constructed as private and public development have transpired.

As identified in the Master Plan, the Southwest Village Specific Plan project is indicated as an area that would be responsible for certain improvements to the OMTS. In the 2004 Master Plan, Southwest Village is grouped into "Phase 2C" and in the 2009 Addendum it is grouped into "Phase 3." These master plan sections are included as Appendix A in this report.

Both the 2004 Master Plan and 2009 Addendum designate a portion of the proposed OMTS in Otay Mesa Road and Beyer Boulevard as the necessary improvement for Southwest Village. It is anticipated that the Southwest Village will share in the cost and construction of this improvement with other private developments in its vicinity.

The necessary offsite improvement to the OMTS that is tributary to Southwest Village involves the replacement of approximately 3,600 linear feet of existing gravity sewer in East Beyer Boulevard with a 27-inch to 33-inch diameter PVC sewer line. This improvement section is shown graphically on Figure 3-2 which presents the existing offsite public sewer facilities as well as the OMTS section to be replaced by the project.

This and other issues involving phasing are discussed in more detail in the next section.

SEWER FACILITIES PHASING

At the time of this report it is not certain the exact order of development that the Southwest Village Specific Plan project will undertake. Currently there is one VTM under design. This will be the first area of the project that will be graded and developed. This VTM is indicated on Figure 3-2.

Lift Station Phasing

At project buildout, Lift Station "1" will serve the majority of the south and southeast portion and Lift Station "2" will serve the majority of the northeast portion of the Southwest Village project. Table 3-1 identifies Lift Station "1" as serving 1,471 EDUs with a capacity of 572 gpm and Lift Station "2" as serving 934 EDUs with a capacity of 386 gpm. As facilities providing regional service, the public or private status of the future lift stations will be determined as development progresses further.

The future lift stations could be constructed as phased facilities only initially servicing planning areas from the respective area's primary land owner(s). The sewer flow from adjacent areas would necessitate additional lift station capacity and potentially components for each unique land ownership.

The details of future phasing efforts for the proposed onsite sewer lift stations will be analyzed as the respective lift station tributary sub-basin's planning area sewer studies are developed.

Offsite OMTS Phasing

The schedule of the offsite OMTS improvement described earlier in this chapter is unknown at the time of this report. The OMTS Master Plan documents projected a completion of between 2020 and 2025. Either the Southwest Village Specific Plan development or an increase in sewer flow in eastern Otay Mesa would be the event that would trigger the need for the OMTS improvements. An increase in sewer flow in eastern Otay Mesa would originate from an expansion of Pump Station 23T (P.S. 23T). If the development of the Southwest Village Specific Plan occurred first there may be some capacity in the existing sewer system that would allow the delay of the OMTS improvements and potentially avoidance of certain improvement portions.

Appendix E presents the offsite analyses of the OMTS. The three scenarios that were analyzed were existing flow only, existing flow plus the entire Southwest Village Specific Plan, and ultimate flow (existing, Southwest Village Specific Plan, and P.S. 23T).

Existing flows are currently being accommodated in the OMTS; however, City d/D design criterion is not being met. Existing 12-inch and 15-inch gravity sewer lines are flowing over one-half full. South of Beyer Boulevard the 12-inch sewer is flowing at 0.55 d/D. The 15-inch sewer is flowing at 0.56 d/D. Maximum velocities are approximately at 10.1 fps for select high slope segments. Minimum velocities are approximately 3.6 fps.

When adding the build-out sewer generation from the Southwest Village Specific Plan area, the existing OMTS necessitates improvements in select segments. These are highlighted on the second spreadsheet analysis in Appendix E. OMTS segments with higher slopes require an upsizing to 27-inch diameter while segments with flatter slopes require an upsizing to 33-inch diameter per City hydraulic flow modeling data.

The existing northern 15-inch in East Beyer Boulevard and 24-inch gravity line under the Interstate 805 and 5 freeways does not require upsizing when Southwest Village Specific Plan build-out flows are added. The maximum depth within the 15-inch and 24-inch sewer under the freeways calculate to be 0.54 d/D and 0.55 d/D respectively.

The ultimate flows that are tributary to the OMTS were analyzed as well. This is included as the third analysis within Appendix E. Current OMTS City hydraulic modeling show approximately an additional average flow of 3.2 MGD that would be delivered from P.S. 23T in eastern Otay Mesa. This ultimate 3.2 MGD would be diverted from the Otay Valley Trunk Sewer (OVTS) into the OMTS when the OVTS reaches capacity. Flows to P.S. 23T are currently only at approximately 1.5 MGD.

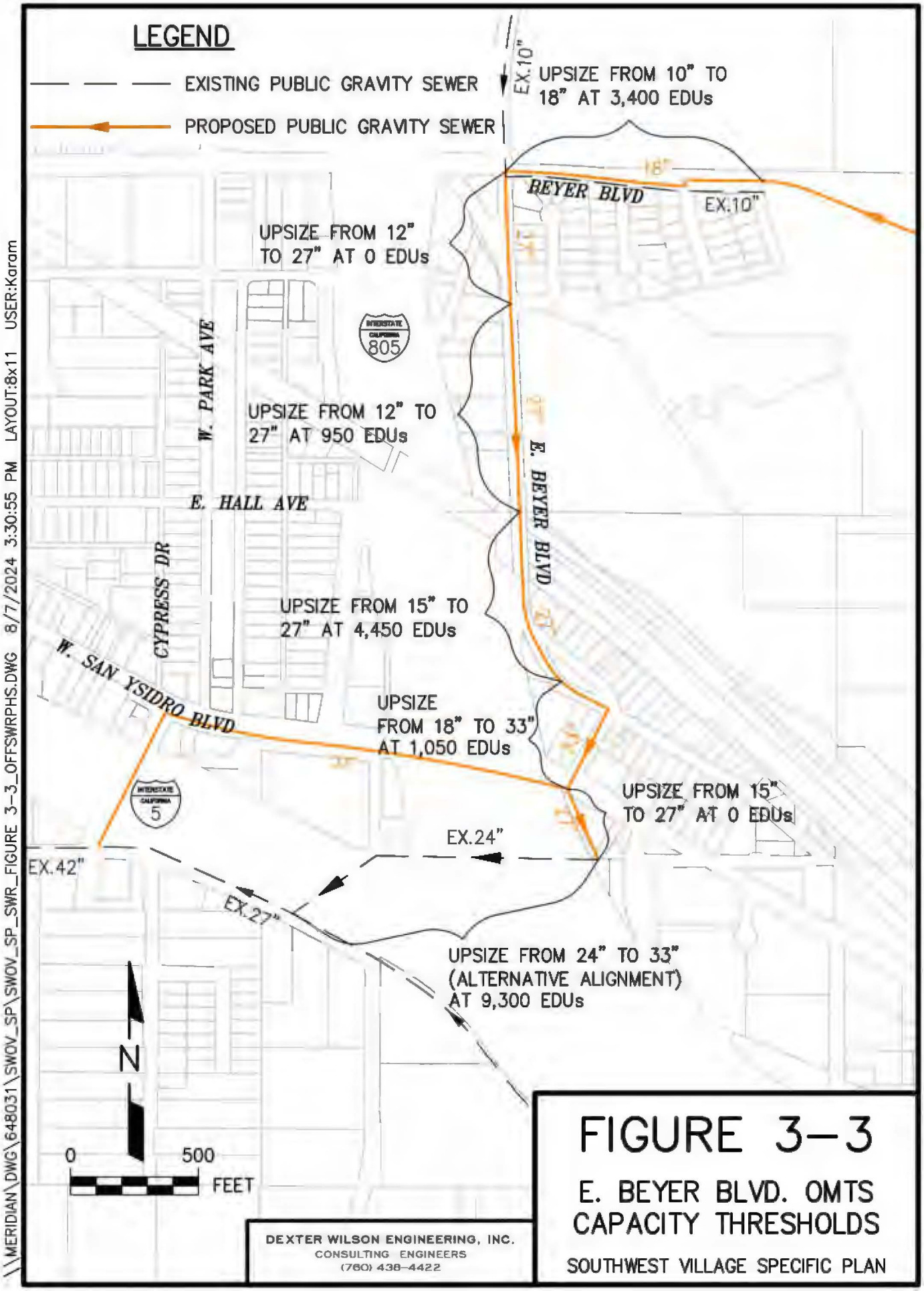
The OMTS would need to be upgraded at every segment to accommodate the ultimate flow condition; this includes the existing northern 15-inch in East Beyer Boulevard 24-inch gravity line under the Interstate 805 and 5 freeways. These segments would need to be upgraded to 27-inch and 33-inch respectively in order to flow under 0.75 d/D with theoretical ultimate flows. A future OMTS master plan as well as additional flow studies will have to assess whether the sizing this specific replacement will be necessary.

Figure 3-3 illustrates the specific sections of the OMTS that will require upgrades at their respective additional EDU thresholds. The City of San Diego utilizes an EDU sewer generation rate of 280 gpd per EDU.

Appendix F presents the offsite analyses of the OMTS in East Beyer Boulevard and its capacity thresholds as tributary EDUs increase. Appendix G contains the OMTS hydraulic modeling data from the City under the existing and ultimate condition as well as the proposed sizes and slopes of the ultimate OMTS for reference.

Note the unit thresholds presented in Figure 3-3 are for development within the entire OMTS tributary area, not just the Southwest Village Specific Plan. Per the OMTS hydraulic modeling data from the City in Appendix G, the criterion for replacement is 0.5 for gravity sewers 15-inch diameter and smaller and is 0.75 for gravity sewers 18-inch diameter and larger.

Separate sewer studies will be supplemented with each individual map/planning area submittal which will confirm whether offsite trunk sewer upgrades are necessary. As presented in Chapter 2, the entire Southwest Village Specific Plan contains a maximum of 4,172 sewer EDUs.



\\MERIDIAN\DWG\648031\SWOV_SP\SWOV_SP_SWR_FIGURE 3-3_OFFSWRPHS.DWG 8/7/2024 3:30:55 PM LAYOUT:8x11 USER:Karam

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FIGURE 3-3

E. BEYER BLVD. OMTS CAPACITY THRESHOLDS

SOUTHWEST VILLAGE SPECIFIC PLAN

CHAPTER 4

CONCLUSIONS AND CONSTRUCTABILITY

All sewer improvements recommended in this report are feasible from a constructability outlook. The recommended sewer facilities can be separated into two categories in regards to constructability:

- **Onsite Sewer Facilities:** Construction of onsite sewer facilities will comprise standard construction practices for new subdivision development. Gravity sewer lines 8-inch diameter through 15-inch diameter are anticipated to be constructed using SDR-35 PVC pipe. Select gravity sewer lines are anticipated to be constructed using SDR-18 PVC pipe to comply with City velocity criteria. All proposed sewer lines and appurtenances onsite in public streets will follow the required City of San Diego guidelines, design criteria, and standard drawings and specifications for new construction.

- **Offsite Sewer Facilities:** Offsite sewer system improvements include construction of large diameter (18-inch and larger) trunk sewer lines. In existing East Beyer Boulevard where the offsite improvements would be constructed, it is not anticipated that a unique right-of-way acquirement and/or encroachment would be needed. Sufficient existing rights-of-way are available. The existing East Beyer Boulevard sewer improvements would require traffic control schemes to accomplish the construction.

  Future Beyer Boulevard, which will contain a new gravity sewer line, will require right-of-way acquisition by the Southwest Village Specific Plan project. The new gravity sewer main will be constructed concurrently with the road.

Pipe material for the existing 42-inch OMTS in Old Otay Mesa Road is HDPE. Segment(s) in Old Otay Mesa Road pass through a landslide area; hence HDPE was chosen due to its ability to sustain minor earth movements without failure. One OMTS segment downstream of the 42-inch segment was constructed last year. The pipe material installed was PVC. It is expected that PVC will continue to be the pipe material for the remaining segments of the OMTS; however, the City should be consulted prior to the start of improvement plan design to confirm acceptable pipe material.

Figure 4-1 presents the land and property ownerships for the entire Southwest Village Specific Plan area.

Summary of Conclusions and Recommendations

The following conclusions and recommendations are summarized based on this EIR-level sewer study prepared for the Southwest Village Specific Plan project.

1. Sewer service to the Southwest Village Specific Plan project will be supplied by the City of San Diego.

2. The 487 acre Southwest Village Specific Plan project, consisting of a maximum of 5,130 dwelling units and mixed-use, school, and park uses will sewer to the Otay Mesa Trunk Sewer (OMTS) system.

3. Sewer generation from the Southwest Village Specific Plan project at buildout is estimated to be an average flow of 1,167,930 gpd and a peak dry weather flow of 2,030,137 gpd.

4. The northwest portion of the project consisting of approximately 2,662 dwelling units will flow by gravity to the Otay Mesa Trunk Sewer. A minimum of two sewer lift stations will be required to adequately provide sewer service to the remaining areas of the Specific Plan area.

5. Figure 3-2 presents the recommended project buildout onsite sewer system configuration, pipe sizing, and future sewer lift station locations.

6. One vesting tentative map is under design development as the initial phase of the Southwest Village Specific Plan project. Phasing beyond this vesting tentative map is unknown at this time.

7. The extension of Beyer Boulevard will allow the total Specific Plan area sewer flow to gravity westward and connect to the OMTS at Otay Mesa Road and East Beyer Boulevard.

LEGEND

- SOUTHWEST VILLAGE BOUNDARY
- TRI-POINTE HOMES
- OTAY MESA LLC
- HANDLER TRUST
- CITY OF SAN DIEGO
- OTHER (PRIVATE)
- SEWER SUB-BASIC BOUNDARY
- PROPOSED PUBLIC GRAVITY SEWER
- PROPOSED PUBLIC FORCE MAIN
- (#) LAND USE AREA

SOUTH-WIND PROJECT

DUAL 6-INCH FORCE MAINS

BEYER BLVD

CENTRAL AVE

CALIENTE AVE

WEST AVE

EAST AVE

PROPOSED FUTURE SEWER LIFT STATION "2"

DUAL 8-INCH FORCE MAINS

PROPOSED FUTURE SEWER LIFT STATION "1"

N

0 600 FEET

\\ARTIC\DWG\648031\SWOV_SP\SWOV_SWR_FIGURE-4-1_OWNERSHIP-MAP.DWG 9/8/2023 5:00:23 PM LAYOUT:11x17 USER:Karam

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FIGURE 4-1

LAND/PROPERTY OWNERSHIP

SOUTHWEST VILLAGE SPECIFIC PLAN

8. An offsite improvement to the OMTS will be required by the Southwest Village Specific Plan area as it develops. The improvement involves the upsizing/replacement of approximately 3,600 liner feet of existing gravity sewer with a 27-inch to 36-inch diameter PVC sewer line. Figure 3-2 graphically shows the location of this required offsite improvement in East Beyer Boulevard. While the Southwest Village Specific Plan project may have to construct this offsite sewer improvement, it will not be responsible for the entire cost as the sewer upgrade is designed to accommodate ultimate buildout Otay Mesa master planned flows. Figure 3-3 illustrates the specific sections of the OMTS that will require upgrades at their respective additional unit thresholds.

9. New sewer lines shall be designed to meet all requirements of the City of San Diego Public Utilities Department Sewer Design Guide, May 2015, or latest edition. Final design will be reflected on the improvement plans and sewer system calculations to be submitted for review and approval.

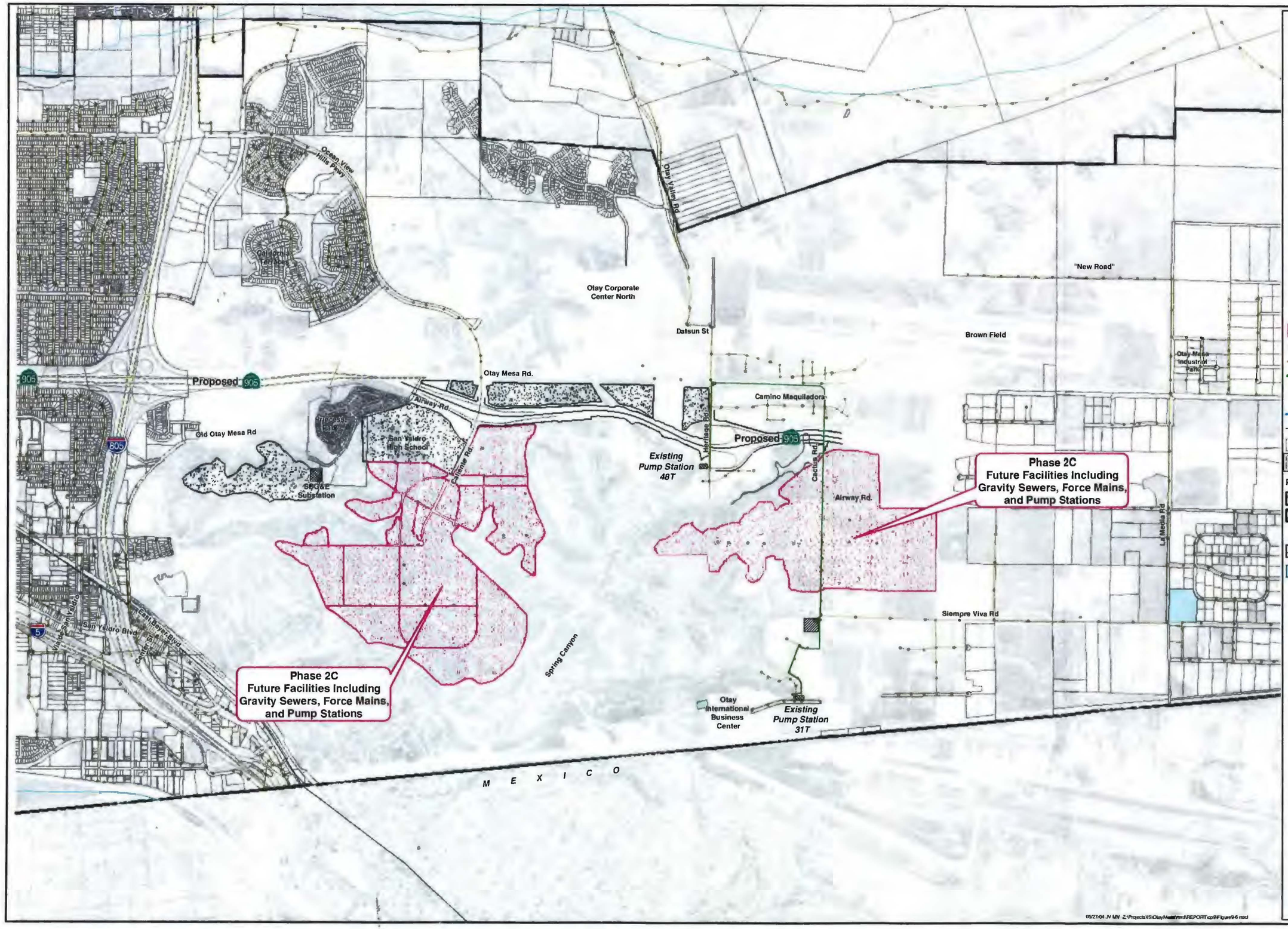
APPENDIX A

OMTS MASTER PLAN EXCERPTS

Otay Mesa Trunk Sewer Alignment Study

Proposed System Improvements For Phase 2C

Figure 9-6



Phase 2C

Existing Sewer Mains

- Gravity
- Force Main
- Manhole
- Rivers
- Railroad
- Parcels
- Municipal Boundary

Pump Stations

- Existing
- Proposed
- SR 905 ROW
- Assumed Developable Areas
- Lakes

NOTE 1: FM = Force Main

NOTE 2: The location of 2C facilities is approximate and subject to change based on future development plans.

