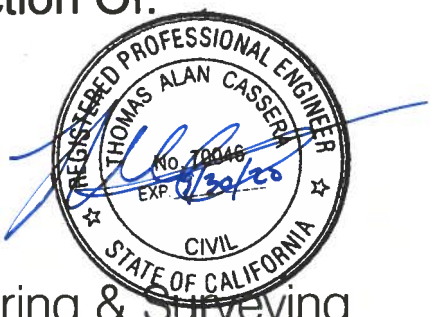
APPENDIX J.3

Level 2 Sewer Study

THE RANCH
LEVEL 2 SEWER STUDY

1st Submittal: September 2018
2nd Submittal: February 2019
3rd Submittal: March 2019
4th Submittal: June 2019
5th Submittal: July 2019

Prepared Under The Direction Of:



cta Engineering & Surveying
Civil Engineering ■ Land Surveying ■ Land Planning

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The purpose of this Level 2 Sewer Study is to identify trunk main sewer facilities for proposed "The Ranch" Special Planning Area project. This study will demonstrate the ability of the proposed gravity sewers to serve The Ranch (Project) and offsite areas from the east.

The Project SPA encompasses 530.06 acres in the City of Rancho Cordova. The Project is situated at eastern terminus of Chrysanthy Blvd. on the easterly side of Rancho Cordova Parkway, and approximately one half mile to the south of Douglas Blvd.. The proposed SPA development consists of mixed land uses and densities. There are proposed lots of low and medium density residential, multi-family, private and public parks, private recreation center, private and public landscape lots, open spaces, public protected areas, and water quality/detention basins. Protected areas and a portion of roadway adjacent to protected areas, not subject to future development, account for 229.16 acres of the gross project area. The net developable area is 300.9 acres. The project is planned to be constructed in several phases.

Proposed sewer system improvements will serve the Project needs, as well as the proposed Arista Del Sol and Cordova Hills Phase 1 to the east. Development of the Project will result in 1,967.6 ESDs resulting in PWWF of 1.613 mgd. The upstream project to the east, Arista Del Sol, is 137.2 acres. ADS will result in 899.1 ESD's and 0.697 mgd. An additional upstream project to the east is Cordova Hills, Phase 1 is approximately 342.0 acres. CHP1 will result in 3290 ESD's and 2.50 mgd (per Cordova Hills Pump Station and Force Main Design Report, Page 7-Table 2). Therefore, the total ESD's and PWWF are 6156.7 ESD's and 4.8101 mgd exiting the site at Rancho Cordova Parkway.

The proposed trunk main will exit into existing 24" sewer line stubbed at the intersection of Rancho Cordova Parkway and Chrysanthy Blvd.. The existing 24" sewer line discharges into Aerojet Interceptor 1B (36" trunk main) flowing westerly into SASD facility S-132 lift station. The SASD system capacity plan shows The Ranch will sewer to the west.

Interim facilities or pump station are not expected to be required for the proposed trunk main in Chrysanthy Boulevard or in-tract development for the Project SPA. However, SASD will require the Project SPA project provide appropriate upgrades to SASD facility S-132 lift station. The project scope and timing of S-132 lift station upgrades will be determined by SASD in the near future.

INTRODUCTION

Level of Study - The Project sewer study is a Level 2 report which focuses on the design of Major Trunk and sewer facilities serving The Ranch SPA and potential upstream sewer sheds.

Location - The Project is located in Rancho Cordova, east of Rancho Cordova Parkway, between Douglas Blvd., Kiefer Road, and Grant Line Road. See the Vicinity Map, Figure 1.

Topography – Lower Morrison Creek South traverses the Project, generally along a southwesterly flow path, joined by lesser tributary channels entering the site on the northern and eastern boundaries. Existing site topography is undulating, ranging from approximately 168.5 feet to 200 feet in elevation (NGVD 1929). Adjacent property to north and west are developed residential while the properties to the south and east are similar rolling agricultural land uses. Adjacent offsite area may drain into the natural channel network.

Project Description - The Project is a proposed residential subdivision consisting of 1,472 single family lots, commercial/multi-family (253 units), neighborhood park sites, and open space lots. Proposed site grading enables gravity sewer service throughout the project. The proposed in-tract collection system will discharge at a single point into off-site sewer in Rancho Cordova Parkway at the location shown on the Sewer Study Map.

Land Use and Zoning – The current land use is vacant, agricultural grazing land. The existing zoning is AG-80. Proposed zoning is Special Planning Area Current zoning consisting of General Plan uses (LDR, MDR, RMU, CMU, P/QP, P/OS, and NR). The gross project area is 530.06 acres; protected areas/adjacent roadway comprises of 229.16 acres.

DESIGN

Assumptions – The Project sewer study is premised upon the following assumptions:

- Property east of the project will sewer to the west through future Chrysanthy Blvd. Property south of the project will sewer to the south. Adjacent parcels north and west of The Ranch are already sewered or will remain as open space.
- There is adequate capacity in existing, downstream sewer facilities. Please see the copy of a September 17, 2018 e-mail from Yadira Lewis, included with the attachments, there is sufficient capacity in the Aerojet Interceptor under existing conditions. Assuming the S132 pump station will be replaced by a Regional San facility that will not cause back-ups to the Aerojet Interceptor, the model predicts minor surcharging in the Aerojet Interceptor under buildout conditions.
- Groundwater will be confirmed through future Geotechnical studies for the project. Recent information from monitoring wells in the area suggests groundwater is 140 below ground surface.
- "Protected Areas" will be preserved in perpetuity per South Sacramento HCP requirements, and granted to a third party. Since Protected Areas will not be developed, ESD's have not been assigned to these lands as it is not practical to demonstrate capacity in the downstream sewer collection systems for these areas.

Approach – Design of the proposed Project sewer system followed the sequence described as follows.

- Sewer sheds reflect project layout shown on the accompanying Sewer Shed Map.
- Design flows, summarized in Table A-1, Appendix A, adhere to SASD Design Standards, dated March 29, 2019.
- Pipe sizes and slopes meet applicable design criteria.

Design Criteria - Design of the proposed Project sewer system is based on the following criteria.

- Sewer flow is calculated on the basis of 6 ESD (Equivalent Single-Family Dwelling) per acre, or the actual count within a shed, whichever is greater. Multifamily sewer flow is calculated at 75% per ESD unit.
- Commercial and Park areas use a design flow of 6 ESD per acre.
- Design flows are computed using formulas from Section 201.2.2 of SASD standards and specifications:
    - PWWF (mgd) = ADWF *PF +I/I
    - ADWF (mgd) = (310 GPD/ESD)*(ESD/ac)*(ac)/1,000,000
    - PF = 3.5 - 1.8*Q^0.05, where Q=ADWF, PF= 1.2 minimum
    - I/I = 1,400 gpd/ac (new pipeline)
- Design of gravity sewers adheres to the following, from Section 202 of SASD standards and specifications:
    - The minimum pipe size (diameter) is 8 inches.
    - The minimum velocity is 2 fps when the pipe is ½ full (collector) or full (trunk).
    - The 'n' value is 0.013.
    - The minimum slope for a collector serving fewer than 6 ESDs is 0.007.
    - The minimum slope for an 8" sewer is 0.0035.

SEWER FLOW INFORMATION

On-site flow from The Ranch SPA totals 1,967.6 ESDs, resulting in PWWF of 1.613 mgd. There would be off-site contribution from proposed Arista Del Sol project of approximately 899.1 ESD's and 0.697 mgd (12" gravity trunk main, and Cordova Hills Phase 1 project of approximately 3290 ESD's and 2.50 mgd (20" FM),

SEWER ALIGNMENT & FACILITIES

- No interim facilities are required for the Project. All pipes are sized for ultimate PWWF.
- Ultimate facilities consist of the following:
    - 8-inch in-tract gravity sewer pipe
    - 12-inch to 21-inch trunk main sewer pipe in Chrysanthy Blvd.
    - 24-inch offsite gravity sewer located in Rancho Cordova Parkway, west from the project entry to the existing manhole in Rancho Cordova Parkway as shown.

CONCLUSIONS

The Level 2 Sewer Study for the Project demonstrates the ability of the proposed gravity system to serve the project. System components are sized for ultimate conditions. According to SASD staff, capacity upgrades will be required at SASD facility S-132 pump station. However, the cost, scope, and timing of the necessary upgrades are not determined as of this date.

APPENDIX A

TABLE A-1 SEWER DESIGN SUMMARY SPREADSHEET

TABLE A-1

THE RANCH SEWER DESIGN SUMMARY

START NODE	STOP NODE	LAND USE	LAND USE AREA (AC)	LAND USE ESDs @ 6 ESD/AC	LAND USE ESD by Lot Count	LAND USE MAX ESDs	TOTALS AREA (AC)	TOTALS CUM ESDs	I/I[1/] (mgd)	ADWF[2/] (mgd)	PF[3/]	PDWF[4/] (mgd)	PWWF[5/] (mgd)	Project PWWF[5/] (cfs)	Total PWWF[5/] (mgd)	Total PWWF[5/] (cfs)	PIPE DATA DIA (in)	PIPE DATA S (ft/ft)	PIPE DATA Capacity @ S (cfs)	Capacity @ S (mgd)	US MAN HOLE DEPTH (FT)	V @ PWWF[6/] (fps)
CHP1	ADS1	R	-	-	-	-	-	-	-	-	-	-	-	-	2.5000	3.8681	20	FM	n/a	n/a	13.7	n/a
ADS1	A	R	-	-	-	-	-	-	-	-	-	-	0.6970	1.0784	3.1970	4.9465	12	0.0255	5.69	3.68	13.7	7.79
A	A1	R	66.6	399.6	385	399.6	66.6	399.6	0.0932	0.1239	1.88	0.2327	0.3259	0.5043	3.5229	5.4508	21	0.0020	7.09	4.58	23.1	3.10
A1	A2	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	26.3	3.42
A2	B	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	25.4	3.43
B	B1	R	76.2	457.2	384	457.2	142.8	856.8	0.1999	0.2656	1.82	0.4822	0.6821	1.0554	3.8791	6.0019	21	0.0020	7.09	4.58	26.0	3.15
B1	C	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	32.6	3.45
C	C1	R	40.1	240.6	197	240.6	182.9	1097.4	0.2561	0.3402	1.79	0.6105	0.8665	1.3407	4.0635	6.2872	21	0.0020	7.09	4.58	31.4	3.34
C1	C2	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	30.7	3.49
C2	D	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	30.0	3.49
D	D1	R	43.1	258.6	133	258.6	226.0	1356.0	0.3164	0.4204	1.78	0.7467	1.0631	1.6449	4.2601	6.5913	21	0.0020	7.09	4.58	29.4	3.35
D1	D2	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	28.2	3.55
D2	E	R	0.0	0.0	0	0.0	0.0	0.0	0	0	0	0	0	0.0000	0	0.0000	21	0.0020	7.09	4.58	26.8	3.86
E	E1	R	59.2	355.2	402	402.0	285.2	1758.0	0.3993	0.5450	1.75	0.9558	1.3551	2.0966	4.5521	7.0431	21	0.0025	7.92	5.12	25.8	4.95
E1	F	MF	8.0	48.0	161	161.0	293.2	1919.0	0.4105	0.5949	1.75	1.0388	1.4492	2.2423	4.6462	7.1888	21	0.012	18.07	11.68	23.9	7.04
F	POC	COMM	8.1	48.6	48.6	48.6	301.3	1967.6	0.4218	0.6872	1.73	1.1913	1.6131	2.4958	4.8101	7.4423	24	0.002	7.84	5.07	23.7	4.88
			301.3	1807.8	1710.9	1967.6	301.3		0.4218													

[1/] 1400 gpd/ac

[2/] 310 gpd/ESD * ESD/ac * A

[3/] 3.5-1.8*(Q^0.05) where Q is ADWF

[4/] ADWF * PF

[5/] ADWF * PF + I/I

[6/] see Flowmaster computations

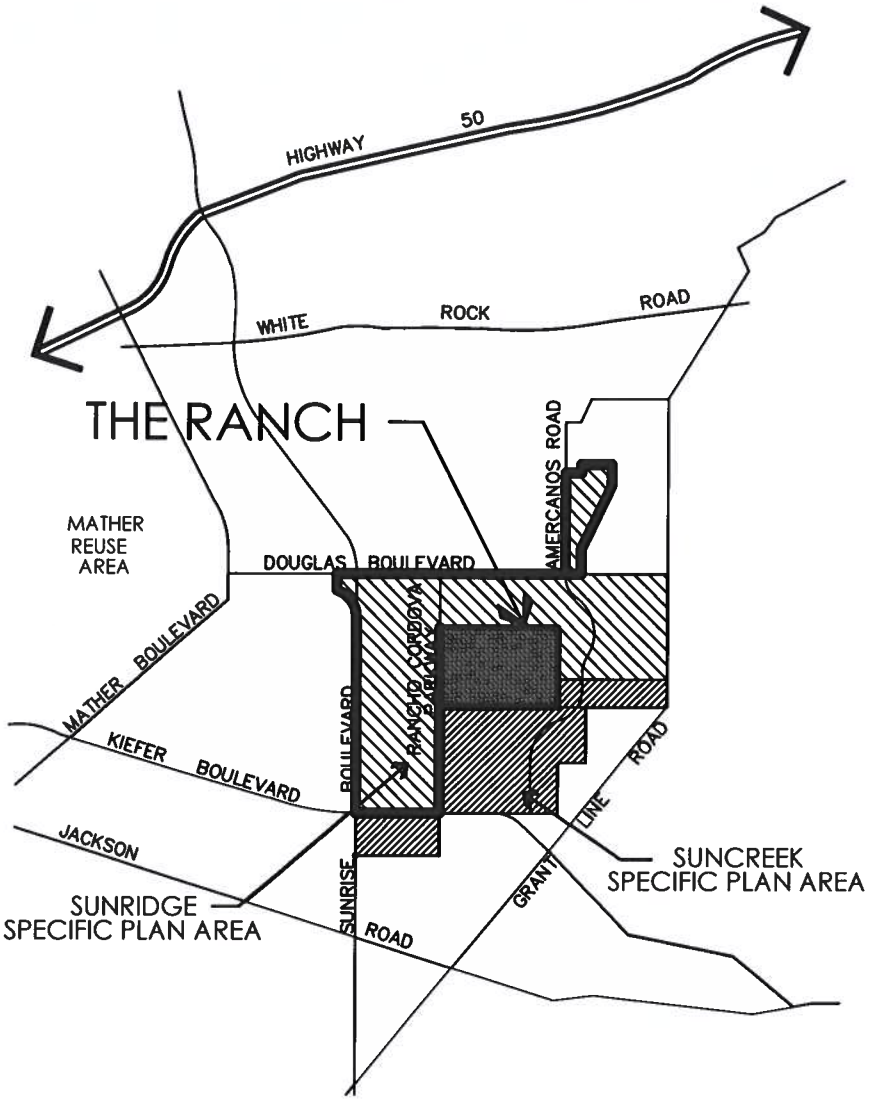
[7/] Multifamily (MF) is 75% ESD, 233 gpd/ESD

