

Appendix L

Sewer System Analysis

**BOARD OF DIRECTORS**

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June 11, 2025

Fairbrook Communities LLC
James Walters
18100 Von Karman Avenue, Suite 870

SUBJECT: Planning (Studies) Approval
Dexter Village (SEWER STUDY)
APPLICATION NO. 2024-00701-PC

Dear James Walters,
Elsinore Valley Municipal Water District (District) has reviewed the subject document(s) for the project and determined that the document(s) comply(ies) with the District's Standards and Specifications. The documents were approved on 6/11/2025 12:00:00 AM and are valid for 2 years from the date of approval.

All approved/recorded documents to the project may be downloaded through the online portal such as, but not limited to, plans, studies, easements, water rights grant deed, state regional board, etc.

The following conditions are applicable to the project:

The next step in the development process shall be to submit the Plan Check Application through the online portal.

If you have any questions, please contact the Engineering Department at (951) 674-3146 Ext. 6705, engservices@evmwd.net.

Respectfully,

Engineering Department
Elsinore Valley Municipal Water District
31315 Chaney Street, Lake Elsinore, CA 92530



ACCEPTED

By Julianna Zaleski at 06-11-2025 13:28:36

Approved as Noted

SEWER SYSTEM ANALYSIS

DEXTER VILLAGE

APPLICATION # 2024-00701-PC

JUNE 2025

PREPARED FOR:

FAIRBROOK COMMUNITIES LLC

18100 VON KARMAN AVENUE, SUITE 870

IRVINE, CA 92612

PREPARED BY:

PROACTIVE ENGINEERING CONSULTANTS

200 SOUTH MAIN STREET

CORONA, CA 92882



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ATTACHMENT F COPY OF EVMWD MASTER PLAN EXISTING LIFT STATION CAPACITY

Chapter 1 - Introduction

Introduction

This report provides a sewer system analysis for the Dexter Village project in the Elsinore Valley Municipal Water District (EVMWD or District). This report will provide information concerning projected sewer flow generation, existing facilities, and recommended facilities associated with serving the project.

Project Overview

The project is located northeast of the I-15 freeway and is bound by 3rd Street on the northwest, Dexter Avenue on the southeast, and 2nd Street on the southeast. The current site is undeveloped land. The proposed project consists of two separate development areas with one on the east side and one on the west side. The west side, development area 1, consists of 7 residential apartment buildings with 230 individual dwelling units, and a recreational clubhouse. The total area for Development Area 1 is 6.65 acres and shall be calculated as High Density Residential. The east side, development area 2, consists of 137 single-family dwelling units, 90 multi-family dwelling unit townhouses, and a recreational clubhouse. The recreational clubhouse in development area 2 is 0.46 acres classified as high-density residential. **Attachment A** depicts the project location and **Attachment B** is the preliminary site plan for the project.

Purpose of Study

The project is located within the Elsinore Valley Municipal Water District for sewer service. The purpose of this report is to establish the sewer facilities that will be required for the development of the project.

Chapter 2 – Design Criteria

This section represents the design criteria used to evaluate recommended sewer system improvements for the project. The criteria utilized in this study are in accordance with the District's 2023 Design Standards.

Wastewater Flow Factors

Table 2-1 presents the wastewater flow factors (WFF) used for projecting sewer generation for the project.

Table 2-1 Wastewater Flow Factors

Land Use Category	WFF (gpd/unit)	Unit
Single Family Residential	250	Dwelling Units (DU)
Condominium/Townhome Residential	150	DU
Business Park	500	acre
General Commercial	1,400	acre
Limited Industrial	500	acre
Open Space - Recreation	100	acre
Public Institutional	500	acre
Hillside Residential	500	acre
Very Low Density Residential (0.1 – 0.5 DU/acre)	300	acre
Low Density Residential (0.5-2 DU/acre)	600	acre
Low Medium Density Residential (2-4 DU/acre)	900	acre
Medium Density Residential (4-6 DU/acre)	1,000	acre
Medium High Density Residential (6-12 DU/acre)	1,100	acre
High Density Residential (12-24 DU/acre)	2,100	acre
Mixed Use (24 DU/acre maximum)	8,400	acre

Design Criteria

Table 2-2 presents the design criteria used for sizing of EVMWD facilities for the project.

