DEXTER WILSON ENGINEERING, INC.

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CONSULTING ENGINEERS

ADDENDUM NO. 1 TO THE SEWER STUDY
FOR THE SOUTHWEST VILLAGE
VTM 1 PROJECT IN THE
CITY OF SAN DIEGO
PTS# 614791

August 22, 2024

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ADDENDUM NO. 1 TO THE SEWER STUDY FOR THE SOUTHWEST VILLAGE VTM 1 PROJECT IN THE CITY OF SAN DIEGO PTS# 614791

August 22, 2024

8-22-2024

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TABLE OF CONTENTS

PAGE NO.

APPENDICES

LIST OF TABLES

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August 22, 2024 648-031

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Attention: Allen Kashani, P.E., Senior Project Manager

Subject: Addendum No. 1 to the Sewer Study for the Southwest Village VTM 1 Project in the City of San Diego, PTS# 614791

Introduction

This report is the first addendum to a previous report entitled "Sewer Study for the Southwest Village VTM 1 Project in the City of San Diego" dated August 21, 2024, prepared by Dexter Wilson Engineering, Inc. (August 2024 Sewer Study). The August 2024 Sewer Study analyzed the existing and proposed buildout public sewer system for VTM 1 as a whole which included a hydraulic analysis to confirm the adequacy of the existing and buildout proposed public sewer system in the vicinity of the project.

As part of this Addendum No. 1, phasing will be analyzed and presented to reflect the proposed sewer Phase 1 which will be served by a temporary sewer lift station. The corresponding proposed phased sewer system will be presented and analyzed within the context of the proposed temporary sewer lift station. Buildout of VTM 1 sewer facilities is presented and analyzed in the August 2024 sewer study.

Southwest Village VTM 1 Sewer Study Addendum No. 1

This Public Sewer Study Addendum No. 1 (Addendum No. 1) provides an update and confirms the phased sewer service for the Southwest Village development because of the timing of constructing the Beyer Boulevard extension in which the project's primary trunk sewer line will be located. This Addendum No. 1 addresses the project sewer generation and temporary sewer lift stations for VTM 1 Phase 1A and Phase 1B. An overview map of existing major sewer facilities is included in Appendix A for reference.

The purpose of Addendum No. 1 is to hydraulically evaluate the proposed temporary sewer lift station and evaluate the onsite and offsite sewer system for the Southwest Village VTM 1 initial phase.

A current schedule for Southwest Village VTM 1 is shown below. The 800th unit and completion of Phase 1 is anticipated to be in approximately the year 2030 depending on market conditions.

Schedule:

Community	2023			2024				2025				2026				2027				2028				2029				2030			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SW Village VTM 1	Entitlements/Permitting							Grading/Improve				Models/Production																			

Southwest Village VTM 1 Sewer Generation Projections – Sewer Phase 1

Sewer generation for Southwest Village VTM 1 sewer Phase 1 are shown as part of this Addendum No. 1 for reference. The sewer generation is copied from the August 2024 Sewer Study.

Table 1 summarizes the average sewer generation for Southwest Village VTM 1 sewer Phase 1A comprising of the first 200 units of the project and Phase 1B comprising of the first 800 units of the project.

TABLE 1
SOUTHWEST VILLAGE VTM 1 PROJECT – SEWER PHASE 1
AVERAGE DRY WEATHER SEWER FLOWS

Residential Planning Area	Dwelling Units	Dwelling Unit Density, DU/net-ac	Unit Density, Pop./DU	Total Population	Average Dry Weather Flow, gpd
9	95	21.6	3.1	295	23,600
10 (partial)	105	10.7	3.4	357	28,560
Sub-Total (Phase 1A)	**200**	**--**	**--**	**652**	**52,160**
8	185	26.1	3.0	555	44,400
10 (partial)	25	10.7	3.4	85	6,800
11	168	17.1	3.2	538	43,040
12	76	11.2	3.1	236	18,880
13 (partial)	146	17.0	3.2	467	37,360
Sub-Total (Phase 1B)	**600**	**--**	**--**	**1,881**	**150,480**
TOTAL PHASE 1	**800**			**2,533**	**202,640**

Peaking Factors

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 Southwest Village VTM 1 Phase 1. The peaking factor for PDWF is the ratio of PDWF to ADWF. The dry weather peaking factor for the Southwest Village VTM 1 Phase 1A project is 2.64 based on a total project population of 652 people. The dry weather peaking factor for the Southwest Village VTM 1 Phase 1B project is 2.20 based on a total project population of 2,533 people.

The peak dry weather flow for the Southwest Village VTM 1 sewer Phase 1A project is 137,702 gpd (96 gpm). The peak dry weather flow for the Southwest Village VTM 1 sewer Phase 1B project is 445,808 gpd (310 gpm).

The peaking factor for peak wet weather flow (PWWF) for the Southwest Village VTM 1 project being used for the analysis of the onsite private sewer systems is 1.0 and 1.85 offsite for the existing Otay Mesa Trunk Sewer area based on other ancillary City of San Diego regional sewer studies within the Otay Mesa Trunk Sewer sub-basin.

Existing Sewer System

Figure 1 presents the existing major sewer facilities in the vicinity of the Southwest Village VTM 1 project. The existing public sewer system includes the Otay Mesa Trunk Sewer west of the project site to which the project will sewer. The Southwest Village VTM 1 Phase 1 project is proposing to convey and connect to the existing 18-inch diameter trunk sewer line in Caliente Avenue. This proposed connection location for VTM 1 Phase 1 precedes the Otay Mesa Trunk Sewer at the Airway Road and Otay Mesa Road intersection by approximately a half mile.

Otay Mesa Trunk Sewer. The Otay Mesa Trunk Sewer surrounds the project and conveys the partial sewer flow from the Otay Mesa community. The Otay Mesa Trunk Sewer consists of a range of pipe sizes from 10-inch diameter up to 42-inch diameter.