N
W E
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Feet

1 inch equals 2,000 feet

PBS&J

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aboveground electrical building would be constructed to house the control panels for the upgraded pump station.

Phase 2B3 would involve the acquisition of land by the City of San Diego on which to construct new Pump Station A1, as well as the preliminary engineering for design of the 8 MGD pump station. The preferred site of Pump Station A1 is located directly south of and adjacent to existing Pump Station 23T. A private party currently owns this site. The pad elevation of the preferred site is approximately 470 feet above mean sea level (AMSL).

9.3.3 Phase 2C Improvements

Phase 2C would provide sewer service to currently undeveloped areas of Otay Mesa located to the south of Caliente Road on the west mesa and to the east and west of Cactus Road on the east mesa. Backbone gravity collection pipelines, redundant force mains and two pump stations are anticipated to be constructed as part of this phase. Pipelines would be located under future roadways; however, the exact locations of the proposed Phase 2C facilities cannot be determined until future development plans are approved. Phase 2C would be constructed for the sole purpose of accommodating future development located to the south of Caliente Road on the west mesa or to the east and west of Cactus Road in the east mesa. If future development does not occur in these areas, then Phase 2C would not be implemented. Because the locations of the Phase 2C pipelines and pump stations are unknown at this time, the environmental effects of these facilities cannot be specifically and comprehensively addressed in the EIR. Therefore, Phase 2C is considered to be a subsequent activity of the Otay Mesa Community Plan Update Program EIR and would require subsequent environmental review, as identified in CEQA Guidelines Section 15168(c)(1), once the locations of the Phase 2C facilities are determined. It is anticipated that the environmental review for the future development projects would include the Phase 2C sewer facilities as a project component. Therefore, it would be the responsibility of the future developer(s) to mitigate for any significant impacts resulting from the construction and operation of the Phase 2C facilities in accordance with the City's CEQA requirements. Figure 9-6 identifies the future development areas in which the Phase 2C improvements would be located.

9.3.4 Phase 2D Improvements

Phase 2D would involve the construction of a new sewer flow diversion structure within the intersection ROW of Otay Mesa and Heritage Roads and a new sewer flow transition structure located under Otay Mesa Road. This phase would also include the installation of a 24-inch force main under Otay Mesa Road between the diversion structure and the transition structure and the installation of a new 42-inch gravity pipeline from the transition structure to the intersection of Otay Mesa Road/Old Otay Mesa Road and then south under Old Otay Mesa Road to its intersection with Airway Road. Figure 9-7 identifies the proposed improvements for Phase 2D.

It should be noted that Phase 2D would only be built once sewer flows at the upgraded Pump Station 23T reach 3.5 to 4 MGD. Otherwise, flows would continue to be pumped north to the Otay Valley Trunk Sewer.

Otay Mesa Trunk Sewer Refinement Analysis

Phased System Improvements

Figure 5

OVTS Capacity Constraint
Peak Flow approx. 10 MGD

California Terraces

Connects to Otay Valley Trunk Sewer

Otay Corporate Center North

Brown Field

Otay Mesa Industrial Park

1 Pipe Sleeve Under Future Caltrans SR 905 R.O.W.

Diversion Structure (Phase 3)

Phase 3
3,600 Feet of 24" FM
to Replace Existing 16"

Existing - 42"

Phase 3
20" - IND
24" - RES

Phase 3
Dual 24" FM
Extension

Proposed 905

San Ysidro High School

Cactus Rd.

Phase 1
Temp SPS to Permanent
24" FM - IND

Phase 4
4,400 Feet of 24" FM
to Replace Existing 16" FM

Phase 1
Temp SPS to Permanent
Add Emergency Storage
0.25 MG - IND
0.50 MG - RES

Phase 3
SPS Upgrade
Pump & Station Piping Upgrades

Phase 3
24" / 30 "

Via de San Ysidro

East Beyer Blvd

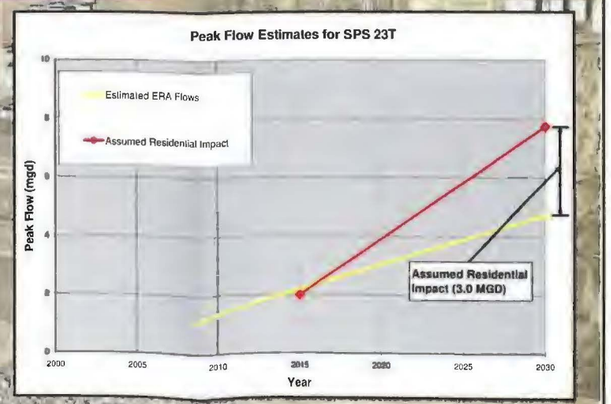
Phase 2 - 4.3 MGD
SPS Upgrade
Pump & Electrical Upgrades

Phase 4
Additional Emergency Storage
RES - only

Spring Canyon

Otay International Business Center

Connects to Existing 24" Freeway Crossing (San Ysidro Interceptor Sewer)



Revised 5/22/2009

Existing
Phase 1
Phase 2
Phase 3A
Phase 3B
Phase 4 (RES)
Pumped
Gravity

Existing Sewer Mains
Gravity
Force Main
Pump Station

SR 905

NOTE 1: FM = Force Main

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If residential development occurs, flows of 3 mgd may occur closer to 2017. Design of this phase is anticipated to begin in 2015 and the estimated equipment and construction cost is $350,000.

Phase 3 – 2020-2025

The threshold capacity of the Otay Valley Trunk Sewer system in Heritage Road is 4.3 mgd. So by 2020 with residential flows, or 2025 without residential flows, when flows from the SPS 23T approach 4 mgd, the "Gap" piece of the Otay Mesa Trunk Sewer must be operational so that flows can be diverted from the Otay Valley Trunk Sewer. The "Gap" facilities include the diversion structure at the intersection of Otay Mesa and Heritage Roads, dual 24-inch forcemains and a 20-inch gravity main that connects to the 42-inch gravity sewer that was constructed in 2005. The forcemain extension conveys the wastewater from the diversion structure west in Otay Mesa Road, through a low point in the road and back up to an elevation where the flow can continue by gravity. The existing 16-inch forcemain will continue to convey flows to the OVTS, while the new 24-inch forcemain extension will convey flows to OMTS via the gravity main in Otay Mesa Road, and allow the City the flexibility to divert flows from OVTS to OMTS at the diversion structure.

In order to provide full redundancy with the existing 8,000 feet of 16-inch forcemain, it is necessary during Phase 3 to replace a portion of this force main with a 24-inch forcemain to improve the 23T PS hydraulics and operation. Approximately, 3,600 feet of 24-inch forcemain is required to increase pumping capacity to 5 mgd. This also will require the installation of the fourth pumping unit.

To accommodate residential flows, the gravity main would increase in size to a 24-inch pipeline. The continuing gravity main is routed west and then south beneath the SR-905 freeway expansion. Caltrans' design of the SR-905 in this location includes pipeline sleeves to accommodate this pipeline. Because the design of the SR-905 required significant cuts in the existing grade in this area, the gravity main is over 40 feet deep on the north side of SR-905 to match invert elevation of the connection point. The design of these facilities is anticipated to begin between 2018 and 2020. The estimated construction cost is $3.7 to 3.9 million.

Phase 3 also includes the construction of the gravity main in Old Otay Mesa Road that replaces an existing 10-inch pipeline that currently connects the south end of the 42-inch gravity main to the San Ysidro Interceptor Sewer collection system. This pipeline will convey flows from SPS 23T as well as flows from the City's south Otay Mesa area. In order to convey up to 12.5 mgd through this pipeline, the size of this pipeline increases from a 24 to a 30-inch pipeline. The connection to the San Ysidro collection system is anticipated to occur at Center Street. The existing pipelines beneath the I-805 freeway overpass in this location were determined to be sufficient to convey up to 12.5 mgd, thus no tunneling beneath the freeway and trolley tracks is required. The design for this reach of pipe was completed for a larger size pipe and

would be modified for the current plan. The estimated cost for construction for this pipeline is $3.8 million.

The design of these facilities is anticipated to begin between 2018 and 2020. However, if residential development on the City's south Otay Mesa begins before flows to SPS 23T reach the threshold for these "Gap" facilities, the schedule for the westernmost section of pipe may be accelerated.

Phase 4 - 2025

If residential development occurs in the City's east Otay Mesa, in accordance with the projected land uses proposed in the Otay Mesa Community Plan Update Scenario 4B, then additional emergency storage, will be required. The remaining section of 16-inch forcemain would be replaced with a 24-inch forcemain.. As shown in Figure 4, this is estimated to occur near 2025. This phase would also include the addition of a new pump at the existing pump station, additional 250,000 gallons of offsite emergency storage and modifications to onsite piping and electrical equipment. The estimated cost for construction of these facilities is $8,300,000.

Proposed Phasing Plan and Schedule Conclusions:

The proposed facilities, through Phase 3, will allow the City to service the industrial buildout (5 mgd). The City will have the flexibility to pump through the existing 16-inch forcemain to OVTS, pump through the new 24-inch forcemain to OMTS, or divert a set amount of flow from the new 24-inch forcemain to OVTS at the diversion structure. During Phase 3 another 100 hp pump would need to be installed and the station would then run with three pumps in parallel. Phase 4, to accommodate the residential/industrial buildout (8 mgd), would require completion of the 24-inch forcemain to provide full redundancy of the projected 8 mgd flows. A summary of the proposed phased facilities and estimated raw construction costs is provided below.

Phase 1 2015

- 250,000 gallons Emergency Storage at SPS 23T
- Redundant 24-inch Forcemain (8,000 feet)
- Total Estimated Construction Cost

Phase 2 2015 – 2020

- SPS 23T Pump/Electrical Upgrades to 5 mgd
- Total Estimated Construction Cost

Phase 3 2020-2025

- Diversion Structure
- 24-inch dual Forcemains (4,000 feet each)
- 24-inch Forcemain Replacement (3,600 feet)
- 20 or 24-inch Gravity Main
- Lower OMTS 24 to 30-inch Gravity Main connection to San Ysidro Interceptor
- SPS 23T Pump/Electrical Upgrades
- Total Estimated Construction Cost

Existing peak wet weather sewer flows to SPS 23T are currently 800 gallons per minute (1.2 million gallons per day (mgd)), as reported by MWWD. Future flows to the pump station are based on projected development as noted in Section 1. Industrial development is likely to occur based on one of the three scenarios presented in the 2006 ERA report. The sewer generation rates for each of the scenarios were calculated and are presented in Table 4. Of the three scenarios, the Medium Scenario with high tech industrial land uses is likely to use the most water and therefore have the largest sewer generation rate. However, based on discussions with City Planning and Economic Development staff, it is most likely that the High Scenario, with low water use, warehouse type buildings similar to current development on the mesa, will occur.

Table 4
Projected City Industrial Sewer Flows through 2030

Scenario	Assumed Absorption through 2030 (Net Acres)	Recommended Average Generation Rate (gpd/net-acre)	Estimated 2030 Average Sewage Generation	Estimated 2030 Peak Sewage Generation [4]
Low	762	1,000[1]	0.76 mgd	1.5 mgd
Medium	958	1,500[2]	1.44 mgd	2.8 mgd
High	1,269	865[3]	0.95 mgd	2.1 mgd

[1] Based on 65% return to sewer from average of OWD billing with outliers removed
[2] Based on 65% return to sewer from average plus 1 std deviation of OWD billing with outliers removed
[3] Based on 75% return to sewer from average of OWD raw billing data
[4] Peaking factor = 1.9, based on City of San Diego MWWD design guidelines

Using the High Scenario, the existing and projected 2030 tributary flows to SPS 23T, including County flows, are estimated to total 5.0 mgd as shown in Table 5. The High Scenario was assumed because it has the largest number of developed acres with an average sewer generation rate similar to the generation rates seen on Otay Mesa to date.

Table 5
Estimated Peak Flows to SPS 23T in 2030

Source of Sewer Flows	Estimated Peak Wet - Weather Sewer Flow
Existing Flow to SPS 23T	1.2 mgd
East Otay Mesa (County) Peak Flows to SPS 23T [1]	1.7 mgd
Subtotal	**2.9 mgd**
High Scenario – Industrial Development	2.1 mgd
Total	**5.0 mgd**

[1] County sewer flows to SPS 23T are estimated to be an average of 1.8 mgd at buildout, based on the East Otay Mesa Sewer Master Plan, November 2006. Assumed 50 percent buildout of County property in 2030 and 1.9 peaking factor. (1.8 mgd x 0.5 x 1.9 = 1.7 mgd)

APPENDIX B

BUILDOUT LAND USE PLAN

Figure 2.2 — Southwest Village Land Use Plan

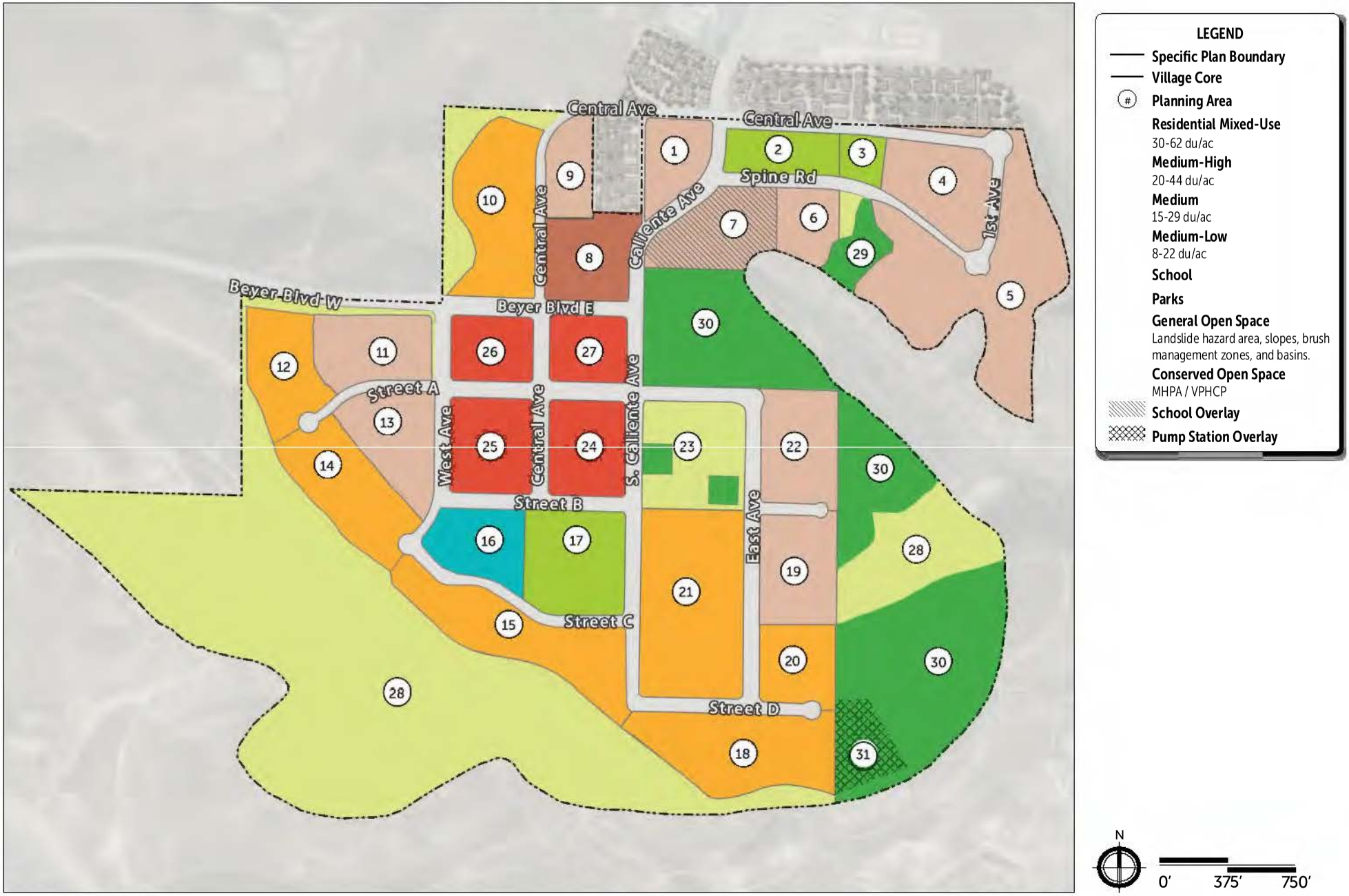

Table 2.1 — Development Summary

PA #	Land Use	Density[1]	Overlay	Acres	Max DUs	Commercial
1	Medium	15-29 du/ac	-	6.9	160	-
2	Park	-	-	5.0	-	-
3	Park	-	-	2.1	-	-
4	Medium	15-29 du/ac	-	9.1	211	-
5	Medium	15-29 du/ac	-	26.2	608	-
6	Medium	15-29 du/ac	School Overlay	4.5	104	-
7	Medium	15-29 du/ac	-	6.9	160	-
8	Medium-High	20-44 du/ac	-	8.0	282	Allowed
9	Medium	15-29 du/ac	-	4.6	107	-
10	Medium-Low	8-22 du/ac	-	12.8	225	-
11	Medium	15-29 du/ac	-	8.2	190	-
12	Medium-Low	8-22 du/ac	-	7.8	137	-
13	Medium	15-29 du/ac	-	8.3	193	-
14	Medium-Low	8-22 du/ac	-	10.3	181	-
15	Medium-Low	8-22 du/ac	-	13.8	243	-
16	School	-	-	6.2	-	-
16	Medium (PA 16 Contingency)	15-29 du/ac	-	6.2	136[2]	-
17	Park	-	-	10.5	-	-
18	Medium-Low	8-22 du/ac	-	13.5	238	-
19	Medium	15-29 du/ac	-	10.2	237	-
20	Medium-Low	8-22 du/ac	-	7.6	134	-
21	Medium-Low	8-22 du/ac	-	15.1	266	-
22	Medium	15-29 du/ac	-	11.5	267	-
23	Open Space / VPHCP	-	-	7.8	-	-
24	Residential Mixed-Use	30-62 du/ac	-	7.7	352	Allowed
25	Residential Mixed-Use	30-62 du/ac	-	8.0	365	Allowed

PA #	Land Use	Density[1]	Overlay	Acres	Max DUs	Commercial
26	Residential Mixed-Use	30-62 du/ac	-	5.5	251	Allowed
27	Residential Mixed-Use	30-62 du/ac	-	4.8	219	Allowed
28	Open Space	-	-	128.1	-	-
29	Open Space / MHPA	-	-	3.2	-	-
30	VPHCP	-	-	51.6	-	-
31	VPHCP	-	Pump Station Overlay	4.6	-	-
	Streets	-	-	57.0	-	-
		Total		**487.4[3]**	**5,130**	**175,000**

1. Density ranges were developed using the Planning Area's net acreage divided by the assumed dwelling unit count.
2. In the unlikely event a school is no longer needed on Planning Area 16, the site will default to Medium Density Residential use. Although the contingency for Planning Area 16 would result in approximately 136 additional dwelling units, the maximum dwelling unit cap of 5,130 units would still apply. It is assumed that each planning area will not construct the maximum number of dwelling units allowed due to site constraints, development priorities, design characteristics, and market conditions at the time a particular planning area is brought forward for development.
3. The total developable acreage is subject to slight changes due to project design refinements, however the maximum development capacity will not change.

