Appendix K2

Sewer Study Technical Memorandum

VALLECITOS WATER DISTRICT

SUNRISE-ORIX DEVELOPMENT SEWER STUDY

WORK ORDER # 204659

FINAL TECHNICAL MEMORANDUM

October 17, 2018

Prepared By: Robert Scholl, P.E. and Eileen Koonce

INTRODUCTION

The proposed Sunrise-Orix Development (Project) is a 192-unit multi-family residential development on two parcels totaling 14.36-acres. The Project property is located south of Barham Drive and west of Myers Avenue. A 3.56-acre parcel (APN 228-312-09) is located in the City of San Marcos and a 10.8-acre parcel (APN 228-312-10) is located in the County of San Diego. The project proposes to annex APN 228-312-10 into the City of San Marcos.

The Project property is located outside of the Vallecitos Water District's (VWD) Sphere of Influence and water service boundary. APN 228-312-09 is located within VWD's sewer service boundary. However, APN 228-312-10 is located outside of VWD's sewer service boundary. The project proposes to receive water service from Rincon Del Diablo Municipal Water District (RDDMWD) and sewer service from VWD.

Per VWD's Ordinance No. 200, properties requesting annexation into the Sewer Improvement District must also be annexed into the District's water service boundary. Therefore, the Project property must annex APN 228-312-10 into both VWD's water and sewer service boundaries to be eligible for sewer service by VWD. LAFCO allows service boundaries to overlap, therefore, the Project property will not be required to detach from RDDMWD and may continue to receive water service from RDDMWD.

All new projects undergo evaluation by VWD to determine if the current water and/or sewer infrastructure is sufficient to accommodate the proposed water demands and sewer generation.

This study considers sewage generation increases due to the proposed Project densification. It analyzes the following aspects of VWD's infrastructure and makes recommendations for capital improvements for impacts that are created due to the land use change:

- Wastewater collection system, including the need to upsize pipelines and manholes, or the need to install new pipelines and manholes
- Wastewater lift stations, including the need to install new lift stations or upsize existing lift stations to serve the proposed development
- Wastewater land outfall, including the need to construct a parallel land outfall to serve this and other proposed developments

- Wastewater treatment facilities, including the need for obtaining additional capacity at the Encina Water Pollution Control Facility (EWPCF) or for expanding the Meadowlark Water Reclamation Facility (MRF)

WASTEWATER SYSTEM ANALYSIS

The proposed 14.36-acre Project will lie completely within VWD sewer shed 26C. Figures 1 - 5 show the development's location in relation to sewer shed boundaries, identify wastewater infrastructure within the vicinity of the development, and identify the downstream collection infrastructure that will be impacted by the development.