Overview of Proposed Sewer Service for VTM 1 Phase 1

Onsite sewer facilities for the Southwest Village VTM 1 Phase 1A project are proposed to be private facilities. The Phase 1A onsite private gravity sewer system flows to a proposed temporary lift station located within PA 10.

Onsite sewer facilities for the Southwest Village VTM 1 Phase 1B project are proposed to be private facilities. The Phase 1B onsite private gravity sewer system flows to a proposed temporary lift station located within PA 11.

Onsite Private Sewer System Slopes. Many of the internal streets within the residential areas are proposed to have private onsite sewer systems. These systems will be designed to maintain a minimum of one (1) percent slope to meet plumbing code standards. Alternatively, the private sewer systems within the residential areas may be designed in accordance with the City of San Diego Sewer Design Guide.

Onsite Private Sewer Temporary Lift Stations. Phase 1A of VTM 1 is comprised of its first 200 units located on the northern portion of the project area within PA 9 and PA 10. Phase 1B of VTM 1 is comprised of its first 800 units located on the northern and western portion of the project area within PA 8, PA 10, PA 11, PA 12, and PA 13. Sewer service will be provided via a temporary private sewer lift station within each phase and constructing dual private force mains via an EMRA in Caliente Avenue and Beyer Boulevard up to Airway Road. The lift stations will each be a duplex submersible pump station with either precast concrete or fiberglass wet well, pump control panel, emergency generator or emergency storage, and odor control system (if needed). 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. Design will limit odors by reducing detention times in the proposed wet well.

The pumping capacity of the temporary private lift stations must account for the peak sewage flow into the station. For 200 VTM 1 Phase 1A units, the peak dry weather flow to the lift station is 137,702 gpd (96 gpm). Using the lift station peaking factor of 1.3, the peak design flow is 125 gpm. In a 4-inch force main, this flow will achieve a velocity of 3.5 fps. This satisfies the City design criteria of 3 to 8 fps for sewer forcemains. For 800 total/VTM 1 Phase 1B units, the peak dry weather flow to the lift station is 445,808 gpd (310 gpm). Using the lift station peaking factor of 1.3, the peak design flow is 403 gpm. In a 6-inch force main, this flow will achieve a velocity of 4.6 fps. This satisfies the City design criteria of 3 to 8 fps for sewer forcemains.

The private sewer lift stations are proposed to include a permanent emergency power generator or emergency storage so that sewage pumping can be maintained during power outages. The lift stations will be designed with two submersible pumps, each capable of handling the full flow from the project. It is unlikely that both pumps would be out of service at the same time.

The proposed Phase 1A sewer system for VTM 1 is shown on Figure 2 in Appendix A. The proposed Phase 1B sewer system for VTM 1 is shown on Figure 3 in Appendix A.

Southwest Village VTM 1 Phase 1 Project Offsite Sewer Analysis – Otay Mesa Trunk Sewer

The offsite sewer system analysis for the Southwest Village VTM 1 project encompasses the Otay Mesa Trunk Sewer to the north and south of the Beyer Boulevard and Otay Mesa Road intersection. The availability of sewer capacity in the downstream Otay Mesa Trunk Sewer south of the Beyer Boulevard and Otay Mesa Road intersection was addressed in the August 2024 Sewer Study.

Existing Otay Mesa Trunk Sewer lines 18-inch diameter and larger adhere to City depth criteria with the additional VTM 1 Phase 1 units. However, the additional units cannot be accommodated in 15-inch diameter and smaller sewer lines while still adhering to City depth criteria since existing sewage flow in the Otay Mesa Trunk Sewer exceeds the criterion of 0.50 for gravity sewers 15-inch diameter and smaller and is 0.75 for gravity sewers 18-inch diameter and larger. Therefore, there are eight existing gravity sewer segments that will ultimately require upgrades for VTM 1 Phase 1. These segments are highlighted on Figure 4 in Appendix A.

The availability of sewer capacity in the downstream Otay Mesa Trunk Sewer north of the Beyer Boulevard and Otay Mesa Road intersection was not addressed in the August 2024 Sewer Study. This analysis is now included in Appendix B. There are several not yet upgraded segments within the downstream Otay Mesa Trunk Sewer north of the Beyer Boulevard and Otay Mesa Road intersection that will need to be upsized as Southwest Village VTM 1 Phase 1 develops. These segments are indicated on Figure 4 in Appendix A.

These Otay Mesa Trunk Sewer segments north of the Beyer Boulevard and Otay Mesa Road intersection will be utilized by the Southwest Village project only as a temporary measure until Beyer Boulevard is constructed. It is proposed that existing sewer lines be allowed to flow above half full up to 0.59 d/D at peak wet weather flow as a temporary condition until Beyer Boulevard is constructed. Note that there are several existing gravity sewer segments flowing above half full between 0.50 d/D and 0.59 d/D under existing flows.

The Otay Mesa Trunk Sewer segments north of the Beyer Boulevard and Otay Mesa Road intersection that have already been constructed to ultimate sizes have been analyzed under ultimate flows as well. All gravity sewer segments already constructed to ultimate sizes are calculated to be at or below the 0.75 d/D depth criteria under ultimate peak wet weather flow even with project flows added. This analysis and the OMTS hydraulic modeling data for ultimate peak wet weather flows from the City are included in Appendix B. Exhibit A at the end of Appendix B presents a manhole diagram for the analyzed sewer lines.

Offsite Sewer Upgrades

The City's anticipated Otay Mesa Trunk Sewer Upgrade Report and corresponding sewer model is expected to identify the ultimate gravity sewer pipe sizes needed for the Otay Mesa Trunk Sewer in order to accommodate ultimate peak wet weather flows for the build-out of the entire South Otay Mesa Sewer Basin. Upgrade of any segment of the Otay Mesa Trunk Sewer should be done to the line sizes determined in the City's South Otay Mesa Trunk Sewer Upgrade Report. A more detailed discussion and analysis of the Otay Mesa Trunk Sewer pipe sizing for the Southwest Village Specific Plan flow is included as part of the "Southwest Village Specific Plan Sewer Study."