2.3 — AFFORDABLE HOUSING

All implementing development applications must meet the requirements of the Land Development Code, which requires affordable units or in-lieu fees for residential development projects (Chapter 14, Article 2, and Division 13: Inclusionary Affordable Housing Regulations). In addition, an implementing development application may also be eligible for the City of San Diego's Affordable Housing, In-Fill Projects, and Sustainable Buildings Development Regulations, as defined in Chapter 14, Article 3, Division 9, if one of the criterion for eligibility is met. The required affordable units will be provided onsite.

APPENDIX C

CITY OF SAN DIEGO SEWER DESIGN CRITERIA

street alignments) and all potential points of entry of sewage from surrounding lands.

1.3.1.3 Depth of Mains

The planning study shall clearly identify all existing and/or proposed facilities which will exceed standard depths for sewer mains as defined in Subsection 2.2.1.5. In cases where proposed sewers will exceed 15 feet in depth, a request for design deviation (ATTACHMENT 2) must be submitted to the Water and Sewer Development Review Senior Civil Engineer with the Sewer Planning Study. A design deviation will only be approved in exceptional cases and when adequate justification is provided. Mains more than 20 feet deep shall also require approval from the Wastewater Collection Division Senior Civil Engineer.

1.3.1.4 Existing Studies

The City of San Diego maintains an extensive library of sewer planning studies which were prepared for lands throughout the City. These studies are available for review at the Water and Sewer Development Section, Public Utilities Department. All studies are catalogued by subdivision or trunk sewer name. Logs of sewer flow study analyses for recently monitored trunk sewers and a map of sewers which meet the Regional Water Quality Control Board (RWQCB) criteria for being critical or sub-critical may also be viewed. In addition, information regarding proposed CIP projects within the vicinity of a given project may be requested. In many cases, an addendum or reference to one of the existing planning studies may be acceptable in lieu of an independent study. Concurrent with the preparation of planning studies for sewers proposed to connect to existing canyon sewer mains, a study of flow redirection per Council Policy 400-13 and a cost-benefit analysis per Council Policy 400-14 shall be prepared (Refer to ATTACHMENT 1). An existing analysis of redirection of flows and a cost-benefit analysis, as required by Council Policies 400-13 and 400-14 respectively, may be available for reference for various existing canyon sewers.

1.3.2 Flow Estimation

1.3.2.1 Land Use

Present or future allowable land use, whichever results in higher equivalent population, shall be used to generate potential sewage flows.

1.3.2.2 Flow Determination

Flow definitions and calculation procedures are listed below. All calculations shall be tabulated for each sewer main section (manhole to manhole) in the

format shown on Figure 1-2.

Equivalent Population: The equivalent population shall be calculated from zoning information (Ref. Section 1.6). For major new facilities such as high rise apartment buildings, flow rates (assuming one lateral) shall be checked based on the most current, adopted edition of the Uniform Plumbing Code. The most conservative flow rate shall govern.

Daily Per Capita Sewer Flow: The sewer flow for the equivalent population shall be 80 gallons per capita per day (gpcd).

Average Dry Weather Flow (ADWF): Equivalent populations shall be used to calculate the average dry weather flow. The average dry weather flow for each sewer main reach (manhole to manhole) shall be determined by multiplying the total accumulated equivalent population contributing to that reach by 80 gallons per capita per day:

Average Dry Weather Flow = (80 gpcpd) x (Equivalent Population)

Peaking Factor for Dry Weather Flow (PFDWF): The peaking factor is the ratio of peak dry weather flow to average dry weather flow. It is dependent upon the equivalent population within a tributary area. The tributary area is the area upstream of, and including, the current reach for the total flow in each reach of pipe. Figure 1-1, consisting of the table prepared by Holmes and Narver in 1960, shall be used to determine peaking factors for each tributary area. In no instance shall the dry weather flow peaking factor be less than 1.5.

Peak Dry Weather Flow (PDWF): The peak dry weather flow for each sewer main reach shall be determined by multiplying the average dry weather flow by the appropriate peaking factor (Note that peak dry weather flows are not algebraically cumulative as routed through the sewer system, i.e. the peak dry weather flow at any point shall be based on the equivalent population in the basin to that point (Ref. Figure 1-2).

Peak Dry Weather Flow = (Average Dry Weather Flow) x (Dry Weather Flow Peaking Factor)

Peaking Factor for Wet Weather Flow (PFWWF): The peaking factor for wet weather flow is the ratio of peak wet weather flow to peak dry weather flow. It is basin-specific and shall be based on essential information available at the time of the planning study. Information such as historical rainfall/sewage flow data, land use, soil data, pipe/manhole age, materials and conditions, groundwater elevations (post development), inflow and infiltration (I/I) studies, size, slope and densities of the drainage basin, etc., should be utilized in the wet weather analysis to estimate the peaking factor for wet weather. Upward adjustments shall be made in areas with expected high inflow and

infiltration (i.e. high ground water or in areas with lush landscaping schemes). Flow meters are installed throughout the City's sewer system. Flow data collected from these meters are available upon request. The objective of this analysis is to quantify the magnitude of peak wet weather flow with a 10-year return period on a statistical basis.

The Senior Civil Engineer overseeing the preparation of the planning study shall coordinate with the City Sewer Modeling Group for approval of the peaking factors to be used for design.

Peak Wet Weather Flow (PWWF): The peak wet weather flow (or design flow) for a gravity sewer main reach shall be determined by multiplying the peak dry weather flow (ref. Figure 1-2) by the appropriate wet weather peaking factor. The peak wet weather flow is the design flow for a gravity sewer main. It is determined at any point in the system based on the associated upstream average dry weather flow in the basis to that point times the peaking factor for wet weather.

Peak Wet Weather Flow = (Peak Dry Weather Flow) x (Wet Weather Peaking Factor)

1.3.3 Pipe Sizing Criteria

1.3.3.1 Hydraulic Requirements

Manning's formula for open-channel flows shall be used to calculate flows in gravity sewer mains. Manning's coefficient of roughness "n" shall be assumed to be 0.013 for all types of sewer pipe. Sewer grades shall be designed for velocities of 3 to 5 feet per second (fps) where possible. This is extremely important in areas where peak flow will not be achieved for many years. The minimum allowable velocity is 2 fps at calculated peak dry weather flow, excluding infiltration. Sewer mains that do not sustain 2 fps at peak flows shall be designed to have a minimum slope of 1 percent. Additional slope may be required by the Senior Civil Engineer where fill of varied depth is placed below the pipe in order to provide adequate slope after expected settlement occurs. The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR 18 PVC (standard dimension ratio polyvinyl chloride), concrete-encased VC (vitrified clay), or PVC sheet-lined reinforced concrete pipe.

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS

Zone	Maximum Density (DU/Net Ac)	Population per DU	Equivalent Population (Pop/Net Ac)
AR-1-1, RE-1-1	0.1	3.5	0.4
RE-1-2	0.2	3.5	0.7
AR-1-2, RE-1-3	1	3.5	3.5
RS-1-1, RS-1-8	1	3.5	3.5
RS-1-2, RS-1-9	2	3.5	7.0
RS-1-3, RS-1-10	3	3.5	10.5
RS-1-4, RS-1-11	4	3.5	14.0
RS-1-5, RS-1-12	5	3.5	17.5
RS-1-6, RS-1-13	7	3.5	24.5
RS-1-7, RS-1-14	9	3.5	31.5
RX-1-1	11	3.4	37.4
RT-1-1	12	3.3	39.6
RX-1-2, RT-1-2, RU-1-1	14	3.2	44.8
RT-1-3, RM-1-2	17	3.1	52.7
RT-1-4	20	3.0	60.0
RM-1-3	22	3.0	66.0
RM-2-4	25	3.0	75.0
RM-2-5	29	3.0	87.0
RM-2-6	35	2.8	98.0
RM-3-7, RM-5-12	43	2.6	111.8
RM-3-8	54	2.4	129.6
RM-3-9	73	2.2	160.6
RM-4-10	109	1.8	196.2
RM-4-11	218	1.5	327.0

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS (Continued)

Zone	Maximum Density (DU / Net Ac)	Population Per DU	Equivalent Population (Pop/Net Ac)
Schools/Public	8.9	3.5	31.2
Offices	10.9	3.5	38.2*
Commercial/Hotels	12.5	3.5	43.7*
Industrial	17.9	3.5	62.5*
Hospital	42.9	3.5	150.0*

Figures with asterisk (*) represent equivalent population per floor of the building.

Definitions:
DU = Dwelling Units
Ac = Acreage
Pop = Population

Net Acreage is the developable lot area excluding areas that are dedicated as public streets in acres. Gross Area is the entire area in acres of the drainage basin, including lots, streets, etc.

For undeveloped areas, assume Net Acreage = 0.8 x Gross Area in Acres

For developed areas, calculate actual Net Acreage.

Tabulated figures are for general case. The tabulated figures shall not be used if more accurate figures are available.

Population is based on actual equivalent dwelling units (EDU) or the maximum estimate obtained from zoning.

Conversion of Fixture Units to Equivalent Dwelling Units (EDU): The Water Meter Data Card, maintained by the Development Services Department, contains a table of plumbing fixtures that should be used for determining the equivalent dwelling units (EDU's) for the purpose of estimating the rate of wastewater generation in residential, commercial, or industrial areas. Currently, the basis for conversion is: 20 fixtures = 1 EDU and 1 EDU = 280 gallons of wastewater per day.

In high rise building areas, flow rates shall be based on the most current, adopted edition of the applicable Plumbing Code, assuming one lateral per area. The most conservative flow rate shall govern.

PUBLIC UTILITIES DEPARTMENT

PEAKING FACTOR FOR SEWER FLOWS
(Dry Weather)

Ratio of Peak to Average Flow*
Versus Tributary Population

Population	Ratio of Peak to Average Flow	Population	Ratio of Peak to Average Flow
200	4.00	4,800	2.01
500	3.00	5,000	2.00
800	2.75	5,200	1.99
900	2.60	5,500	1.97
1,000	2.50	6,000	1.95
1,100	2.47	6,200	1.94
1,200	2.45	6,400	1.93
1,300	2.43	6,900	1.91
1,400	2.40	7,300	1.90
1,500	2.38	7,500	1.89
1,600	2.36	8,100	1.87
1,700	2.34	8,400	1.86
1,750	2.33	9,100	1.84
1,800	2.32	9,600	1.83
1,850	2.31	10,000	1.82
1,900	2.30	11,500	1.80
2,000	2.29	13,000	1.78
2,150	2.27	14,500	1.76
2,225	2.25	15,000	1.75
2,300	2.24	16,000	1.74
2,375	2.23	16,700	1.73
2,425	2.22	17,400	1.72
2,500	2.21	18,000	1.71
2,600	2.20	18,900	1.70
2,625	2.19	19,800	1.69
2,675	2.18	21,500	1.68
2,775	2.17	22,600	1.67
2,850	2.16	25,000	1.65
3,000	2.14	26,500	1.64
3,100	2.13	28,000	1.63
3,200	2.12	32,000	1.61
3,500	2.10	36,000	1.59
3,600	2.09	38,000	1.58
3,700	2.08	42,000	1.57
3,800	2.07	49,000	1.55
3,900	2.06	54,000	1.54
4,000	2.05	60,000	1.53
4,200	2.04	70,000	1.52
4,400	2.03	90,000	1.51
4,600	2.02	100,000+	1.50

*Based on formula: Peak Factor = $6.2945 \times (pop)^{-0.1342}$
(Holmes & Narver, 1960)

FIGURE 1-1

depths below the ground surface, in order of descending water quality. Potable water pipelines shall be located above both reclaimed water pipes and sewer mains, and reclaimed water mains shall be located above sewer mains. A minimum vertical separation of one foot shall be provided between the top and bottom surfaces of the pipes in the same street or easement.

1.4.2.3 Crossing Mains

A minimum vertical separation of 12 inches shall be provided between the top and bottom surfaces of crossing utility conduits and shall comply with the *State of California Department of Health Services Criteria for the Separation of Water Mains and Sanitary Sewers*. Separation measurements shall be taken from the outer most surface of any pipeline protection (i.e. concrete encasement or steel sleeve) which may be installed. Where the vertical separation is less than 12 inches, a request for design deviation (ATTACHMENT 2), with justification, shall be submitted for review. If approved, for pipes 12 inches or less in diameter, a 12-inch sand cushion, or alternatively a minimum 6-inch sand cushion with 1 inch neoprene pad shall be used. Separations of less than 7 inches will not be allowed by the City. For skewed main crossings, see Subsection 2.2.6. Mains crossing large facilities shall evaluate deflection across the span, changes in hydraulics due to change of slope, shear forces, and special joint designs to account for pipe movement.

1.5 PUMP STATION PLANNING CRITERIA

If at all possible, the construction of a sewer pump station is to be avoided. However, in cases where constraints such as topography and environmentally sensitive habitat dictate, a pump station may be necessary (Ref. Council Policies 400-13 and 400-14 – ATTACHMENT 1). The DESIGN ENGINEER shall analyze the planning area for the sewer system to minimize the number of units to be pumped and to design the shortest possible force main. In cases where only a small tributary area is to be served by a pump station, the City will accept the facility as public only if it can be shown that the capitalized cost of facility replacement and maintenance will not exceed 50 percent of the standard sewer fees for the area to be served. Otherwise, the pump station must be privately owned, maintained and operated. In cases where a pump station will be a public facility, specific criteria for the design, construction, and operational testing of sewer pump stations are given in Chapter 7.

1.5.1 Pump Station Design Capacity

The Pump Station Design Capacity shall be calculated as follows:

Pump Station Design Capacity (PSDC): Pump stations shall be designed to pump the calculated peak wet weather flow from the upstream tributary area.

Pump Station Reserve Capacity Factor (PSRCF): This is a safety factor that takes into account that service pumps will generally not be operating at their

full intended design capacity due to mechanical wear and the subsequent loss of efficiency, and increases in force main friction loss due to the deposition of solids and grit. The reserve capacity factor shall be 1.0 if two (2) hours emergency storage (Ref. Subsection 7.2.6.7) or six hours emergency storage (Ref. Subsection 7.2.7) are provided. Where this storage is not provided in design, then a reserve capacity factor greater than 1.0 shall be used and an appropriate factor shall be evaluated for approval, on a case-by-case basis, by the Wastewater Collections Division Senior Civil Engineer.

Pump Station Design Capacity = (Peak Wet Weather Flow) x (Pump Station Reserve Capacity Factor)

1.5.2 Private Pump Stations

Private pump stations (privately-owned and operated) serving more than one lot shall not be located in the public right-of-way. The capacity for private pump stations shall be determined in the same manner as for public pump stations. Station wet well detention times shall not exceed 4 hours. A planning study for the pump station outlining capacity of the pumps, equivalent dwelling units (EDU) served, capacity of the wet well, detention times, length and size of the force main, and provision of any odor control equipment shall be submitted for review to Water and Sewer Development Review, Public Utilities Department. Private pump stations shall require separate structural, mechanical, and electrical permits from the City of San Diego, Development Services Department, Building Review Division. However, private pump station plans are not reviewed for compliance with City of San Diego Sewer Design Guide Chapter 7 criteria. As such, it shall be the responsibility of the DESIGN ENGINEER to ensure that all private pump stations are adequately sized, have sufficient redundant measures (dual force mains, back-up power supply, auto dialer alarm system to a licensed plumber with 24-hour response, etc.), and comply with all applicable local, state, and federal regulations. In the design of such facilities, the DESIGN ENGINEER shall utilize sound engineering judgment to provide for an adequate design for any potential failure during the service life of the pump station. If a developer elects to construct a private sewer system including a sewer pump station, then a letter of agreement must be executed over all lots served in the subdivision if the pump station will serve two or more lots. A copy of this agreement is available at the City Plan Check Counter and the City Website http://www.sandiego.gov/mwwd/business/sewer. Also required is a recorded copy of the CC&R's for the home or business owners association, outlining the responsibility and maintenance requirements for the shared private improvements.