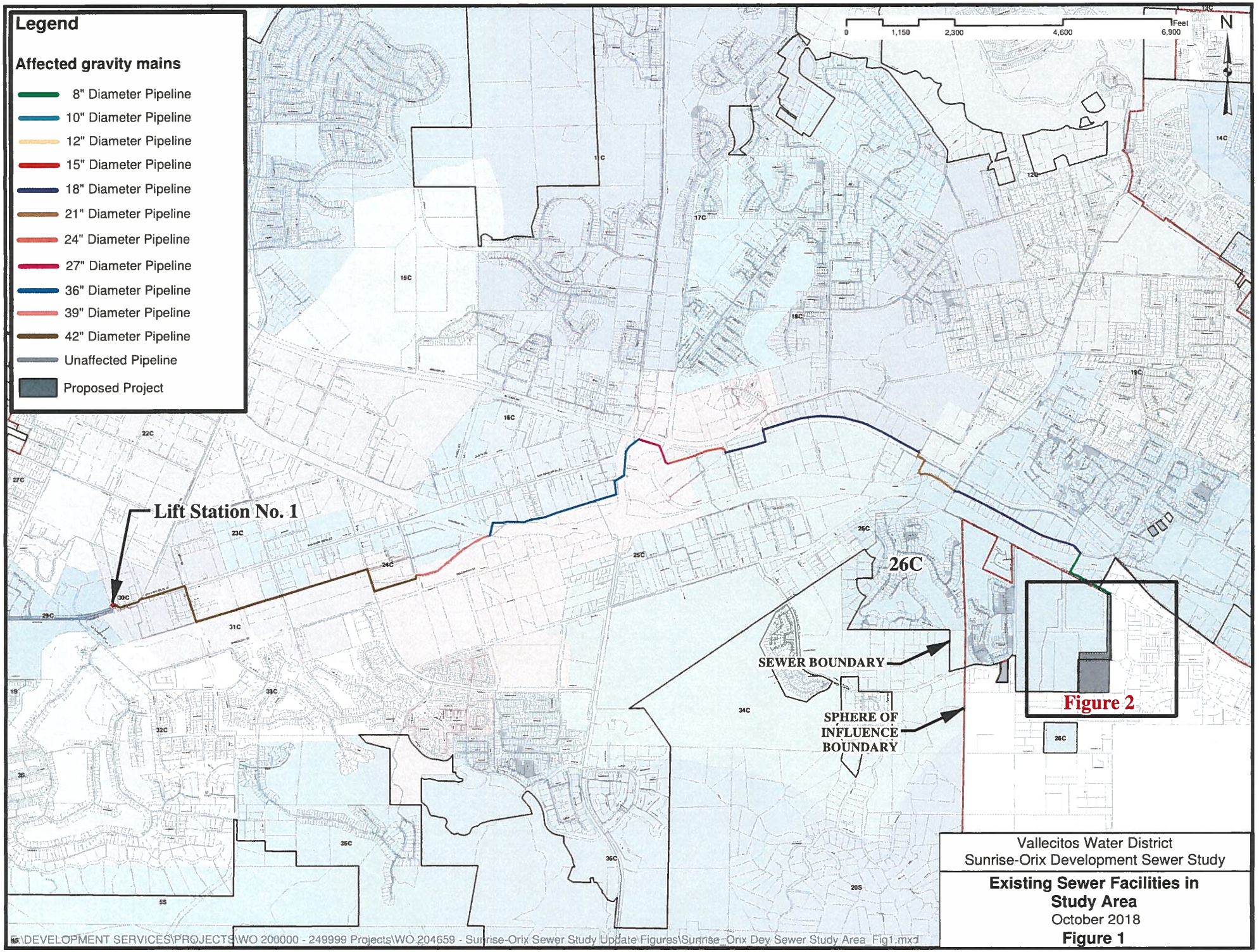
Wastewater Flow Projections

The General Plan designation for APN 228-310-09 by the City of San Marcos (as of June 30, 2008) was Residential 4-6 du/ac which equates to Residential 4-8 du/ac in VWD's 2008 Master Plan. The General Plan designation for APN 228-310-10 by the County of San Diego (as of June 30, 2008) was also Light Industrial. The 2008 Master Plan based its ultimate wastewater generation planning on this approved land use. The Project proposes a density increase with 192 multi-family homes on 14.36 acres (Residential 12-15 du/ac).

Table 1 provides the average wastewater generated both under the density planned for in the 2008 Master Plan and under the proposed Project densification. The table shows that the Project will increase the projected average wastewater generation from the 2008 Master Plan land use by approximately 17,232 gallons per day (gpd).

Table 1 – Project Estimated Wastewater Flows

Land Use Type	Area (acres)	Residential Units	Duty Factor (gpd/acre)	Wastewater Flow (gpd)
2008 Master Plan Land Use Flows				
Light Industrial	10.80		1,300	14,040
Residential 4-8 du/ac	3.56		1,300	4,628
Total	**14.36**			**18,668**
Proposed Development Flows				
Residential (12-15 du/ac)	14.36	192	2,500	35,900
Total	**14.36**			**35,900**
Total Increased Wastewater Flow				**17,232**