Conclusions and Recommendations

The following conclusions and recommendations are summarized based on the sewer system analysis prepared for the proposed Southwest Village VTM 1 Phase 1 development project in the Otay Mesa area of the City of San Diego.

1. The Southwest Village VTM 1 sewer Phase 1 project, consisting of 800 total residential dwelling units, will gravity sewer to proposed private temporary sewer lift station(s) which will pump via private force mains to an existing 18-inch trunk sewer line in Caliente Avenue.

2. The Southwest Village VTM 1 Phase 1 project will construct a private gravity sewer collection system within the initial planning areas which will flow to the proposed private temporary sewer lift stations. Future development within the Southwest Village Specific Plan area will enable the proposed private temporary sewer lift stations to be abandoned and gravity flow to Beyer Boulevard.

3. There are eight segments of existing Otay Mesa Trunk Sewer downstream of the Southwest Village VTM 1 Phase 1 project connection point that do not have available capacity for the buildout of the Southwest Village VTM 1 Phase 1 project. This is based on sewer flow monitoring and modeling as provided by the City as well as an estimation of future sewer flow from approved projects. These eight segments will need to be ultimately upgraded by VTM 1 Phase 1 and are shown on Figure 4.

4. Figure 2 provides the recommended onsite sewer system improvements for the 200 total unit Southwest Village VTM 1 Phase 1A project.

5. Figure 3 provides the recommended onsite sewer system improvements for the 800 total unit Southwest Village VTM 1 Phase 1B project.

6. All temporary lift stations will cease, and corresponding force mains abandoned after the construction of Beyer Boulevard and the new sewer trunk line west to Otay Mesa Trunk Sewer.

7. 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.

If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to contact the undersigned.

Dexter Wilson Engineering, Inc.

Steven Henderson, P.E.

SH:AO:ah

Attachments

APPENDIX A

EXISTING OTAY MESA SEWER FACILITIES (FIGURE 1), PROPOSED PHASE 1A SEWER SYSTEM (FIGURE 2), PROPOSED PHASE 1B SEWER SYSTEM (FIGURE 3), AND PROPOSED ULTIMATE SEWER FACILITIES (FIGURE 4)

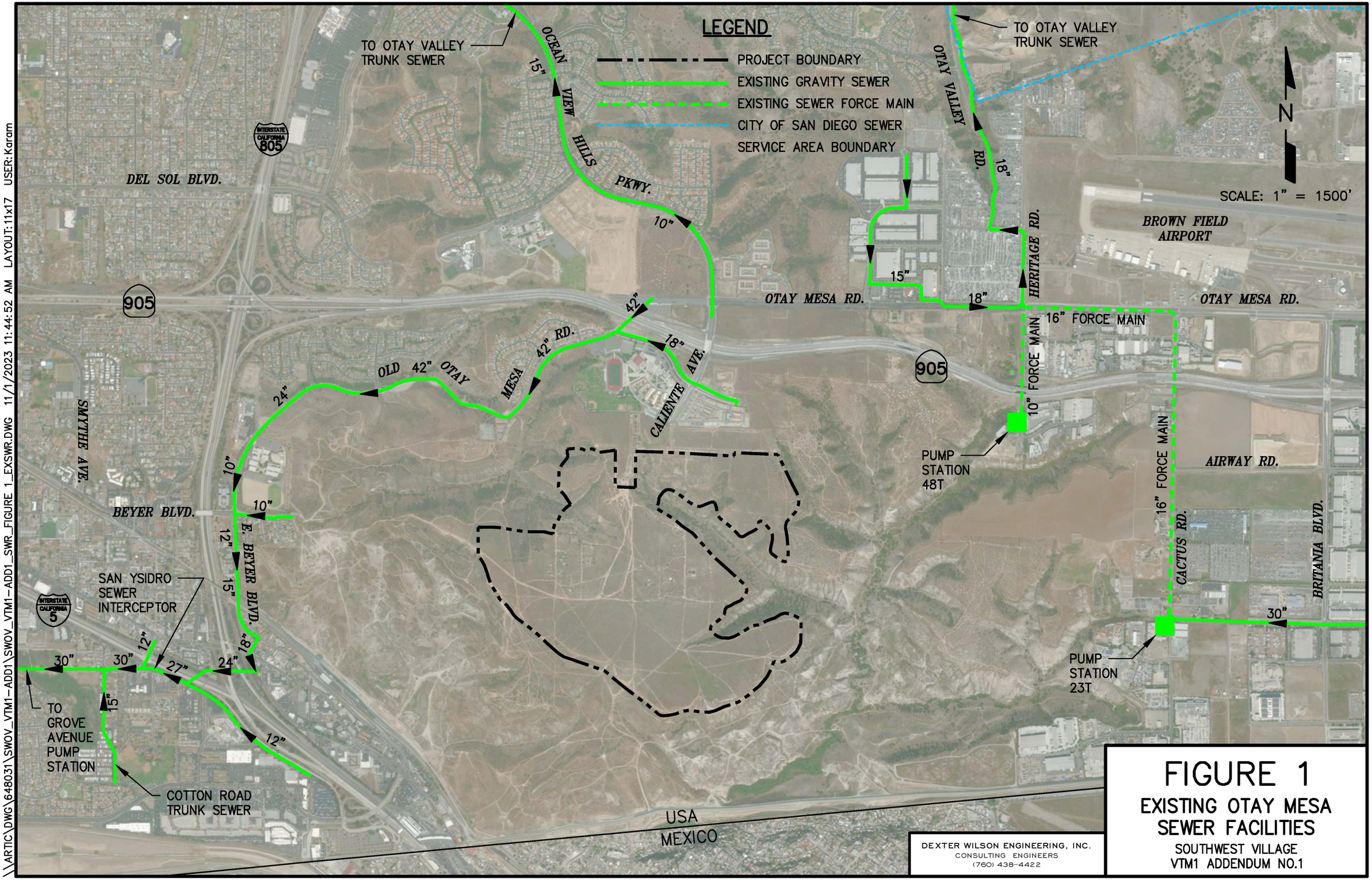

FIGURE 1

EXISTING OTAY MESA SEWER FACILITIES

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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LEGEND