8/ COMMERCIAL (COMM) is 6 ESD/AC, 1900 gpd/ESD

ATTACHMENTS

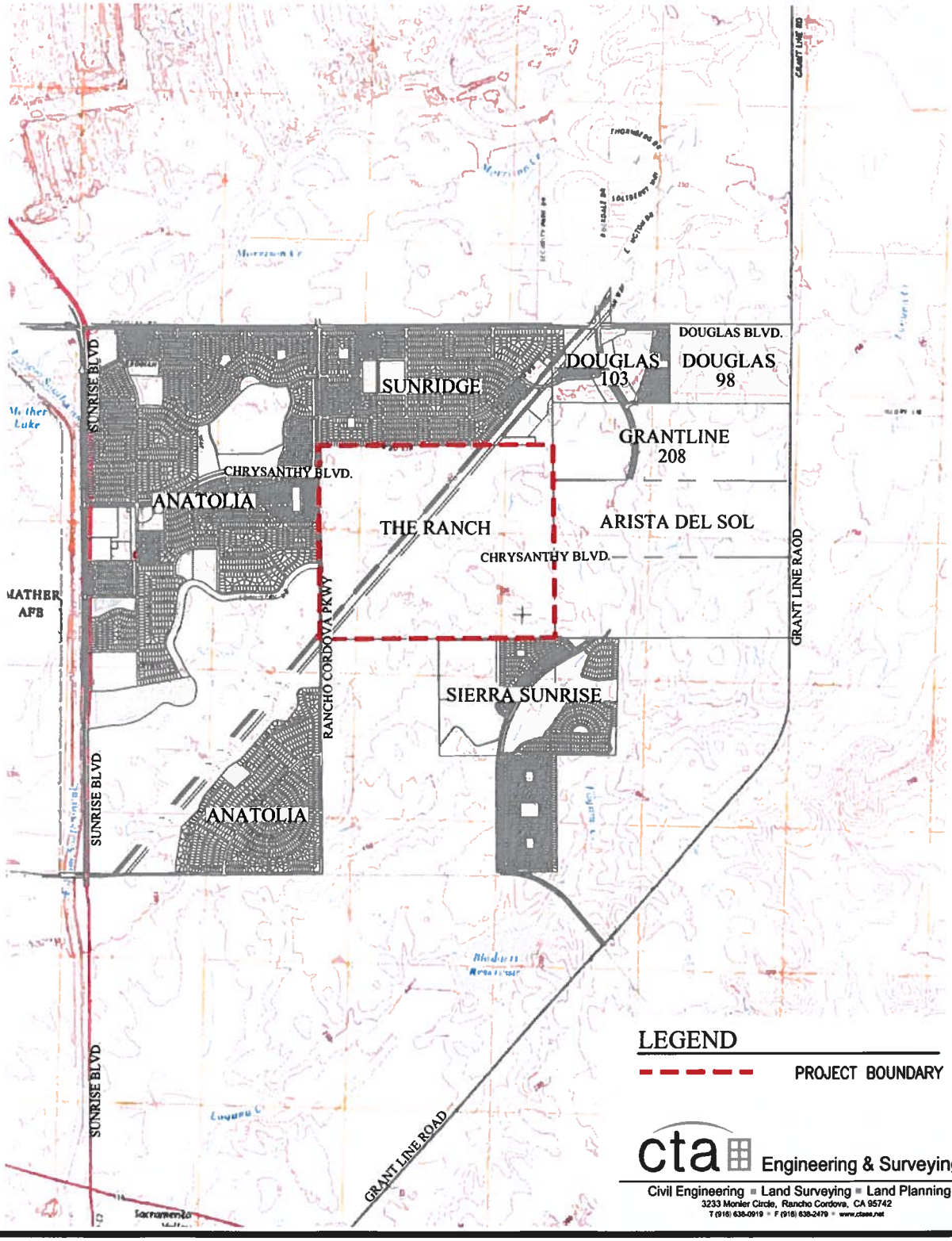
LOCATION MAP
LOCATION MAP WITH TOPOGRAPHY
SITE PLAN
SMALL LOT TENTATIVE MAP
PRELIMINARY GRADING AND DRAINAGE PLAN
SEWER SHED MAP
SRCSD SERVICE AREA
SASD SERVICE AREA
AJ SUNRISE DOUGLAS TRUNK SHED
FIGURE 6-1 - TRUNK SHEDS MAP - 2010 SASD SYSTEM CAPACITY PLAN
BR EAST RANCH TRUNK SHED – 2015 AMENDMENT
EMAIL EXCHANGE WITH SASD

LOCATION MAP



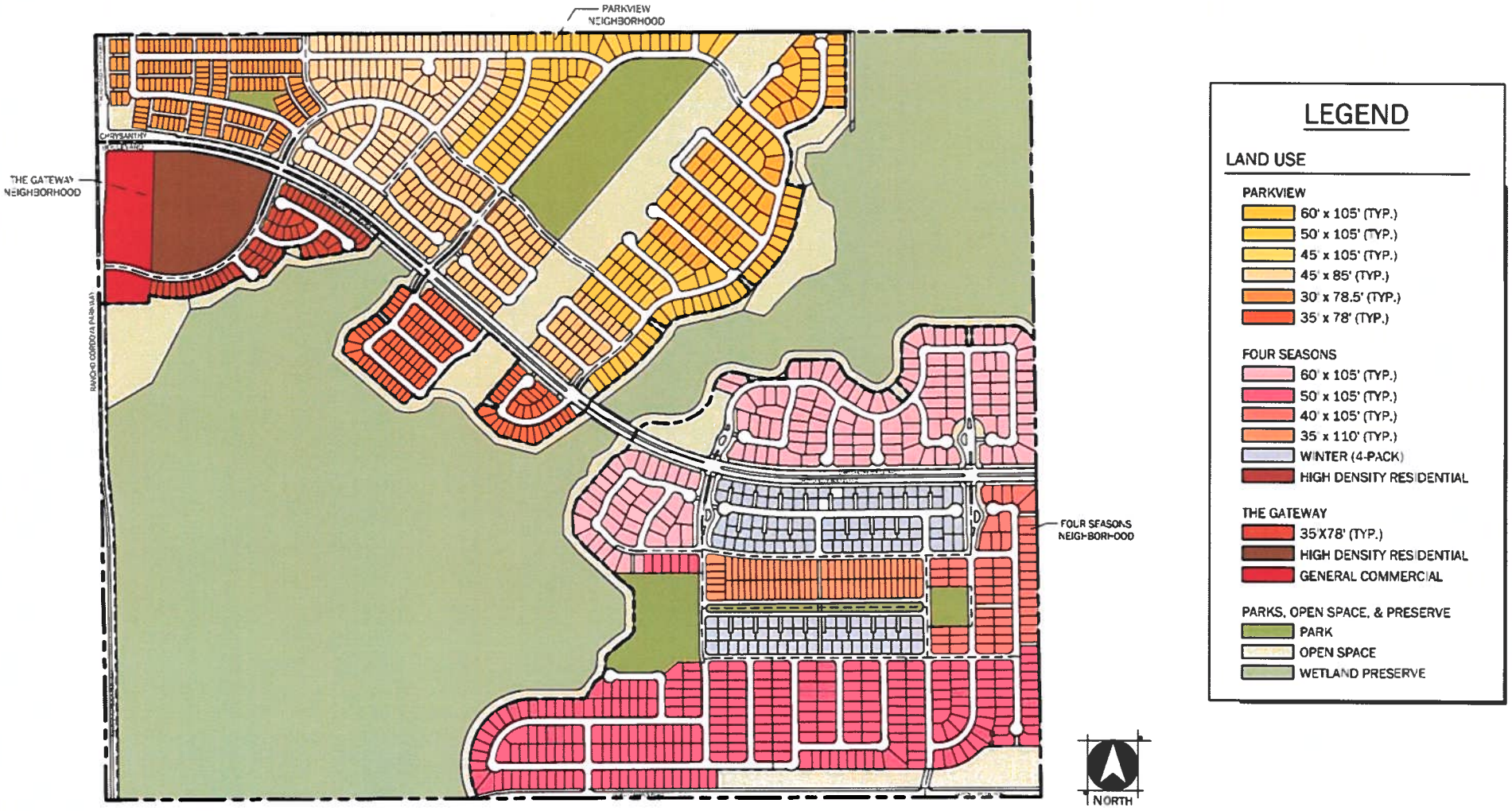
THE RANCH
LOCATION MAP

RANCHO CORDOVA, CALIFORNIA
NOT TO SCALE AUGUST, 2018



cta Engineering & Surveying
Civil Engineering ▪ Land Surveying ▪ Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0919 ▪ F (916) 638-2479 ▪ www.ctaes.net

Exhibit 3: Land Use Plan (Proposed Zoning Districts)

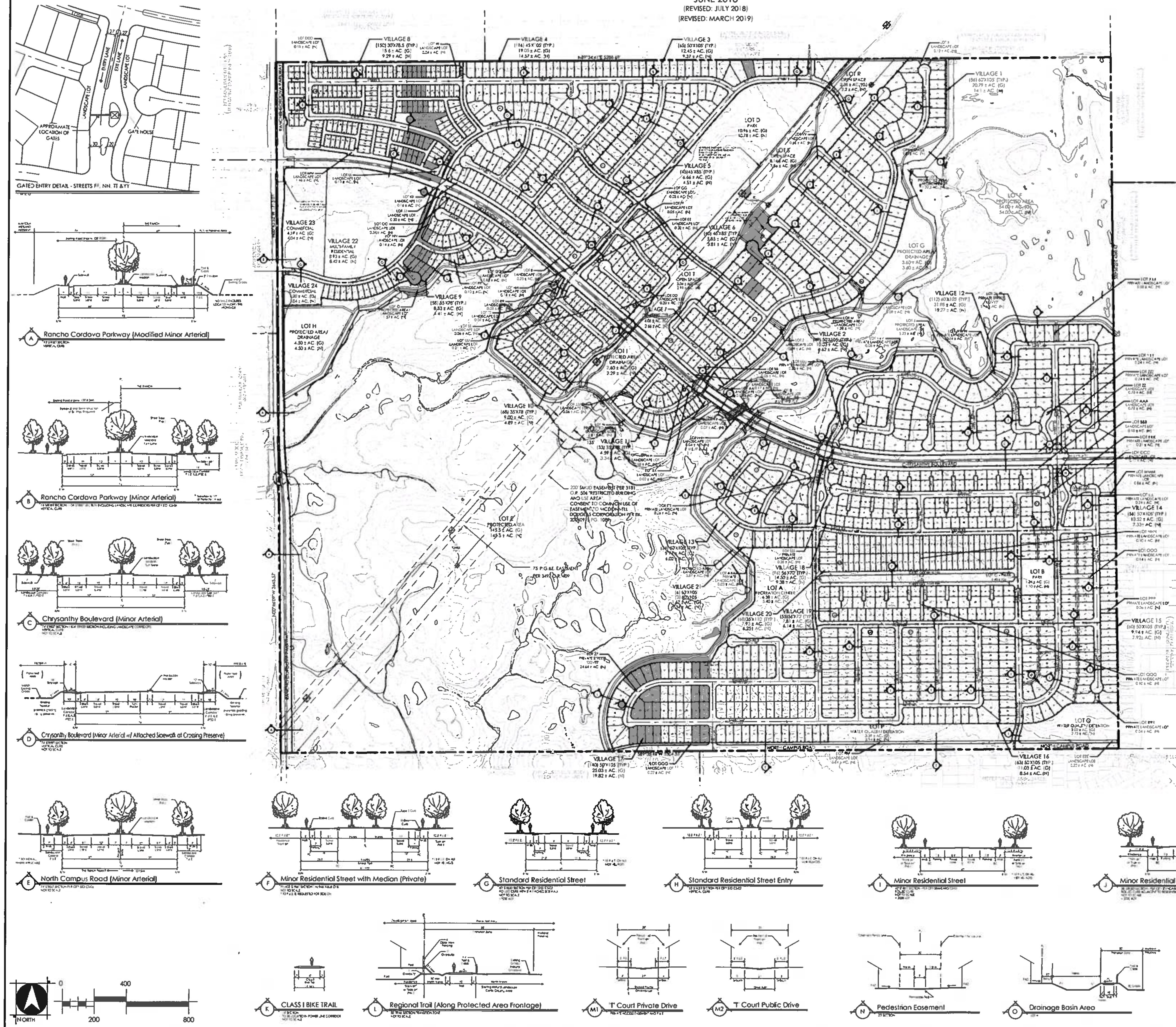


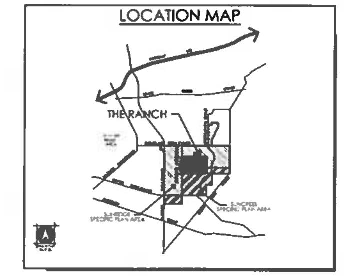
SMALL LOT TENTATIVE SUBDIVISION MAP

THE RANCH

CITY OF RANCHO CORDOVA, CALIFORNIA

JUNE 2018
(REVISED: JULY 2018)
(REVISED: MARCH 2019)





PROJECT NOTES

OWNER/APPLICANT
K. HOVNANIAN HOMES NORTHERN INC.
3721 DOUGLAS BOULEVARD SUITE 150
ROSEVILLE, CA 95661
CONTACT: OLGA SCIORTINO
PHONE: (916) 945-5362

PLANNER
WOOD RODGERS INC.
3301 "C" STREET BLDG. 100-B
SACRAMENTO, CA 95816
CONTACT: PAUL MEUSER
PHONE: (916) 341-7760

ENGINEER/SURVEYOR
CTA ENGINEERING AND SURVEYING
3233 MONIER CIRCLE
RANCHO CORDOVA, CA 95742
CONTACT: TOM CASSERA
PHONE: (916) 638-0919

ASSESSORS PARCEL NUMBERS
067-0040-008

AREA
530 ± ACRES GROSS

NUMBER OF LOTS/PARCELS

1,471	SINGLE FAMILY LOTS
2	GENERAL COMMERCIAL LOTS
1	RECREATION CENTER LOT
3	PARK LOTS
2	PROTECTED AREA LOTS
9	PROTECTED AREA / LANDSCAPE LOTS
2	WATER QUALITY / DETENTION BASIN LOTS
5	OPEN SPACE LOTS
40	PUBLIC LANDSCAPE LOTS
17	PRIVATE LANDSCAPE LOTS
25	PRIVATE DRIVE LOTS
2	PRIVATE STREET LOTS

EXISTING USE
VACANT

EXISTING GENERAL PLAN
URBAN DEVELOPMENT AREA

PROPOSED GENERAL PLAN
LDR, MDR, RMU, CMU, P/OP, P/OS, NR

EXISTING ZONING
AG-80

PROPOSED ZONING
SPECIAL PLANNING AREA

PUBLIC SERVICES & FACILITY PROVIDERS

IMPROVEMENTS:	CITY OF RANCHO CORDOVA
WATER:	SACRAMENTO COUNTY WATER
SEWER:	SACRAMENTO AREA SEWER DISTRICT
DRAINAGE:	CITY OF RANCHO CORDOVA
ELECTRICITY:	S.M.U.D.
GAS:	PACIFIC GAS & ELECTRIC
TELEPHONE:	AT&T
SCHOOL DISTRICT:	ELK GROVE UNIFIED SCHOOL DISTRICT
FIRE DISTRICT:	SACRAMENTO METRO FIRE DISTRICT
PARK DISTRICT:	CORDOVA RECREATION & PARK DISTRICT

NOTES:

1. SUBDIVIDER(S) RESERVES THE RIGHT TO FILE MULTIPLE MAPS PURSUANT TO SECTION 66456.1 OF THE SUBDIVISION MAP ACT.
2. THIS IS AN APPLICATION FOR A DEVELOPMENT PERMIT.
3. A 10 FOOT PUBLIC UTILITY EASEMENT WILL BE LOCATED ADJACENT TO ALL RIGHTS OF WAY EXCEPT AS APPROVED BY THE CITY ENGINEER. THIS APPLICATION REQUESTS A 5' P.U.E./SETBACK FOR 'T' COURT HOMES AND 10' P.U.E. FOR FRONT AND SIDE YARDS.
4. PARCEL (LARGE LOT) NUMBERING IS FOR IDENTIFICATION PURPOSES ONLY AND DOES NOT INDICATE PHASING ORDER OF DEVELOPMENT. ULTIMATE DEVELOPMENT PHASING SHALL BE ORDERLY AND WILL BE DETERMINED AT FINAL MAP AND/OR IMPROVEMENT PLAN STAGE.
5. THIS APPLICATION ALSO SEEKS A GENERAL PLAN AMENDMENT, REZONE, AND SPECIAL DEVELOPMENT PERMIT.
6. ALL EXISTING STRUCTURES TO BE REMOVED AND ALL EXISTING WELLS TO BE ABANDONED, ADJUSTED (BY OTHERS) AND/OR RELOCATED.
7. THE AERIAL TOPOGRAPHY SHOWN HEREON WAS FLOWN IN NOVEMBER 2003.
8. THIS EXHIBIT IS FOR TENTATIVE MAP PURPOSES ONLY. ALL SITE AREAS TO BE VERIFIED PRIOR TO FINAL MAP.
9. PARK FEES FOR ALL FINAL LOTS WILL BE DEFERRED UNTIL ACTUAL SITE DEVELOPMENT PERMIT.
10. NON-STANDARD ELBOW, NO ON-STREET PARKING ALLOWED ON KNUCKLE.
11. A 12.5' P.U.E. WILL BE PROVIDED ADJACENT TO RIGHT-OF-WAY. A 10 P.U.E. WILL BE PROVIDED ADJACENT TO RIGHT-OF-WAY TO VILLAGES DESIGNATED AS MDR.