Table 2-2 Design Criteria		
Description	Value	Units
Peaking Factor		
Peak Dry Weather Flow (PDWF) for Collector Sewer (< 18-inch diameter)	3.0 of Average Dry Weather Flow (ADWF)	gpd
Peak Dry Weather Flow (PDWF) for Trunk Sewer (\geq 18-inch diameter)	2.5 of ADWF	gpd
Coefficient of Pipe Friction		
Manning "n" value	0.013	unitless
Hazen-William's "C" factor	120	unitless
Pipeline Velocity		
Minimum velocity for ADWF	2	fps
Maximum velocity for ADWF	10	fps
Flow Depth Ratio (d/D)		
Proposed sewers that are less than 18 inches in diameter for PDWF	0.50	unitless
Proposed sewers that are greater than or equal to 18 inches in diameter for PDWF	0.75	unitless
Existing sewers under PDWF	0.75	unitless
Existing sewers under PWWF	0.92	unitless
Manhole Friction Head Loss		
Average manhole friction head losses	0.1	feet
Peak manhole friction head losses	0.5	feet
Lift Stations and Force Mains		
ADWF (existing conditions) minimum velocity	3.0	fps
Hazen-William's "C" factor	120	unitless
Lift Station Peaking Factor	3.0 of Average Dry Weather Flow (ADWF)	gpd
Minimum force main velocity with all pumps running	4	fps
Minimum force main velocity during normal operations	2.5	fps
Maximum force main velocity	7	fps

Chapter 3 – Projected Wastewater Flow

This chapter provides the projected wastewater flows and lift station pumping capacity requirements for the project based on the criteria presented in Chapter 2.

Projected Wastewater Flow

Table 3-1 presents the projected wastewater flow factor (WFD) for ADWF and PDWF.

Table 3-1 Projected Wasterwater Flows						
Description/Land Use ¹	Area (Acres) or Quantity (DU)	EDU	WFD (gpd/unit)	Unit	ADWF (gpd)	PDWF (gpd)
DA 1 MFD/High Density	6.65	56	2,100	Acres	13,965	41,895
DA 2 SFD	137	137	250	DU	34,250	102,750
DA 2 Townhomes	84	25	150	DU	12,600	37,800
DA 2 Clubhouse (HD)	0.46	2	2,100	Acres	966	2,898
<hr/>						
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Total					61,781	185,343

Note 1. DA refers to Development Areas as Delineated in attachments.

Chapter 4 – Existing Wastewater Facilities

This chapter describes the existing wastewater facilities. **Attachment C** presents a map showing the boundaries of the project.

Existing Wastewater Facilities

There is currently an existing sewer main along 3rd Street that extends well north of the project site and continues south of the I-15 freeway. The sewer main is 15" in diameter for the segment fronting the proposed project and increases to 18" at the intersection of Dexter Avenue and 3rd Street, continuing as an 18" going down 3rd Street. There is an existing 8" stub at said intersection in the easterly direction of Dexter Avenue. There are no existing sewer facilities in Dexter Avenue between 3rd Street and 2nd Street. There are also no existing sewer facilities in 2nd Street along the project frontage.

Chapter 5 – Wastewater System Analysis

This chapter presents the recommended wastewater system improvements required to provide service to the project. An evaluation of distribution, storage, and pumping facilities is provided.

Hydraulic Modeling

The analysis of the wastewater system and node diagram is provided in **Attachment D**. The results of this analysis indicate that the maximum d/D is 0.39, under PDWF, which is below the maximum d/D criteria of 0.5. The velocities in this analysis range from 2.00 fps to 2.18 fps. The following analysis was conducted on the proposed gravity sewer mains.