EXISTING PUBLIC GRAVITY SEWER

PROPOSED PRIVATE GRAVITY SEWER

PROPOSED TEMPORARY PRIVATE FORCE MAIN

N

0 200 FEET

AIRWAY RD

CALIENTE AVE

EX.18"

PROPOSED PRIVATE DISCHARGE MANHOLE

PROPOSED PRIVATE GRAVITY SEWER CONNECTING TO EXISTING PUBLIC MANHOLE

CENTRAL AVE

DUAL 6" PRIVATE FORCE MAINS (EMRA WILL BE REQUIRED)

WEST AVE

TEMPORARY SEWER LIFT STATION FOR PHASE 1A

FIGURE 2

VTM1 SEWER PHASE 1A

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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LEGEND

- PROJECT BOUNDARY
- EXISTING PUBLIC SEWER
- EXISTING PRIVATE GRAVITY SEWER
- EXISTING TEMPORARY PRIVATE FORCE MAIN
- PROPOSED PUBLIC SEWER
- PROPOSED PRIVATE SEWER
- PROPOSED TEMPORARY PRIVATE FORCE MAIN

NOTE: EMRA WILL BE REQUIRED FOR PRIVATE FORCE MAINS

PROPOSED PRIVATE DISCHARGE MANHOLE

CALIENTE AVE

EX-18"

DUAL 6"

SOUTHWIND PROJECT

PROPOSED PRIVATE FORCE MAIN CONNECTING TO PROPOSED PRIVATE FORCE MAIN

CENTRAL AVE

PROPOSED PRIVATE GRAVITY SEWER CONNECTING TO EXISTING PUBLIC MANHOLE

SEWER STUB TO SOUTHWIND PROJECT

TEMPORARY PHASE 1A PRIVATE SEWER LIFT STATION (TO BE ABANDONED AS PART OF PHASE 1B)

PA-9

PA-10

PA-8

TEMPORARY PHASE 1B PRIVATE SEWER LIFT STATION

HIGHLIGHTED PROPOSED PUBLIC SEWER TO BE LOCATED IN 26' WIDE EASEMENT

PROPOSED BEYER BLVD

15"

DUAL 6"

15"

12"

PA-12

PA-11

15"

STREET "A"

8"

8"

PA-13

WEST AVE

12"

PROPOSED CALIENTE AVE

PA-14

12"

N

0 400 FEET

FIGURE 3

PROPOSED VTM 1 PHASE 1B SEWER SYSTEM

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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905

EX.42"

OTAY MESA RD

EX.18"

905

CALIENTE AVE

AIRWAY RD

N

0 800 FEET

EX.42"

EXISTING OTAY MESA
TRUNK SEWER (OMTS)

EX.24"

OTAY MESA RD

INTERSTATE CALIFORNIA 805

SOUTH-WIND
PROJECT

CENTRAL AVE

HIGHLIGHTED SEGMENTS TO
BE CONSTRUCTED BY VTM 1.
SEE FIGURE 4 FOR DETAIL.

VTM1

EX.10"

EX.12"

18"(SDR 18 PVC)

18"

EX.10"

BEYER BLVD.

15"

8"

8"

CALIENTE AVE

12"

DUAL 6-INCH
FORCE MAINS

27"

E. BEYER BLVD

UPSIZE FROM
12" TO 27"

15"

15"

8"

12"

8"

8"

8"

WEST AVE

8"

8"

8"

12"

12"

8"

8"

8"

FUTURE SEWER
LIFT STATION "2"

27"

33"

UPSIZE FROM
15" TO 30"

30"

EX.24"

10"

10"

EAST AVE

DUAL 8-INCH
FORCE MAINS

FUTURE SEWER
LIFT STATION "1"

EX.27"

INTERSTATE CALIFORNIA 5

10"

15"

LEGEND

- SOUTHWEST VILLAGE SPECIFIC PLAN BOUNDARY
- EXISTING PUBLIC GRAVITY SEWER
- PROPOSED PUBLIC GRAVITY SEWER
- PROPOSED PUBLIC GRAVITY SEWER (TO BE CONSTRUCTED BY VTM-1 PHASE 1)
- PROPOSED PUBLIC SEWER FORCE MAIN

FIGURE 4

PROPOSED SPECIFIC PLAN ULTIMATE SEWER FACILITIES

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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APPENDIX B