Legend
Affected gravity mains
8" Diameter Pipeline
10" Diameter Pipeline
12" Diameter Pipeline
15" Diameter Pipeline
18" Diameter Pipeline
21" Diameter Pipeline
24" Diameter Pipeline
27" Diameter Pipeline
36" Diameter Pipeline
39" Diameter Pipeline
42" Diameter Pipeline
Unaffected Pipeline
Proposed Project
0
1,150
2,300
4,600
6,900
Feet
N
Lift Station No. 1
26C
SEWER BOUNDARY
SPHERE OF INFLUENCE BOUNDARY
Figure 2
Vallecitos Water District
Sunrise-Orix Development Sewer Study
Existing Sewer Facilities in Study Area
October 2018
Figure 1
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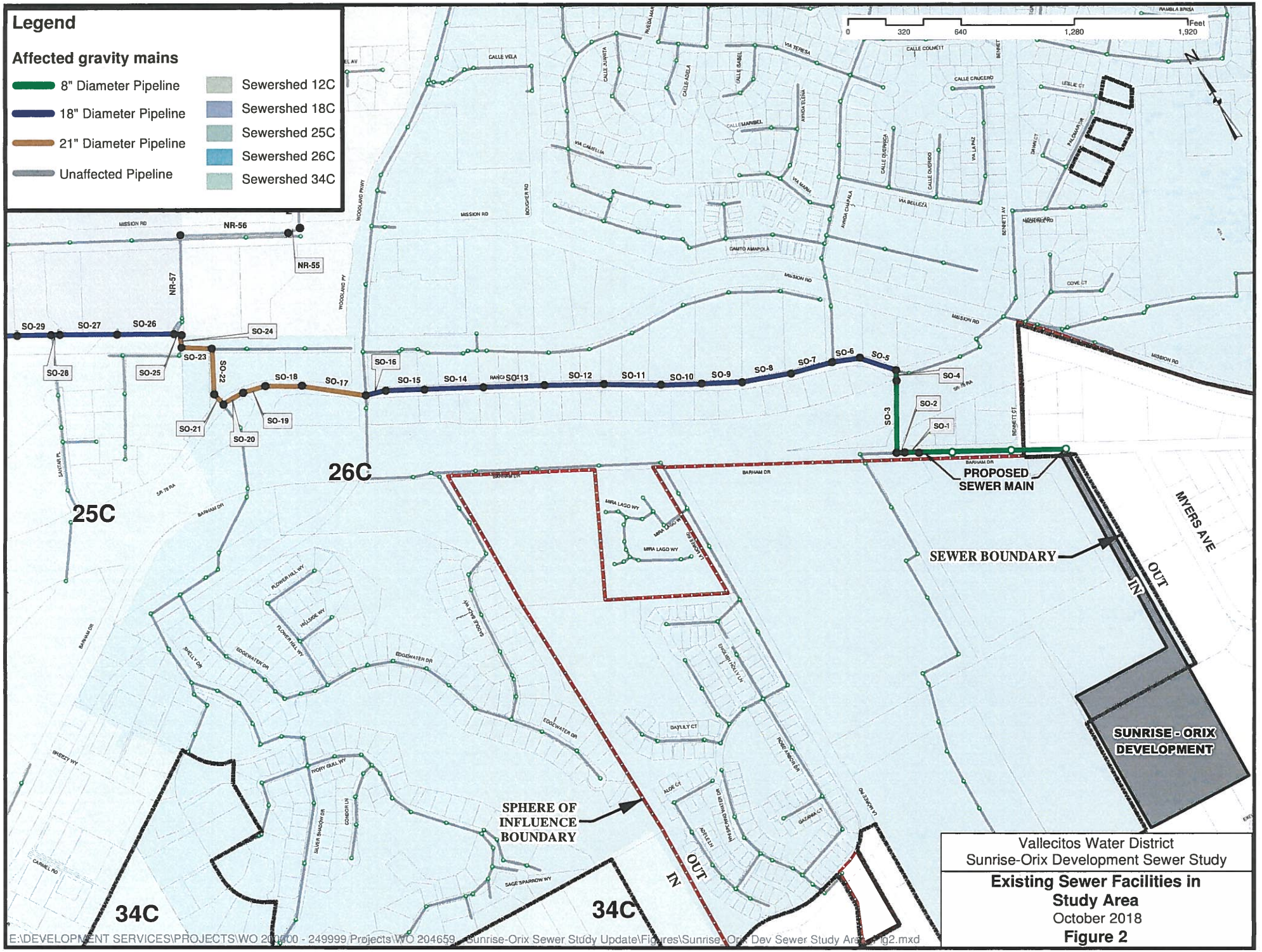
Legend
Affected gravity mains
8" Diameter Pipeline
18" Diameter Pipeline
21" Diameter Pipeline
Unaffected Pipeline
Sewershed 12C
Sewershed 18C
Sewershed 25C
Sewershed 26C
Sewershed 34C
0
320
640
1,280
1,920
Feet
N
NR-56
NR-55
NR-57
SO-29
SO-28
SO-27
SO-26
SO-25
SO-24
SO-23
SO-22
SO-21
SO-20
SO-19
SO-18
SO-17
SO-16
SO-15
SO-14
SO-13
SO-12
SO-11
SO-10
SO-9
SO-8
SO-7
SO-6
SO-5
SO-4
SO-3
SO-2
SO-1
25C
26C
34C
PROPOSED SEWER MAIN
SEWER BOUNDARY
SPHERE OF INFLUENCE BOUNDARY
SUNRISE - ORIX DEVELOPMENT
MYERS AVE
OUT
IN
OUT
IN
MISSION RD
BARHAM DR
MIRA LAGO WY
EDGEWATER DR
BENNETT ST
CALLE VELA
VIA TERESA
CALLE CRUCERO
CALLE MARIBEL
VIA CAMELLIA
VIA MAINA
VIA BELLEZA
CAMITO AMAPOLA
COVE CT
WOODLAND PKWY
BOUGHER RD
SR 76 RA
CARMEL RD
SAGE SPARROW WY
IVORY GULL WY
SILVER SHADOW DR
CONDOR LN
FLOWER HILL WY
HILLSIDE WY
SHELLY DR
BREEZY WY
DAYLILY CT
ROSE FINCH DR
ALOE CT
GAZANIA CT
ADELELI
LA MORTE RD
Vallecitos Water District
Sunrise-Orix Development Sewer Study
Existing Sewer Facilities in Study Area
October 2018
Figure 2
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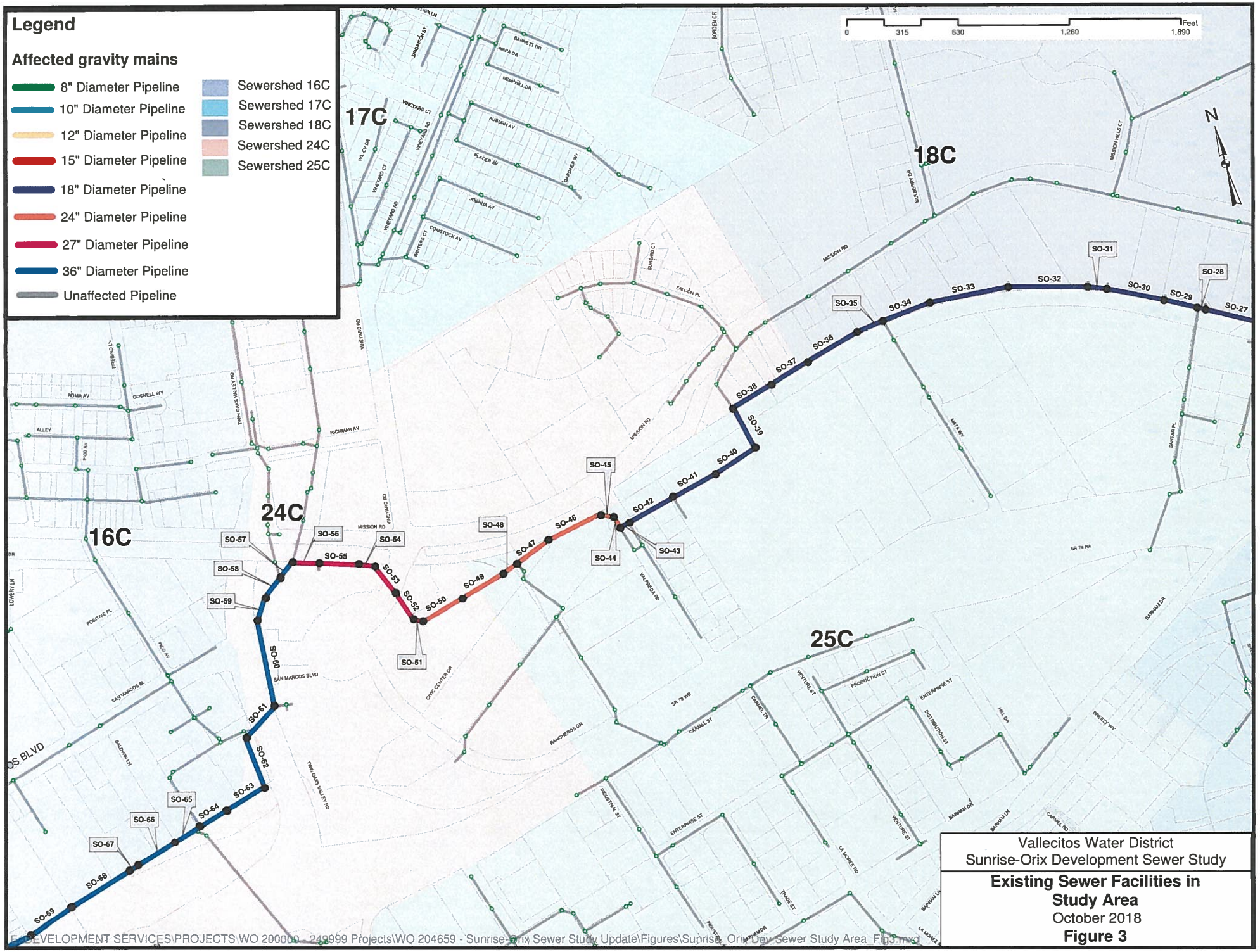