1. Average Dry Weather Flow
2. Peak Dry Weather Flow

Wasterwater Analysis Summary

Table 5-1 summarizes the wastewater analysis results.

Table 5-1 Summary of Wastewater Analysis					
Description	Criteria Value	Units	Minimum Value	Maximum Value	Criteria Met (Yes/No)
Pipeline Velocity					
Minimum velocity	2	fps	2.00	N/A	Yes
Maximum velocity	10	fps	N/A	2.18	Yes
Flow Depth Ratio (d/D)					
Proposed sewers that are less than 18 inches in diameter for PDWF	0.50	unitless	0.04	0.39	Yes
Proposed sewers that are greater than or equal to 18 inches in diameter for PDWF	0.75	unitless	N/A	N/A	

Velocity

All velocities of the proposed sewer system at outflow connections to the mainline in Dexter Avenue fall below the maximum of 10 fps and meet the minimum design criteria of 2 fps. As shown in **attachment D node diagram and Table 1**, the minimum velocity calculated in Development Area 2 is 2.00 fps with a calculated maximum velocity of 2.18 fps. To achieve the minimum velocity on the upstream portions of the sewer run, the pipe slopes were increased while pipe slopes were slightly flattened on the downstream portion of the run. The proposed 8" mainline in Dexter Avenue meets min/max velocity requirements, as shown in **Attachment D “Offsite Backbone” Table**.

Flow Depth Ratio

All flow depth ratios (d/D) fall below the maximum d/D ratio of 0.5 during the peak dry weather flow, as shown in **Attachment D, Tables 1-3**. The maximum d/D ratio calculated on this project is 0.39.

Lift Station Capacity Evaluation

The project flows discharge directly to the Regional Waste-Water Treatment Plant. No lift station analysis is required.

Table 5-2 summarizes the lift station capacity evaluation.

Table 5-2 Lift Station Capacity Evaluation				
Lift Station	Existing Pumping Surplus ¹ [A] (gpm)	Required Pumping Capacity [B] (gpm)	Available Pumping Capacity [A – B] (gpm)	Deficient (Yes/No)
N/A	N/A	N/A	N/A	N/A

Note 1. Existing capacity surplus from Master Plan attached in Attachments F.

Chapter 6 - Recommended Wastewater Facilities

This chapter presents the recommended wastewater system improvements required to provide service to the project. **Attachment E** presents the proposed wastewater facilities to be constructed for the project.

Wastewater System Improvements

All proposed public sewer lines within the project area (in-tract) are to be 8-inch. The proposed offsite sewer line in Dexter Avenue, between 3rd Street and 2nd Street shall be 8-inch. Proposed private sewer lines in Development Area 1 (in-tract) are to be 8-inch. All in-tract private sewer laterals in Development Area 1, and those located in alleys within Development Area 2, are to be 6-inch.

Lift Station Improvements

The project flows discharge directly to the Regional Waste-Water Treatment Plant. No lift station improvements are proposed.

ATTACHMENT A

LOCATION MAP



LOCATION MAP

SCALE: 1"=1000'

FIGURE 1

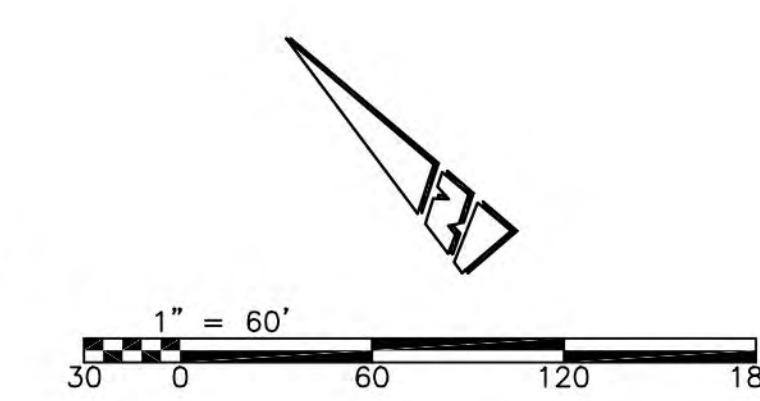
ATTACHMENT B

SITE PLAN



LAND USE AREAS:

- DEVELOPMENT AREA 1 BOUNDARY
- DEVELOPMENT AREA 2 BOUNDARY
- SINGLE FAMILY RESIDENTIAL
- MULTIFAMILY RESIDENTIAL (HIGH DENSITY)
- SINGLE FAMILY TOWNHOMES
- CLUBHOUSE/RECREATIONAL



DEXTER VILLAGE SITE PLAN

ATTACHMENT C
EXISTING WASTEWATER FACILITY MAP



LEGEND

— — — — — R/W
— — — — — EXISTING SEWER MAIN

LAND USE AREAS:

A scale bar diagram. At the top, the text "1'' = 60'" is written above a horizontal line. Below this line is a shorter horizontal line with a black and white checkered pattern. The number "30" is at the far left, followed by a small black square containing the number "0". To the right of the checkered pattern, the numbers "60", "120", and "180" are placed at regular intervals along the line.

DEXTER VILLAGE EXISTING SEWER FACILITIES

PROACTIVE

ENGINEERING CONSULTANTS

200 South Main Street, Suite 300
Corona, CA 92882 (951) 280-3300

ATTACHMENT D

HYDRAULIC MODEL ANALYSIS AND NODE/PIPE DIAGRAM

Hydraulic

SEGMENT	Dexter Village - Sewer Capacity Calculations SFD & Townhome Site (Development Area 2)																								
	A1.1	A1.2	A1.3	A1.4	A2.1	A2.2	A2.3	A2.4	A3.1	A3.2	A3.3	A3.4	A3.5	A4.1	A4.2	A4.3	A4.4	A5.1	A5.2	A5.3	A6.1	A6.2	A6.3	A6.4	8
Lot No. / PA																									
Land Use	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	SFD	
Duty Factor (gpd/DU)	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
Units	9	18	26	35	43	52	61	69	70	80	81	81	81	89	89	97	105	8	8	8	16	16	24	32	137
Duty Factor (gpd/DU)																									
Units																									
Lot No. / PA																									
Land Use																									
Duty Factor (gpd/DU)																									
Units																									
Duty Factor (gpd/acre)																									
Units																									
Reach Area Flow (gpd)	2,250	4,500	6,500	8,750	10,750	13,000	15,250	17,250	17,500	20,000	20,250	20,250	22,350	24,350	26,450	28,450	32,550	2,000	2,000	4,100	6,100	8,200	10,200	15,266	47,816
Total Flow at Node (gpd)	2250	4500	6500	8750	10750	13000	15250	17250	17500	20000	20250	20250	22350	24350	26450	28450	32550	2000	2000	4100	6100	8200	10200	15266	47816
Peaking Factor	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Peak Wastewater Flow (mgd)	0.0068	0.0135	0.0195	0.0263	0.0323	0.0390	0.0458	0.0518	0.0525	0.0600	0.0608	0.0608	0.0671	0.0731	0.0794	0.0854	0.0977	0.0060	0.0060	0.0123	0.0183	0.0246	0.0306	0.0458	0.1434
Diameter (inches)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
Diameter (inches)	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	
Slope	0.0150	0.0340	0.0250	0.0190	0.0160	0.0135	0.0120	0.0110	0.0100	0.0100	0.0100	0.0090	0.0080	0.0080	0.0070	0.0070	0.0070	0.0150	0.0150	0.0360	0.0260	0.0200	0.0170	0.0120	0.0050
$k=Q_n/(d^{2.67})s^{0.5}$	0.0033	0.0043	0.0073	0.0113	0.0151	0.0199	0.0248	0.0293	0.0297	0.0356	0.0361	0.0361	0.0420	0.0485	0.0527	0.0606	0.0693	0.0029	0.0014	0.0038	0.0067	0.0103	0.0139	0.0248	0.1205
D/d	0.06	0.07	0.09	0.11	0.12	0.14	0.16	0.17	0.17	0.19	0.19	0.19	0.20	0.22	0.23	0.24	0.26	0.06	0.04	0.06	0.08	0.10	0.12	0.16	0.35
Ca	0.0192	0.0234	0.0336	0.0456	0.0559	0.0678	0.0791	0.0889	0.0898	0.1020	0.1029	0.1029	0.1144	0.1268	0.1346	0.1486	0.1635	0.0176	0.0104	0.0214	0.0317	0.0428	0.0527	0.0791	0.2431
Area=Ca(d)^2	0.0085	0.0104	0.0149	0.0203	0.0248	0.0301	0.0351	0.0395	0.0399	0.0453	0.0457	0.0457	0.0509	0.0564	0.0598	0.0660	0.0727	0.0078	0.0046	0.0095	0.0141	0.0190	0.0234	0.0352	0.1080
Velocity=Q/Area (ft/s)	1.23	2.01	2.02	2.00	2.01	2.00	2.01	2.03	2.03	2.05	2.06	2.06	2.04	2.01	2.05	2.00	2.08	1.19	2.00	2.00	2.01	2.00	2.02	2.01	2.05