SOUTHWEST VILLAGE
VTM 1 PHASE 1 OFFSITE SEWER ANALYSIS
CALCULATION SPREADSHEET RESULTS

min. slope segments analyzed in spreadsheet below

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

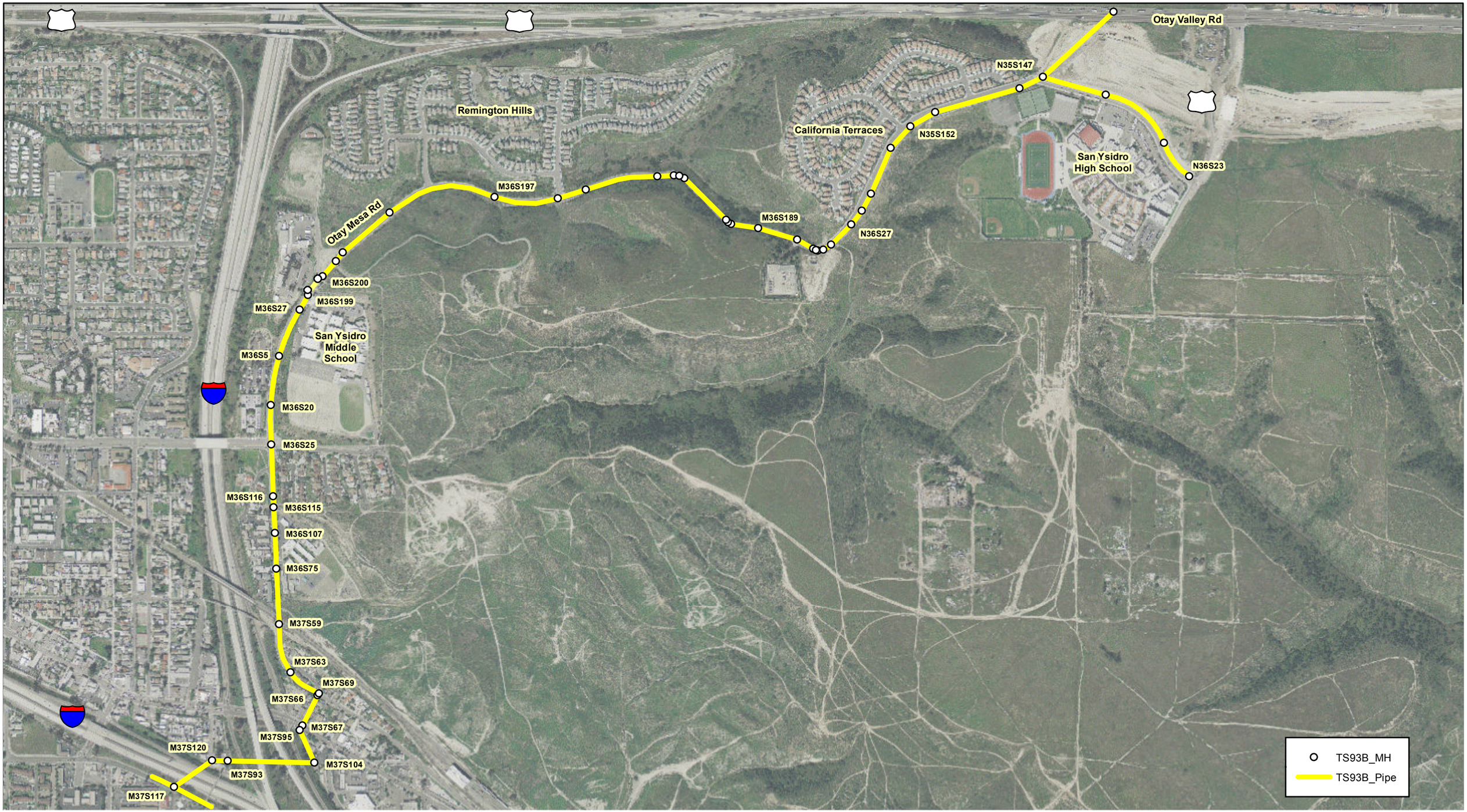
DRAFT

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

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

ULTIMATE 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. 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

min. slope segments analyzed in spreadsheet below

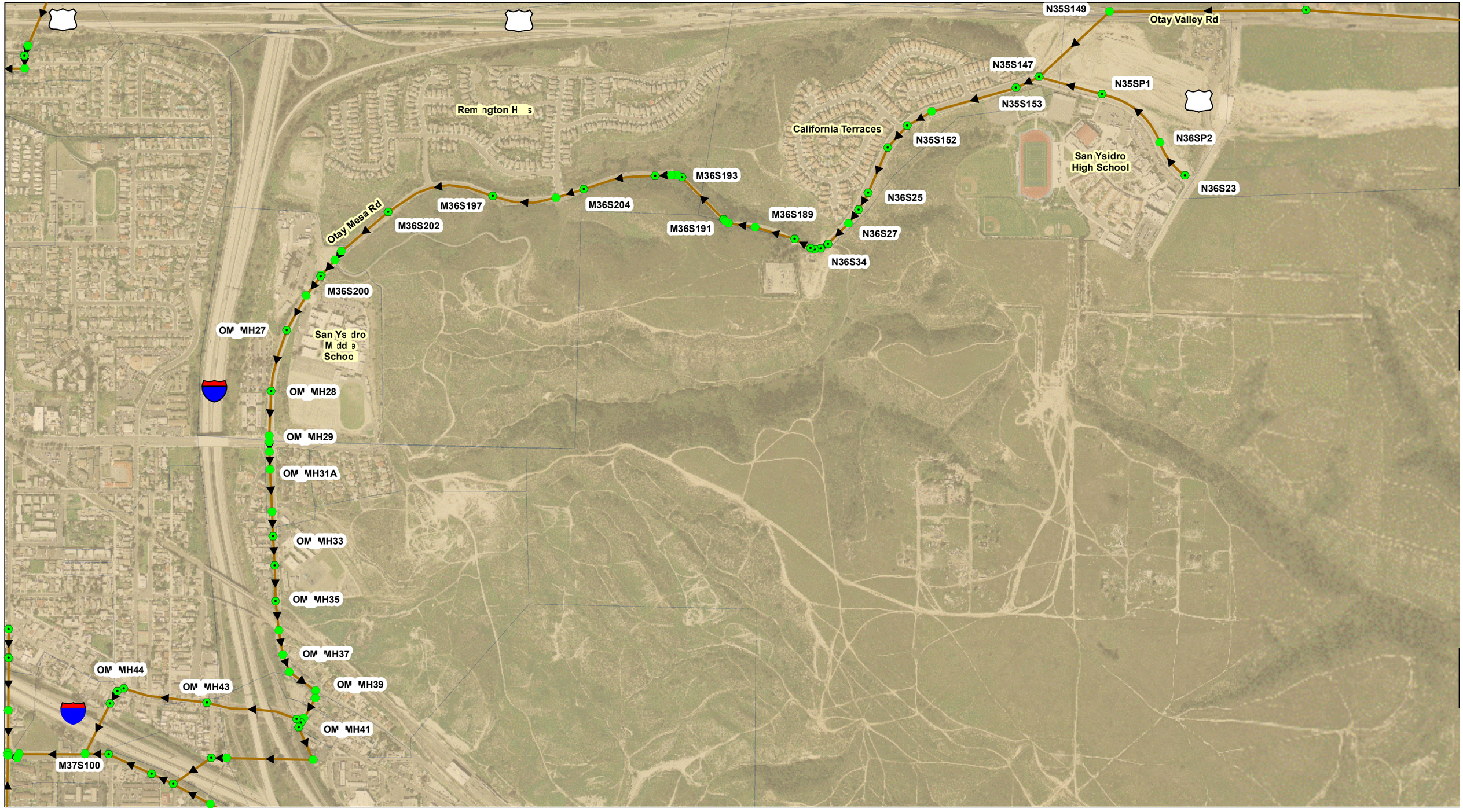
spreadsheet was calibrated to match this d/D