LAND USE SUMMARY

PARCEL/LOT NUMBERS	GENERAL PLAN DESIGNATION	LAND USE (LOT SIZE)	GROSS ACRES	NET ACRES	DWELLING UNITS	GROSS DENSITY
TRADITIONAL SINGLE-FAMILY RESIDENTIAL						
VILLAGE 1	LDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	20.79	14.1	[illegible]	[illegible]
VILLAGE 2	LDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	10.03	6.42	[illegible]	[illegible]
VILLAGE 3	LDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	12.45	9.37	[illegible]	[illegible]
VILLAGE 4	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	19.05	14.37	[illegible]	[illegible]
VILLAGE 5	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	6.66	4.51	[illegible]	[illegible]
VILLAGE 6	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	5.05	3.81	[illegible]	[illegible]
VILLAGE 7	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	4.05	2.66	[illegible]	[illegible]
VILLAGE 8	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	15.60	9.29	[illegible]	[illegible]
VILLAGE 9	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	8.33	4.41	[illegible]	[illegible]
VILLAGE 10	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	9.00	4.89	[illegible]	[illegible]
VILLAGE 11	MDR [illegible]	TRADITIONAL SF RESIDENTIAL [illegible]	4.59	3.34	[illegible]	[illegible]
SUB-TOTAL			116.41	77.57	728	
ACTIVE ADULT SINGLE-FAMILY RESIDENTIAL						
VILLAGE 12	LDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	31.98	19.27	[illegible]	[illegible]
VILLAGE 13	LDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	9.74	4.03	[illegible]	[illegible]
VILLAGE 14	LDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	10.52	7.33	[illegible]	[illegible]
VILLAGE 15	LDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	9.94	7.92	[illegible]	[illegible]
VILLAGE 16	MDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	11.03	8.54	[illegible]	[illegible]
VILLAGE 17	MDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	25.03	19.82	[illegible]	[illegible]
VILLAGE 18	MDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	14.50	9.38	[illegible]	[illegible]
VILLAGE 19	MDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	7.81	6.14	[illegible]	[illegible]
VILLAGE 20	MDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	7.93	6.25	[illegible]	[illegible]
VILLAGE 21	LDR [illegible]	ACTIVE ADULT SF RESIDENTIAL [illegible]	1.67	1.34	[illegible]	[illegible]
SUB-TOTAL			130.15	92.01	693	
VILLAGE 22	HDR	MULTI-FAMILY RESIDENTIAL	8.93	8.42		
SUB-TOTAL			8.93	8.42		
VILLAGE 23	GC	GENERAL COMMERCIAL	4.19	4.04		
VILLAGE 24	GC	GENERAL COMMERCIAL	1.20	1.04		
SUB-TOTAL			5.39	5.08		
LOT A	MDR	MEDIUM DENSITY RESIDENTIAL	6.38	5.40	[illegible]	[illegible]
LOT B	P/OS	PARK (PRIVATE)	1.34	1.10		
LOT C	P/OS	PARK (PRIVATE)	1.40	1.40		
LOT D	P/OS	PARK (PUBLIC)	10.96	10.78		
LOT E	NR	PROTECTED AREA (PUBLIC)	145.55	145.50		
LOT F	NR	PROTECTED AREA (PUBLIC)	54.00	54.00		
LOT G-I	NR	PROTECTED AREA/DRAINAGE BASIN	10.70	10.39		
LOT J-O	NR	PROTECTED AREA/LANDSCAPE LOT		15.98		
LOT P-Q	P/OS	WATER QUALITY/DETENTION	6.39	5.67		
LOT R-U	P/OS	OPEN SPACE (PUBLIC)	14.14	13.58		
LOT V-JJJ	LDR/MDR	PUBLIC LANDSCAPE LOT		9.63		
LOT KKK-AAAA	LDR/MDR	PRIVATE LANDSCAPE LOT		2.58		
LOT 1-25	MDR	PRIVATE DRIVE		1.10		
LOT 26 & 27	LDR/MDR & P/OS	PRIVATE RIGHT-OF-WAY		30.40		
MINOR RIGHT-OF-WAY	LDR/MDR & P/OS	PUBLIC RIGHT-OF-WAY		21.15		
MAJOR RIGHT-OF-WAY			18.41	18.41		
SUB-TOTAL			269.22	347.02		
TOTAL			530.10	530.10	1,471	

NOTE:
GROSS ACREAGE EXCLUDES RANCHO CORDOVA PARKWAY & CHRYSANTHY BOULEVARD ONLY.
VILLAGE NET ACREAGE EXCLUDES PROTECTED AREA/LANDSCAPE LOTS, PRIVATE & PUBLIC LANDSCAPE LOTS, PRIVATE DRIVES AND PRIVATE & PUBLIC RIGHT-OF-WAYS.

K. Hovnanian

WOOD RODGERS
ENGINEERING • MAPPING • PLANNING • SURVEYING
3301 C St. Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

cta Engineering & Surveying
Civil Engineering ▪ Land Surveying ▪ Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0616 ▪ F (916) 638-0679 ▪ www.ctaes.net

PRELIMINARY GRADING AND DRAINAGE PLAN
THE RANCH

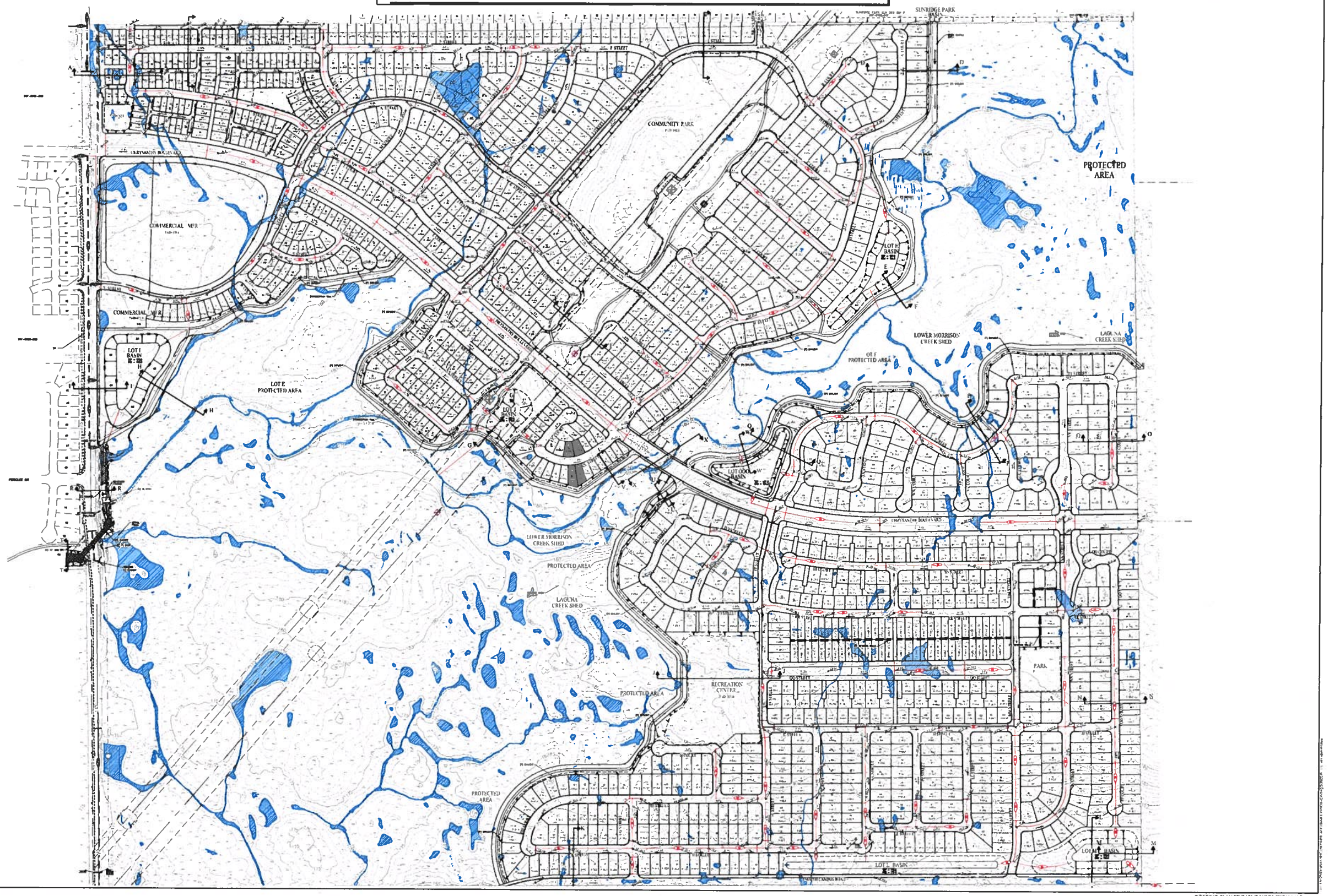
CITY OF RANCHO CORDOVA | FEBRUARY, 2019 | STATE OF CALIFORNIA

LEGEND

PROPOSED CONTOUR	PROPOSED RETAINING WALL	DRAINAGE SHED BOUNDARY	
EXISTING CONTOUR	PROPOSED SLOPE BANK	PROPOSED DRAINAGE SYSTEM	
PAD ELEVATION	PROPOSED DAYLIGHT LINE	PROPOSED PEDESTRIAN TRAIL	

WETLAND
100 YR. WATER SURFACE ELEVATION

0 75 150 300'
SCALE: 1" = 150'



GRADING PLAN TENTATIVE SUBDIVISION MAP

THE RANCH - NORTH
SEWER SHED MAP
CITY OF RANCHO CORDOVA, CALIFORNIA

SCALE: 1"=100' JULY, 2019

LEGEND

EXISTING SEWER	8"EXS	BOUNDARY LINE	
PROPOSED SEWER	21"SD	PROPERTY LINE	
SEWER SHED BOUNDARY			
NODE POINT	X		

SHED TABLE		
NODE	ACREAGE	MAX ESD
CHP1	342.0	3,290
ADS1	137.2	899.1
A	66.6	399.6
B	76.2	457.2
C	40.1	240.6
D	43.1	258.6
E	59.2	402.0
E1	8.0	*161.0
F	8.1	48.6
TOTAL	780.5	6,156.7

*MAX ESD IS 75% OF PRELIMINARY MF UNIT COUNT.

0 50' 100' 200'
SCALE: 1" = 100'

GRANT DEED
SUNRIDGE PARK VILLAGE 8A
SUNRIDGE PARK VILLAGE 9A
BASIN OUTFALL DITCH
SHED E (402 UNITS)
SHED E1 (*215 UNITS)
MULTI-FAMILY
COMMERCIAL
SHED E
SHED D (133 UNITS)
SHED C (197 UNITS)
SHED D
SHED C
SHED B (355 UNITS)
PARK
OPEN SPACE
OPEN SPACE
PROTECTED AREA 64.14 AC
PROTECTED AREA 160.86 AC
RANCHO CORDOVA PARKWAY
CHRYSANTHY BOULEVARD
CHRYSANTHY BOULEVARD
ANATOLIA IV VILLAGE I
ANATOLIA II VILLAGE 11
ANATOLIA II VILLAGE 12B
COMMERCIAL

NODE F: A(acres)=8.1AC; ΣA(acres)=780.5 AC; ESD=48.6; Σ ESD=6,156.7; Q=4.6970mgd
NODE E1: A(acres)=8.0 AC; ΣA(acres)=772.4AC; ESD=161.0; Σ ESD=6,108.1; Q=4.6482mgd
NODE E: A(acres)=59.2 AC; ΣA(acres)=764.4AC; ESD=402.0; Σ ESD=5,947.1; Q=4.5521mgd
NODE D2: A(acres)=0; ΣA(acres)=705.2AC; ESD=0; Σ ESD=5,545.1; Q=4.2601mgd
NODE D1: A(acres)=0; ΣA(acres)=705.2AC; ESD=0; Σ ESD=5,545.1; Q=4.2601mgd
NODE D: A(acres)=43.1AC; ΣA(acres)=705.2 AC; ESD=258.6; Σ ESD=5,545.1; Q=4.2601mgd
NODE C2: A(acres)=0; ΣA(acres)=320.3 AC; ESD=0; Σ ESD=3,997.4; Q=3.0574mgd
NODE C3: A(acres)=0; ΣA(acres)=662.1 AC; ESD=0; Σ ESD=5,286.5; Q=4.0453mgd
NODE C: A(acres)=40.1 AC; ΣA(acres)=662.1 AC; ESD=240.6; Σ ESD=5,286.5; Q=4.0453mgd
NODE B: A(acres)=76.2AC; ΣA(acres)=622.0AC; ESD=457.2; Σ ESD=5,045.9; Q=3.8791mgd
NODE B1: A(acres)=0; ΣA(acres)=622.0 AC; ESD=0; Σ ESD=5,045.9; Q=3.8791mgd
NODE A2: A(acres)=0; ΣA(acres)=545.8AC; ESD=0; Σ ESD=4,588.7; Q=3.5229mgd

SSMH RIM=178.0 24" INV(OUT)=147.31 21" INV(IN)=147.58 D=30.4'
SSMH RIM=181.5 21" INV OUT=155.49 21" INV(IN)=155.54 D=26.0'
SSMH RIM=178.9 21" INV OUT=154.19' 21" INV IN=154.24 D=24.7'
SSMH RIM=183.4 21" INV OUT=156.22 21" INV IN=156.27 D=27.2'
SSMH RIM=185.4 24" INV OUT=156.96' 24" INV IN=157.01 D=28.4'
SSMH RIM=187.3 21" INV OUT=157.71 21" INV IN=157.76' D=29.6'
SSMH RIM=188.6 21" INV OUT=158.46 21" INV IN=158.51 D=30.1'
SSMH RIM=190.0 21" INV OUT=159.22 21" INV IN=159.27 D=30.8'
SSMH RIM=191.4 21" INV OUT=159.97 21" INV IN=160.02 D=31.4'
SSMH RIM=193.5 21" INV OUT=160.96 21" INV IN=161.01 D=32.5'
SSMH RIM=187.7 21" INV OUT=161.91 21" INV IN=161.96 D=25.8'
SSMH RIM=188.4 21" INV OUT=162.95 21" INV IN=163.00 D=25.0'