1.6 ZONE - DENSITY CONVERSIONS

Table 1-1 shall be used in planning studies to determine the equivalent

APPENDIX D

SPREADSHEET CALCULATION -
PROPOSED ULTIMATE ONSITE SEWER SYSTEM

DATE: 8/7/2024

SEWER STUDY SUMMARY

FOR: Southwest Village Specific Plan Project City of San Diego Proposed Onsite Sewer Collection System and Projected Flows

SHT 1 OF 1

JOB NUMBER: 648-031

BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

TRIBUTARY AREAS (LUs)	FROM	EST. IE (ft)	TO	EST. IE (ft)	EST. LENGTH (ft)	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
							IN-LINE	TOTAL							M.G.D.	C.F.S.							
19, 20, 22; 50% of 21	210	492	202	476	1300	184,819	2310.2	2310.2	80	184,819	2.239	413,792	1.00	413,792	0.414	0.640	10	1.23	0.122003	0.30000	0.36	0.2546	3.62
16 & 17; 50% of 24 & 25	208	480	206	473	600	79,904	998.8	998.8	80	79,904	2.503	200,016	1.00	200,016	0.200	0.309	8	1.17	0.109824	0.22667	0.34	0.2355	2.96
15 & 50% of 21	206	473	204	466	1100	90,182	1127.3	2126.1	80	170,086	2.273	386,683	1.00	386,683	0.387	0.598	10	0.64	0.158555	0.34167	0.41	0.3032	2.84
18	204	466	202	463	300	57,021	712.8	2838.8	80	227,107	2.162	490,950	1.00	490,950	0.491	0.760	10	1.00	0.160589	0.34167	0.41	0.3032	3.61
	202	463	200	460	700	0	0.0	5149.1	80	411,926	1.993	820,823	1.00	820,823	0.821	1.270	15	0.43	0.139104	0.47500	0.38	0.2739	2.97
1, 7, & LS "2"	110	507	109	480	550	299,854	3748.2	3748.2	80	299,854	2.075	622,312	1.00	622,312	0.622	0.963	8	4.91	0.166576	0.28000	0.42	0.3130	6.92
	109	480	18	477	550	0	0.0	3748.2	80	299,854	2.075	622,312	1.00	622,312	0.622	0.963	12	0.55	0.169495	0.42000	0.42	0.3130	3.08
LS "1"	12	478.9	11	478.1	80	0	0.0	5149.1	80	411,926	1.993	820,823	1.00	820,823	0.821	1.270	12	1.00	0.165112	0.42000	0.42	0.3130	4.06
50% of 14	11	478.1	10	474.4	350	21,754	271.9	5421.0	80	433,680	1.975	856,691	1.00	856,691	0.857	1.326	12	1.06	0.167604	0.42000	0.42	0.3130	4.24
	10	474.4	9	472.0	270	0	0.0	5421.0	80	433,680	1.975	856,691	1.00	856,691	0.857	1.326	12	0.89	0.182780	0.44000	0.44	0.3328	3.98
	9	472.0	8	468.0	210	0	0.0	5421.0	80	433,680	1.975	856,691	1.00	856,691	0.857	1.326	12	1.90	0.124862	0.36000	0.36	0.2546	5.21
50% of 24, 25, & 26	8	468.0	7	466.0	200	88,400	1105.0	7581.5	80	606,521	1.887	1,144,716	1.00	1,144,716	1.145	1.771	15	1.00	0.126999	0.45000	0.36	0.2546	4.45
	7	466.0	6	463.3	275	0	0.0	7581.5	80	606,521	1.887	1,144,716	1.00	1,144,716	1.145	1.771	15	0.98	0.128169	0.45000	0.36	0.2546	4.45
	6	463.3	5	461.9	140	0	0.0	7581.5	80	606,521	1.887	1,144,716	1.00	1,144,716	1.145	1.771	15	1.00	0.126999	0.45000	0.36	0.2546	4.45
	5	461.9	12	452.5	160	0	0.0	7581.5	80	606,521	1.887	1,144,716	1.00	1,144,716	1.145	1.771	15	5.87	0.052396	0.28750	0.23	0.1365	8.30
50% of 12 & 14	116	477.4	114	475.3	220	38,227	478	478	80	38,227	3.081	117,760	1.00	117,760	0.118	0.182	8	0.95	0.071483	0.09333	0.14	0.0668	6.14
	114	475.3	112	470.3	370	0	0	478	80	38,227	3.081	117,760	1.00	117,760	0.118	0.182	8	1.35	0.060078	0.09333	0.14	0.0668	6.14
50% of 13	112	470.3	108	467.6	260	23,107	289	767	80	61,334	2.779	170,474	1.00	170,474	0.170	0.264	8	1.04	0.099213	0.08667	0.13	0.0600	9.89
50% of 13	108	467.6	7	466.0	130	23,107	289	1056	80	84,441	2.484	209,747	1.00	209,747	0.210	0.325	8	1.23	0.112127	0.08000	0.12	0.0534	13.67
Southwind Project (75 Offsite Units)	SW 1	475.5	SW 2	469.4	295	21,000	262.5	263	80	21,000	3.798	79,765	1.00	79,765	0.080	0.123	8	2.07	0.032898	0.15333	0.23	0.1365	2.03
50% of 8 & 9	SW 2	469.4	18	463.3	210	34,000	425.0	688	80	55,000	2.845	156,498	1.00	156,498	0.156	0.242	8	2.90	0.054458	0.17333	0.26	0.1623	3.36
27	20	466.0	18	463.3	250	39,520	494.0	4242.2	80	339,374	2.038	691,641	1.00	691,641	0.692	1.070	12	1.08	0.133874	0.37000	0.37	0.2642	4.05
	18	463.3	17	461.5	170	0	0.0	4929.7	80	394,374	2.004	790,174	1.00	790,174	0.790	1.223	12	1.06	0.154468	0.40000	0.40	0.2934	4.17
50% of 8 & 9	17	461.5	16	459.4	200	34,000	425.0	5354.7	80	428,374	1.980	848,104	1.00	848,104	0.848	1.312	15	1.05	0.091824	0.38750	0.31	0.2074	4.05
50% of 26	16	459.4	15	457.1	195	22,880	286.0	5640.7	80	451,254	1.964	886,467	1.00	886,467	0.886	1.372	15	1.18	0.090556	0.37500	0.30	0.1982	4.43
10	15	457.1	14	454.8	220	54,067	675.8	6316.5	80	505,321	1.934	977,429	1.00	977,429	0.977	1.512	15	1.05	0.106056	0.41250	0.33	0.2260	4.28
	14	454.8	13	453.0	170	0	0.0	6316.5	80	505,321	1.934	977,429	1.00	977,429	0.977	1.512	15	1.06	0.105384	0.41250	0.33	0.2260	4.28
11	13	453.0	12	452.5	40	45,658	570.7	6887.2	80	550,979	1.911	1,052,695	1.00	1,052,695	1.053	1.629	15	1.25	0.104460	0.41250	0.33	0.2260	4.61
	12	452.5	3	449.0	350	0	0.0	14468.7	80	1,157,500	1.760	2,037,712	1.00	2,037,712	2.038	3.153	15	1.00	0.226071	0.62500	0.50	0.3930	5.13
	3	449.0	2	446.3	250	0	0.0	14946.6	80	1,195,727	1.751	2,093,847	1.00	2,093,847	2.094	3.240	15	1.08	0.223529	0.61250	0.49	0.3827	5.42
50% of 12	2	446.3	1	442.4	460	16,474	205.9	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	15	0.85	0.255380	0.67500	0.54	0.4330	4.85
	1	442.4	19	440.0	205	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	15	1.17	0.217326	0.61250	0.49	0.3827	5.48
	19	440.0	20	432.5	255	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	15	2.94	0.137113	0.47500	0.38	0.2739	7.66
	20	432.5	21	420.7	275	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	15	4.29	0.113518	0.42500	0.34	0.2355	8.91
	21	420.7	22	411.9	160	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	15	5.50	0.100267	0.40000	0.32	0.2167	9.69
	22	411.9	23	395.9	240	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	6.67	0.056006	0.36000	0.24	0.1449	10.06
	23	395.9	24	370.7	320	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.88	0.051531	0.34500	0.23	0.1365	10.68
	24	370.7	25	347.9	290	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.86	0.051573	0.34500	0.23	0.1365	10.68
	25	347.9	26	324.1	300	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.93	0.051341	0.34500	0.23	0.1365	10.68
	26	324.1	27	293.9	385	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.84	0.051632	0.34500	0.23	0.1365	10.68
	27	293.9	28	274.2	250	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.88	0.051514	0.34500	0.23	0.1365	10.68
	28	274.2	29	254.4	250	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.92	0.051384	0.34500	0.23	0.1365	10.68
	29	254.4	30	234.2	260	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.77	0.051880	0.34500	0.23	0.1365	10.68
	30	234.2	31	214.0	280	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	7.21	0.053839	0.36000	0.24	0.1449	10.06
	31	214.0	Ex. 5	205.5	300	0	0.0	15152.5	80	1,212,200	1.748	2,119,526	1.00	2,119,526	2.120	3.280	18	2.83	0.085909	0.45000	0.30	0.1982	7.35
						1,145,693						2,091,246						Min Slope 0.43		Max dn/D 0.54		Min Vel. 2.03

LU = Land Use Area

L.S. "1" Average Flow

Max Vel. 13.67

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

APPENDIX E

SPREADSHEET CALCULATION – OFFSITE SEWER SYSTEM (OMTS)

DATE: 3/4/2022

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Existing Flows Only)

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units	Ex. 5	Ex. 4	18,200	227.5	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.07	0.010349	0.00000	0.00	0.0000	#DIV/0!
	Ex. 4	Ex. 3	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	4.67	0.010789	0.28333	0.34	0.2355	0.67
	Ex. 3	Ex. 2	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.77	0.009703	0.34167	0.41	0.3032	0.52
	Ex. 2	M36S 25	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.30	0.010120	0.34167	0.41	0.3032	0.52
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential	M36S 25	M36S 116	18,200	227.5	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	3.08	0.264778	0.55000	0.55	0.4430	8.07
	M36S 116	M36S 115	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	3.08	0.264778	0.55000	0.55	0.4430	8.07
	M36S 115	M36S 107	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	5.60	0.196365	0.46000	0.46	0.3527	10.13
	M36S 107	M36S 75	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	5.60	0.196365	0.46000	0.46	0.3527	10.13
	M36S 75	M37S 59	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	15	6.20	0.102928	0.41250	0.33	0.2260	10.12
	M37S 59	M37S 63	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	15	6.00	0.104630	0.41250	0.33	0.2260	10.12
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	9528.2	80	762,256	1.831	1,396,054	1.85	2,582,699	2.583	3.996	18	0.33	0.306738	0.90000	0.60	0.4920	3.61
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	9674.2	80	773,932	1.828	1,414,900	1.85	2,617,564	2.618	4.050	18	0.33	0.310879	0.90000	0.60	0.4920	3.66
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	18	0.33	0.313501	0.91500	0.61	0.5020	3.62
	M37S 67	M37S 95	0	0.0	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	15	1.15	0.273084	0.70000	0.56	0.4530	5.77
	M37S 95	M37S 104	0	0.0	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	15	1.15	0.273084	0.70000	0.56	0.4530	5.77
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99
	M37S 93	M37S 120	0	0.0	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,076,780	13,460	0.33	0.61	3.61	10.12

LU = Land Use Area

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 8/22/2024

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Existing & Specific Plan Flows) SHT

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc. REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
SW Village + Southwind + Ex. Res.	Ex. 5	Ex. 4	1,214,642	15183.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.07	0.064331	0.39000	0.26	0.1623	9.00
	Ex. 4	Ex. 3	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	4.67	0.067063	0.39000	0.26	0.1623	9.00
	Ex. 3	Ex. 2	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.77	0.060316	0.37500	0.25	0.1535	9.51
	Ex. 2	M36S 25	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.30	0.062903	0.37500	0.25	0.1535	9.51
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
SW Village + Southwind + Ex. Res.	M36S 25	M36S 116	1,214,642	15183.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	12	3.08	0.658901	#N/A	#N/A	#N/A	#N/A
	M36S 116	M36S 115	0	0.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	12	3.08	0.658901	#N/A	#N/A	#N/A	#N/A
	M36S 115	M36S 107	0	0.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	12	5.60	0.488654	#N/A	#N/A	#N/A	#N/A
	M36S 107	M36S 75	0	0.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	12	5.60	0.488654	#N/A	#N/A	#N/A	#N/A
	M36S 75	M37S 59	0	0.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	15	6.20	0.256137	0.67500	0.54	0.4330	13.15
	M37S 59	M37S 63	0	0.0	23345.5	80	1,867,642	1.664	3,107,390	1.85	5,748,672	5.749	8.895	15	6.00	0.260371	0.67500	0.54	0.4330	13.15
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	24483.7	80	1,958,698	1.654	3,240,311	1.85	5,994,576	5.995	9.276	18	0.33	0.711955	#N/A	#N/A	#N/A	#N/A
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	24629.7	80	1,970,374	1.653	3,257,231	1.85	6,025,877	6.026	9.324	18	0.33	0.715673	#N/A	#N/A	#N/A	#N/A
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	24723.8	80	1,977,906	1.652	3,268,130	1.85	6,046,040	6.046	9.355	18	0.33	0.718068	#N/A	#N/A	#N/A	#N/A
	M37S 67	M37S 95	0	0.0	24723.8	80	1,977,906	1.652	3,268,130	1.85	6,046,040	6.046	9.355	15	1.15	0.625494	#N/A	#N/A	#N/A	#N/A
	M37S 95	M37S 104	0	0.0	24723.8	80	1,977,906	1.652	3,268,130	1.85	6,046,040	6.046	9.355	15	1.15	0.625494	#N/A	#N/A	#N/A	#N/A
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	28415.3	80	2,273,222	1.628	3,700,655	1.85	6,846,211	6.846	10.593	24	0.65	0.269637	1.10000	0.55	0.4430	5.98
	M37S 93	M37S 120	0	0.0	28415.3	80	2,273,222	1.628	3,700,655	1.85	6,846,211	6.846	10.593	24	0.65	0.269637	1.10000	0.55	0.4430	5.98
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	28415.3	80	2,273,222	1.628	3,700,655	1.85	6,846,211	6.846	10.593	24	0.65	0.269637	1.10000	0.55	0.4430	5.98

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
2,273,222	28,415	0.33	#N/A	#N/A	#N/A

LU = Land Use Area

= Segements which exceed replacement depth criteria of 0.55 d/D for 15" and smaller or 0.75 d/D for 18" and larger

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 8/22/2024

JOB NUMBER: 648-031

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Ultimate (23T) & Speficic Plan Flows) SHT ____ OF ____

BY: Dexter Wilson Engineering, Inc. REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
SW Village + Southwind + Ex. Res.	Ex. 5	Ex. 4	1,214,642	15183.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.07	0.064331	0.39000	0.26	0.1623	9.00
	Ex. 4	Ex. 3	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	4.67	0.067063	0.39000	0.26	0.1623	9.00
	Ex. 3	Ex. 2	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.77	0.060316	0.37500	0.25	0.1535	9.51
	Ex. 2	M36S 25	0	0.0	15183.0	80	1,214,642	1.748	2,123,425	1.00	2,123,425	2.123	3.286	18	5.30	0.062903	0.37500	0.25	0.1535	9.51
OMTS*	M36S 20	M36S 25	3,838,650	47983.1	47983.1	80	3,838,650	1.553	5,961,082	1.85	11,028,002	11.028	17.064	27	2.00	0.180450	0.99000	0.44	0.3328	10.13
SW Village + Southwind + Ex. Res.	M36S 25	M36S 116	1,214,642	15183.0	63166.2	80	5,053,292	1.527	7,715,547	1.69	13,016,128	13.016	20.140	27	0.60	0.388849	1.59750	0.71	0.5960	6.68
	M36S 116	M36S 115	0	0.0	63166.2	80	5,053,292	1.527	7,715,547	1.69	13,016,128	13.016	20.140	27	0.60	0.388849	1.59750	0.71	0.5960	6.68
	M36S 115	M36S 107	5,300	66.3	63232.4	80	5,058,592	1.527	7,723,304	1.69	13,029,215	13.029	20.161	27	1.90	0.218734	1.10250	0.49	0.3827	10.41
	M36S 107	M36S 75	0	0.0	63232.4	80	5,058,592	1.527	7,723,304	1.69	13,029,215	13.029	20.161	27	5.10	0.133508	0.83250	0.37	0.2642	15.07
	M36S 75	M37S 59	0	0.0	63232.4	80	5,058,592	1.527	7,723,304	1.69	13,029,215	13.029	20.161	27	6.40	0.119180	0.78750	0.35	0.2450	16.25
	M37S 59	M37S 63	0	0.0	63232.4	80	5,058,592	1.527	7,723,304	1.69	13,029,215	13.029	20.161	27	6.10	0.122075	0.81000	0.36	0.2546	15.64
Ex. EDUs	M37S 63	M37S 69	77,000	962.5	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	27	5.50	0.130436	0.83250	0.37	0.2642	15.29
	M37S 69	M37S 66	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	27	5.30	0.132875	0.83250	0.37	0.2642	15.29
	M37S 66	M37S 67	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	27	4.60	0.142627	0.87750	0.39	0.2836	14.25
	M37S 67	M37S 95	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	27	3.90	0.154899	0.90000	0.40	0.2934	13.77
	M37S 95	M37S 104 (OM MH 41)	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	1.00	0.179135	1.21000	0.44	0.3328	8.13
	M37S 104 (OM MH 41)	OM MH 42	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	1.00	0.179135	1.21000	0.44	0.3328	8.13
	OM MH 42	OM MH 43	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	0.40	0.283237	1.56750	0.57	0.4620	5.85
	OM MH 43	OM MH 44	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	0.40	0.283237	1.56750	0.57	0.4620	5.85
	OM MH 44	OM MH 45	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	0.80	0.200279	1.26500	0.46	0.3527	7.67
	OM MH 45	OM MH 46	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	0.60	0.231262	1.37500	0.50	0.3930	6.88
Junction with Ex. 42"	OM MH 46	OM MH 47	0	0.0	64194.9	80	5,135,592	1.526	7,835,923	1.69	13,219,202	13.219	20.455	33	0.50	0.253335	1.45750	0.53	0.4230	6.39