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

DATE: 1/23/2024

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Phase 1 Project City of San Diego Offsite Analysis in Beyer Blvd. Existing Flows, EDUs = 0

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.							
OMTS*	M36S 199 A	M36S 199	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	24	3.30	0.039353	0.40000	0.20	0.1118	7.81
	M36S 199	M36S 27	0	0.0	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	10	6.90	0.281003	0.47500	0.57	0.4620	10.88
	M36S 27	M36S 5	0	0.0	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	10	7.00	0.278989	0.46667	0.56	0.4530	11.10
	M36S 5	M36S 20	0	0.0	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	10	7.00	0.278989	0.46667	0.56	0.4530	11.10
	M36S 20	M36S 25	0	0.0	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
65 Ex. EDUs	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	0.62	3.61	11.10

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: 1/23/2024

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Phase 1 Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **200**

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.							
OMTS* + Phased Flow EDUs (see above)	M36S 199 A	M36S 199	703,600	8795.0	8795.0	80	703,600	1.849	1,300,796	1.85	2,406,472	2.406	3.724	24	3.30	0.041967	0.42000	0.21	0.1199	7.76
	M36S 199	M36S 27	0	0.0	8795.0	80	703,600	1.849	1,300,796	1.85	2,406,472	2.406	3.724	10	6.90	0.299664	0.49167	0.59	0.4820	11.12
	M36S 27	M36S 5	0	0.0	8795.0	80	703,600	1.849	1,300,796	1.85	2,406,472	2.406	3.724	10	7.00	0.297516	0.49167	0.59	0.4820	11.12
	M36S 5	M36S 20	0	0.0	8795.0	80	703,600	1.849	1,300,796	1.85	2,406,472	2.406	3.724	10	7.00	0.297516	0.49167	0.59	0.4820	11.12
	M36S 20	M36S 25	0	0.0	8795.0	80	703,600	1.849	1,300,796	1.85	2,406,472	2.406	3.724	27	2.00	0.039377	0.45000	0.20	0.1118	6.58
65 Ex. EDUs	M36S 25	M36S 116	18,200	227.5	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	12	3.08	0.281965	0.57000	0.57	0.4620	8.24
	M36S 116	M36S 115	0	0.0	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	12	3.08	0.281965	0.57000	0.57	0.4620	8.24
	M36S 115	M36S 107	0	0.0	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	12	5.60	0.209111	0.48000	0.48	0.3727	10.21
	M36S 107	M36S 75	0	0.0	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	12	5.60	0.209111	0.48000	0.48	0.3727	10.21
	M36S 75	M37S 59	0	0.0	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	15	6.20	0.109609	0.42500	0.34	0.2355	10.34
	M37S 59	M37S 63	0	0.0	9022.5	80	721,800	1.842	1,329,752	1.85	2,460,040	2.460	3.807	15	6.00	0.111421	0.42500	0.34	0.2355	10.34
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	10160.7	80	812,856	1.818	1,477,678	1.85	2,733,704	2.734	4.230	18	0.33	0.324673	0.93000	0.62	0.5120	3.67
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	10306.7	80	824,532	1.816	1,497,299	1.85	2,770,003	2.770	4.286	18	0.33	0.328984	0.94500	0.63	0.5210	3.66
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	10400.8	80	832,064	1.815	1,509,932	1.85	2,793,374	2.793	4.322	18	0.33	0.331760	0.94500	0.63	0.5210	3.69
	M37S 67	M37S 95	0	0.0	10400.8	80	832,064	1.815	1,509,932	1.85	2,793,374	2.793	4.322	15	1.15	0.288989	0.72500	0.58	0.4720	5.86
	M37S 95	M37S 104	0	0.0	10400.8	80	832,064	1.815	1,509,932	1.85	2,793,374	2.793	4.322	15	1.15	0.288989	0.72500	0.58	0.4720	5.86
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	14092.3	80	1,127,380	1.765	1,990,348	1.85	3,682,144	3.682	5.698	24	0.65	0.145021	0.78000	0.39	0.2836	5.02
	M37S 93	M37S 120	0	0.0	14092.3	80	1,127,380	1.765	1,990,348	1.85	3,682,144	3.682	5.698	24	0.65	0.145021	0.78000	0.39	0.2836	5.02
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	14092.3	80	1,127,380	1.765	1,990,348	1.85	3,682,144	3.682	5.698	24	0.65	0.145021	0.78000	0.39	0.2836	5.02

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,127,380	14,092	0.33	0.63	3.66	11.12

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: 1/23/2024

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Phase 1 Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **350**