469 LF @ S=0.0141
500 LF @ S=0.0025
339 LF @ S=0.0025
347 LF @ S=0.0025
348 LF @ S=0.0025
353 LF @ S=0.0025
450 LF @ S=0.0025
447 LF @ S=0.0025
496 LF @ S=0.0020
476 LF @ S=0.0020

(E)SSMH RIM=179.73 27"NW IN=149.93 27"NW OUT=149.85
(E)SSMH RIM=179.54 24"S INV IN=146.79 15"NW IN=145.42 27"S INV OUT=146.84
(E)SSMH RIM=179.79 27"NW IN=148.55 27"NW OUT=148.45
(E)SSMH RIM=178.22 CAN NOT OPEN
(E)SSMH RIM=178.17 27"NW IN=146.17 27"NW IN=146.17 36"NW OUT=145.97
(E)SSMH RIM=179.33 15"NW OUT=148.51 15"NW IN=148.56 12"W IN=163.23
(E)SSCO ∞ 15"NW OUT=148.86
(E)SSMH RIM=177.76 8"NW IN=164.65 12"W OUT=164.68
(E)SSMH RIM=176.52 8"NW(S)=170.24

cta Engineering & Surveying
Civil Engineering • Land Surveying • Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0919 • F (916) 638-2479 • www.ctaeis.net

THE RANCH - SOUTH

SEWER SHED MAP

CITY OF RANCHO CORDOVA, CALIFORNIA

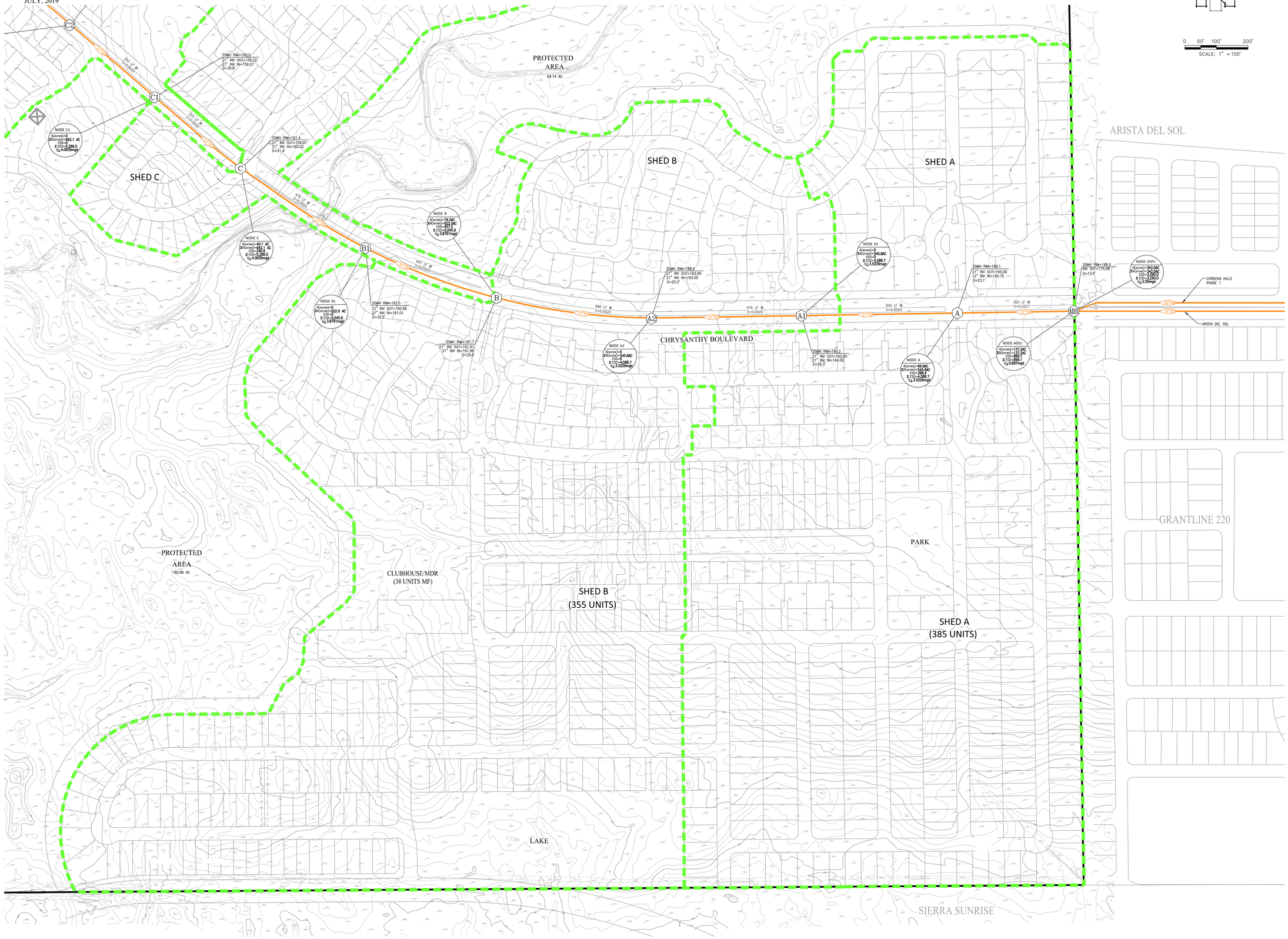
SCALE: 1"=100' JULY, 2019

LEGEND

- EXISTING SEWER
- PROPOSED SEWER
- SEWER SHED BOUNDARY
- NODE POINT
- BOUNDARY LINE
- PROPERTY LINE

SHED TABLE		
NODE	ACREAGE	MAX ESD
CHP1	342.0	3,290
ADS1	137.2	899.1
A	66.6	399.6
B	76.2	457.2
C	40.1	240.6
D	43.1	258.6
E	59.2	402.0
E1	8.0	*161.0
F	8.1	48.6
TOTAL	780.5	6,156.7

*MAX ESD IS 75% OF PRELIMINARY MF UNIT COUNT.



cta Engineering & Surveying

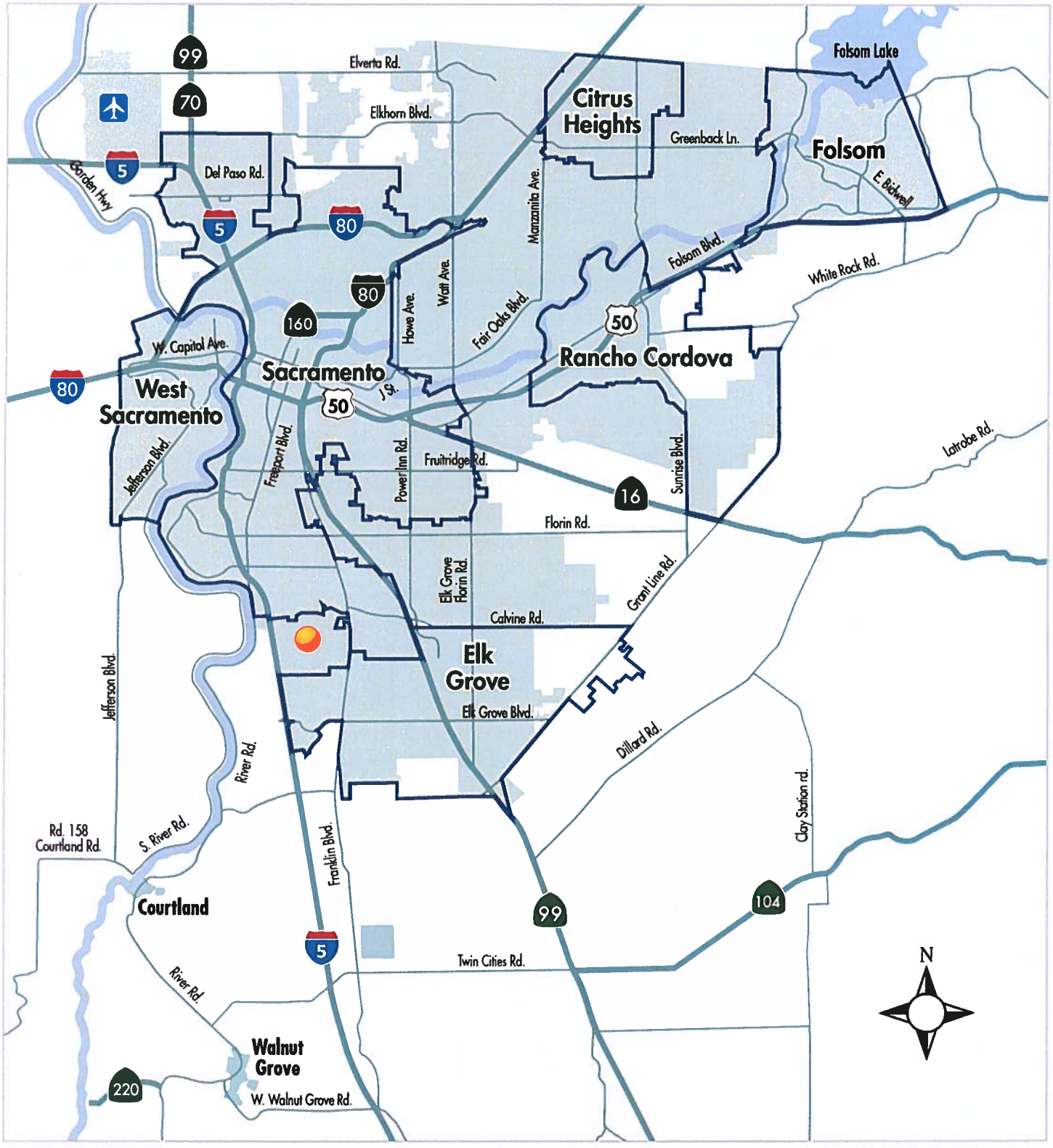
Civil Engineering ▪ Land Surveying ▪ Land Planning

3233 Monier Circle, Rancho Cordova, CA 95742

T (916) 638-0919 ▪ F (916) 638-2479 ▪ www.ctaes.net

M:\17-129-001\PLANNING\EXHIBITS\190708-SEWER STUDY EXHIBIT.dwg, 7/16/2019 4:16:24 PM, athomas, 1:1

SRCSD SERVICE AREA



LEGEND

- SRCSD Service Area
- City Boundaries
- Rivers
- Sacramento Regional Wastewater Treatment Plant
- Highways
- Main Roads