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
5,135,592	64,195	0.40	0.71	5.85	16.25

LU = Land Use Area

* OMTS tributary area peak sewer flow based on flow modeling performed by the City

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

APPENDIX F

SPREADSHEET CALCULATION –
EAST BEYER BLVD. OMTS CAPACITY THRESHOLDS

DATE: 9/8/2023

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **950**

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units	Ex. 5	Ex. 4	18,200	227.5	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.07	0.010349	0.00000	0.00	0.0000	#DIV/0!
	Ex. 4	Ex. 3	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	4.67	0.010789	0.28333	0.34	0.2355	0.67
	Ex. 3	Ex. 2	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.77	0.009703	0.34167	0.41	0.3032	0.52
	Ex. 2	M36S 25	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.30	0.010120	0.34167	0.41	0.3032	0.52
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + Phased Flow EDUs (see above)	M36S 25	M36S 116	284,200	3552.5	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	27	0.60	0.093087	0.69750	0.31	0.2074	4.59
	M36S 116	M36S 115	0	0.0	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	27	0.60	0.093087	0.69750	0.31	0.2074	4.59
	M36S 115	M36S 107	0	0.0	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	27	5.60	0.030470	0.40500	0.18	0.0961	9.91
	M36S 107	M36S 75	0	0.0	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	27	5.60	0.030470	0.40500	0.18	0.0961	9.91
	M36S 75	M37S 59	0	0.0	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	15	6.20	0.138834	0.47500	0.38	0.2739	11.27
	M37S 59	M37S 63	0	0.0	11715.0	80	937,200	1.797	1,684,298	1.85	3,115,952	3.116	4.821	15	6.00	0.141129	0.47500	0.38	0.2739	11.27
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	12853.2	80	1,028,256	1.782	1,832,336	1.85	3,389,821	3.390	5.245	18	0.33	0.402598	1.09500	0.73	0.6140	3.80
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	12999.2	80	1,039,932	1.780	1,851,118	1.85	3,424,569	3.425	5.299	18	0.33	0.406724	1.09500	0.73	0.6140	3.84
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	13093.3	80	1,047,464	1.779	1,863,211	1.85	3,446,940	3.447	5.334	18	0.33	0.409381	1.11000	0.74	0.6230	3.80
	M37S 67	M37S 95	0	0.0	13093.3	80	1,047,464	1.779	1,863,211	1.85	3,446,940	3.447	5.334	27	3.90	0.040390	0.45000	0.20	0.1118	9.42
	M37S 95	M37S 104	0	0.0	13093.3	80	1,047,464	1.779	1,863,211	1.85	3,446,940	3.447	5.334	33	1.00	0.046710	0.60500	0.22	0.1281	5.51
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	16784.8	80	1,342,780	1.729	2,321,422	1.85	4,294,631	4.295	6.645	24	0.65	0.169143	0.84000	0.42	0.3130	5.31
	M37S 93	M37S 120	0	0.0	16784.8	80	1,342,780	1.729	2,321,422	1.85	4,294,631	4.295	6.645	24	0.65	0.169143	0.84000	0.42	0.3130	5.31
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	16784.8	80	1,342,780	1.729	2,321,422	1.85	4,294,631	4.295	6.645	24	0.65	0.169143	0.84000	0.42	0.3130	5.31

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,342,780	16,785	0.33	0.74	3.80	11.27

LU = Land Use Area

Previously Upgraded Segment

Segment to be Upgraded at Stated Unit Threshold

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 6/22/2023

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **1050**

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units + Phased Flow	Ex. 5	Ex. 4	312,200	3902.5	3902.5	80	312,200	2.060	643,116	1.00	643,116	0.643	0.995	10	5.07	0.093412	0.00000	0.00	0.0000	#DIV/0!
	Ex. 4	Ex. 3	0	0.0	3902.5	80	312,200	2.060	643,116	1.00	643,116	0.643	0.995	10	4.67	0.097379	0.28333	0.34	0.2355	6.08
	Ex. 3	Ex. 2	0	0.0	3902.5	80	312,200	2.060	643,116	1.00	643,116	0.643	0.995	10	5.77	0.087581	0.34167	0.41	0.3032	4.73
	Ex. 2	M36S 25	0	0.0	3902.5	80	312,200	2.060	643,116	1.00	643,116	0.643	0.995	10	5.30	0.091338	0.34167	0.41	0.3032	4.73
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + Phased Flow EDUs (see above)	M36S 25	M36S 116	312,200	3902.5	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	27	0.60	0.095619	0.69750	0.31	0.2074	4.72
	M36S 116	M36S 115	0	0.0	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	27	0.60	0.095619	0.69750	0.31	0.2074	4.72
	M36S 115	M36S 107	0	0.0	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	27	1.90	0.053733	0.54000	0.24	0.1449	6.75
	M36S 107	M36S 75	0	0.0	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	27	5.10	0.032797	0.42750	0.19	0.1039	9.42
	M36S 75	M37S 59	0	0.0	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	15	6.20	0.142611	0.48750	0.39	0.2836	11.18
	M37S 59	M37S 63	0	0.0	12065.0	80	965,200	1.792	1,730,115	1.85	3,200,712	3.201	4.953	15	6.00	0.144968	0.48750	0.39	0.2836	11.18
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	13203.2	80	1,056,256	1.777	1,877,302	1.85	3,473,009	3.473	5.374	18	0.33	0.412477	1.11000	0.74	0.6230	3.83
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	13349.2	80	1,067,932	1.775	1,895,976	1.85	3,507,555	3.508	5.427	18	0.33	0.416580	1.12500	0.75	0.6320	3.82
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	13443.3	80	1,075,464	1.774	1,907,998	1.85	3,529,796	3.530	5.462	18	0.33	0.419222	1.12500	0.75	0.6320	3.84
	M37S 67	M37S 95	0	0.0	13443.3	80	1,075,464	1.774	1,907,998	1.85	3,529,796	3.530	5.462	27	3.90	0.041361	0.47250	0.21	0.1199	9.00
	M37S 95	M37S 104	0	0.0	13443.3	80	1,075,464	1.774	1,907,998	1.85	3,529,796	3.530	5.462	33	1.00	0.047833	0.60500	0.22	0.1281	5.64
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	17134.8	80	1,370,780	1.724	2,362,975	1.85	4,371,504	4.372	6.764	24	0.65	0.172171	0.86000	0.43	0.3229	5.24
	M37S 93	M37S 120	0	0.0	17134.8	80	1,370,780	1.724	2,362,975	1.85	4,371,504	4.372	6.764	24	0.65	0.172171	0.86000	0.43	0.3229	5.24
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	17134.8	80	1,370,780	1.724	2,362,975	1.85	4,371,504	4.372	6.764	24	0.65	0.172171	0.86000	0.43	0.3229	5.24

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,370,780	17,135	0.33	0.75	3.83	11.18

LU = Land Use Area

Previously Upgraded Segment

Segment to be Upgraded at Stated Unit Threshold

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 6/22/2023

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **3400**

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units + Phased Flow	Ex. 5	Ex. 4	970,200	12127.5	12127.5	80	970,200	1.792	1,738,269	1.00	1,738,269	1.738	2.690	10	5.07	0.252482	0.44167	0.53	0.4230	9.16
	Ex. 4	Ex. 3	0	0.0	12127.5	80	970,200	1.792	1,738,269	1.00	1,738,269	1.738	2.690	10	4.67	0.263203	0.45833	0.55	0.4430	8.74
	Ex. 3	Ex. 2	0	0.0	12127.5	80	970,200	1.792	1,738,269	1.00	1,738,269	1.738	2.690	10	5.77	0.236721	0.42500	0.51	0.4030	9.61
	Ex. 2	M36S 25	0	0.0	12127.5	80	970,200	1.792	1,738,269	1.00	1,738,269	1.738	2.690	10	5.30	0.246876	0.43333	0.52	0.4130	9.38
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + Phased Flow EDUs (see above)	M36S 25	M36S 116	970,200	12127.5	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	27	0.60	0.151353	0.90000	0.40	0.2934	5.28
	M36S 116	M36S 115	0	0.0	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	27	0.60	0.151353	0.90000	0.40	0.2934	5.28
	M36S 115	M36S 107	0	0.0	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	27	1.90	0.085053	0.67500	0.30	0.1982	7.81
	M36S 107	M36S 75	0	0.0	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	27	5.10	0.051914	0.51750	0.23	0.1365	11.34
	M36S 75	M37S 59	0	0.0	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	15	6.20	0.225734	0.62500	0.50	0.3930	12.77
	M37S 59	M37S 63	0	0.0	20290.0	80	1,623,200	1.687	2,738,548	1.85	5,066,315	5.066	7.839	15	6.00	0.229466	0.62500	0.50	0.3930	12.77
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	21428.2	80	1,714,256	1.680	2,880,694	1.85	5,329,284	5.329	8.246	27	5.50	0.052585	0.51750	0.23	0.1365	11.93
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	21574.2	80	1,725,932	1.679	2,898,434	1.85	5,362,102	5.362	8.297	27	5.30	0.053898	0.54000	0.24	0.1449	11.31
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	21668.3	80	1,733,464	1.678	2,909,599	1.85	5,382,758	5.383	8.329	27	4.60	0.058077	0.54000	0.24	0.1449	11.35
	M37S 67	M37S 95	0	0.0	21668.3	80	1,733,464	1.678	2,909,599	1.85	5,382,758	5.383	8.329	27	3.90	0.063074	0.56250	0.25	0.1535	10.72
	M37S 95	M37S 104	0	0.0	21668.3	80	1,733,464	1.678	2,909,599	1.85	5,382,758	5.383	8.329	30	1.00	0.094050	0.77500	0.31	0.2074	6.43
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	25359.8	80	2,028,780	1.648	3,342,648	1.85	6,183,899	6.184	9.569	24	0.65	0.243552	1.04000	0.52	0.4130	5.79
	M37S 93	M37S 120	0	0.0	25359.8	80	2,028,780	1.648	3,342,648	1.85	6,183,899	6.184	9.569	24	0.65	0.243552	1.04000	0.52	0.4130	5.79
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	25359.8	80	2,028,780	1.648	3,342,648	1.85	6,183,899	6.184	9.569	24	0.65	0.243552	1.04000	0.52	0.4130	5.79

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
2,028,780	25,360	0.60	0.52	5.28	12.77

LU = Land Use Area

Previously Upgraded Segment

Segment to be Upgraded at Stated Unit Threshold

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 8/22/2024

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **4450**

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units + Phased Flow	Ex. 5	Ex. 4	1,264,200	15802.5	15802.5	80	1,264,200	1.742	2,202,230	1.00	2,202,230	2.202	3.408	18	5.07	0.066719	0.39000	0.26	0.1623	9.33
	Ex. 4	Ex. 3	0	0.0	15802.5	80	1,264,200	1.742	2,202,230	1.00	2,202,230	2.202	3.408	18	4.67	0.069552	0.40500	0.27	0.1711	8.85
	Ex. 3	Ex. 2	0	0.0	15802.5	80	1,264,200	1.742	2,202,230	1.00	2,202,230	2.202	3.408	18	5.77	0.062554	0.37500	0.25	0.1535	9.87
	Ex. 2	M36S 25	0	0.0	15802.5	80	1,264,200	1.742	2,202,230	1.00	2,202,230	2.202	3.408	18	5.30	0.065238	0.39000	0.26	0.1623	9.33
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + Phased Flow EDUs (see above)	M36S 25	M36S 116	1,264,200	15802.5	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	27	0.60	0.175748	0.96750	0.43	0.3229	5.57
	M36S 116	M36S 115	0	0.0	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	27	0.60	0.175748	0.96750	0.43	0.3229	5.57
	M36S 115	M36S 107	0	0.0	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	27	1.90	0.098762	0.72000	0.32	0.2167	8.30
	M36S 107	M36S 75	0	0.0	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	27	5.10	0.060281	0.56250	0.25	0.1535	11.71
	M36S 75	M37S 59	0	0.0	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	15	6.20	0.262118	0.67500	0.54	0.4330	13.45
	M37S 59	M37S 63	0	0.0	23965.0	80	1,917,200	1.659	3,179,948	1.85	5,882,903	5.883	9.103	15	6.00	0.266451	0.68750	0.55	0.4430	13.15
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	25103.2	80	2,008,256	1.649	3,312,267	1.85	6,127,695	6.128	9.482	27	5.50	0.060463	0.56250	0.25	0.1535	12.20
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	25249.2	80	2,019,932	1.648	3,329,560	1.85	6,159,685	6.160	9.531	27	5.30	0.061915	0.56250	0.25	0.1535	12.27
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	25343.3	80	2,027,464	1.648	3,340,702	1.85	6,180,300	6.180	9.563	27	4.60	0.066681	0.58500	0.26	0.1623	11.64
	M37S 67	M37S 95	0	0.0	25343.3	80	2,027,464	1.648	3,340,702	1.85	6,180,300	6.180	9.563	27	3.90	0.072419	0.60750	0.27	0.1711	11.04
	M37S 95	M37S 104	0	0.0	25343.3	80	2,027,464	1.648	3,340,702	1.85	6,180,300	6.180	9.563	33	1.00	0.083750	0.79750	0.29	0.1890	6.69
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	29034.8	80	2,322,780	1.625	3,774,137	1.85	6,982,154	6.982	10.804	24	0.65	0.274991	1.12000	0.56	0.4530	5.96
	M37S 93	M37S 120	0	0.0	29034.8	80	2,322,780	1.625	3,774,137	1.85	6,982,154	6.982	10.804	24	0.65	0.274991	1.12000	0.56	0.4530	5.96
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	29034.8	80	2,322,780	1.625	3,774,137	1.85	6,982,154	6.982	10.804	24	0.65	0.274991	1.12000	0.56	0.4530	5.96

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
2,322,780	29,035	0.60	0.56	5.57	13.45

LU = Land Use Area

Previously Upgraded Segment

Segment to be Upgraded at Stated Unit Threshold

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 8/22/2024

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **9300**

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units + Phased Flow	Ex. 5	Ex. 4	2,622,200	32777.5	32777.5	80	2,622,200	1.606	4,211,574	1.00	4,211,574	4.212	6.517	18	5.07	0.127594	0.54000	0.36	0.2546	11.38
	Ex. 4	Ex. 3	0	0.0	32777.5	80	2,622,200	1.606	4,211,574	1.00	4,211,574	4.212	6.517	18	4.67	0.133012	0.55500	0.37	0.2642	10.96
	Ex. 3	Ex. 2	0	0.0	32777.5	80	2,622,200	1.606	4,211,574	1.00	4,211,574	4.212	6.517	18	5.77	0.119629	0.52500	0.35	0.2450	11.82
	Ex. 2	M36S 25	0	0.0	32777.5	80	2,622,200	1.606	4,211,574	1.00	4,211,574	4.212	6.517	18	5.30	0.124761	0.54000	0.36	0.2546	11.38
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + Phased Flow EDUs (see above)	M36S 25	M36S 116	2,622,200	32777.5	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	0.60	0.284670	1.28250	0.57	0.4620	6.30
	M36S 116	M36S 115	0	0.0	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	0.60	0.284670	1.28250	0.57	0.4620	6.30
	M36S 115	M36S 107	0	0.0	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	1.90	0.159971	0.92250	0.41	0.3032	9.61
	M36S 107	M36S 75	0	0.0	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	5.10	0.097641	0.72000	0.32	0.2167	13.44
	M36S 75	M37S 59	0	0.0	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	6.40	0.087162	0.67500	0.30	0.1982	14.69
	M37S 59	M37S 63	0	0.0	40940.0	80	3,275,200	1.573	5,150,760	1.85	9,528,905	9.529	14.744	27	6.10	0.089280	0.67500	0.30	0.1982	14.69
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	42078.2	80	3,366,256	1.570	5,284,289	1.85	9,775,935	9.776	15.127	27	5.50	0.096461	0.69750	0.31	0.2074	14.41
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	42224.2	80	3,377,932	1.569	5,301,209	1.85	9,807,237	9.807	15.175	27	5.30	0.098579	0.72000	0.32	0.2167	13.83
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	42318.3	80	3,385,464	1.569	5,312,119	1.85	9,827,420	9.827	15.206	27	4.60	0.106032	0.74250	0.33	0.2260	13.29
	M37S 67	M37S 95	0	0.0	42318.3	80	3,385,464	1.569	5,312,119	1.85	9,827,420	9.827	15.206	27	3.90	0.115155	0.76500	0.34	0.2355	12.75
	M37S 95	M37S 104	0	0.0	42318.3	80	3,385,464	1.569	5,312,119	1.85	9,827,420	9.827	15.206	33	1.00	0.133172	1.01750	0.37	0.2642	7.61
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	46009.8	80	3,680,780	1.559	5,736,677	1.85	10,612,853	10.613	16.422	24	0.65	0.417986	1.50000	0.75	0.6320	6.50
	M37S 93	M37S 120	0	0.0	46009.8	80	3,680,780	1.559	5,736,677	1.85	10,612,853	10.613	16.422	24	0.65	0.417986	1.50000	0.75	0.6320	6.50
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	46009.8	80	3,680,780	1.559	5,736,677	1.85	10,612,853	10.613	16.422	24	0.65	0.417986	1.50000	0.75	0.6320	6.50

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
3,680,780	46,010	0.60	0.75	6.30	14.69

LU = Land Use Area

Previously Upgraded Segment

Segment to be Upgraded at Stated Unit Threshold

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

APPENDIX G

EXISTING AND ULTIMATE OMTS HYDRAULIC MODELING DATA FROM THE CITY OF SAN DIEGO

DRAFT

CITY OF SAN DIEGO
FLOW CALCULATION TABLE
TS93B WEST OTAY MESA
2018 WWF - BASEFLOW + SOUTHWEST DEVELOPMENT 788 DU (No I&I)