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.							
OMTS* + Phased Flow EDUs (see above)	M36S 199 A	M36S 199	741,550	9269.4	9269.4	80	741,550	1.837	1,361,970	1.85	2,519,644	2.520	3.899	24	3.30	0.043940	0.42000	0.21	0.1199	8.13
	M36S 199	M36S 27	0	0.0	9269.4	80	741,550	1.837	1,361,970	1.85	2,519,644	2.520	3.899	24	6.90	0.030388	0.36000	0.18	0.0961	10.14
	M36S 27	M36S 5	0	0.0	9269.4	80	741,550	1.837	1,361,970	1.85	2,519,644	2.520	3.899	24	7.00	0.030170	0.36000	0.18	0.0961	10.14
	M36S 5	M36S 20	0	0.0	9269.4	80	741,550	1.837	1,361,970	1.85	2,519,644	2.520	3.899	24	7.00	0.030170	0.36000	0.18	0.0961	10.14
	M36S 20	M36S 25	0	0.0	9269.4	80	741,550	1.837	1,361,970	1.85	2,519,644	2.520	3.899	24	2.00	0.056442	0.48000	0.24	0.1449	6.73
65 Ex. EDUs	M36S 25	M36S 116	18,200	227.5	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	12	3.08	0.295151	0.59000	0.59	0.4820	8.27
	M36S 116	M36S 115	0	0.0	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	12	3.08	0.295151	0.59000	0.59	0.4820	8.27
	M36S 115	M36S 107	0	0.0	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	12	5.60	0.218890	0.49000	0.49	0.3827	10.41
	M36S 107	M36S 75	0	0.0	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	12	5.60	0.218890	0.49000	0.49	0.3827	10.41
	M36S 75	M37S 59	0	0.0	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	15	6.20	0.114735	0.42500	0.34	0.2355	10.83
	M37S 59	M37S 63	0	0.0	9496.9	80	759,750	1.832	1,391,940	1.85	2,575,089	2.575	3.985	15	6.00	0.116632	0.43750	0.35	0.2450	10.41
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	10635.1	80	850,806	1.812	1,541,285	1.85	2,851,378	2.851	4.412	18	0.33	0.338648	0.96000	0.64	0.5310	3.69
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	10781.0	80	862,482	1.810	1,560,759	1.85	2,887,403	2.887	4.468	18	0.33	0.342927	0.96000	0.64	0.5310	3.74
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	10875.2	80	870,014	1.808	1,573,296	1.85	2,910,599	2.911	4.504	18	0.33	0.345682	0.97500	0.65	0.5400	3.71
	M37S 67	M37S 95	0	0.0	10875.2	80	870,014	1.808	1,573,296	1.85	2,910,599	2.911	4.504	15	1.15	0.301117	0.73750	0.59	0.4820	5.98
	M37S 95	M37S 104	0	0.0	10875.2	80	870,014	1.808	1,573,296	1.85	2,910,599	2.911	4.504	15	1.15	0.301117	0.73750	0.59	0.4820	5.98
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	14566.6	80	1,165,330	1.759	2,049,475	1.85	3,791,528	3.792	5.867	24	0.65	0.149329	0.80000	0.40	0.2934	5.00
	M37S 93	M37S 120	0	0.0	14566.6	80	1,165,330	1.759	2,049,475	1.85	3,791,528	3.792	5.867	24	0.65	0.149329	0.80000	0.40	0.2934	5.00
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	14566.6	80	1,165,330	1.759	2,049,475	1.85	3,791,528	3.792	5.867	24	0.65	0.149329	0.80000	0.40	0.2934	5.00

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,165,330	14,567	0.33	0.65	3.69	10.83

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: 1/23/2024

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Phase 1 Project City of San Diego Offsite Analysis in Beyer Blvd. Phased Flows, EDUs = **800**

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.							
OMTS* + Phased Flow EDUs (see above)	M36S 199 A	M36S 199	855,400	10692.5	10692.5	80	855,400	1.811	1,548,953	1.85	2,865,562	2.866	4.434	24	3.30	0.049973	0.46000	0.23	0.1365	8.12
	M36S 199	M36S 27	0	0.0	10692.5	80	855,400	1.811	1,548,953	1.85	2,865,562	2.866	4.434	24	6.90	0.034559	0.38000	0.19	0.1039	10.67
	M36S 27	M36S 5	0	0.0	10692.5	80	855,400	1.811	1,548,953	1.85	2,865,562	2.866	4.434	24	7.00	0.034312	0.38000	0.19	0.1039	10.67
	M36S 5	M36S 20	0	0.0	10692.5	80	855,400	1.811	1,548,953	1.85	2,865,562	2.866	4.434	24	7.00	0.034312	0.38000	0.19	0.1039	10.67
	M36S 20	M36S 25	0	0.0	10692.5	80	855,400	1.811	1,548,953	1.85	2,865,562	2.866	4.434	24	2.00	0.064191	0.52000	0.26	0.1623	6.83
65 Ex. EDUs	M36S 25	M36S 116	18,200	227.5	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	27	3.08	0.038523	0.45000	0.20	0.1118	7.99
	M36S 116	M36S 115	0	0.0	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	27	3.08	0.038523	0.45000	0.20	0.1118	7.99
	M36S 115	M36S 107	0	0.0	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	12	5.60	0.248347	0.53000	0.53	0.4230	10.69
	M36S 107	M36S 75	0	0.0	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	12	5.60	0.248347	0.53000	0.53	0.4230	10.69
	M36S 75	M37S 59	0	0.0	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	15	6.20	0.130176	0.46250	0.37	0.2642	10.95
	M37S 59	M37S 63	0	0.0	10920.0	80	873,600	1.808	1,579,259	1.85	2,921,629	2.922	4.521	15	6.00	0.132328	0.46250	0.37	0.2642	10.95
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	12058.2	80	964,656	1.793	1,729,227	1.85	3,199,070	3.199	4.950	18	0.33	0.379943	1.03500	0.69	0.5780	3.81
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	12204.2	80	976,332	1.791	1,748,257	1.85	3,234,276	3.234	5.005	18	0.33	0.384124	1.05000	0.70	0.5870	3.79
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	12298.3	80	983,864	1.789	1,760,509	1.85	3,256,942	3.257	5.040	18	0.33	0.386816	1.05000	0.70	0.5870	3.82
	M37S 67	M37S 95	0	0.0	12298.3	80	983,864	1.789	1,760,509	1.85	3,256,942	3.257	5.040	27	1.15	0.070281	0.60750	0.27	0.1711	5.82
	M37S 95	M37S 104	0	0.0	12298.3	80	983,864	1.789	1,760,509	1.85	3,256,942	3.257	5.040	33	1.15	0.041156	0.57750	0.21	0.1199	5.56
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	15989.8	80	1,279,180	1.740	2,225,930	1.85	4,117,970	4.118	6.372	24	0.65	0.162186	0.82000	0.41	0.3032	5.25
	M37S 93	M37S 120	0	0.0	15989.8	80	1,279,180	1.740	2,225,930	1.85	4,117,970	4.118	6.372	24	0.65	0.162186	0.82000	0.41	0.3032	5.25
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	15989.8	80	1,279,180	1.740	2,225,930	1.85	4,117,970	4.118	6.372	24	0.65	0.162186	0.82000	0.41	0.3032	5.25