Dexter Village - Sewer Capacity Calculations					
Offsite Sewer					
SEGMENT	9	10	11	12	13
Lot No. / PA					
Land Use	SFD/TH	SFD/TH	SFD/TH	SFD/TH	SFD/TH
Duty Factor (gpd/DU)	250	250	250	250	250
Units	137	137	137	137	137
Duty Factor (gpd/DU)	150	150	150	150	150
Units	84	84	84	84	84
Lot No. / PA					
Land Use				MFD	MFD
Duty Factor (gpd/acres)				2100	2100
Acres				4.91	4.91
Duty Factor (gpd/acres)					
Acres					
Lot No. / PA					
Land Use	Clubhouse	Clubhouse	Clubhouse	Clubhouse	Clubhouse
Duty Factor (gpd/DU)					
Units					
Duty Factor (gpd/acres)	2100	2100	2100	2100	2100
Acres	0.46	0.46	0.46	1.13	1.13
Reach Area Flow (gpd)	47,816	47,816	47,816	59,534	59,534
Total Flow at Node (gpd)	47816	47816	47816	59534	59534
Peaking Factor	3.00	3.00	3.00	3.00	3.00
Peak Wastewater Flow (mgd)	0.1434	0.1434	0.1434	0.1786	0.1786
Diameter (inches)	8	8	8	8	8
Diameter (feet)	0.67	0.67	0.67	0.67	0.67
Slope	0.0050	0.0050	0.0050	0.0050	0.0050
$k' = Q_n / (d^{2.67})s^{0.5}$	0.1205	0.1205	0.1205	0.1500	0.1500
D/d	0.35	0.35	0.35	0.39	0.39
Ca	0.2431	0.2431	0.2431	0.2850	0.2850
Area=Ca(d)^2	0.1080	0.1080	0.1080	0.1267	0.1267
Velocity=Q/Area (ft/s)	2.05	2.05	2.05	2.18	2.18