EXISTING CONDITION

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
5624494	N36S23.1	N36SP2	513.50	511.59	539.70	0.005	18	359	3.0	4.36	24.2	0.637	4.96	12.8
5624494	N36SP2.1	N35SP1	511.59	508.09	538.06	0.005	18	676	3.0	4.39	24.4	0.637	4.89	13.0
5624494	N35SP1.1	N35S147	508.09	485.89	520.00	0.040	18	559	6.1	2.66	14.8	0.637	13.53	4.7
5625234	N35S147.1	N35S153	485.74	484.39	519.00	0.006	42	218	2.8	3.29	7.8	0.637	51.18	1.2
5625237	N35S153.1	N35S154	484.39	480.13	507.00	0.006	42	747	2.7	3.35	8.0	0.637	49.11	1.3
5625239	N35S154.1	N35S152	480.13	478.65	503.60	0.006	42	243	2.8	3.30	7.9	0.637	50.75	1.3
5625242	N35S152.1	N36S24	478.65	477.13	496.30	0.006	42	252	2.8	3.31	7.9	0.637	50.51	1.3
5625244	N36S24.1	N36S25	477.13	469.50	480.90	0.018	42	423	4.1	2.55	6.1	0.637	87.34	0.7
5625246	N36S25.1	N36S26	469.50	458.95	470.90	0.064	42	165	7.6	2.48	5.9	1.125	164.44	0.7
5625249	N36S26.1	N36S27	458.95	450.50	462.30	0.058	42	145	7.3	2.53	6.0	1.125	156.99	0.7
5625248	N36S27.1	N36S28	450.50	436.00	449.80	0.059	42	245	7.4	2.53	6.0	1.125	158.21	0.7
5625252	N36S28.1	N36S34	436.00	431.65	446.20	0.057	42	76	7.3	2.55	6.1	1.125	155.58	0.7
5625254	N36S34.1	N36S32	431.65	430.74	446.20	0.018	42	50	4.9	3.33	7.9	1.125	87.73	1.3
00000	N36S32.1	N36S33	430.74	430.25	445.40	0.031	42	16	5.9	2.95	7.0	1.125	113.81	1.0
00000	N36S33.1	N36S30	430.25	429.63	444.60	0.031	42	20	5.9	2.94	7.0	1.125	114.50	1.0
00000	N36S30.1	N36S31	429.63	418.63	434.50	0.058	42	191	7.3	2.54	6.1	1.125	156.02	0.7
00000	N36S31.1	M36S189	418.63	398.88	418.20	0.056	42	355	7.2	2.56	6.1	1.125	153.37	0.7
00000	M36S189.1	M36S190	398.88	385.88	400.60	0.056	42	234	7.2	2.56	6.1	1.125	153.33	0.7
00000	M36S190.1	M36S191	385.88	384.68	399.20	0.038	42	31	6.3	2.79	6.7	1.125	127.54	0.9
00000	M36S191.1	M36S192	384.68	383.38	397.90	0.048	42	27	6.9	2.65	6.3	1.125	142.72	0.8
00000	M36S192.1	M36S193	383.38	358.73	371.40	0.049	42	500	6.9	2.64	6.3	1.125	144.38	0.8
00000	M36S193.1	M36S195	358.73	356.38	369.00	0.050	42	47	6.9	2.63	6.3	1.125	144.85	0.8
00000	M36S195.1	M36S194	356.38	353.98	366.70	0.051	42	47	7.0	2.61	6.2	1.125	146.95	0.8
00000	M36S194.1	M36S203	353.98	346.38	358.80	0.056	42	136	7.2	2.56	6.1	1.125	153.90	0.7
00000	M36S203.1	M36S204	346.38	312.63	324.30	0.054	42	630	7.1	2.58	6.2	1.125	150.55	0.7
00000	M36S204.1	M36S196	312.63	295.88	307.60	0.068	42	247	7.7	2.44	5.8	1.125	169.54	0.7
00000	M36S196.1	M36S197	295.88	276.35	290.50	0.034	42	579	6.1	2.88	6.9	1.125	119.43	0.9
00000	M36S197.1	M36S202	276.35	242.38	254.60	0.035	42	980	6.1	2.86	6.8	1.125	121.10	0.9
00000	M36S202.1	M36S198	242.38	238.73	254.60	0.007	42	522	3.5	4.18	10.0	1.125	54.41	2.1
00000	M36S198.1	M36S201	238.73	237.53	253.20	0.012	42	98	4.2	3.66	8.7	1.125	71.85	1.6
00000	M36S201.1	M36S200	237.53	229.65	247.70	0.046	42	170	6.8	2.67	6.4	1.125	139.93	0.8
00000	M36S200.1	M36S199B	229.65	229.45	247.00	0.020	24	10	5.4	3.80	15.8	1.125	16.89	6.7
00000	M36S199B.1	M36S199A	229.45	227.00	237.00	0.012	24	197	5.4	5.50	22.9	1.881	16.14	11.7

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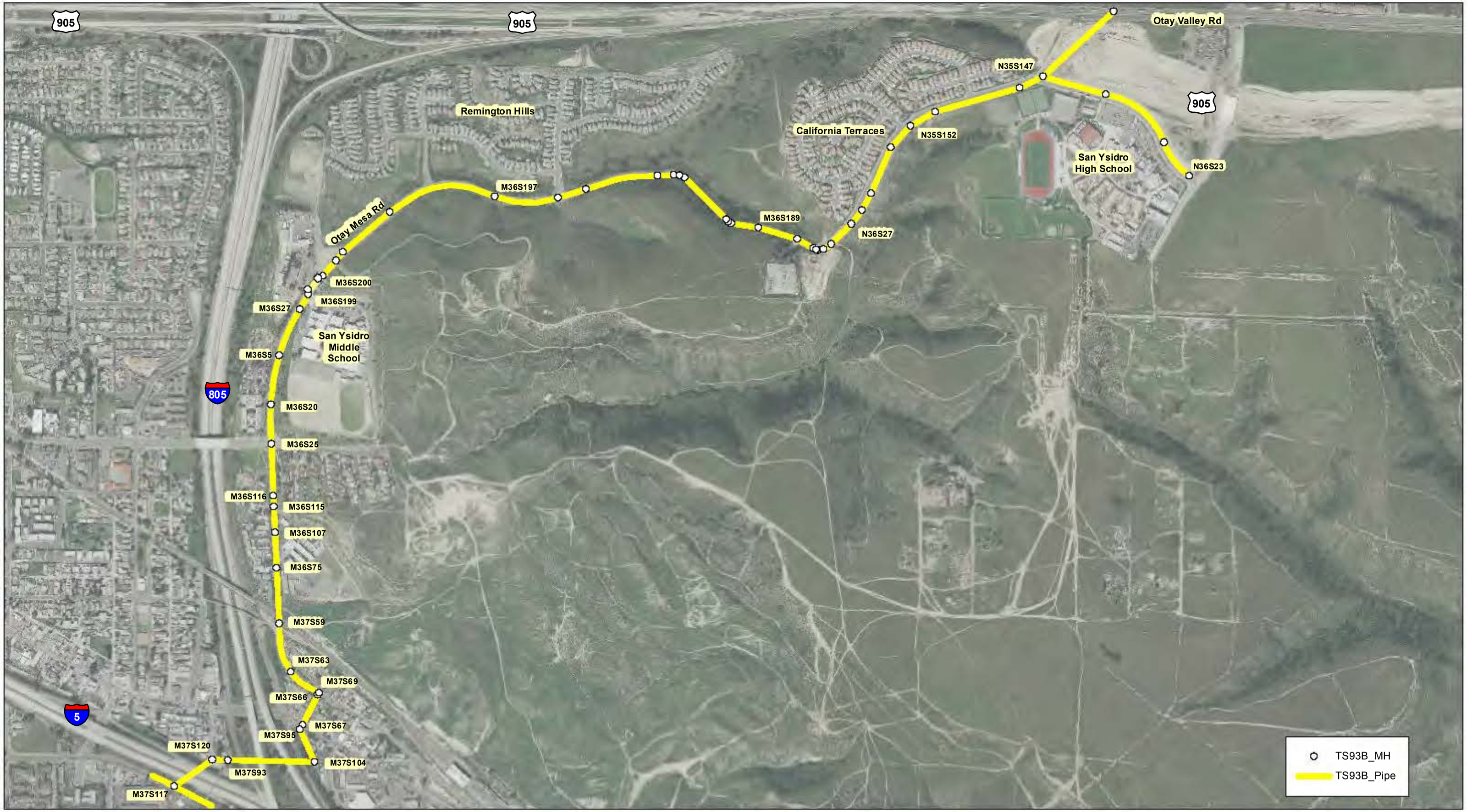
CITY OF SAN DIEGO
FLOW CALCULATION TABLE
TS93B WEST OTAY MESA
2018 WWF - BASEFLOW + SOUTHWEST DEVELOPMENT 788 DU (No I&I)

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
00000	M36S199A.1	M36S199	227.00	226.80	236.85	0.033	24	6	7.6	4.31	18.0	1.881	25.33	7.4
00000	M36S199.1	M36S27	226.80	216.99	225.99	0.069	10	143	10.6	5.04	50.4	1.881	3.16	59.5
64843	M36S27.1	M36S5	216.99	185.49	195.49	0.070	10	450	10.6	5.01	50.1	1.881	3.75	50.1
64846	M36S5.1	M36S20	185.49	157.96	167.96	0.070	10	393	10.6	5.01	50.1	1.881	3.75	50.1
64855	M36S20.1	M36S25	157.96	150.96	162.47	0.020	12	350	6.6	6.54	54.5	1.881	3.26	57.7
64858	M36S25.1	M36S116	150.47	137.38	146.38	0.031	12	425	8.2	6.52	54.3	2.319	4.04	57.4
64791	M36S116.1	M36S115	137.38	131.40	135.36	0.062	12	97	10.7	5.32	44.3	2.319	5.72	40.5
64834	M36S115.1	M36S107	131.40	119.18	127.18	0.054	12	228	10.2	5.56	46.3	2.337	5.33	43.8
64835	M36S107.1	M36S75	119.18	102.00	108.00	0.056	12	307	10.3	5.49	45.8	2.337	5.45	42.9
64832	M36S75.1	M37S59	102.00	74.00	80.00	0.062	15	450	10.6	4.83	32.2	2.337	10.42	22.4
64984	M37S59.1	M37S63	74.00	46.72	55.72	0.061	15	450	10.5	4.86	32.4	2.337	10.28	22.7
64985	M37S63.1	M37S69	46.72	45.72	51.76	0.003	18	306	3.6	10.07	55.9	2.337	3.88	60.2
64992	M37S69.1	M37S66	45.72	45.65	51.65	0.003	18	22	3.6	11.21	62.3	2.720	3.83	71.0
64980	M37S66.1	M37S67	45.65	45.15	52.73	0.002	18	283	2.8	14.17	78.7	2.745	2.85	96.3
64981	M37S67.1	M37S95	45.15	44.56	52.56	0.011	15	53	5.9	8.60	57.3	2.760	4.41	62.6
64973	M37S95.1	M37S104	44.56	41.27	52.04	0.012	15	278	6.0	8.44	56.3	2.760	4.54	60.8
64996	M37S104.1	M37S93	40.04	35.38	50.38	0.006	24	720	4.9	8.40	35.0	3.095	11.77	26.3
64929	M37S93.1	M37S120	35.38	34.51	50.51	0.006	24	135	4.9	8.41	35.1	3.095	11.74	26.4
64928	M37S120.1	M37S117	34.51	31.76	47.76	0.007	24	386	5.1	8.30	34.6	3.171	12.34	25.7

* Southwest: 788 DU or 675 EDU - 0.189 mgd average daily flow, Peak at 0.421 mgd (@Byer, Manole M36S25)

* flow exceeds sewer design guides criteria



West Otay Mesa TS (TS 93B)

Project Model

N

1 inch = 750 feet

DRAFT

ULTIMATE CONDITION

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
West Otay Mesa Trunk Sewer - Ultimate Pipe Sizing
2050 WWF with Flow Diversion From Sewer Pump Station 23T

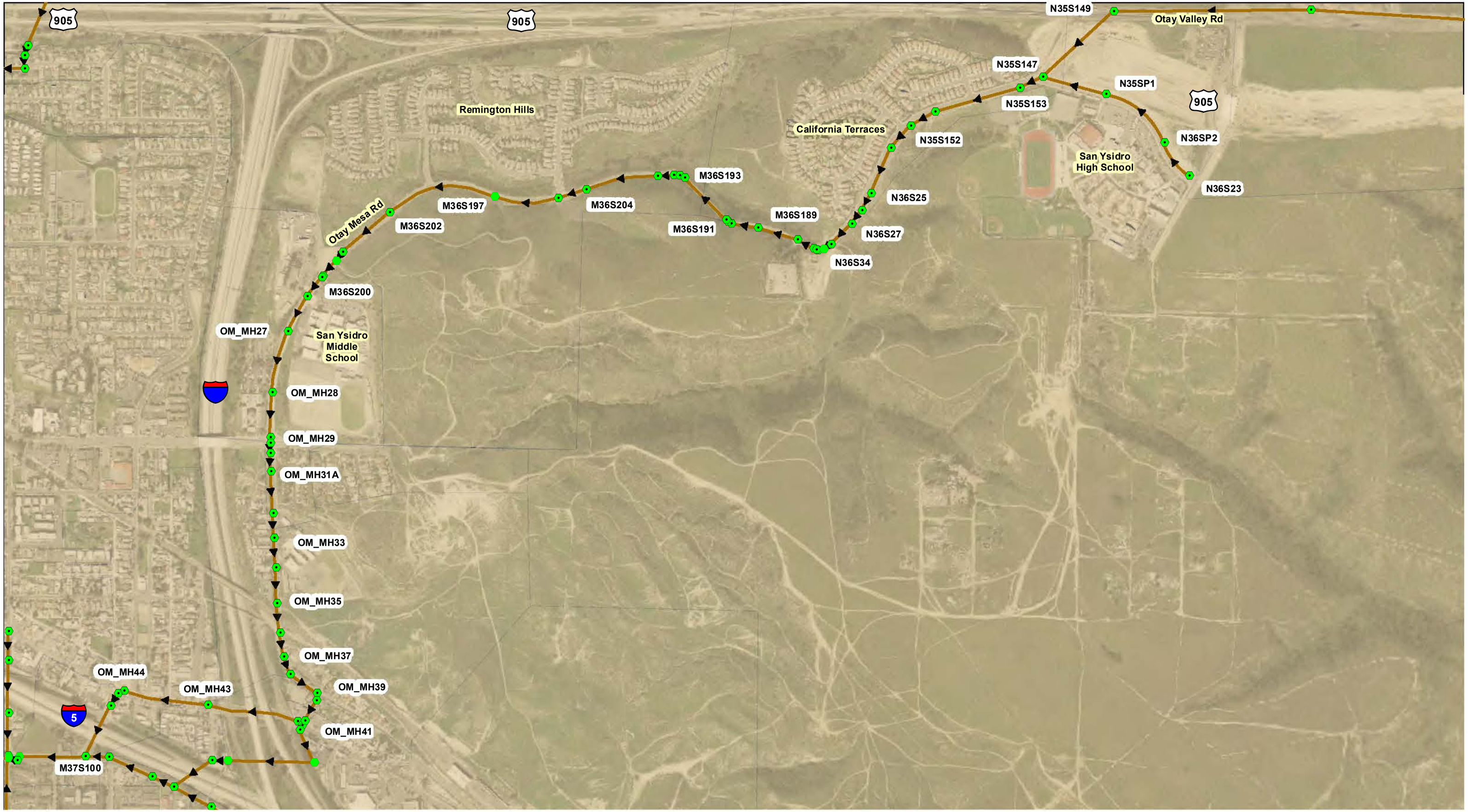
FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
5625234	N35S147.1	N35S153	485.74	484.39	519.00	0.006	42	218	6.19	13.39	31.9	485.51	486.10	33.49	10.557	51.18	20.6
5625237	N35S153.1	N35S154	484.39	480.13	507.00	0.006	42	747	6.19	13.38	31.9	481.25	481.84	25.76	10.557	49.11	21.5
5625239	N35S154.1	N35S152	480.13	478.65	503.60	0.006	42	243	6.31	13.20	31.4	479.75	480.37	23.85	10.557	50.75	20.8
5625242	N35S152.1	N36S24	478.65	477.13	496.30	0.006	42	252	6.32	13.19	31.4	478.23	478.85	18.07	10.557	50.51	20.9
5625244	N36S24.1	N36S25	477.13	469.50	480.90	0.018	42	423	8.47	10.68	25.4	470.39	471.51	10.51	10.557	87.34	12.1
5625246	N36S25.1	N36S26	469.50	458.95	470.90	0.064	42	165	11.89	8.50	20.2	459.66	461.85	11.24	10.706	164.44	6.5
5625249	N36S26.1	N36S27	458.95	450.50	462.30	0.058	42	145	11.94	8.47	20.2	451.21	453.42	11.09	10.706	156.99	6.8
5625248	N36S27.1	N36S28	450.50	436.00	449.80	0.059	42	245	11.83	8.53	20.3	436.71	438.89	13.09	10.706	158.21	6.8
5625252	N36S28.1	N36S34	436.00	431.65	446.20	0.057	42	76	8.53	10.74	25.6	432.55	433.67	13.66	10.706	155.58	6.9
5625254	N36S34.1	N36S32	431.65	430.74	446.20	0.018	42	50	8.54	10.73	25.5	431.63	432.77	14.57	10.706	87.73	12.2
	N36S32.1	N36S33	430.74	430.25	445.40	0.031	42	16	9.97	9.61	22.9	431.05	432.60	14.35	10.706	113.81	9.4
	N36S33.1	N36S30	430.25	429.63	444.60	0.031	42	20	10.01	9.59	22.8	430.43	431.99	14.17	10.706	114.50	9.3
	N36S30.1	N36S31	429.63	418.63	434.50	0.058	42	191	11.74	8.58	20.4	419.35	421.49	15.16	10.706	156.02	6.9
	N36S31.1	M36S189	418.63	398.88	418.20	0.056	42	355	11.74	8.58	20.4	399.60	401.74	18.61	10.706	153.37	7.0
	M36S189.1	M36S190	398.88	385.88	400.60	0.056	42	234	10.61	9.20	21.9	386.65	388.40	13.95	10.706	153.33	7.0
	M36S190.1	M36S191	385.88	384.68	399.20	0.038	42	31	10.65	9.18	21.9	385.45	387.21	13.76	10.706	127.54	8.4
	M36S191.1	M36S192	384.68	383.38	397.90	0.048	42	27	11.34	8.78	20.9	384.11	386.11	13.79	10.706	142.72	7.5
	M36S192.1	M36S193	383.38	358.73	371.40	0.049	42	500	11.38	8.76	20.9	359.46	361.47	11.94	10.706	144.38	7.4
	M36S193.1	M36S195	358.73	356.38	369.00	0.050	42	47	11.43	8.74	20.8	357.11	359.14	11.89	10.706	144.85	7.4
	M36S195.1	M36S194	356.38	353.98	366.70	0.051	42	47	11.52	8.69	20.7	354.70	356.77	12.00	10.706	146.95	7.3
	M36S194.1	M36S203	353.98	346.38	358.80	0.056	42	136	11.62	8.64	20.6	347.10	349.20	11.70	10.706	153.90	7.0
	M36S203.1	M36S204	346.38	312.63	324.30	0.054	42	630	11.68	8.60	20.5	313.35	315.47	10.95	10.706	150.55	7.1
	M36S204.1	M36S196	312.63	295.88	307.60	0.068	42	247	10.22	9.46	22.5	296.67	298.29	10.93	10.706	169.54	6.3
	M36S196.1	M36S197	295.88	276.35	290.50	0.034	42	579	10.26	9.43	22.5	277.14	278.77	13.36	10.706	119.43	9.0
	M36S197.1	M36S202	276.35	242.38	254.60	0.035	42	980	6.56	12.96	30.9	243.46	244.13	11.14	10.706	121.10	8.8
	M36S202.1	M36S198	242.38	238.73	254.60	0.007	42	522	6.73	12.96	30.9	239.81	240.51	14.79	10.977	54.41	20.2
	M36S198.1	M36S201	238.73	237.53	253.20	0.012	42	98	7.62	11.84	28.2	238.52	239.42	14.68	10.977	71.85	15.3
	M36S201.1	M36S200	237.53	231.36	247.70	0.036	42	170	7.43	12.06	28.7	232.37	233.22	15.34	10.977	123.82	8.9
	M36S200.1	OM_MH25	231.36	229.77	247.70	0.010	42	166	6.25	13.87	33.0	230.93	231.53	16.77	11.028	63.65	17.3
	OM_MH25.1	OM_MH26	229.65	227.50	238.90	0.012	24	180	8.29	14.95	62.3	228.75	229.81	10.15	11.028	15.98	69.0
	OM_MH26.1	OM_MH27	227.50	202.25	214.80	0.070	24	360	15.61	9.11	38.0	203.01	206.80	11.79	11.028	38.73	28.5
	OM_MH27.1	OM_MH28	202.25	156.90	168.80	0.067	27	675	10.36	11.68	43.2	157.87	159.54	10.93	11.028	51.89	21.3
	OM_MH28.1	OM_MH29	156.90	151.40	162.18	0.023	27	242	5.64	19.62	72.7	153.04	153.53	9.15	11.028	30.18	36.5
Beyer Bl	OM_MH29.1	OM_MH30	151.40	151.10	162.22	0.006	27	50	6.60	19.36	71.7	152.71	153.39	9.51	13.012	15.51	83.9
	OM_MH30.1	OM_MH31	151.10	150.40	162.29	0.006	27	116	6.77	18.90	70.0	151.98	152.69	10.32	13.011	15.55	83.7
	OM_MH31.1	OM_MH31A	150.10	146.38	160.00	0.019	27	198	10.20	13.43	49.7	147.50	149.12	12.50	13.022	27.44	47.5
	OM_MH31A.1	OM_MH32	142.38	127.45	139.30	0.051	27	290	14.50	10.27	38.0	128.31	131.57	10.99	13.022	45.42	28.7
	OM_MH32.1	OM_MH33	127.45	107.25	125.70	0.064	27	314	15.27	9.90	36.7	108.08	111.70	17.63	13.029	50.78	25.7
	OM_MH33.1	OM_MH34	107.25	78.85	106.60	0.061	27	464	15.37	9.84	36.4	79.67	83.34	26.93	13.029	49.53	26.3
	OM_MH34.1	OM_MH35	78.58	61.30	92.30	0.055	27	312	14.45	10.31	38.2	62.16	65.40	30.14	13.029	47.11	27.7
	OM_MH35.1	OM_MH36	61.30	53.25	80.00	0.053	27	151	13.91	10.72	39.7	54.14	57.15	25.86	13.219	46.22	28.6