Vallecitos Water District
Sunrise-Orix Development Sewer Study

Existing Sewer Facilities in Study Area
October 2018
Figure 3

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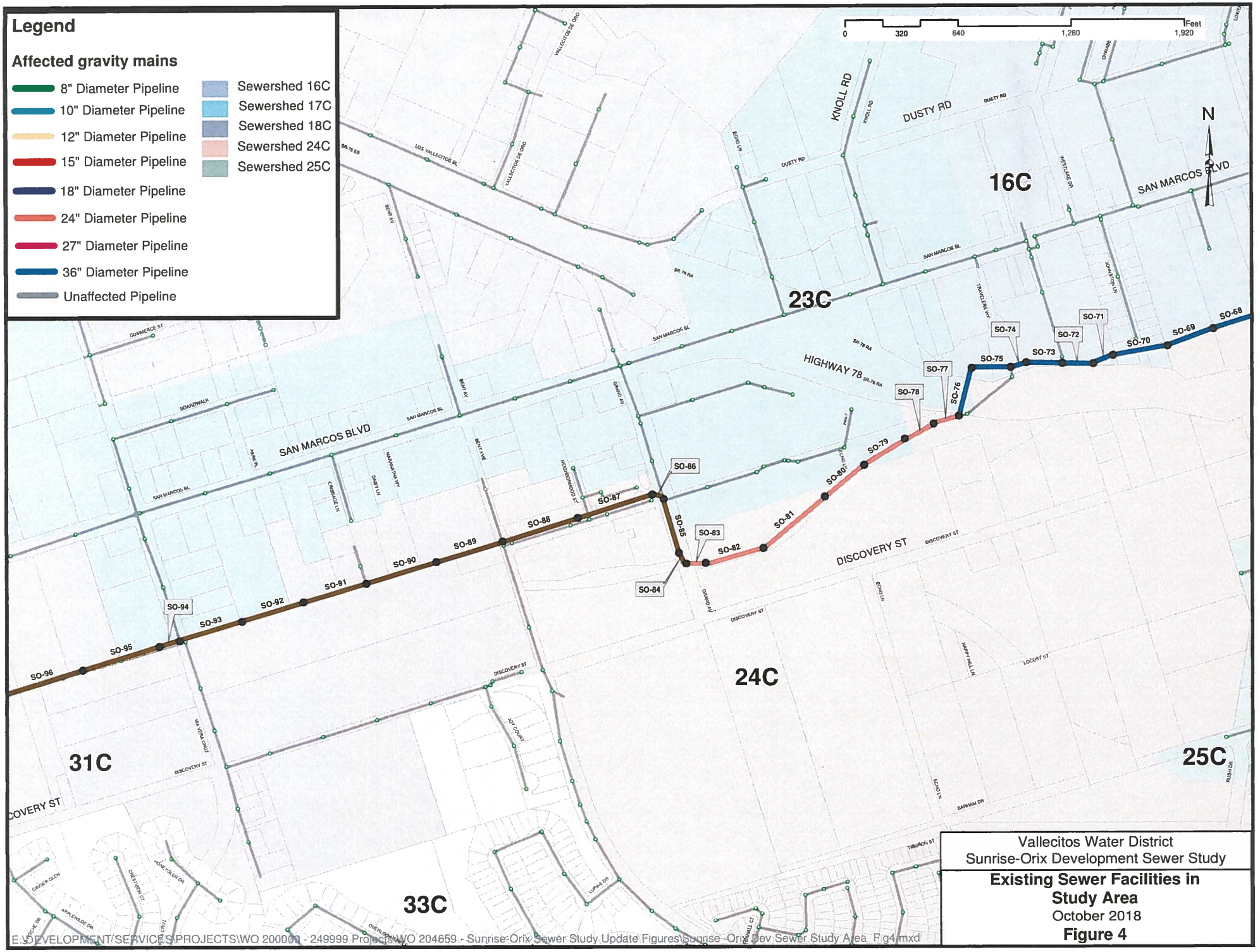