Exhibit G

SASD SERVICE AREA

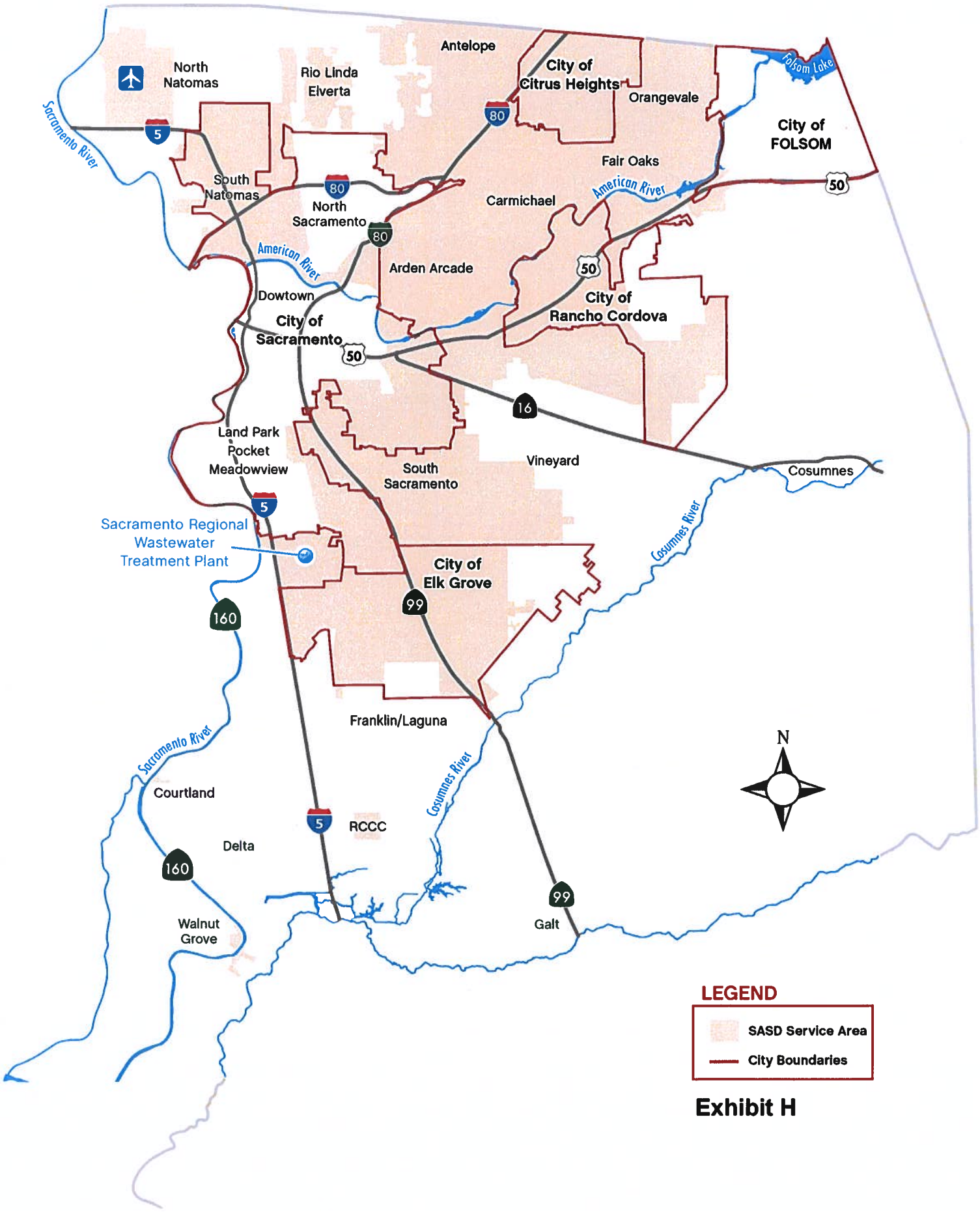
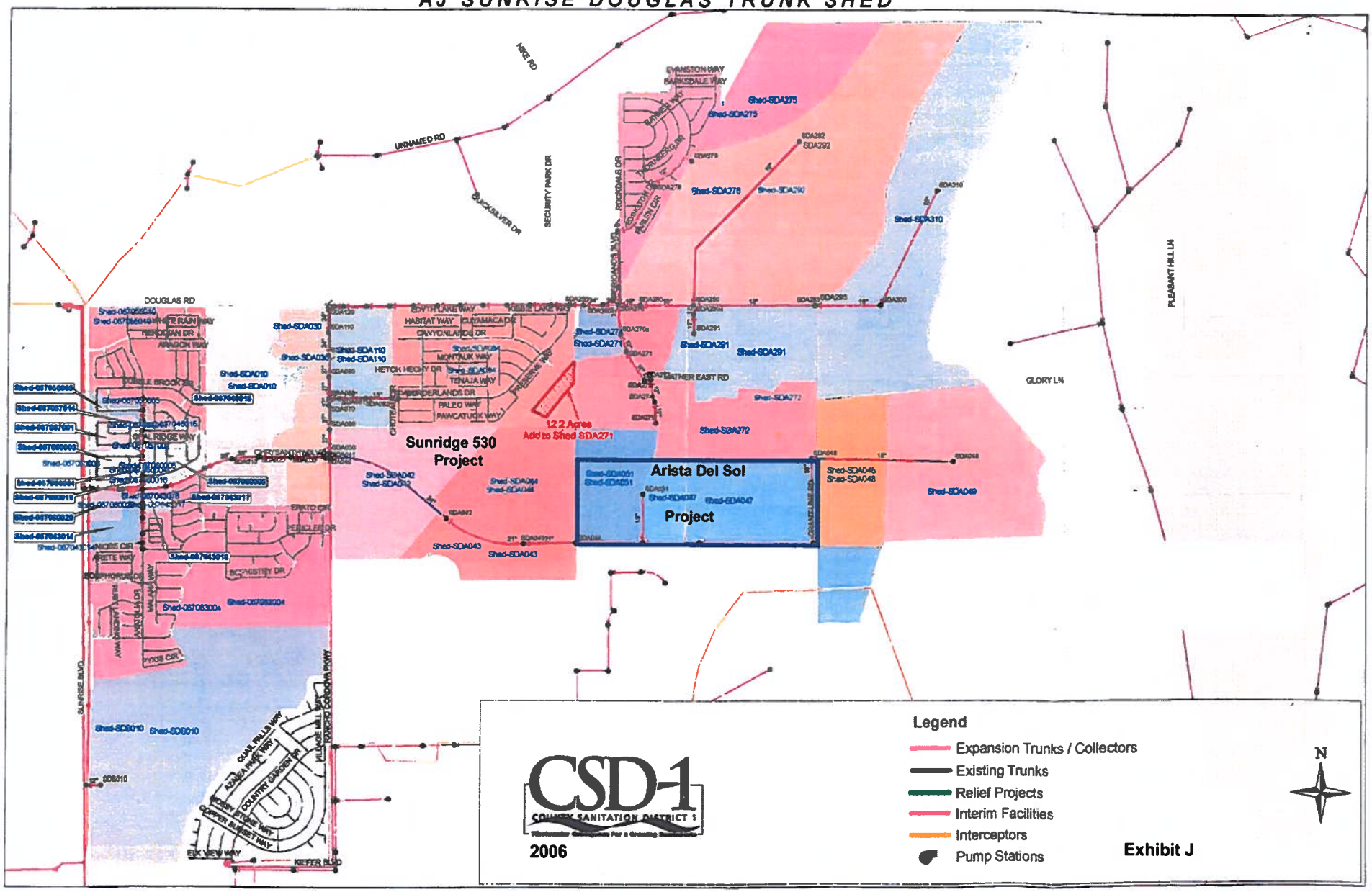
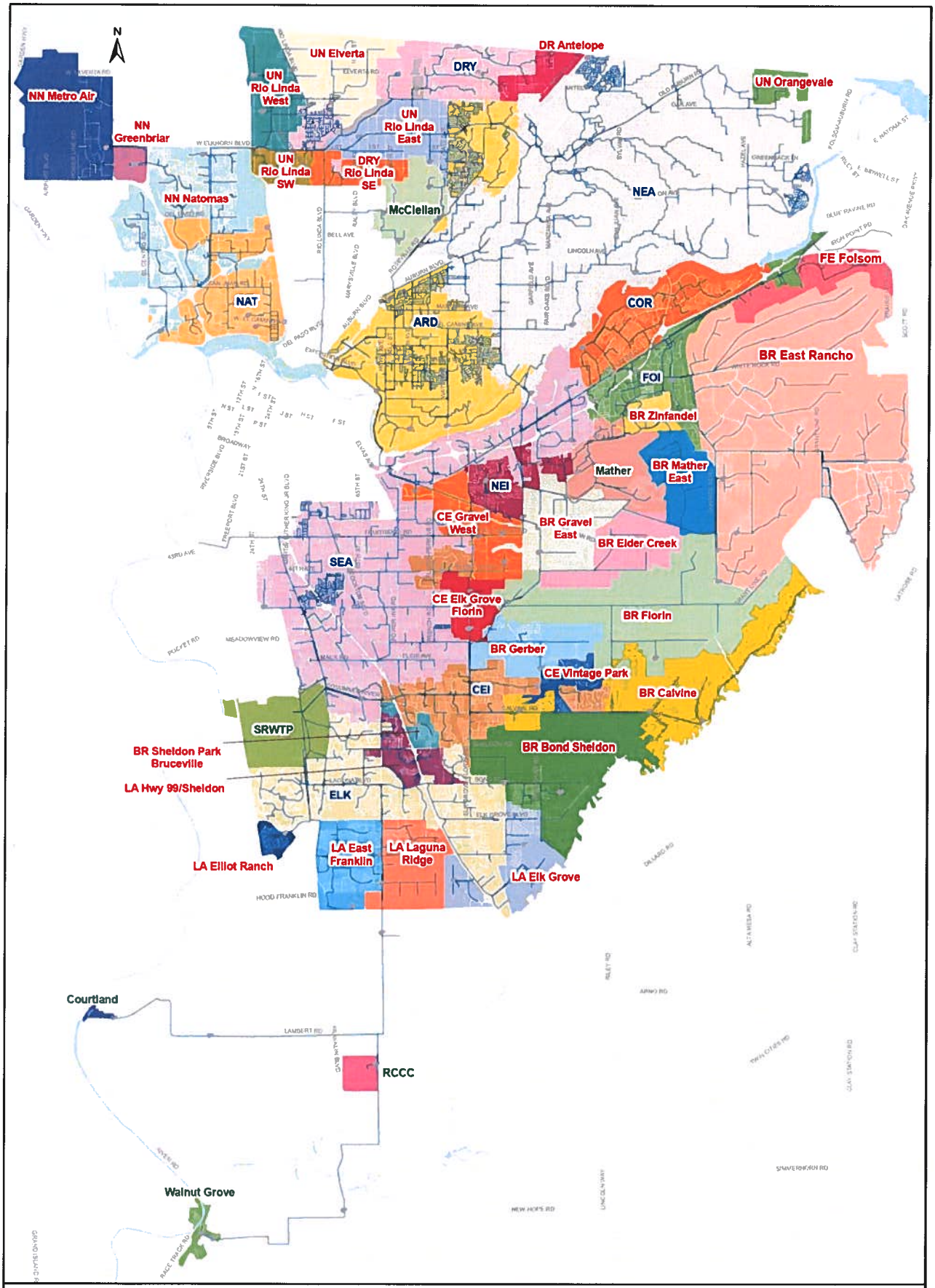


Exhibit H

AJ SUNRISE DOUGLAS TRUNK SHED





Legend

Blue Label: Relief Area Shed
Red Label: Expansion Area Shed
Green Label: To be Determined

SACRAMENTO AREA SEWER DISTRICT

2010 SASD SYSTEM CAPACITY PLAN

Trunk Sheds Map

FIGURE 6-1

Date last revised: 9/6/2011

SASD 2010 SYSTEM CAPACITY PLAN EXPANSION TRUNK SHEDS

BR EAST RANCHO TRUNK SHED – *2015 AMENDMENT*

Introduction

This amendment summarizes the new BR East Rancho near-term and buildout expansion trunk shed plans. Due to recent development activity, SASD has proceeded with an update to the BR East Rancho Expansion Trunk Shed Plan, ahead of the scheduled 2020 System Capacity Plan (SCP) update.

The information in the 2010 SCP BR East Rancho Expansion Trunk Shed Plan was used as a starting reference for this 2015 update. The latest approved sewer study information was included in the update, along with the most recent land use information from the City of Rancho Cordova and Sacramento County. Significant changes to the 2010 SCP were made in areas that were previously planned to be served by future interceptors.

Area Description

The BR East Rancho Trunk Shed encompasses a large area located in the eastern part of Sacramento County, south of Folsom Boulevard. The western half of the shed lies in the City of Rancho Cordova, east of Sunrise Boulevard. The shed extends east to the Urban Services Boundary. The southern boundary includes Grant Line Road and the Urban Services Boundary.

Trunk System Facilities

The BR East Rancho **buildout** expansion trunks are planned to drain to either of two locations which are referred to as Location #1 Outfall and Location #2 Outfall. Location #1 Outfall is located at the S132 Chrysanthy Pump Station (PS), and it will serve the developments in the southern portion of the BR East Rancho shed. Location #2 Outfall is located adjacent to White Rock Road, approximately one-half mile east of Sunrise Boulevard, and it will serve the developments in the northern portion of the BR East Rancho shed. Flows at the two outfall locations are planned to be conveyed by future Regional interceptor facilities.

For the **near-term** conditions, initial flows from the developments in the northern portion of BR East Rancho (Rio Del Oro and Westborough) will drain to the S070 Sunrise White Rock PS system on the interim basis. Ultimately these developments will discharge to Location #2 Outfall. Flows from the developments in the southern portion of BR East Rancho (Anatolia, Arista Del Sol, Cordova Hills, Montelena, North Douglas, Sunridge Lot J, Sunridge Park, and SunCreek) will be conveyed to the S132 Chrysanthy PS.

The BR East Rancho Trunk Shed near-term expansion trunk facilities will be presented first, followed by the buildout summary. The planning trunk facilities are summarized for each of the development areas. The development areas are defined by the sewer studies names, and the areas without sewer studies have been given a name in most cases.

Please refer to the **BR East Rancho Planned Development Areas** map **(Figure A.3-1)** when reviewing the trunk shed plan descriptions below.

A. BR East Rancho Near-Term Expansion Trunk Facilities (Figure A.3-2)

Anatolia, Montelena, Sunridge Lot J, Sunridge Park, and North Douglas – These sheds discharge to the existing trunk system. Their flows are conveyed to S132 PS.

Arista Del Sol – The shed is served by an interim PS. The interim force main will convey flow northward and connect to the existing Douglas Trunk.

Cordova Hills – Phase 1 development will be served by a new permanent PS. Its force main will convey flow northward and connect to the existing Douglas Trunk on an interim basis. The upstream portion of the force main between the PS wet well and Chrysanthy Boulevard will be permanent. The downstream portion of the force main from Chrysanthy Boulevard to the existing Douglas Trunk will be interim until the permanent force main is extended west along Chrysanthy Boulevard and discharges to the Location #1 Outfall.

SunCreek – The Phase 1 development will be served by a new permanent PS. Its force main will convey flow northward and connect to the existing Aerojet Interceptor 1 on Chrysanthy Boulevard.

Rio Del Oro – The Phase 1 development will discharge to existing collectors on White Rock Road, and its flow will be conveyed to S070.

Westborough – The Phase 1 development will be served by an interim pump station. The interim force main will convey flow west along White Rock Road and discharge into the existing 10-inch S070 force main.

B. BR East Rancho Buildout Expansion Trunk Facilities (Figure A.3-3)

Aerojet Lands – This area currently does not have an approved sewer study. The proposed sewer system of the northern portion of this area has been redirected to drain to the Folsom East Interceptor; therefore, it is no longer a part of the BR East Rancho Trunk Shed. The southern portion of the Aerojet Lands area is planned to be served by a trunk that discharges to the Location #2 Outfall.

Anatolia – The trunk system that serves this area has been constructed, and no new trunks are required.

Arboretum – This area is planned to be served by a pump station and two trunk branches. The pump station will be located near the intersection of Jackson Highway and Sunrise Boulevard. The force main will convey flow to the north along Sunrise Boulevard and discharge to the Location #1 Outfall.

Arista Del Sol – Arista Del Sol is planned to be served by a trunk that will be constructed across The Ranch development. The connection point to this future trunk is located in the southwest corner of the development, near the shared boundary with The Ranch development.

Cordova Hills – Cordova Hills will be served by two trunk pump stations situated near each other in the southwest portion of the development. The north pump station will have two contributing trunks while the south pump station will have one contributing trunk. The south pump station will also serve significant areas that lie outside of the Cordova Hills development, known as South Cordova Hills. The pump station force mains convey flow northward to Chrysanthy Boulevard where they follow the right of way west and discharge to the Location #1 Outfall.

Douglas 98 – This area will drain to a future trunk extension of the existing Douglas Trunk.

Douglas 103 – This area requires no additional trunk facilities. Local collectors will discharge to the existing Douglas Trunk.

Grantline 208 – This area requires no additional trunk facilities. Local collectors will discharge to the existing Douglas Trunk.

Montelena – The trunk system that serves this development has been constructed. No additional trunk facilities are required.

North Cordova Hills – North Cordova Hills and the area located to the west currently have no sewer studies. The North Cordova Hills area is proposed to be served by two trunk pump stations located on Glory Lane. Both pump stations' force mains convey flow west along Glory Lane and Douglas Road to the Location #1 Outfall. Each pump station is served by a primary trunk and its minor trunk branches. The area to the immediate west of North Cordova Hills will be served by a trunk that discharges to the extension of the existing Douglas Trunk. The area to the northwest of North Cordova Hills and east of Rio Del Oro will be served by a trunk system that conveys flow to the west along White Rock Road and drains to the Location #2 Outfall.

North Douglas – The sewer system that serves this area has been constructed, and no new trunks are required.

Rio Del Oro – Rio Del Oro will be served by several trunks and a pump station. The proposed pump station located in the southwest corner of the development will serve the southern portion of the development. The pump station force main conveys flow south, adjacent to Sunrise Boulevard, to the Location #1 Outfall. The trunks serving the northern portion of Rio Del Oro will drain to the Location #2 Outfall.

South Cordova Hills – This area is located south of the Cordova Hills development, and it does not have a sewer study. This area is planned to be served by one of the Cordova Hills pump stations.

SunCreek – SunCreek will be served by two trunk pump stations. One proposed pump station is located approximately in the center of the development and will capture flow from the northern portions of the shed area via two trunks. Its force main will convey flow to the north along Rancho Cordova Parkway and discharge to the existing Aerojet Interceptor 1B located in Chrysanthy Boulevard. The second proposed pump station is located in the southwest corner of the development, and it serves the remainder of the shed. This pump station will also provide service to the Anatolia 3 development, which currently is draining to an interim pump station. The ultimate buildout force main of the second proposed pump station will convey flow to the north, along Sunrise Boulevard, and discharge to the Location #1 Outfall.

Sunridge Lot J – The trunk system that serves this development has been constructed. No additional trunk facilities are required.

Sunridge Park – The trunk system that serves this development has been constructed. No additional trunk facilities are required.

The Ranch – The Ranch development is planned to be served by a future trunk that connects to the Aerojet Interceptor 1B located in Chrysanthy Boulevard.

Westborough – The Westborough development will be served by a trunk that discharges to the Location #2 Outfall.

Attribute data and model results for the BR East Rancho **buildout** expansion trunks are presented in the table below. The BR East Rancho Trunk Shed is subdivided into five smaller sub areas as shown in **Figure A.3-4**. **Figures A.3-5** through **A.3-9** display the details of each sub area which include the proposed trunk sewers, modeled manholes, and the contributing area to each manhole.