DRAFT

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
West Otay Mesa Trunk Sewer - Ultimate Pipe Sizing
2050 WWF with Flow Diversion From Sewer Pump Station 23T

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
	OM_MH36.1	OM_MH37	53.25	46.50	72.80	0.046	27	148	13.98	10.68	39.6	47.39	50.43	25.41	13.219	42.75	30.9
	OM_MH37.1	OM_MH38	46.50	43.25	58.00	0.039	33	84	8.10	14.54	44.1	44.46	45.48	13.54	13.219	67.24	19.7
	OM_MH38.1	OM_MH39	43.25	41.35	52.40	0.010	33	197	7.20	15.94	48.3	42.68	43.48	9.72	13.218	33.57	39.4
	OM_MH39.1	OM_MH40	41.35	40.77	52.80	0.010	33	59	5.87	18.76	56.8	42.33	42.87	10.47	13.218	33.89	39.0
	OM_MH40.1	OM_MH41	40.77	39.77	52.00	0.004	33	252	6.18	17.98	54.5	41.27	41.86	10.73	13.219	21.53	61.4
								Start of By-Pass (New Line)									
	OM_MH41.1	OM_MH42	39.77	39.36	50.00	0.008	33	53	5.71	19.18	58.1	40.96	41.47	9.04	13.218	30.07	44.0
	OM_MH42.1	OM_MH43	39.36	36.46	50.00	0.004	33	767	5.72	19.15	58.0	38.06	38.56	11.94	13.209	21.02	62.8
	OM_MH43.1	OM_MH44	36.46	33.66	50.00	0.004	33	739	6.18	17.96	54.4	35.16	35.75	14.84	13.205	21.04	62.8
	OM_MH44.1	OM_MH45	33.66	33.23	48.00	0.008	33	53	6.86	16.55	50.1	34.61	35.34	13.39	13.204	30.79	42.9
	OM_MH45.1	OM_MH46	33.23	32.45	47.00	0.006	33	125	6.59	17.08	51.7	33.87	34.55	13.13	13.204	27.00	48.9
	OM_MH46.1	M37S100	32.45	29.95	48.70	0.005	33	457	6.21	18.19	55.1	31.47	32.06	17.23	13.197	25.28	52.2

TOTAL LENGTH (MILES):	2.62	LENGTH OF PIPE - d/D < 50% (MILES):	2.04	LENGTH OF PIPE - Q/CAP < 50% (MILES):	2.14
LENGTH WEIGHTED Q/CAP:	26.0	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.59	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.45
LENGTH WEIGHTED d/D:	36.5	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.03
LENGTH WEIGHTED HGL BELOW RIM (FT):	15.21	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00



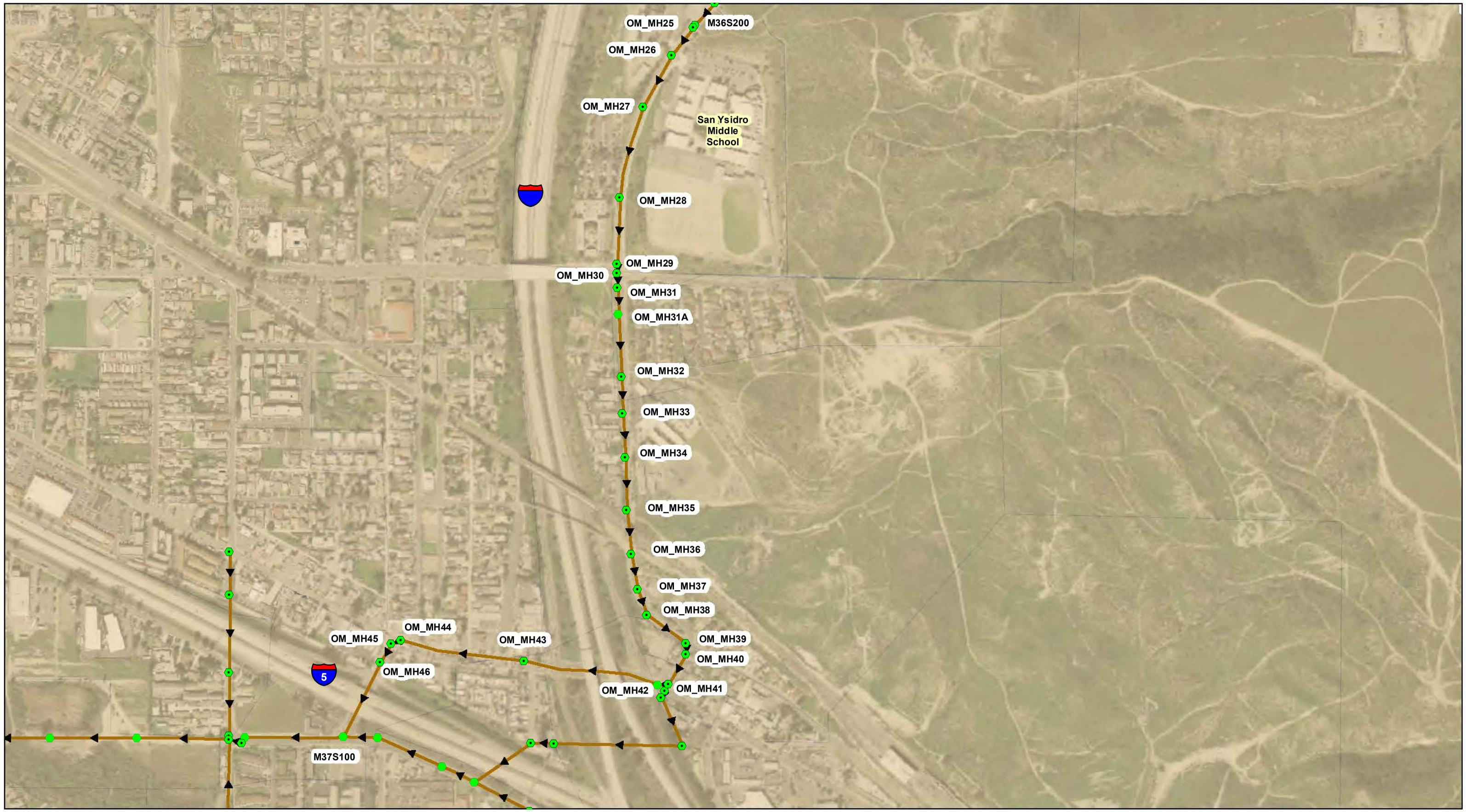
West Otay Mesa TS (TS 93B)

Project Model

TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Node
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Conduit
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Subcatchment

1 inch = 750 feet

N



West Otay Mesa TS (TS 93B)

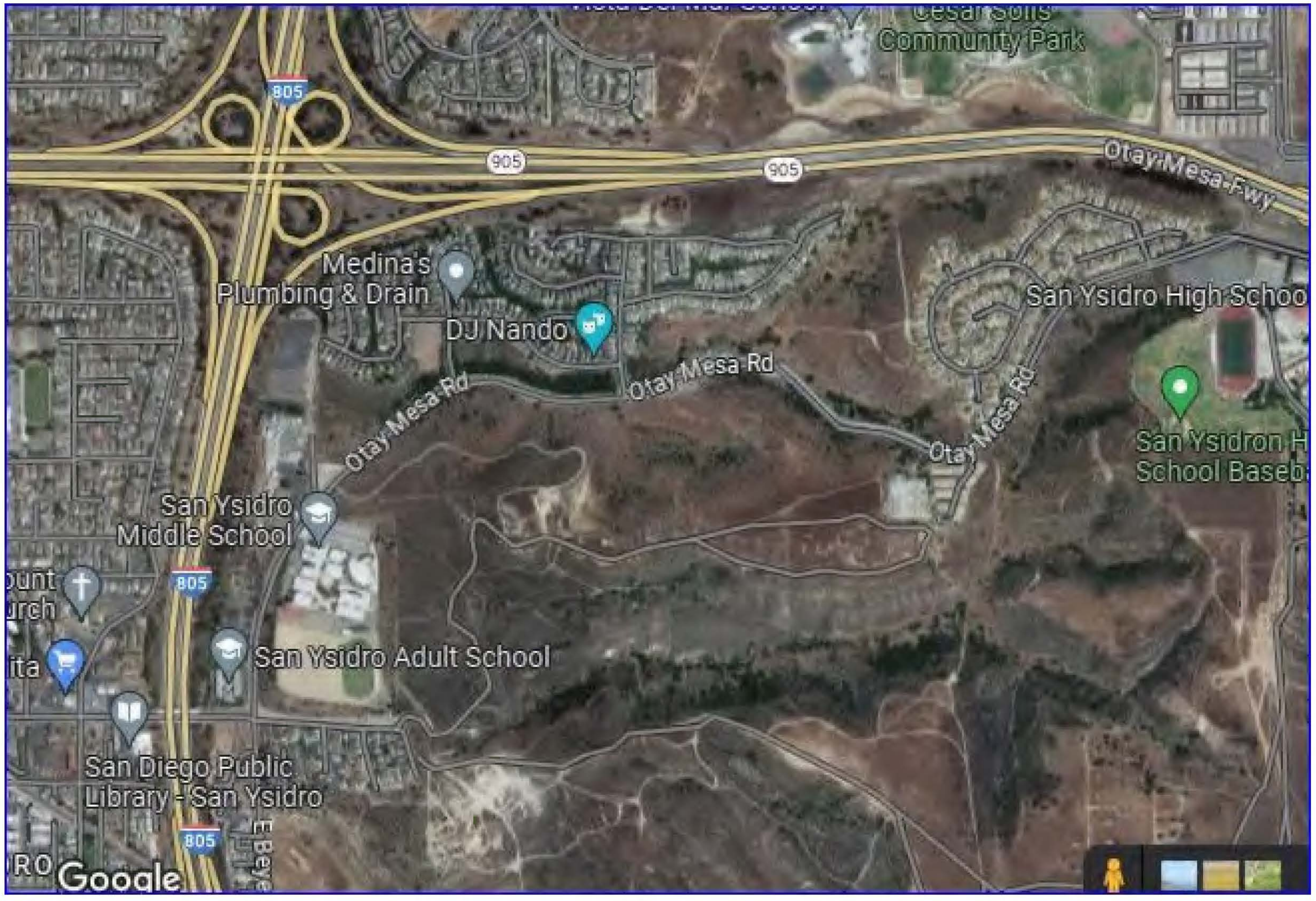
Project Model

TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Node
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Conduit
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Subcatchment

N

1 inch = 505 feet

West Otay Mesa Trunk Sewer – Location Map



ALIGNMENT ALONG OTAY MESA RD.

APPENDIX H

RESPONSES TO CITY COMMENTS

Discipline	#	Lead	Comment	Response
PUD-Water & Sewer Dev	**74**	Civil Sense	Sheet 7 (Central Ave Street X-section): Please label the Proposed 4" Sewer Force Main as temporary and private. Please also show dual 4" force mains. (New Issue)	Cross section for Public Street Central Avenue (STA 19+50 to STA 27+00 +/-) has been revised on Sheet 7 to call out and show proposed temporary private dual 6” sewer force mains.
PUD-Water & Sewer Dev	**75**	Civil Sense	Sheet 8 (West Ave): When accounting for pipe diameter size, there does not appear to be 10' separation distance (edge-to-edge) between the water and sewer mains in West Avenue. Please adjust utilities for 10' separation (clear). (New Issue)	The sections have been revised to provide 10 feet clear separation on Sheet 8.
PUD-Water & Sewer Dev	**76**	Civil Sense	Utility Plan: Please add the following note. ALL PROPOSED PUBLIC DOMESTIC WATER SERVICE LINE DIAMETERS ARE PROVIDED FOR CLARITY OF INTENT ONLY. ACTUAL SERVICE LINE DIAMETERS WILL BE BASED UPON THE PROJECTS APPROVED WATER METER DATA CARD. (New Issue)	Note has been added as Note 14 on Sheet 17 Note has been added as Note 15 on Sheet 18.
PUD-Water & Sewer Dev	**77**	Civil Sense	Edit Note No. 8 to indicate the private sewer main will convert to a public sewer main when: 1) the Southwind project connects to the sewer main in Private Drive O 2) a public sewer easement is dedicated between Private Drive E and O 3) an access easement is dedicated on Private Drive E (between Central Avenue and Private Drive O) 4) an EMRA requirement for all non-sewer utilities and surface improvements. (New Issue)	Note 8 on 17 has been revised to indicate when private sewer main would convert to a public sewer main.
PUD-Water & Sewer Dev	**78**	Civil Sense	Please provide station numbering along West Avenue and public Street A. (New Issue)	Stationing has been added along West Ave. and Public Street 'A'. See Sheets 10, 12, 16, 18 and 20.
PUD-Water & Sewer Dev	**79**	Civil Sense	Please show and label a private discharge manhole, prior to the force main connection to the public sewer main in Caliente Ave, and indicate a single pipe gravity flow from the discharge manhole to the public manhole. Please also, label a 10ft (minimum) long pipe from between the discharge manhole and public manhole. (New Issue)	The private discharge manhole and connection pipe between the discharge manhole and existing public sewer manhole is shown on labeled on Sheet 23.
PUD-Water & Sewer Dev	**80**	Civil Sense	Label the Sewer Force Main (Phase 1) as private. (New Issue)	Legend on Sheet 17 has been revised to call out Private Sewer Force Main. Call outs have also been provided along PVT. Drive D and central Ave.
PUD-Water & Sewer Dev	**81**	Civil Sense	Sheet 24: The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	The 16" sewer has been revised to 18" in Beyer Blvd as shown on Sheet 24.
PUD-Water & Sewer Dev	**82**	Civil Sense	Per Section 2.2.5.1 (Alignment of Sewers) of the Sewer Design Guide, "Sewers designed to serve properties on both sides of a street shall be located along the centerline of the street according to SDRSD M-22 and City of San Diego Drawing SDM-111". Please locate the proposed sewer to the centerline of the street and relocate water mains north of the sewer. (New Issue)	As confirmed by Martha Blake in our meeting on 8/21, there will never be development on either side of Beyer Boulevard since there are environmentally sensitive lands and conservation easements on both sides. Also, there is a 4 foot wide raised median almost the entire length of the street.
PUD-Water & Sewer Dev	**83**	Civil Sense	Please label the vertical separation between all utility crossings. (New Issue)	A note has been added to Sheets 24 and 25 regarding vertical separation between the public utilities.
PUD-Water & Sewer Dev	**84**	DWE	The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	Beyer Blvd. gravity sewer has been revised to 18" diameter SDR 18.
PUD-Water & Sewer Dev	**85**	DWE	Please label and reference all sewer lift stations as "Future Sewer Lift Station." (New Issue)	All figures and exhibits now reflect this labeling change.
PUD-Water & Sewer Dev	**86**	DWE	Page 4-1: Revise "21-inch to 36-inch" trunk sewer to "18" and larger." (New Issue)	Page 4-1 in the Specific Plan Sewer Study has been revised accordingly.