Vallecitos Water District
Sunrise-Orix Development Sewer Study

Existing Sewer Facilities in Study Area
October 2018
Figure 4

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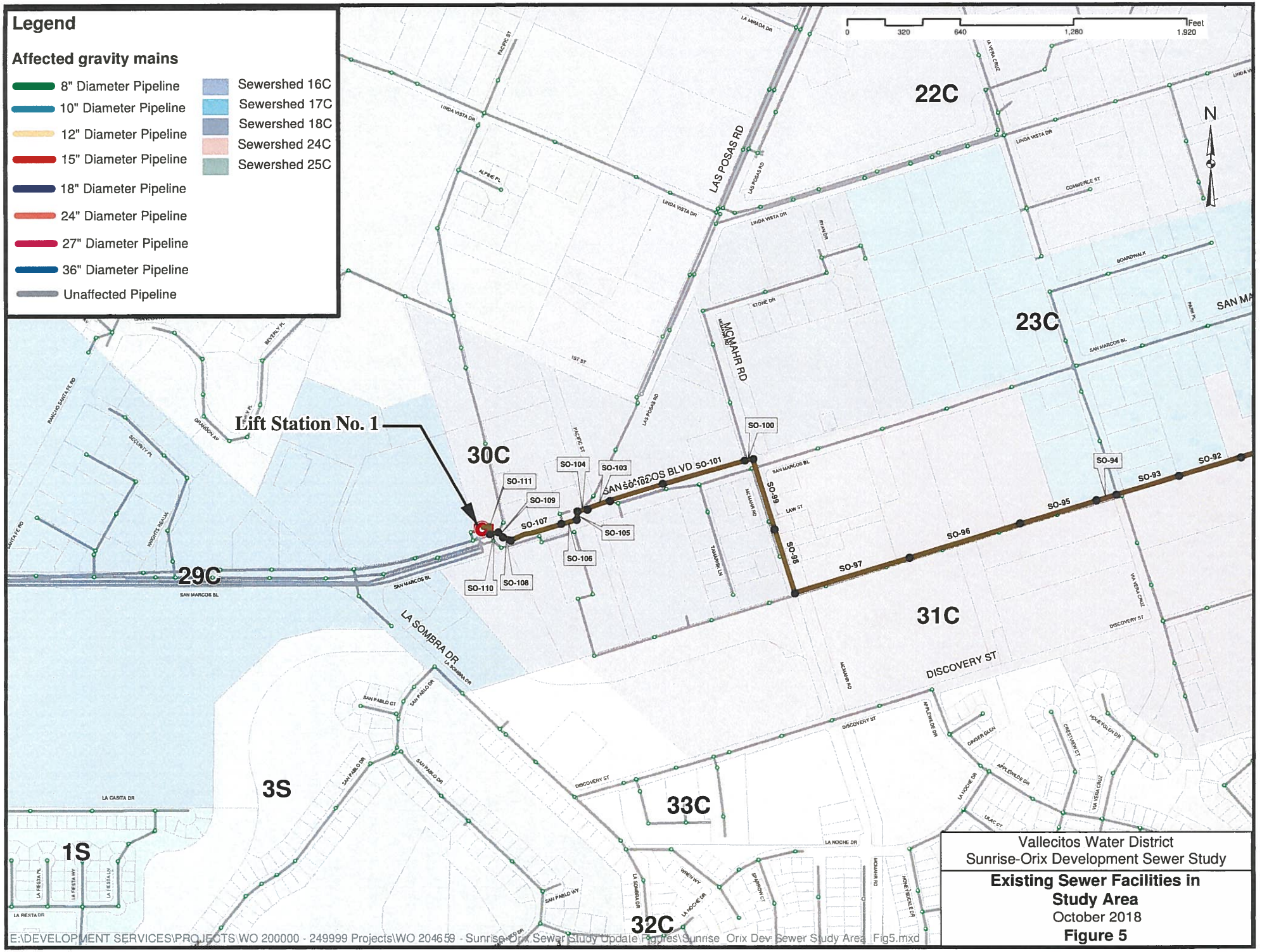

Vallecitos Water District
Sunrise-Orix Development Sewer Study

Existing Sewer Facilities in Study Area

October 2018

Figure 5

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Wastewater Collection System Analysis

The 2008 Master Plan outlines VWD's wastewater system design criteria which are as follows:

Wastewater Collection Infrastructure Criteria

The wastewater pipeline criteria to be met both within and downstream of the development are as follows:

- Pipes 12 inches in diameter and smaller: ½ full maximum at peak flow
- Pipes over 12 inches in diameter: ¾ full maximum at peak flow
- Minimum velocity: 2 feet per second
- Maximum velocity: 10 feet per second
- Manning's n for gravity pipes: .013
- Hazen-Williams C-factor for force mains/siphons: 120
- Slope for pipes 12 inches in diameter and smaller: 0.4% minimum
- Slope for pipes over 12 inches in diameter: to be determined by VWD

When flow depth in gravity pipes exceeds maximum levels as stated above, a pipe upsize will be specified.

Wastewater Model Scenarios

The following scenarios were modeled to identify system impacts that may be created by the proposed sewer generation, and to recommend any improvements required to provide service to the Project:

- Average Dry Weather Flow with existing flows at the Project site
- Average Dry Weather Flow with the proposed Project
- Peak Dry Weather Flow with existing flows at the Project
- Peak Dry Weather Flow with the proposed Project
- Peak Wet Weather Flow with existing flows at the Project site
- Peak Wet Weather Flow with the proposed Project

The peak dry weather curve is:

$$\text{Peak Dry Weather Factor} = 2.16 \times (\text{Average Dry Weather Flow Rate})^{-0.1618}$$

The wet weather peak curve is:

$$\text{Peak Wet Weather Factor} = 2.78 \times (\text{Average Dry Weather Flow Rate})^{-0.087}$$

Wastewater Model Results

Modeling focused not only on the sewer collection infrastructure in the direct vicinity of the Project, but also on all downstream infrastructure from the development to Lift Station No. 1 on San Marcos Boulevard that would be impacted by the additional flows (see Figures 1 through 5).

The Project proposes to construct approximately 900 feet of new 8-inch sewer main in Barham Drive from the Project property frontage to the proposed connection to VWD's existing 8-inch sewer main in Barham Drive near the Hwy 78 on-ramp west of Bennett Court.

Table 5 presents a summary of the modeling results from this analysis. The modeling results showed that the proposed Project resulted in deficiencies under peak wet weather flows during ultimate build-out conditions in pipe segment SO-3. This 430-foot pipe segment will require upsizing to 10-inches to meet VWD design criteria, as will the 45-foot segment of 8-inch pipeline immediately downstream.