Sewer Capacity Calculations

DEVELOPMENT AREA 2

SEGMENT	DIAMETER (IN)	SLOPE	D/d	VELOCITY (FT/S)
A1.1	8	0.0148	0.06	1.23
A1.2	8	0.0148	0.08	2.01
A1.3	8	0.0148	0.10	2.02
A1.4	8	0.0148	0.11	2.00
A2.1	8	0.0148	0.13	2.01
A2.2	8	0.0148	0.14	2.00
A2.3	8	0.0148	0.15	2.01
A2.4	8	0.0148	0.16	2.03
A3.1	8	0.0050	0.21	2.03
A3.2	8	0.0050	0.22	2.05
A3.3	8	0.0050	0.22	2.06
A3.4	8	0.0050	0.22	2.06
A3.5	8	0.0050	0.24	2.04
A4.1	8	0.0050	0.25	2.01
A4.2	8	0.0050	0.26	2.05
A4.3	8	0.0050	0.27	2.00
A4.4	8	0.0050	0.28	2.08
A5.1	8	0.0240	0.05	1.03
A5.2	8	0.0280	0.05	2.00
A5.3	8	0.0280	0.07	2.00
A6.1	8	0.0280	0.08	2.01
A6.2	8	0.0280	0.10	2.00
A6.3	8	0.0280	0.11	2.02
A6.4	8	0.0280	0.13	2.01
8	8	0.0068	0.32	2.05