PUD-Water & Sewer Dev	**87** DWE	Figure 4-1, please adjust legend to coincide with the drawing. (New Issue)	Figure 4-1 (Land/Property Ownership) utilizes colors to differenciate the ownerships. It was determined the colors did not flatten correctly during the upload. The figure should now be able to be viewed with the correct color contrasting.
PUD-Water & Sewer Dev	**88** DWE	Exhibit A: Update size of proposed public sewer main to coincide with Appendix F. (New Issue)	Sizing has been corrected.
PUD-Water & Sewer Dev	**89** DWE	Exhibit A: there are two manholes labeled OM MH 43. Please check the manhole numbering. (New Issue)	The eastern OM HM 43 has been corrected to OM MH 42.
PUD-Water & Sewer Dev	**90** DWE	Exhibit A: Show and label the proposed public sewer main for the Southwind project. (New Issue)	The Southwind sewer main is now shown as proposed on Exhibit A.
PUD-Water & Sewer Dev	**92** DWE	The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	Beyer Blvd. gravity sewer has been revised to 18" diameter SDR 18.
PUD-Water & Sewer Dev	**93** DWE	Please label and reference all sewer lift stations as "Future Sewer Lift Station." (New Issue)	All figures and exhibits now reflect this labeling change.
PUD-Water & Sewer Dev	**94** DWE	Figure 5: Show the private force main connection to the public sewer system. (New Issue)	Figure 5 now shows the connection at Caliente Ave via an expanded window.
PUD-Water & Sewer Dev	**95** DWE	Figure 5: Please add an EMRA requirement for the private force main on Figure 5. (New Issue)	Figure 5 now indicates that an EMRA is required for the proposed private force main.
PUD-Water & Sewer Dev	**96** DWE	Sewer Study Summary (Existing Flows plus VTM 1, with Upgrades): Revise the existing 12" mains to be upsized to 15" for sewer segments M36S 115 to M36S 107 and M36S 107 to M36S75. (New Issue)	These segments are now shown to be upsized accordingly
PUD-Water & Sewer Dev	**97** DWE	Please discuss how odor control will be implemented for the sewer lift stations. (New Issue)	A brief overview and discussion of odor control is now inlcluded in both the Specific Plan and VTM 1 sewer studies.
PUD-Water & Sewer Dev	**98** DWE	Exhibit A: Show and label sewer segments M36S-115 to M36S-107 and M36S-107 to M36S-75 to be upsized to 15". (New Issue)	These segments are now shown to be upsized accordingly
PUD-Water & Sewer Dev	**99** DWE	Per email to applicant dated 4/5/2023, PUD requested the developer to perform an assessment report for the Otay Valley Mesa and Princess Park Pump Stations. Please provide an update. (New Issue)	The Assessment Report for Otay Valley Mesa and Princess Park Pump Stations are included with this submittal.

REVIEW COMMENT FORM

Name of Project:	Southwest Village	**Design Phase:**	
Project Manager:		**WBS Number:**	
Project Engineer:		**Date:**	5/9/2024
Plan Reviewer(s):	Alex Ottens; Steven Bayooz		

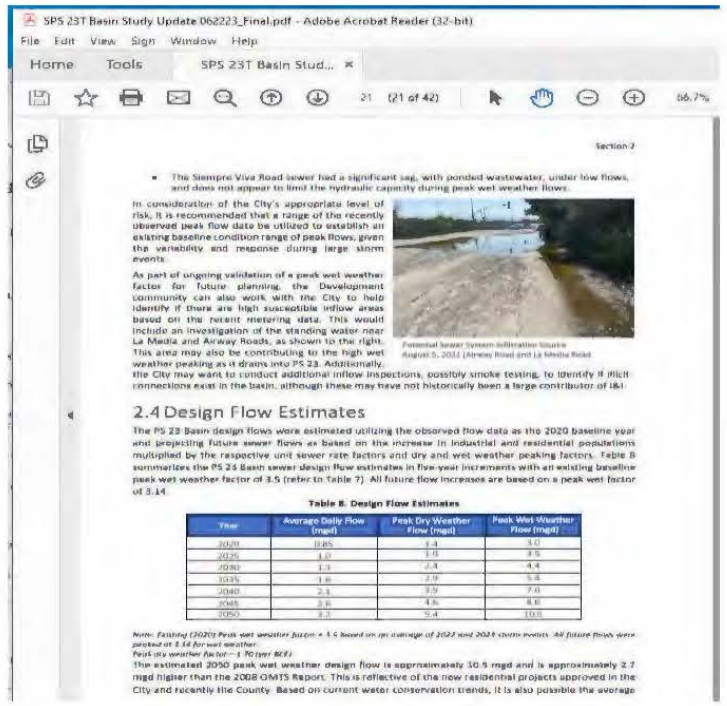
No.	Reviewer Initials	Reference	STA	Comments	Design Guide Reference (Section #)	Designer's Response	Column1	DSD - Water and Sewer Development Review Comments (6/5/2024)	Designer's Response2
	AO	WSA VTM 1	Sheet 13	Show parallel line on West Ave as to-be-abandoned in final buildout.		Will note that parallel line on West Ave will be abandoned at full Specific Plan buildout.	1	Address PUD's comment.	Figure 2 has been revised accordingly.
	AO	Water Study SP	Sheet 20/21	Report and exhibit lists Otay Mesa PS as to be abandoned. It is not currently functional, but is on PUD's priority list as a high priority replacement project. It will not be abandoned.		Will revise statement to "be replaced by others."	2	Address PUD's comment.	All relevant figures/exhibits and text have been updated to state "replaced" not "abandoned."
	AO	WSA VTM 1 Addendum 1	Sheet 15	Exhibit shows Otay Mesa PS as to be abandoned. As mentioned in previous comment, there is a plan to replace it.		Will revise statement to "be replaced by others."	3	Address PUD's comment.	All relevant figures/exhibits and text have been updated to state "replaced" not "abandoned."
	AO	WSA VTM 1 Addendum 1	Sheet 20	2023 peak demands were unusually low compared to previous years. The recorded numbers may not be representative of normal max day usage.		This flow meter data was sent in October 2023 from PUD with direction for it to be used to assess current capacity in 680 Zone. PUD had accepted an 800 unit threshold in Dec. 2023 for supplying the project via Caliente Avenue parallel water lines only (not Beyer Boulevard).	4	PUD's comment is informational. This comment is cleared.	--
	SB	WSA VTM 1 Addendum 1	Figure 2	It appears PA-12 and PA-14 are dead end with only one pipe serving them		PA-12 and PA-14 will be supplied by the parallel piping loop similar to the rest of the PA's in the VTM.	5	This comment is cleared.	--

REVIEW COMMENT FORM

Name of Project: Southwest Village
Project Manager:
Project Engineer:
Plan Reviewer(s):

Design Phase:
WBS Number:
Date: 5/9/2024

No.	Reviewer Initials	Reference	STA	Comments	Design Guide Reference (Section #)	Designer's Response	Column1	DSD - Water and Sewer Development Review Comments (6/5/2024)	Designer's Response2
		Specific Plan Sewer Study	Page 3-9	Based on the latest accepted flow projections from Sewer Pump Station 23 Basin Study dated June 20, 2023, the 2050 average dry weather flow of 3.2 MGD should be used, not 2.86 MGD as stated in the Southwest Village Specific Plan. The current peak daily dry weather flow to PS23t is currently at 1.5-1.7 MGD.		2050 ultimate sewer flows from PS 23 were sent to us by the City in June 2023. These flows have been used in the sewer studies since the time. Flows were stated as "Max Flow" and these are shown to be 10~11 mgd. A 10~11 mgd max flow equates to greater than a 3x total peaking factor for even 3.2 mgd. Confirm that the current offsite analyses are still acceptable? Per comment 3 in May 24, 2024 e-mail, the proposed pipe sizes (24-inch, 27-inch, and 33-inch) are adequate for PS23T ultimate flow diversion.	1	Per PUD, "The max wet weather flows of 10.5 mgd that they have been using is correct. I just commented on the average flow, which they stated at 2.86 mgd, It should be 3.2 as shown in the excerpt from PS23 Basin Study see snipped report. And flows to PS23 are currently at 1.5 mgd peak dry weather flow. The way I read their statement below is an average flow of 1.5 mgd to PS23." Address PUD's comment.	Page 3-9 has been updated to reflect the projected 3.2 mgd 2050 average dry weather flow as stated in the SPS 23T Basin Study.
		Specific Plan Sewer Study	Page 4-2	The City of San Diego is currently consulting with the City Attorney/City Legal Counsel regarding the Reimbursement Agreement.		Status	2	PUD reviewer is currently communicating with the city attorney and anticipates a statement from them in 2-3 weeks. Approval of the sewer studies (SP and VTM) will need to wait for city attorney's response or add a disclosure to both reports stating the reimbursement agreement is awaiting legal determination from the City's Attorney's Office.	All relevant studies will state that the reimbursement agreement is awaiting legal determination from the City's Attorney's Office.
		Specific Plan Sewer Study	Figure 4	Along Beyer Blvd, there are proposed public gravity sewers to be constructed, going from 15" to 18" (SDR 18 PVC), then decreasing to 15". Pipes normally increase in size in the downstream direction. Can the downstream proposed 15" sewer be upsized to 18"?		The 18" sewer in Beyer Blvd. is only proposed as 18" due to high velocity and available pipe size for SDR 18. Pipeline segment was initially proposed as 16" but was requested by the City to be 18" since 16" is not a valid sewer size. Even though the section is proposed as 18" diameter, the actual hydraulic flow in the section only requires a 15" diameter. We would request for the downstream section of Beyer Blvd. remain at 15" due to this exceptional reason for the 18" middle segment.	3	This comment is cleared.	Per the 8-6-2024 meeting with City PUD Staff, this 15" section is now proposed as 18".
		Specific Plan Sewer Study	Figure 4	Along Otay Mesa Rd, there are existing public gravity sewers that go from 24" to 10" to 12" to 27". Pipes normally increase in size in the downstream direction. Can the downstream existing 10" and 12" be upsized to 24"?		These segments along Otay Mesa Road north of Beyer Blvd. will only be utilized by the first 800 units of the project on an interim basis. These segments will be replaced as needed as unit counts increase and flow depth criteria is exceeded. PDF pages 27-31 of the VTM 1 Addendum 1 sewer study show these calculations. At buildout, the Specific Plan will not utilize these segments along Otay Mesa Road north of Beyer Blvd.	4	This comment is cleared.	--
		Specific Plan Sewer Study		The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per Sewer Design Guide subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR-18 PVC, concrete-encased VC, or PVC sheet-lined reinforced concrete pipe (Sewer Design Guide 1.3.3.1)		Per e-mail from City on 6/5/2023, SDR 18 PVC is acceptable for the proposed gravity sewer main where velocities are greater than 10 fps.	5	This comment is cleared.	--
		VTM Sewer Study	Page 5	The development should use a PWWF peaking factor of 1.5 to the peak dry weather flows instead of 1.0 for onsite public sewer pipe sizing to account for future inflow & infiltration into the system as the system aged (>30 years later) and the lifespan of PVC sewer systems being 100 years.		A previous City comment from Jan. 2020 stated to use a 1.0 peak wet weather factor for onsite hydraulic calculations. Hence all reports/studies have used a 1.0 wet weather factor since that time of the comment.	6	PUD's comment is informational. This comment is cleared.	--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Section 2

- This Siempre Viva Road sewer had a significant sag, with ponded wastewater, under low flows, and does not appear to limit the hydraulic capacity during peak wet weather flows.

In consideration of the City's appropriate level of risk, it is recommended that a range of the recently observed peak flow data be utilized to establish an existing baseline condition range of peak flows, given the variability and response during large storm events.

As part of ongoing validation of a peak wet weather factor for future planning, the Development Community can also work with the City to help identify if there are high susceptible inflow areas based on the recent metering data. This would include an investigation of the standing water near La Media and Airway Roads, as shown to the right. This area may also be contributing to the high wet weather peaking as it drains into PS 23. Additionally, the City may want to conduct additional inflow inspections, possibly smoke testing, to identify if illicit connections exist in the basin, although these may have not historically been a large contributor of I&I.

Potential Sewer System Infiltration Source
August 5, 2021 (Airway Road and La Media Road

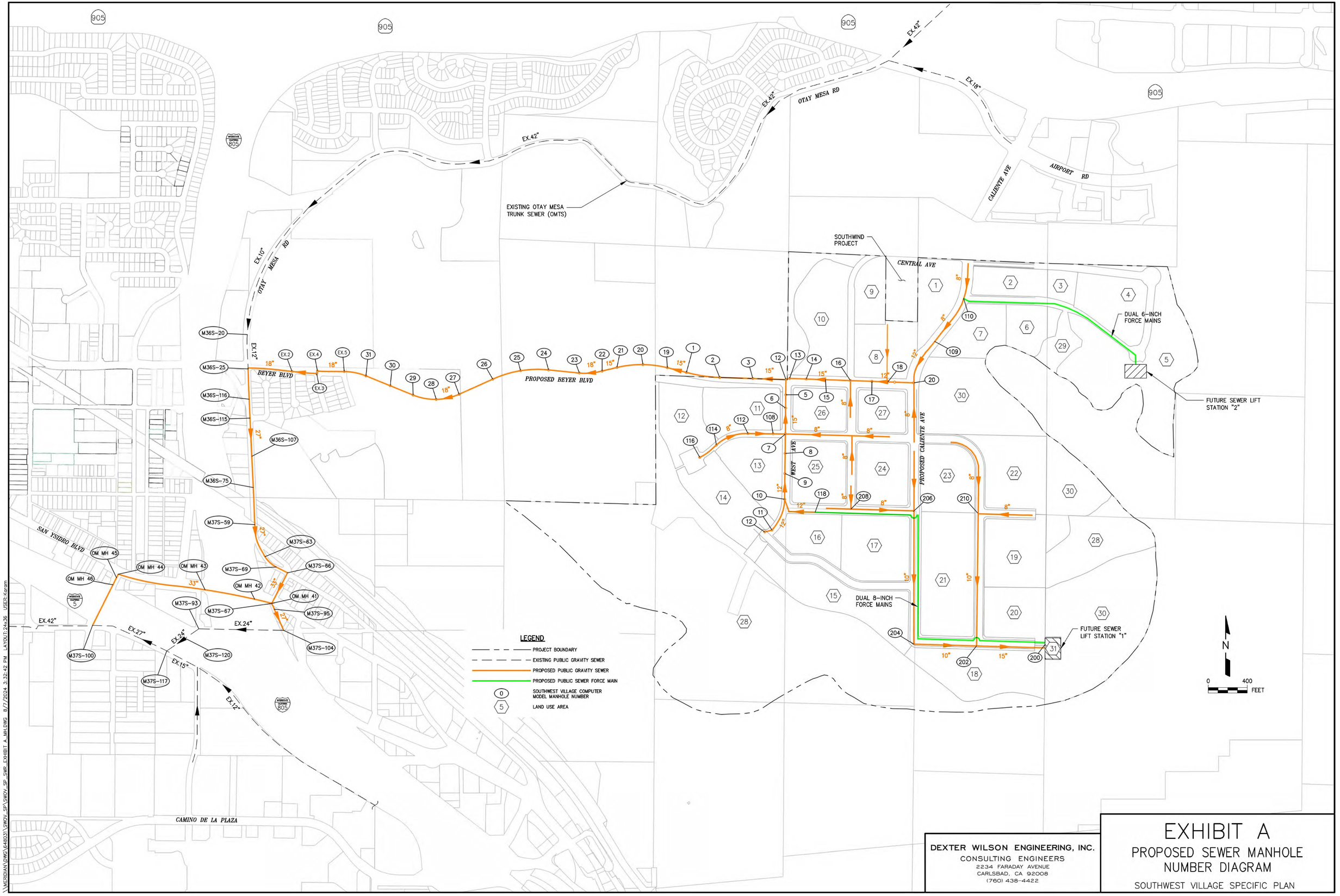
2.4 Design Flow Estimates

The PS 23 Basin design flows were estimated utilizing the observed flow data as the 2020 baseline year and projecting future sewer flows as based on the increase in industrial and residential populations multiplied by the respective unit sewer rate factors and dry and wet weather peaking factors. Table 8 summarizes the PS 23 Basin sewer design flow estimates in five-year increments with an existing baseline peak wet weather factor of 3.5 (refer to Table 7). All future flow increases are based on a peak wet factor of 3.14.

Table 8. Design Flow Estimates

Year	Average Daily Flow (mgd)	Peak Dry Weather Flow (mgd)	Peak Wet Weather Flow (mgd)
2020	0.85	1.4	3.0
2025	1.0	1.6	3.5
2030	1.3	2.1	4.4
2035	1.6	2.7	5.8
2040	2.1	3.3	7.0
2045	2.6	4.1	8.8
2050	3.2	5.1	10.5

Note: Existing (2020) Peak wet weather factor = 3.5 based on an average of 2022 and 2023 storm events. All future flows were analyzed at 3.14 for wet weather.
Peak dry weather factor — 1.70 (per BCE)
The estimated 2050 peak wet weather design flow is approximately 10.5 mgd and is approximately 2.7 mgd higher than the 2008 GMTS Report. This is reflective of the new residential projects approved in the City and recently the County. Based on current water conservation trends, it is also possible the average



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DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
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EXHIBIT A

PROPOSED SEWER MANHOLE NUMBER DIAGRAM

SOUTHWEST VILLAGE SPECIFIC PLAN