Table 2 - Wastewater Model Results and Recommended Gravity Main Improvements

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project Development			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
SO-1	61	8	0.033	0	0.00			42	0.15		
SO-2	35	8	0.029	2	0.04			44	0.15		
SO-3	430	8	0.004	139	0.45			181	0.52	10	0.37
SO-4	45	8	0.049	139	0.23			181	0.27	10	0.2
SO-5	232	18	0.004	384	0.25			426	0.28		
SO-6	133	18	0.008	384	0.21			426	0.22		
SO-7	237	18	0.003	536	0.31			578	0.33		
SO-8	299	18	0.003	536	0.31			578	0.33		
SO-9	217	18	0.003	536	0.31			578	0.33		
SO-10	232	18	0.068	536	0.15			578	0.15		
SO-11	298	18	0.028	536	0.18			578	0.19		
SO-12	352	18	0.006	537	0.26			579	0.27		
SO-13	350	18	0.010	541	0.23			583	0.24		
SO-14	348	18	0.004	545	0.29			587	0.31		
SO-15	215	18	0.007	551	0.26			593	0.27		
SO-16	136	18	0.033	555	0.18			597	0.18		
SO-17	401	21	0.003	696	0.29			738	0.30		
SO-18	150	21	0.004	703	0.27			745	0.28		
SO-19	148	21	0.003	707	0.29			749	0.30		
SO-20	100	21	0.005	710	0.26			752	0.27		
SO-21	79	21	0.004	800	0.29			842	0.30		
SO-22	250	21	0.004	805	0.29			847	0.30		
SO-23	170	21	0.004	811	0.29			853	0.30		
SO-24	112	21	0.006	816	0.26			858	0.27		
SO-25	10	21	0.010	818	0.23			860	0.24		

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Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
SO-26	348	18	0.010	1964	0.46			2006	0.46		
SO-27	335	18	0.010	1972	0.46			2014	0.46		
SO-28	54	18	0.011	1977	0.44			2019	0.45		
SO-29	187	18	0.010	2024	0.46			2066	0.47		
SO-30	340	18	0.011	2028	0.45			2070	0.46		
SO-31	109	18	0.011	2035	0.45			2077	0.46		
SO-32	453	18	0.010	2041	0.46			2083	0.47		
SO-33	446	18	0.011	2051	0.45			2093	0.46		
SO-34	319	18	0.009	2057	0.48			2099	0.49		
SO-35	130	18	0.015	2067	0.42			2109	0.42		
SO-36	330	18	0.010	2071	0.47			2113	0.47		
SO-37	246	18	0.011	2075	0.46			2117	0.46		
SO-38	256	18	0.008	2081	0.50			2123	0.51		
SO-39	247	18	0.005	2346	0.62			2388	0.63		
SO-40	278	18	0.006	2349	0.59			2391	0.60		
SO-41	280	18	0.004	2355	0.68			2397	0.68		
SO-42	280	18	0.014	2393	0.46			2435	0.47		
SO-43	30	18	0.067	2393	0.31			2435	0.31		
SO-44	104	24	0.010	2393	0.34			2435	0.34		
SO-45	57	24	0.004	2393	0.43			2435	0.43		
SO-46	335	24	0.006	2393	0.38			2435	0.39		
SO-47	197	24	0.006	2399	0.38			2441	0.39		
SO-48	85	24	0.014	2467	0.31			2509	0.32		
SO-49	304	24	0.002	2470	0.53			2512	0.54		
SO-50	292	24	0.003	2474	0.47			2516	0.48		

Table 2 - Wastewater Model Results and Recommended Gravity Main Improvements

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project Development			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
SO-51	20	27	0.015	2474	0.26			2516	0.28		
SO-52	204	27	0.003	247	0.13			289	0.14		
SO-53	200	27	0.002	2518	0.45			2560	0.45		
SO-54	85	27	0.006	2519	0.33			2561	0.34		
SO-55	230	27	0.004	2520	0.37			2562	0.37		
SO-56	170	27	0.006	2532	0.33			2574	0.34		
SO-57	135	36	0.003	4415	0.36			4457	0.36		
SO-58	128	36	0.005	4415	0.31			4457	0.32		
SO-59	140	36	0.007	4415	0.29			4457	0.29		
SO-60	470	36	0.004	4395	0.33			4437	0.33		
SO-61	235	36	0.002	4395	0.40			4437	0.40		
SO-62	291	36	0.004	4395	0.33			4437	0.33		
SO-63	272	36	0.003	4395	0.36			4437	0.36		
SO-64	116	36	0.005	4395	0.31			4437	0.32		
SO-65	136	36	0.006	5745	0.34			5787	0.35		
SO-66	249	36	0.004	5745	0.38			5787	0.38		
SO-67	51	36	0.007	5745	0.33			5787	0.33		
SO-68	400	36	0.006	5745	0.34			5787	0.35		
SO-69	278	36	0.004	5745	0.38			5787	0.38		
SO-70	321	36	0.005	5745	0.36			5787	0.36		
SO-71	124	36	0.005	5745	0.36			5787	0.36		
SO-72	162	36	0.005	5745	0.36			5787	0.36		
SO-73	206	36	0.004	6354	0.40			6396	0.41		
SO-74	91	36	0.005	6354	0.38			6396	0.38		
SO-75	220	36	0.005	6354	0.38			6396	0.38		