BR East Rancho
Trunk Sewer Data and Model Results
Buildout 10-Year Design Storm

US Manhole	DS Manhole	Link Type	Diameter (in)	Length (ft)	US Rim Elev. (ft)	US Invert Elev. (ft)	DS Rim Elev. (ft)	DS Invert Elev. (ft)	Slope (%)	Full Capacity (mgd)	Peak Flow (mgd)	% Full Capacity	d/D
2879-EN02	2879-EN01	Pump									6.7		
2207-EN03	2207-EN02	Gravity Main	15	475	139.0	117.4	138.0	108.9	1.800	5.6	0.9	16	0.8
2123-EN01	2207-EN02	Gravity Main	21	1965	140.5	111.7	138.0	108.9	0.140	3.9	1.0	25	0.5
2207-EN01	2291-EN01	Gravity Main	24	1285	139.0	107.9	134.5	106.1	0.140	5.5	2.6	47	0.5
2207-EN02	2207-EN01	Gravity Main	24	805	138.0	108.9	139.0	107.9	0.120	5.1	2.2	44	0.5
2291-EN01	2375-EN01	Gravity Main	27	2380	134.5	106.1	139.5	103.2	0.120	7.0	3.0	43	0.5
2375-EN01	2376-EN05	Gravity Main	27	740	139.5	103.2	136.5	102.3	0.120	7.0	3.7	53	0.5
2376-EN05	2376-EN03	Gravity Main	27	585	136.5	102.3	134.0	101.4	0.160	8.1	3.9	48	0.6
2376-EN01	2460-EN01	Gravity Main	30	935	130.5	99.9	128.5	98.7	0.120	9.2	4.9	53	0.5
2376-EN02	2376-EN01	Gravity Main	30	795	132.5	100.8	130.5	99.9	0.120	9.2	4.7	51	0.5
2376-EN03	2376-EN02	Gravity Main	30	455	134.0	101.4	132.5	100.8	0.120	9.2	4.6	50	0.5
2460-EN01	2460-EN02	Gravity Main	30	185	128.5	98.7	124.0	98.5	0.120	9.4	5.1	54	0.5
2460-EN02	2460-INT01	Gravity Main	30	311	124.0	98.5	124.7	98.2	0.100	8.4	5.1	60	0.5
2285-EN02	2285-EN01	Gravity Main	10	2269	275.6	261.0	258.0	240.0	0.920	1.4	1.3	93	0.8
2288-EN01	2373-EN01	Gravity Main	15	3313	194.7	173.1	191.1	167.1	0.180	1.8	1.1	62	0.6
2285-EN01	2286-EN01	Gravity Main	15	2961	258.0	233.2	229.7	212.0	0.720	3.5	2.3	64	0.8
2286-EN01	2287-EN01	Gravity Main	15	2884	229.7	212.0	201.7	186.3	0.890	4.0	3.5	89	0.7
2375-EN03	2375-EN02	Gravity Main	18	687	170.6	151.3	138.0	125.6	3.740	13.2	8.5	64	0.6
2287-EN01	2372-EN01	Gravity Main	27	2704	201.7	185.3	193.4	182.6	0.100	6.3	4.7	74	0.6
2372-EN01	2373-EN01	Gravity Main	27	2661	193.4	172.2	191.1	169.6	0.100	6.3	5.3	83	0.7
2375-EN02	2460-INT01	Gravity Main	27	2935	138.0	124.8	124.7	118.0	0.230	9.7	8.7	90	0.8
2373-EN01	2374-EN01	Gravity Main	30	2653	191.1	157.2	180.9	154.5	0.100	8.4	7.4	88	0.8
2374-EN01	2375-EN03	Gravity Main	30	3264	180.9	154.5	170.6	151.3	0.100	8.4	8.1	97	0.8
2452-EN01	2453-EN02	Gravity Main	10	1334	280.0	267.9	273.1	256.8	0.830	1.3	1.0	79	0.7
2453-EN01	2454-EN02	Gravity Main	12	2208	267.1	253.8	232.0	217.8	1.630	2.9	2.1	72	0.7
2537-EN01	2454-EN02	Gravity Main	12	2398	259.9	241.1	232.0	225.0	0.670	1.9	1.7	89	0.7
2453-EN02	2453-EN01	Gravity Main	15	1476	273.1	256.4	267.1	253.8	0.180	1.8	1.5	86	0.7
2537-EN02	2537-EN01	Gravity Main	15	1439	266.0	245.3	259.9	241.1	0.300	2.3	1.4	61	0.6
2454-EN01	2455-EN01	Gravity Main	18	2610	253.3	210.0	204.1	191.9	0.690	5.7	5.0	89	0.7
2454-EN02	2454-EN01	Gravity Main	18	1590	232.0	217.0	253.3	210.0	0.440	4.5	4.5	99	0.9
2623-EN01	2539-EN01	Gravity Main	10	2308	218.0	212.0	192.0	187.4	1.070	1.5	1.0	70	0.6
2539-EN01	2455-EN01	Gravity Main	15	2336	192.0	187.0	204.1	182.8	0.180	1.8	1.4	81	0.7
2374-EN02	2459-EN01	Gravity Main	21	2964	180.9	162.4	142.6	129.9	1.100	10.7	7.3	68	0.6
2459-EN01	2460-INT01	Gravity Main	24	3146	142.6	129.7	124.7	115.0	0.470	10.0	7.3	73	0.6
2371-EN01	2371-EN02	Gravity Main	30	638	240.0	179.8	191.4	179.2	0.100	8.4	7.4	88	0.7
2372-EN02	2373-EN02	Gravity Main	30	2751	190.1	168.0	180.2	165.3	0.100	8.4	7.4	88	0.7
2373-EN02	2374-EN02	Gravity Main	30	2825	180.2	165.3	180.9	162.4	0.100	8.4	7.3	87	0.7
2371-EN02	2372-EN02	Gravity Main	30	2683	191.4	179.2	190.1	176.5	0.100	8.4	7.4	88	0.7
2455-EN01	2371-EN01	Gravity Main	30	1719	204.1	181.5	240.0	179.8	0.100	8.4	6.9	83	0.8
2618-EN02	2618-EN01	Gravity Main	12	1316	222.1	204.5	202.0	193.0	0.870	2.2	1.2	54	0.5
2618-EN03	2618-EN02	Gravity Main	12	476	227.7	208.6	222.1	204.5	0.870	2.2	1.2	54	0.5
2618-EN01	2702-EN01	Gravity Main	18	1362	202.0	187.0	198.0	183.5	0.260	3.5	3.1	88	0.8
2786-EN01	2870-EN01	Gravity Main	18	2264	208.9	178.5	180.4	169.9	0.380	4.2	3.7	87	0.7
2702-EN01	2786-EN01	Gravity Main	18	1303	198.0	183.5	208.9	178.5	0.380	4.2	3.7	87	0.7
2870-EN01	2954-EN02	Gravity Main	21	2418	180.4	160.0	192.3	152.0	0.330	5.9	4.6	78	0.7
2954-EN02	2954-EN03	Gravity Main	24	535	192.3	152.0	158.0	150.4	0.310	8.1	5.4	66	0.6
2618-EN05	2618-EN04	Gravity Main	12	1437	224.3	213.0	206.0	193.0	1.390	2.7	1.0	36	0.4
2619-EN01	2618-EN05	Gravity Main	12	2104	254.4	240.8	224.3	213.0	1.320	2.7	1.0	37	0.4
2618-EN04	2618-EN01	Gravity Main	15	1300	206.0	192.6	202.0	187.2	0.410	2.7	1.7	62	0.7
3460-EN05	3460-EN06	Pump									6.8		

BR East Rancho
Trunk Sewer Data and Model Results
Buildout 10-Year Design Storm

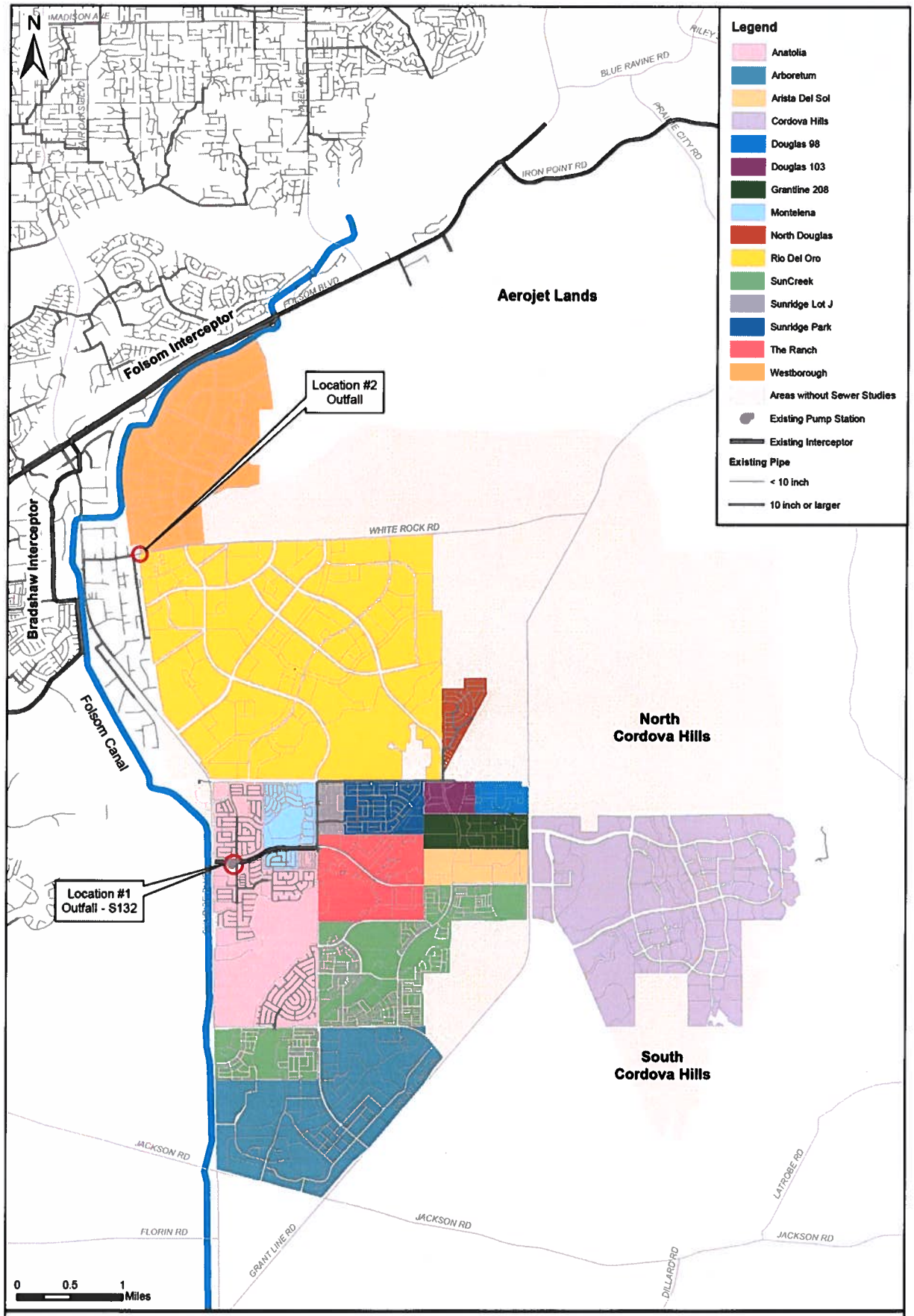
US Manhole	DS Manhole	Link Type	Diameter (in)	Length (ft)	US Rim Elev. (ft)	US Invert Elev. (ft)	DS Rim Elev. (ft)	DS Invert Elev. (ft)	Slope (%)	Full Capacity (mgd)	Peak Flow (mgd)	% Full Capacity	d/D
2787-EN02	2787-EN01	Gravity Main	12	1391	224.3	207.0	211.8	200.0	0.500	1.6	1.3	80	0.7
2787-EN01	2872-EN02	Gravity Main	15	1142	211.8	200.0	203.3	190.0	0.880	3.9	1.7	44	0.7
2872-EN02	2872-EN01	Gravity Main	15	1347	203.3	190.0	193.9	180.7	0.690	3.5	2.4	68	0.6
2872-EN01	2956-EN01	Gravity Main	18	687	193.9	180.5	188.1	177.0	0.500	4.8	3.5	73	0.6
2956-EN01	2955-EN02	Gravity Main	27	1171	188.1	171.2	184.0	170.0	0.100	6.3	4.5	72	0.6
2789-EN01	2873-EN02	Gravity Main	15	1479	257.3	231.9	256.0	229.3	0.180	1.8	1.3	76	0.8
2873-EN02	2873-EN01	Gravity Main	15	1263	256.0	229.3	248.0	227.0	0.180	1.8	1.6	90	0.7
2874-EN01	2874-EN02	Gravity Main	18	3042	247.8	220.2	215.4	191.0	0.960	6.7	2.4	37	0.6
2874-EN02	2875-EN02	Gravity Main	18	339	215.4	191.0	210.7	189.2	0.510	4.9	3.1	63	0.6
2875-EN01	326-227-1011	Gravity Main	18	349	208.6	187.5	206.3	185.3	0.630	5.4	3.1	57	0.7
2875-EN02	2875-EN01	Gravity Main	18	311	210.7	189.2	208.6	187.6	0.520	4.9	3.1	62	0.6
2873-EN01	2874-EN01	Gravity Main	21	202	248.0	220.5	247.8	220.2	0.120	3.6	2.4	69	0.6
2708-EN01	2709-EN02	Gravity Main	12	1480	198.3	171.4	172.0	162.0	0.630	1.8	1.2	64	0.6
2709-EN01	2710-EN01	Gravity Main	18	1402	173.7	150.0	164.1	147.4	0.190	2.9	2.2	75	0.9
2709-EN02	2709-EN01	Gravity Main	18	2589	172.0	156.5	173.7	150.3	0.240	3.3	1.8	53	0.5
2710-EN01	2794-EN01	Gravity Main	18	1820	164.1	147.7	150.0	142.3	0.300	3.7	2.9	79	0.7
2794-EN01	2795-EN03	Gravity Main	21	1945	150.0	142.0	152.0	139.7	0.120	3.6	3.2	90	0.7
2795-EN03	2879-EN03	Gravity Main	24	2195	152.0	136.1	146.0	133.7	0.110	4.9	3.8	78	0.7
2879-EN03	2879-EN02	Gravity Main	30	59	146.0	118.5	146.0	118.5	0.100	8.4	6.7	80	0.5
3460-EN03	3460-EN01	Pump									4.2		
2795-EN02	2795-EN01	Gravity Main	12	1788	164.8	128.4	148.0	122.7	0.320	1.3	1.1	86	0.7
2795-EN01	2879-EN03	Gravity Main	18	1904	148.0	122.2	146.0	119.5	0.140	2.5	1.8	70	0.6
2954-EN03	2954-EN01	Pump									5.4		
3205-EN01	3205-EN04	Gravity Main	15	625	155.0	125.9	147.0	124.5	0.230	2.0	1.4	70	0.7
3205-EN02	3205-EN01	Gravity Main	15	757	158.0	133.0	155.0	130.7	0.300	2.3	1.4	61	0.6
3290-EN01	3374-EN01	Gravity Main	15	1398	141.7	120.3	141.0	117.7	0.180	1.8	1.7	97	0.8
3290-EN02	3290-EN01	Gravity Main	15	566	151.6	121.3	141.7	120.3	0.180	1.8	1.7	93	0.8
3205-EN04	3206-EN02	Gravity Main	15	894	147.0	124.5	145.2	122.9	0.180	1.8	1.5	83	0.8
3206-EN02	3290-EN02	Gravity Main	15	892	145.2	122.9	151.6	121.3	0.180	1.8	1.7	93	0.8
3374-EN01	3458-EN01	Gravity Main	18	1743	141.0	117.5	142.1	114.8	0.150	2.7	1.8	68	0.7
3458-EN01	3459-EN03	Gravity Main	18	1743	142.1	114.8	136.0	112.4	0.140	2.5	1.9	74	0.6
3459-EN02	3543-EN01	Gravity Main	21	2126	138.0	110.9	142.7	108.3	0.120	3.6	2.9	81	0.8
3459-EN03	3459-EN02	Gravity Main	21	1051	136.0	112.1	138.0	110.9	0.120	3.6	2.6	72	0.7
3543-EN01	3627-EN01	Gravity Main	21	1861	142.7	108.3	132.1	106.1	0.120	3.6	3.2	90	0.7
3460-EN02	3460-EN03	Gravity Main	24	22	124.0	100.8	124.0	100.7	0.110	4.9	4.2	87	0.5
3627-EN01	3628-EN01	Gravity Main	24	1326	132.1	105.8	135.6	104.4	0.110	4.9	3.8	77	0.7
3628-EN01	3460-EN02	Gravity Main	24	3280	135.6	104.4	124.0	100.8	0.110	4.9	3.9	81	0.7
3123-EN04	3123-EN03	Gravity Main	12	735	185.0	177.6	187.0	175.2	0.330	1.3	0.9	70	0.6
3123-EN03	3207-EN07	Gravity Main	15	650	187.0	175.2	181.0	172.9	0.350	2.5	1.1	44	0.6
3207-EN06	3207-EN05	Gravity Main	15	784	182.0	170.0	177.0	167.5	0.320	2.4	1.5	62	0.6
3207-EN07	3207-EN06	Gravity Main	15	878	181.0	172.9	182.0	170.0	0.330	2.4	1.4	56	0.6
3291-EN05	3291-EN03	Gravity Main	18	567	164.4	154.4	166.5	153.6	0.140	2.6	2.1	81	0.8
3291-EN06	3291-EN07	Gravity Main	18	486	169.0	160.9	165.0	154.8	1.260	7.6	2.0	26	0.7
3291-EN07	3291-EN05	Gravity Main	18	291	165.0	154.8	164.4	154.4	0.140	2.5	2.0	80	0.7
3291-EN09	3291-EN06	Gravity Main	18	1182	172.0	165.0	169.0	160.9	0.350	4.0	1.9	48	0.5
3207-EN05	3291-EN09	Gravity Main	18	633	177.0	167.5	172.0	165.0	0.400	4.3	1.6	37	0.5
2955-EN02	2955-EN01	Pump									4.5		
3207-EN03	3207-EN02	Gravity Main	12	362	176.0	166.4	166.0	163.7	0.750	2.0	1.0	49	0.5
3207-EN01	3291-En04	Gravity Main	15	1385	170.1	159.6	173.8	156.2	0.250	2.1	1.1	53	0.6
3207-EN02	3207-EN01	Gravity Main	15	547	166.0	163.4	170.1	159.6	0.700	3.5	1.1	31	0.5