Less than 10 EDU
S=1.5%

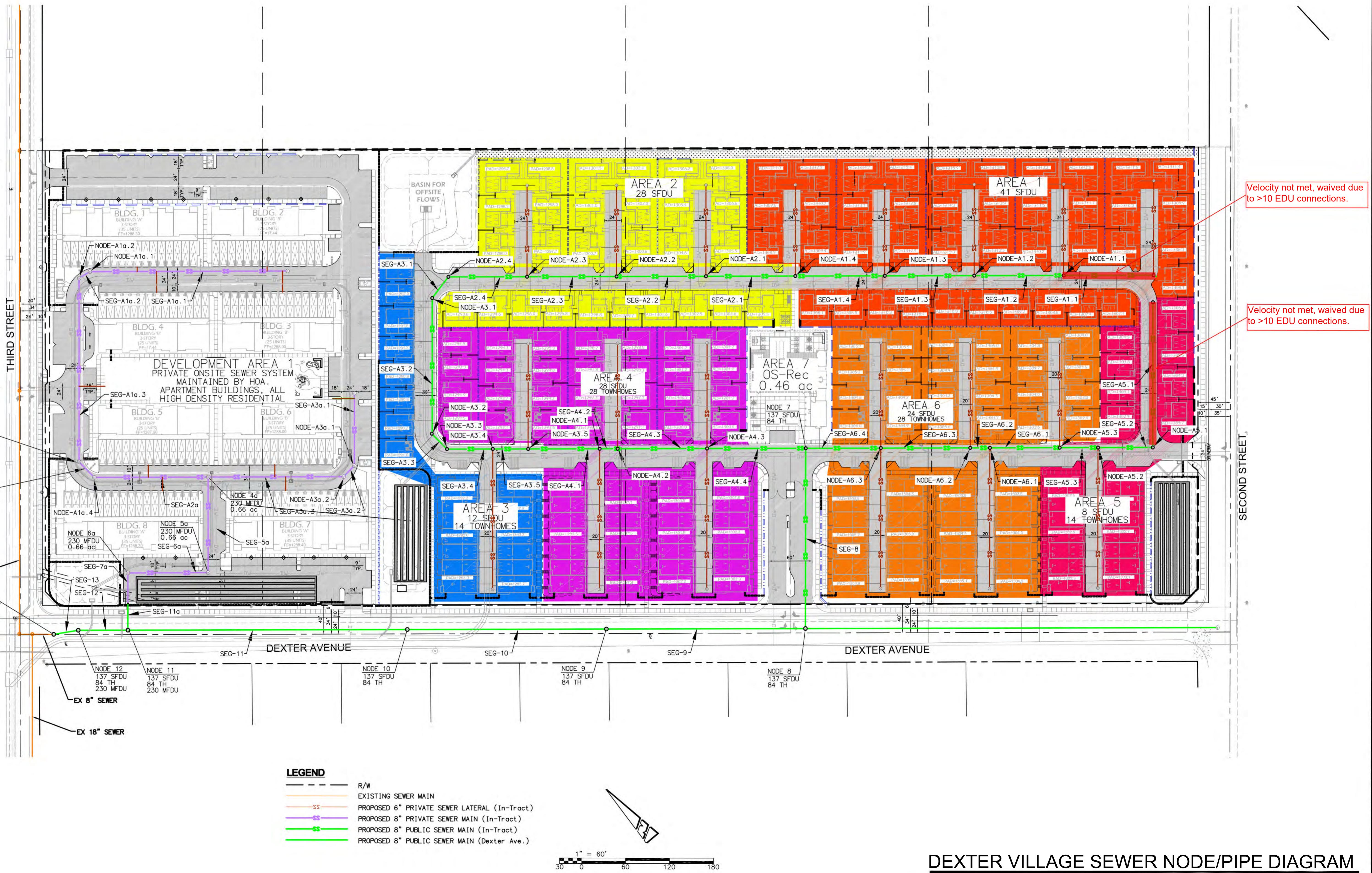
Less than 10 EDU
S=1.5%

DEVELOPMENT AREA 1

Development Area 1 in-tract sewer facilities will be private and maintained by the HOA. The private system will connect just inside the right-of-way to a cleanout and 8" sewer lateral. The 8" EVMWD maintained public sewer lateral is shown as segment 11a in the Offsite table.

OFFSITE (BACKBONE)

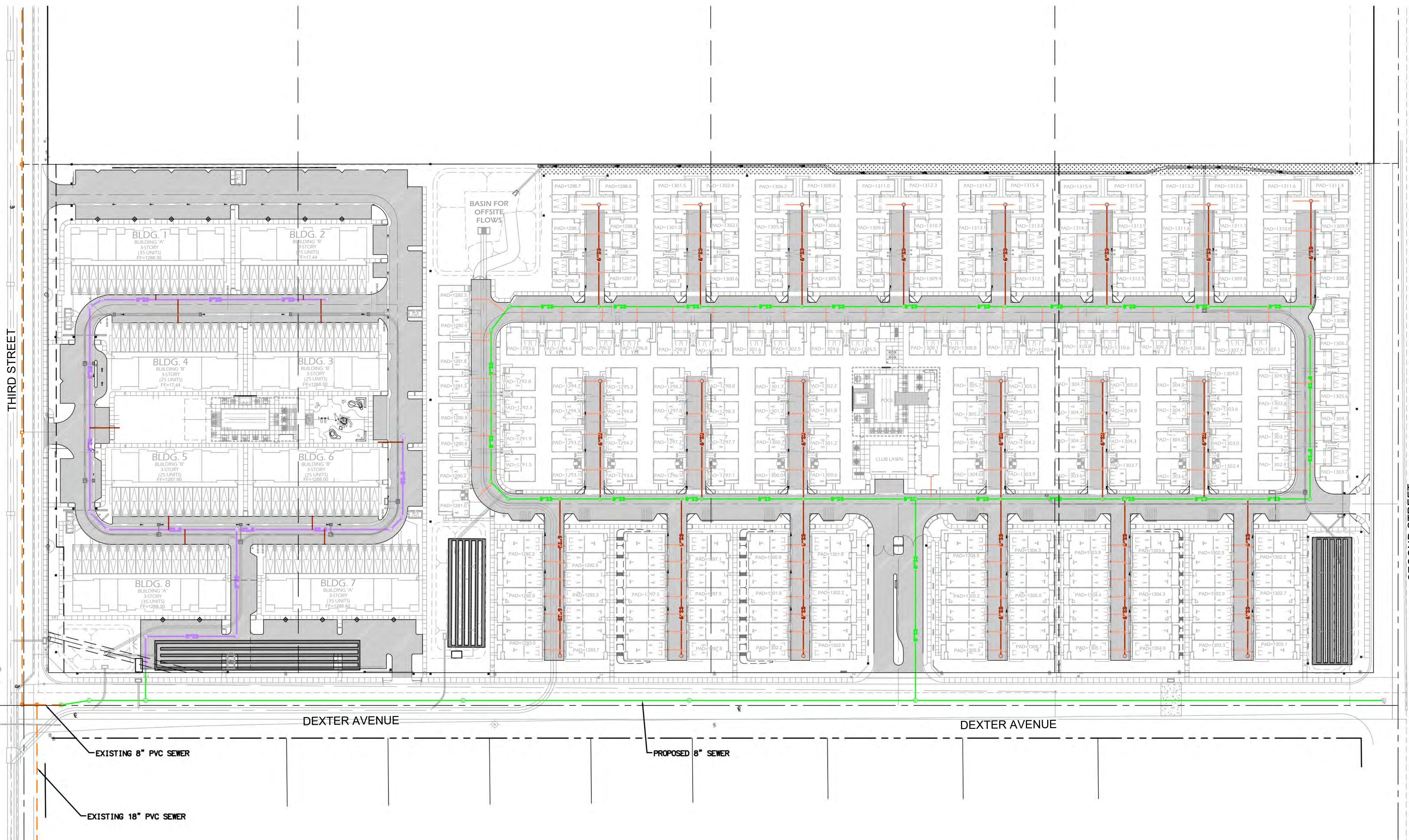
SEGMENT	DIAMETER (IN)	SLOPE	D/d	VELOCITY (FT/S)
9	8	0.0050	0.35	2.05
10	8	0.0050	0.35	2.05
11	8	0.0050	0.35	2.05
11a	8	0.0128	0.15	2.01
12	8	0.0050	0.39	2.20
13	8	0.0050	0.39	2.18