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,279,180	15,990	0.33	0.70	3.79	10.95

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: 1/23/2024

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Phase 1 Project City of San Diego Offsite Analysis in Already Upgraded Segments in Caliente Ave, Airway Rd, and Old Otay Mesa Rd. (Ultimate (23T) Flows)

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

REMARKS (TRIBUTARY AREAS)	PIPE ID*	IN-LINE FLOW - EXISTING* (gpd)	IN-LINE FLOW - PROJECT** (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.							
Caliente/Airway	N36SP2.1	149,300	335,640	6061.8	6061.8	80	484,940	1.947	944,184	1.85	1,746,741	1.747	2.703	18	0.50	0.168537	0.63000	0.42	0.3130	3.84
	N35S147.1	3,660,000	335,640	49945.5	49945.5	80	3,995,640	1.548	6,185,702	1.85	11,443,549	11.444	17.707	42	0.60	0.105236	1.15500	0.33	0.2260	6.40
	OM_MH25.1	3,839,000	335,640	52183.0	52183.0	80	4,174,640	1.544	6,444,133	1.85	11,921,646	11.922	18.447	24	1.20	0.344768	1.30000	0.65	0.5400	8.54
	OM_MH28.1	9,500,000	335,640	122945.5	122945.5	80	9,835,640	1.500	14,753,460	1.85	27,293,901	27.294	42.233	27	2.30	0.416463	1.68750	0.75	0.6320	13.20

Min Slope
0.50

Max dn/D
0.75

Min Vel.
3.84

Max Vel.
13.20

LU = Land Use Area

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

** SW Village VTM 1 Phase 1 and Candlelight Flows

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

PIPE INFORMATION				
FROM	TO	SIZE	SLOPE	LENGTH
SW 2	SW 1	8	2.07%	295
SW 1	18	8	2.90%	210
116	114	8	0.87%	230
114	112	8	1.03%	340
112	108	8	0.97%	300
108	7	8	0.83%	120
212	11	12	1.00%	90
11	10	12	0.92%	380
10	9	12	0.94%	310
9	8	12	0.95%	190
8	7	12	1.71%	210
7	6	15	0.57%	280
6	5	15	0.87%	150
5	12	15	4.94%	160
20	18	12	1.08%	250
18	17	12	1.06%	170
17	16	15	1.05%	200
16	15		1.18%	195
15	14	15	1.05%	220
14	13	15	1.06%	170
13	12	15	1.25%	40
12	3	15	1.00%	350
3	2	15	1.08%	250

MANHOLE INFORMATION			
NO.	RIM	INVERT	DEPTH
SW 2	484.7	475.5	9.2
SW 1	477.7	469.4	8.3
116	490.4	472.7	17.7
114	488.4	470.7	17.7
112	485	467.2	17.8
108	482.1	464.3	17.8
212	494.9	476.0	18.9
11	495.4	475.1	20.3
10	494.3	471.6	22.7
9	489.5	468.7	20.8
8	486.1	466.9	19.2
7	482.2	463.3	18.9
6	475.1	461.7	13.4
5	471.2	460.4	10.8
20	481.27	466.0	15.27
18	478.71	463.3	15.4
17	476.98	461.5	15.5
16	474.96	459.4	15.6
15	472.69	457.1	15.59
14	470.42	454.8	15.62
13	468.9	453.0	15.89
12	468.8	452.5	16.3
3	465.3	449	16.3
2	462.6	446.3	16.3

M36S-27
M36S-199A
M36S-199
M36S-5
M36S-20
M36S-25
M36S-116
M36S-115
M36S-107
M36S-75
M37S-59
M37S-63
M37S-66
M37S-69
M37S-67
M37S-95
M37S-93
M37S-120
M37S-104
M37S-117
N35S147.1
N36S92.1
EX.42"
EX.24"
EX.10"
EX.12"
EX.27"
EX.15"
EX.18"
27"
OTAY MESA RD
BEYER BLVD
PROPOSED BEYER BLVD
AIRPORT RD
CALIENTE AVE
PROPOSED CALIENTE AVE
WEST AVE
CENTRAL AVE
SOUTHWIND PROJECT
DUAL 6"
SEWER STUB TO SOUTHWIND PROJECT
PROPOSED PHASE 1A PRIVATE SEWER LIFT STATION
PROPOSED PHASE 1B PRIVATE SEWER LIFT STATION
PA-8
PA-9
PA-10
PA-11
PA-12
PA-13
PA-14
SW1
SW2
INTERSTATE CALIFORNIA 805
INTERSTATE CALIFORNIA 5

LEGEND

- PROJECT BOUNDARY
- EXISTING PUBLIC GRAVITY SEWER
- EXISTING PRIVATE FORCE MAIN
- PROPOSED PUBLIC GRAVITY SEWER
- PROPOSED PRIVATE GRAVITY SEWER
- PROPOSED PRIVATE FORCE MAIN
- (1) COMPUTER MODEL MANHOLE NUMBER/PIPE ID

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

EXHIBIT A
SEWER MANHOLE NUMBER DIAGRAM
SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1