BR East Rancho
Trunk Sewer Data and Model Results
Buildout 10-Year Design Storm

US Manhole	DS Manhole	Link Type	Diameter (in)	Length (ft)	US Rim Elev. (ft)	US Invert Elev. (ft)	DS Rim Elev. (ft)	DS Invert Elev. (ft)	Slope (%)	Full Capacity (mgd)	Peak Flow (mgd)	% Full Capacity	d/D
3291-EN04	3291-EN03	Gravity Main	18	936	173.8	156.2	166.5	153.6	0.280	3.6	1.7	48	0.8
3291-EN01	3376-EN03	Gravity Main	24	2503	161.8	148.0	148.0	134.0	0.560	11.0	4.1	37	0.4
3291-EN02	3291-EN01	Gravity Main	24	590	170.0	153.0	161.8	148.1	0.830	13.3	4.0	30	0.4
3376-EN01	3460-EN04	Gravity Main	24	180	142.0	124.2	132.0	120.9	1.840	19.8	4.5	23	0.6
3376-EN02	3376-EN01	Gravity Main	24	1123	138.0	129.0	142.0	124.3	0.420	9.5	4.5	48	0.5
3376-EN03	3376-EN02	Gravity Main	24	918	148.0	133.9	138.0	129.1	0.520	10.6	4.5	42	0.5
3291-EN03	3291-EN02	Gravity Main	24	386	166.5	153.6	170.0	153.0	0.160	5.8	3.9	67	0.6
3460-EN04	3460-EN05	Gravity Main	27	43	132.0	120.9	132.0	120.9	0.100	6.3	6.8	107	0.6
3293-EN01	3460-EN04	Gravity Main	10	4219	237.0	200.0	132.0	122.3	1.840	1.9	1.7	86	0.7
3209-EN01	3293-EN01	Gravity Main	12	899	237.0	206.9	237.0	200.0	0.770	2.0	1.4	69	0.6
3209-EN02	3209-EN01	Gravity Main	12	796	236.0	212.6	237.0	207.0	0.700	1.9	1.3	65	0.6
3209-EN03	3209-EN02	Gravity Main	12	957	238.0	217.4	236.0	212.7	0.490	1.6	0.9	55	0.5
3719-EN03	3719-EN02	Pump									3.7		
3213-EN01	3296-EN01	Gravity Main	15	859	169.0	154.5	162.5	153.0	0.180	1.8	1.0	58	0.6
3296-EN01	3296-EN02	Gravity Main	15	491	162.5	146.2	161.8	145.6	0.130	1.5	1.3	89	0.7
3211-EN01	3211-EN02	Gravity Main	15	373	181.0	168.6	180.0	168.0	0.160	1.7	0.9	54	0.5
3211-EN02	3212-EN03	Gravity Main	15	1287	180.0	168.0	173.4	165.7	0.180	1.8	0.9	50	0.5
3212-EN01	3213-EN01	Gravity Main	15	1694	172.0	161.7	169.0	158.6	0.180	1.8	1.0	55	0.5
3212-EN02	3212-EN01	Gravity Main	15	1024	170.8	163.6	172.0	161.7	0.180	1.8	1.0	53	0.5
3212-EN03	3212-EN02	Gravity Main	15	1142	173.4	165.7	170.8	163.6	0.180	1.8	0.9	52	0.5
3296-EN02	3296-EN10	Gravity Main	18	727	161.8	143.9	158.0	142.9	0.140	2.6	1.6	64	0.6
3296-EN10	3296-EN03	Gravity Main	24	62	158.0	142.4	158.0	142.3	0.110	4.9	4.4	91	0.5
3295-EN01	3296-EN07	Gravity Main	18	1591	172.0	155.9	162.1	153.7	0.140	2.5	2.0	78	0.7
3296-EN05	3296-EN10	Gravity Main	18	582	159.0	145.7	158.0	144.5	0.190	3.0	2.8	93	0.8
3296-EN06	3296-EN05	Gravity Main	18	719	164.0	148.0	159.0	147.0	0.140	2.5	2.0	78	0.7
3296-EN07	3296-EN06	Gravity Main	18	461	162.1	153.7	164.0	153.0	0.140	2.5	2.0	78	0.7
3551-EN02	3551-EN01	Pump									2.1		
3296-EN03	3296-EN04	Pump									4.4		
3466-EN01	3550-EN02	Gravity Main	18	2852	141.0	116.7	137.0	112.6	0.140	2.6	1.4	53	0.5
312-218-1016	3466-EN01	Gravity Main	18	809	132.0	117.8	141.0	116.7	0.140	2.5	1.4	54	0.5
3550-EN02	3551-EN02	Gravity Main	21	1998	137.0	110.6	131.0	107.7	0.140	3.9	2.1	53	0.5
3549-EN01	3550-EN01	Gravity Main	15	734	151.9	124.9	133.0	116.9	1.090	4.4	1.0	24	0.6
3550-EN01	3634-EN01	Gravity Main	15	724	133.0	116.9	142.2	115.6	0.180	1.8	1.1	63	0.6
3634-EN01	3718-EN04	Gravity Main	15	1967	142.2	115.6	128.1	112.1	0.180	1.8	1.2	67	0.6
3718-EN04	3718_EN03	Gravity Main	15	645	128.1	112.1	127.0	96.9	2.350	6.4	1.3	20	0.6
3718_EN03	3718-EN02	Gravity Main	18	341	127.0	96.6	127.0	96.2	0.140	2.5	1.9	76	0.6
3632-EN01	3717-EN04	Gravity Main	15	436	143.0	122.0	143.0	121.1	0.200	1.9	1.1	56	0.5
3717-EN04	3717-EN03	Gravity Main	15	1197	143.0	121.1	142.0	115.1	0.500	3.0	1.1	37	0.6
3717-EN02	3717-EN01	Gravity Main	18	1006	145.0	113.1	140.0	111.7	0.140	2.6	1.5	59	0.6
3717-EN03	3717-EN02	Gravity Main	18	1049	142.0	115.1	145.0	113.3	0.170	2.8	1.4	52	0.5
3717-EN01	3718-EN06	Gravity Main	18	669	140.0	111.7	140.0	110.5	0.170	2.8	1.6	55	0.6
3718-EN05	3718-EN02	Gravity Main	18	826	138.0	109.6	127.0	96.2	1.620	8.7	1.7	20	0.6
3718-EN06	3718-EN05	Gravity Main	18	865	140.0	110.5	138.0	109.6	0.110	2.3	1.6	69	0.6
3718-EN01	3719-EN01	Gravity Main	24	2006	129.9	94.9	118.0	93.1	0.090	4.4	3.7	86	0.7
3718-EN02	3718-EN01	Gravity Main	24	694	127.0	95.7	129.9	94.9	0.120	5.0	3.7	74	0.7
3719-EN01	3719-EN03	Gravity Main	24	35	118.0	93.1	122.0	92.8	0.780	12.9	3.7	29	0.4
3128-EN01	3045-EN01	Gravity Main	15	1136	189.2	154.8	184.0	152.8	0.180	1.8	1.5	82	0.7
3128-EN02	3128-EN01	Gravity Main	15	1303	193.4	157.2	189.2	154.8	0.180	1.8	1.5	82	0.7
3045-EN01	322-221-1009	Gravity Main	18	1715	184.0	152.5	179.7	150.1	0.140	2.5	1.8	70	0.6
2540-EN01	2541-EN02	Gravity Main	15	2147	175.2	159.4	172.0	155.6	0.180	1.8	1.2	69	0.6

BR East Rancho
Trunk Sewer Data and Model Results
Buildout 10-Year Design Storm

US Manhole	DS Manhole	Link Type	Diameter (in)	Length (ft)	US Rim Elev. (ft)	US Invert Elev. (ft)	DS Rim Elev. (ft)	DS Invert Elev. (ft)	Slope (%)	Full Capacity (mgd)	Peak Flow (mgd)	% Full Capacity	d/D
2458-EN01	2543-EN01	Gravity Main	18	1431	179.6	148.0	164.6	139.3	0.610	5.3	4.0	76	0.7
2544-EN02	2544-EN01	Gravity Main	18	813	158.2	135.4	136.0	130.0	0.660	5.5	5.4	97	0.8
2541-EN01	2542-EN01	Gravity Main	21	1682	173.8	152.7	173.4	150.7	0.120	3.5	3.3	94	0.9
2541-EN02	2541-EN01	Gravity Main	21	1330	172.0	155.1	173.8	153.5	0.120	3.6	2.7	76	0.7
2542-EN01	2458-EN01	Gravity Main	21	2211	173.4	150.5	179.6	147.9	0.120	3.6	3.7	105	1.0
2460-EN03	2460-INT01	Gravity Main	27	299	124.0	110.1	124.7	109.8	0.100	6.3	5.7	90	0.6
2543-EN01	2544-EN02	Gravity Main	27	3236	164.6	138.6	158.2	135.4	0.100	6.3	5.0	79	0.7
2544-EN01	2460-EN03	Gravity Main	27	2373	136.0	112.4	124.0	110.1	0.100	6.3	5.7	90	0.7
2954-EN03	3131-EN01	Force Main	15	31664	158.0	151.0	168.0	160.0			5.4		1.0
2955-EN02	3131-EN01	Force Main	15	26476	182.4	169.0	168.0	160.0			4.5		1.0
3460-EN03	3131-EN01	Force Main	12	25920	124.0	98.4	168.0	160.0			4.2		1.0
3460-EN05	3131-EN01	Force Main	15	24480	138.0	120.9	168.0	160.0			6.8		1.0
3296-EN03	N47-MH0108A	Force Main	12	8567	158.0	142.6	177.4	167.0			4.4		1.0
2879-EN02	3131-EN01	Force Main	14	6004	146.0	118.0	168.0	160.0			6.7		1.0
3719-EN03	3131-EN01	Force Main	12	16654	116.2	92.8	168.0	160.0			3.7		1.0
3551-EN02	3131-EN01	Force Main	12	11852	131.0	107.7	168.0	160.0			2.1		1.0