Table 2 - Wastewater Model Results and Recommended Gravity Main Improvements

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project Development			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
SO-76	286	36	0.005	6354	0.38			6396	0.38		
SO-77	152	39	0.006	6379	0.33			6421	0.33		
SO-78	176	39	0.003	6379	0.39			6421	0.39		
SO-79	271	39	0.002	6379	0.44			6421	0.44		
SO-80	297	39	0.002	6379	0.44			6421	0.44		
SO-81	452	39	0.002	6379	0.44			6421	0.44		
SO-82	337	39	0.002	6379	0.44			6421	0.44		
SO-83	123	39	0.008	6419	0.30			6461	0.30		
SO-84	58	42	0.006	6419	0.30			6461	0.30		
SO-85	308	42	0.002	6419	0.39			6461	0.39		
SO-86	69	42	0.001	6419	0.47			6461	0.48		
SO-87	448	42	0.003	6419	0.35			6461	0.35		
SO-88	448	42	0.003	6419	0.35			6461	0.35		
SO-89	404	42	0.006	6963	0.31			7005	0.31		
SO-90	404	42	0.006	6966	0.31			7008	0.31		
SO-91	368	42	0.003	6966	0.37			7008	0.37		
SO-92	368	42	0.003	6966	0.37			7008	0.37		
SO-93	368	42	0.003	6966	0.37			7008	0.37		
SO-94	120	42	0.002	6966	0.41			7008	0.41		
SO-95	457	42	0.004	6966	0.34			7008	0.34		
SO-96	650	42	0.004	6966	0.34			7008	0.34		
SO-97	677	42	0.004	6966	0.34			7008	0.34		
SO-98	373	42	0.004	6966	0.34			7008	0.34		
SO-99	420	42	0.004	6966	0.34			7008	0.34		
SO-100	20	42	0.005	6966	0.32			7008	0.32		

Table 2 - Wastewater Model Results and Recommended Gravity Main Improvements

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project Development			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
SO-101	486	42	0.004	6966	0.34			7008	0.34		
SO-102	500	42	0.004	6966	0.34			7008	0.34		
SO-103	156	42	0.005	7305	0.33			7347	0.33		
SO-104	20	42	0.007	7305	0.30			7347	0.30		
SO-105	15	42	0.053	9815	0.21			9857	0.21		
SO-106	138	42	0.003	9815	0.44			9857	0.44		
SO-107	347	42	0.001	9815	0.61			9857	0.62		
SO-108	18	42	0.006	9815	0.37			9857	0.37		
SO-109	9	42	0.033	9815	0.24			9857	0.24		
SO-110	9	42	0.011	9906	0.32			9948	0.32		
SO-111	73	42	0.004	10530	0.43			10572	0.43		

CIP SP-25
CIP SP-2 (complete)
SP-11 & SP-12 (Active)

Wastewater Lift Station Analysis

Lift stations are sized for peak wet weather flow with manufacturer's recommended cycling times for pumping equipment. Since the proposed Project is not located in a sewer shed that is served by a lift station, there are no lift station upgrade requirements for this project.

Parallel Land Outfall Analysis

VWD's existing land outfall is shown in Figure 6. The outfall is approximately 8 miles in length and consists of 4 gravity pipeline sections and 3 siphon sections varying in diameter from 20 inches to 54 inches. VWD maintains the entire pipeline from Lift Station No. 1 to the Encina Water Pollution Control Facility (EWPCF). From Lift Station No. 1 to El Camino Real, VWD is the sole user of this pipeline. From El Camino Real to the EWPCF, the ownership capacity is as shown in Table 3 below:

Table 3 – Land Outfall Capacity Ownership by Agency

Agency	Ownership Percentage	Capacity (MGD)
Carlsbad	23.98%	5.00
Vista	17.99%	3.75
VWD	58.03%	12.10
Totals	**100.00%**	**20.85**

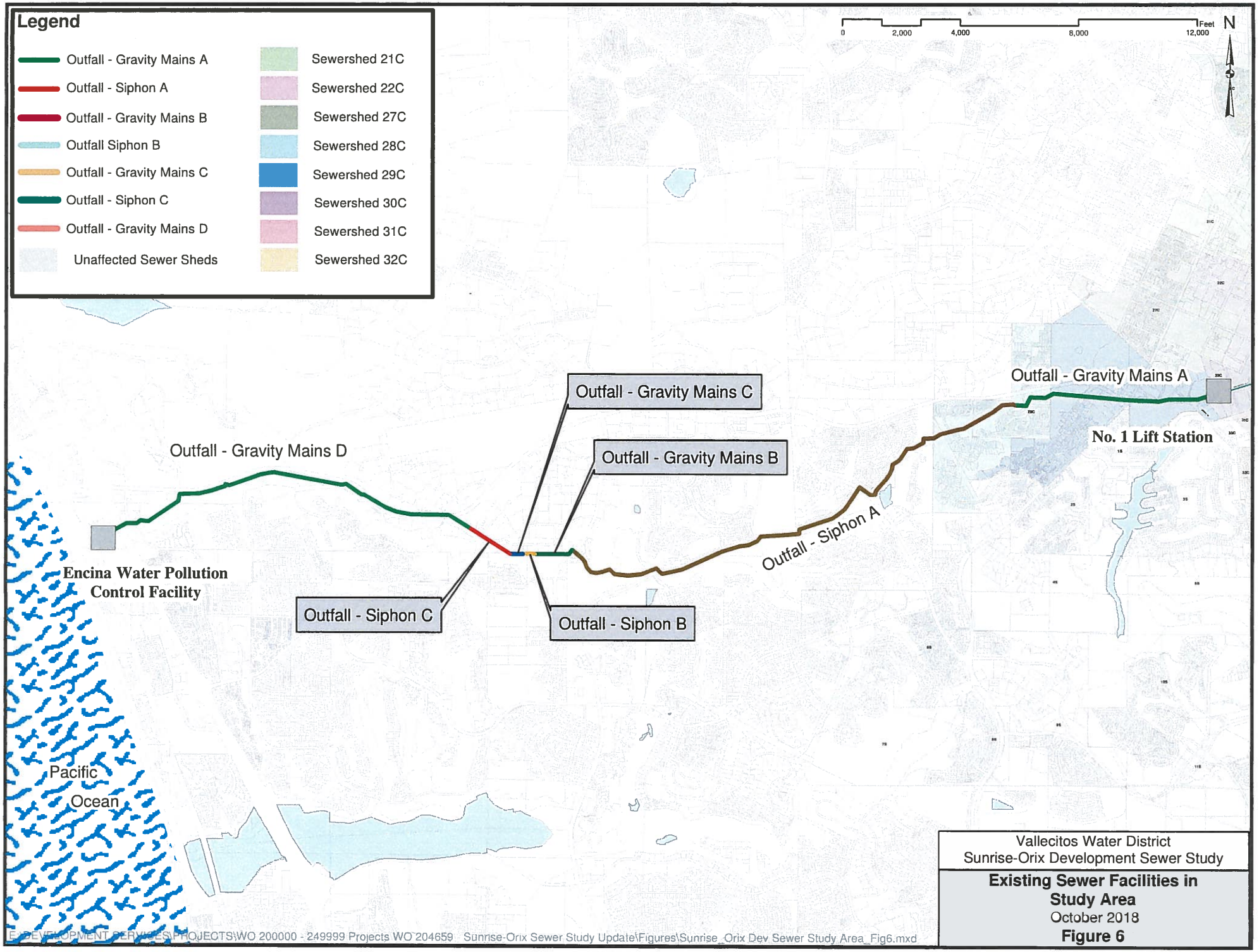
The Meadowlark Water Reclamation Facility (MRF) has a capacity of 5.0 MGD with a peak wet weather capacity of 8.0 MGD. Therefore, VWD has a combined peak wet weather wastewater collection capacity of 20.10 MGD (12.10 MGD + 8.0 MGD).