DEXTER VILLAGE SEWER NODE/PIPE DIAGRAM

PROACTIVE ENGINEERING CONSULTANTS

ATTACHMENT E
PROPOSED WASTEWATER FACILITY MAP



DEXTER VILLAGE PROPOSED SEWER FACILITIES

PROACTIVE
ENGINEERING CONSULTANTS
200 South Main Street, Suite 300
Corona, CA 92882 (951) 280-3300

ATTACHMENT F
COPY OF EVMWD MASTER PLAN EXISTING LIFT STATION CAPACITY

Table 0.1 Lift Station and Force Main Evaluation

Lift Station Name	Number of Pumps	PDWF (gpm)	PWWF (gpm)	Firm Capacity (gpm)	Surplus/Deficit ⁽¹⁾	Force Main Deficient?
A-1	2	3	35	255	220	No
A-2	3	1,390	3,857	2,400	-1,457	Yes
A-3	2	186	579	1,125	546	No
A-4	2	428	1,359	1,780	421	No
A-5	2	21	85	N/A	N/A	No
Alberhill	2	30	49	N/A	N/A	No
B-1	3	2,684	3,648	2,800	-848	No
B-2	3	1,970	3,369	2,400	-969	Yes
B-3	2	353	1,351	1,400	49	No
B-4	2	238	1,003	1,200	197	No
B-5	2	94	621	1,000	379	No
B-6	2	97	577	1,000	423	No
B-7	2	103	452	650	198	No
B-8	2	91	448	650	202	No
B-9	2	58	432	350	-82	No
B-10	3	42	293	350	57	No
Backbasin	2	0	0	N/A	N/A	No
Big Range	2	61	177	335	158	No
Bolo	2	63	173	200	27	No
Canyon Hills	2	127	371	N/A	N/A	No
Collier	2	40	147	800	653	No
Continental	3	551	607	2,100	1,493	No
Gray Fox	3	385	629	1,396	767	No
Greer Ranch	2	131	303	350	47	No
Horsethief	2	62	108	200	92	No
Lighthouse	3	187	416	1,500	1,084	No