VWD's 2014 average daily wastewater flow was 7.2 MGD. This corresponds to a peak wet weather flow of 16.9 MGD, which falls within VWD's combined peak wet weather collection capacity.

The 2008 Master Plan estimated that, under approved land uses, VWD has an ultimate build-out average dry weather flow of 13.3 MGD. This corresponds to a peak wet weather flow of 29.5 MGD, which exceeds VWD's combined peak wet weather collection capacity. To accommodate additional wastewater flows from planned development, the 2008 Master Plan recommended conveyance of peak flows to the EWPCF through a parallel land outfall.

The Project proposes to generate an additional average wastewater flow of 17,232 gpd that was not accounted for in the Land Outfall's capacity studied in the 2008 Master Plan.

The analysis finds that outfall capacity is currently available to serve the Project's proposed wastewater generation. Wastewater Capital Facility Fees paid by this Project will be used toward design and construction of a parallel land outfall to be sized to accommodate ultimate build-out wastewater flows.



Vallecitos Water District
Sunrise-Orix Development Sewer Study

Existing Sewer Facilities in Study Area
October 2018
Figure 6

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Wastewater Treatment Facility Analysis

VWD utilizes two wastewater treatment facilities to treat wastewater collected within its sewer service area.

- The Meadowlark Reclamation Facility (MRF) has liquids treatment capacity of up to 5.0 MGD with a peak wet weather capacity of 8.0 MGD. MRF does not have solids treatment capacity, and therefore all solids are treated at the Encina Water Pollution Control Facility (EWPCF).
- The EWPCF is located in the City of Carlsbad. This is a regional facility with treatment capacity of up to 40.51 MGD. VWD's current ownership capacity is noted below.

Solids Treatment Capacity
VWD currently owns 10.47 MGD of solids treatment capacity at EWPCF. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in a projected solids treatment capacity deficiency of 2.83 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate solids treatment capacity exists at this time to serve the Project.

Liquids Treatment Capacity
VWD currently owns 7.67 MGD of liquids treatment capacity at the EWPCF in addition to the liquids treatment capacity of 5.0 MGD at MRF for a total of 12.67 MGD of liquids treatment capacity. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in a projected liquids treatment capacity deficiency of 0.63 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate liquids treatment capacity exists at this time to serve the Project.

Ocean Disposal Capacity
VWD currently owns 10.47 MGD of ocean disposal capacity at the EWPCF. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in an ocean disposal deficiency of 2.83 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate ocean disposal capacity exists at this time to serve the Project.

The District has determined that adequate wastewater treatment and disposal capacity exists for the proposed Project at this time subject to the qualifications referenced in the Conclusions and Conditions.

CONCLUSIONS AND CONDITIONS

The proposed Sunrise-Orix Development is expected to increase wastewater flow over the ultimate flows projected in the 2008 Master Plan by 17,232 gpd. As a result of these additional wastewater flows, the Project will have the following impacts:

- An increase in solids handling, liquids handling and ocean disposal needs at the Encina Water Pollution Control Facility of 17,232 gpd.

The following items are required as conditions of providing service to the proposed Project:

- Annexation of APN 228-312-10 into both VWD's water and sewer service boundaries prior to service being provided. Water service to be provided by Rincon Del Diablo Municipal Water District.
- Payment of all applicable Wastewater Capital Facility fees in affect at the time service is committed in accordance with District rules and regulations.
- Construction and acceptance of all wastewater facilities required for service to the Project including, but not limited to, the following:
    - All private on-site sewer facilities.
    - All off-site wastewater facility improvements connecting the Project site to the existing 8-inch sewer main in Barham Drive consisting of approximately 900 feet of new 8-inch diameter sewer main in Barham Drive.
    - All off-site wastewater facility improvements identified in Table 5 consisting of approximately 475 feet of 8-inch diameter sewer main crossing State Highway 78 that must be upsized to 10-inch diameter pipe (SO-3 and SO-4).

The District currently has sewer capacity available to serve the Project as proposed. However, the ability to provide sewer service in the future depends upon ultimate build-out of the Project and could change depending upon the timing of the build-out, as well as annexations and build-outs of other development projects, the District's treatment capacity at the EWPCF and other factors affecting growth in the District which may change over time.

This Study is based on the current adopted land use utilized in VWD's 2008 Master Plan. The study addresses the incremental facility impacts of this Project only and does not include or consider any additional projects within VWD's service area that have deviated from adopted Master Plan land uses. Any land use changes upstream and/or downstream of the Study area may necessitate a revision of any onsite and offsite studies. VWD shall determine if and when revisions to the Study are necessary. Costs for revising this Study shall be borne by the Developer.