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

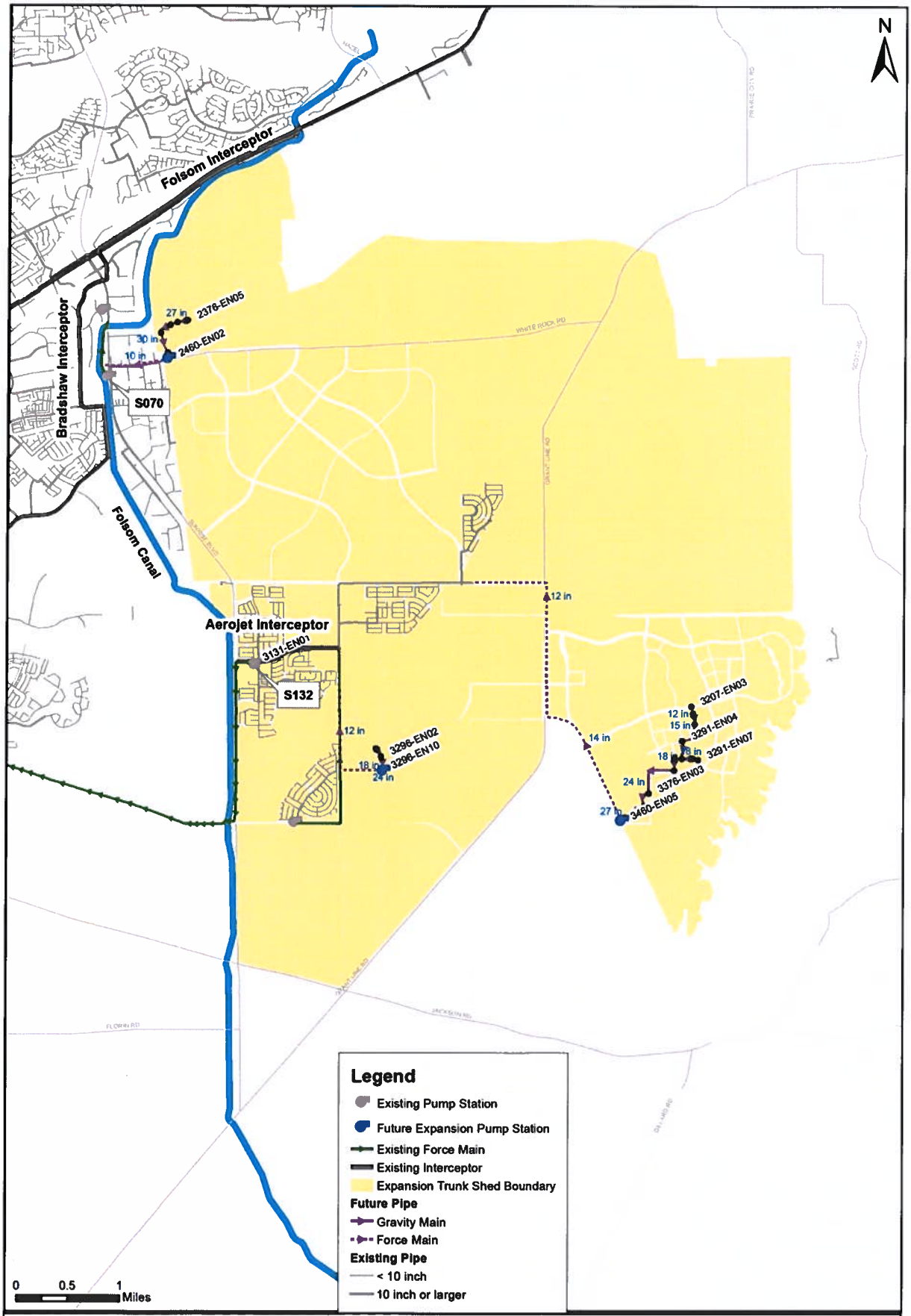
BR East Rancho

Planned Development Areas

Figure A.3-1

SACRAMENTO AREA SEWER DISTRICT

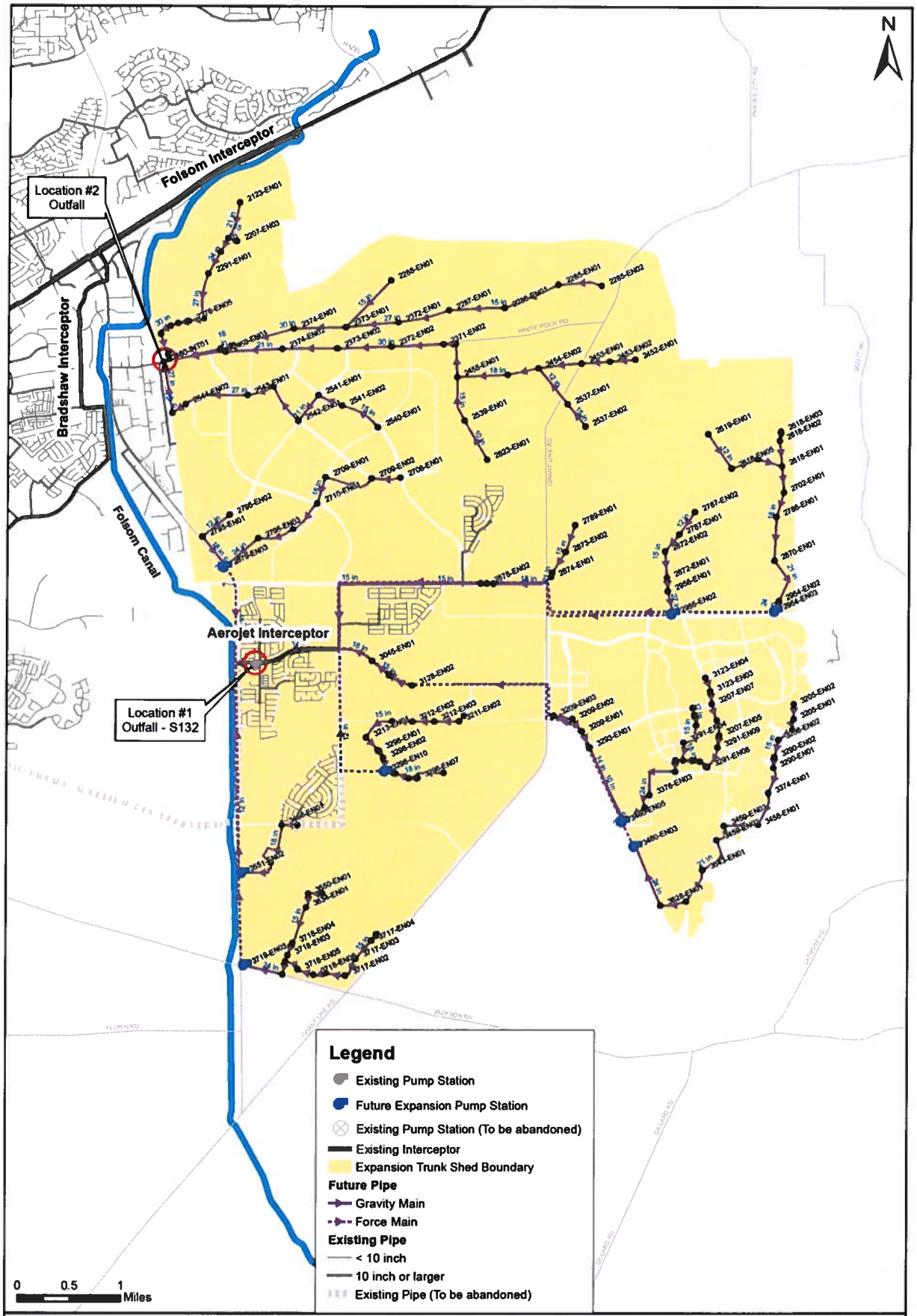
Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE
BR East Rancho
Near-Term Expansion Plan
Figure A.3-2

SACRAMENTO AREA SEWER DISTRICT

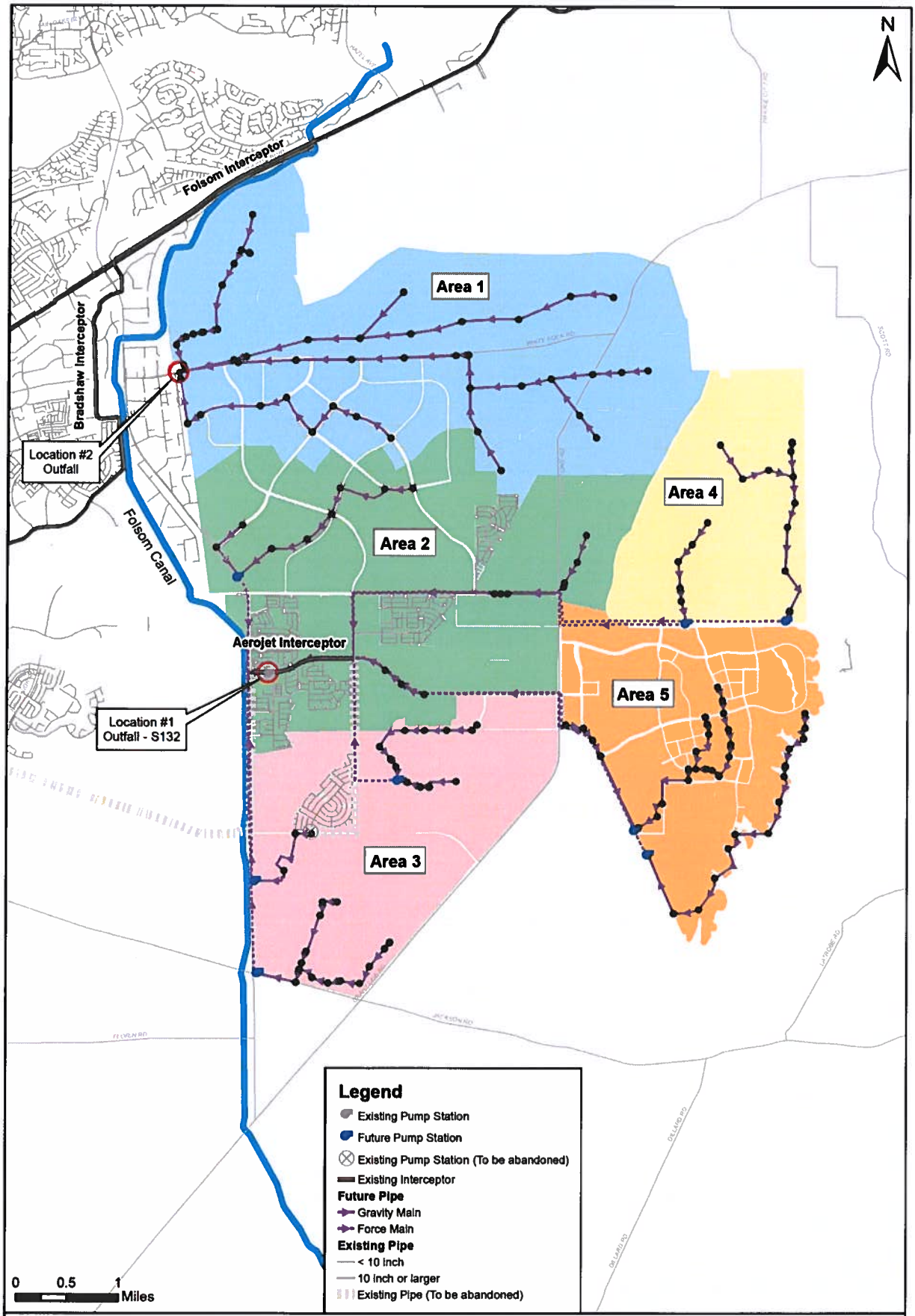
Updated: 8/24/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE
BR East Rancho
Buildout Expansion Plan
Figure A.3-3

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016



SACRAMENTO AREA SEWER DISTRICT

SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

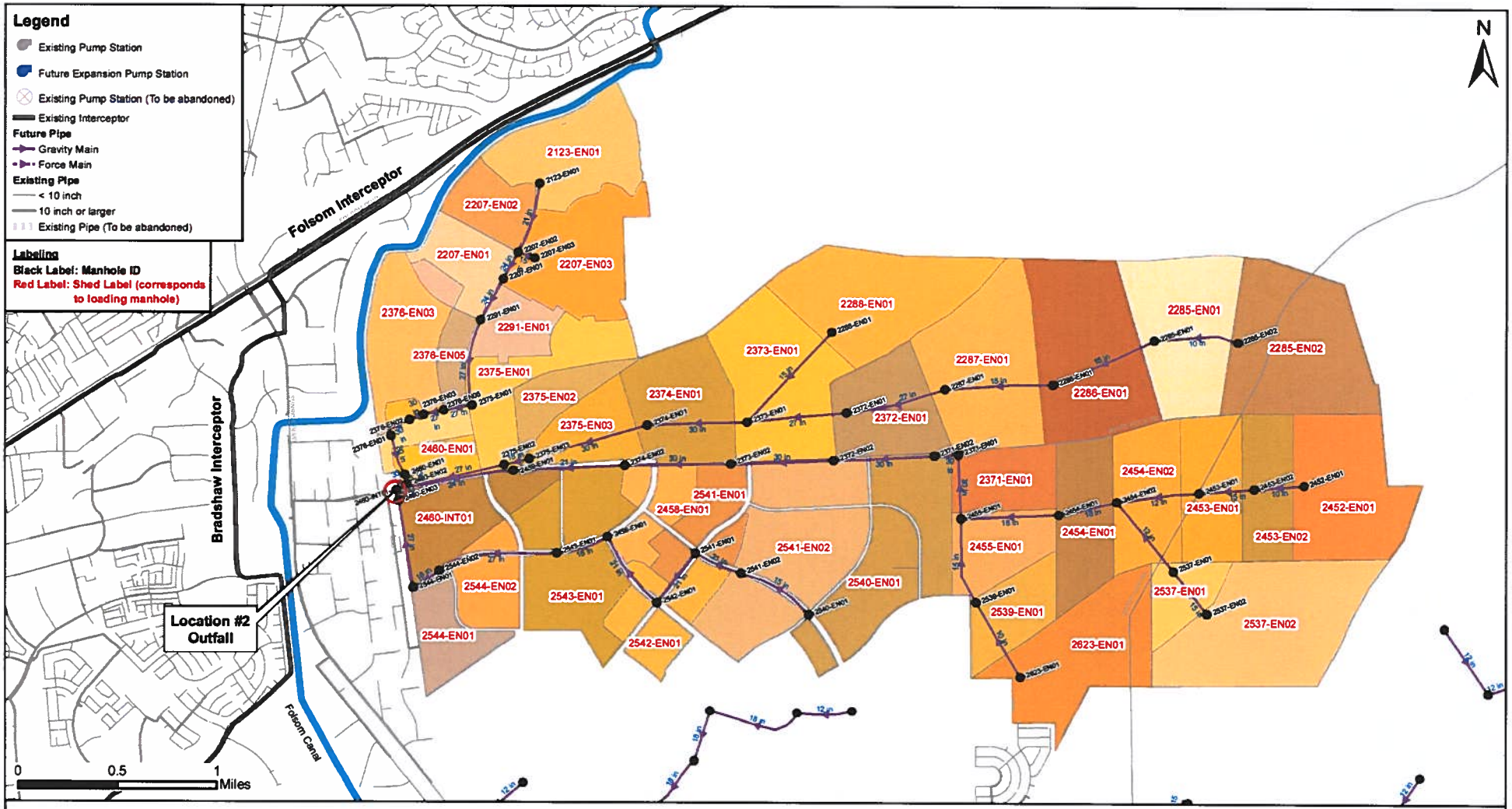
BR East Rancho

Sewer Shed Map (Area 1 - Area 5)

Buildout Expansion Plan

FIGURE A.3-4

Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

BR East Rancho

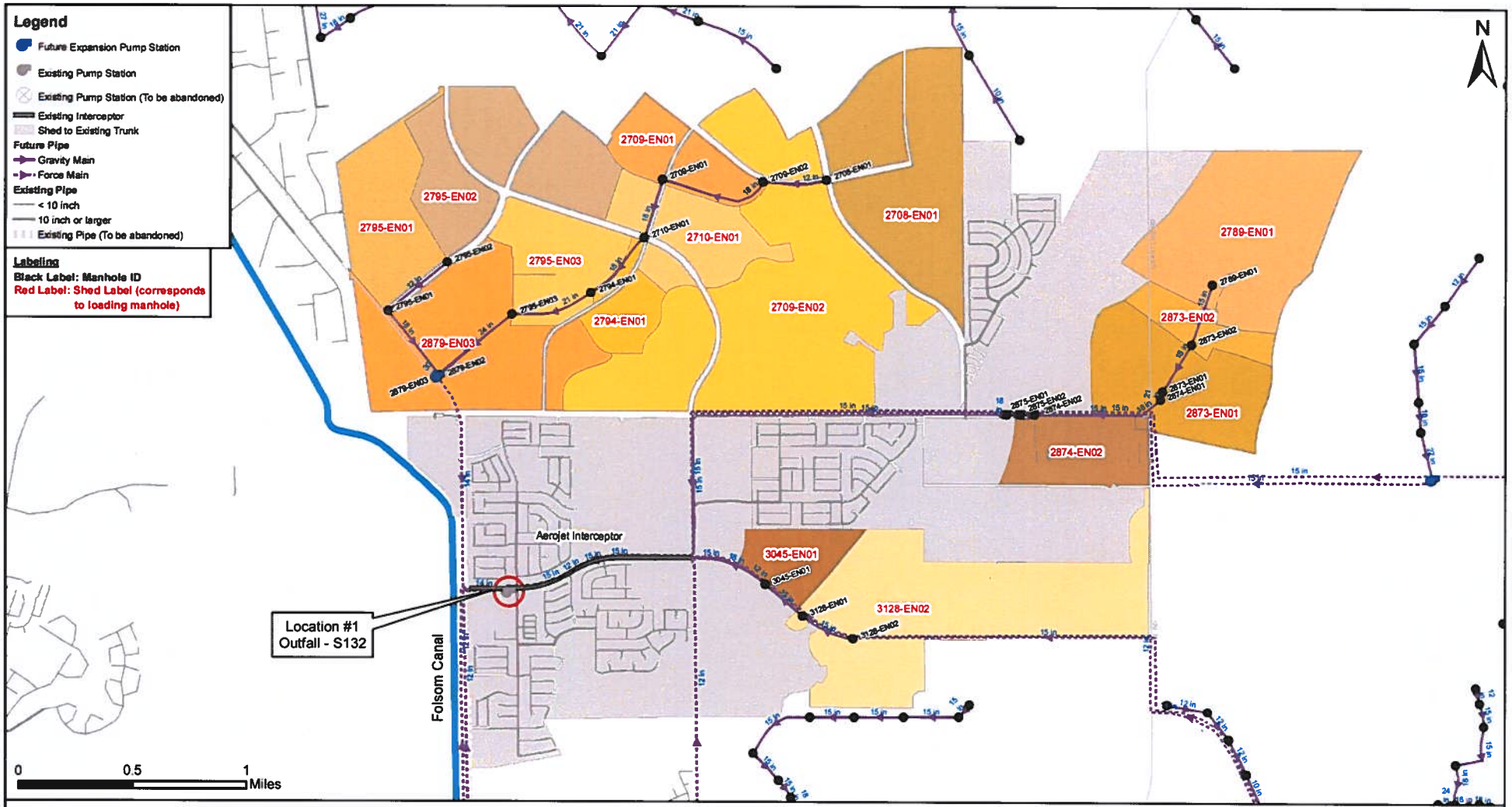
Sewer Shed Map - Area 1

Buildout Expansion Plan

FIGURE A.3-5

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

BR East Rancho

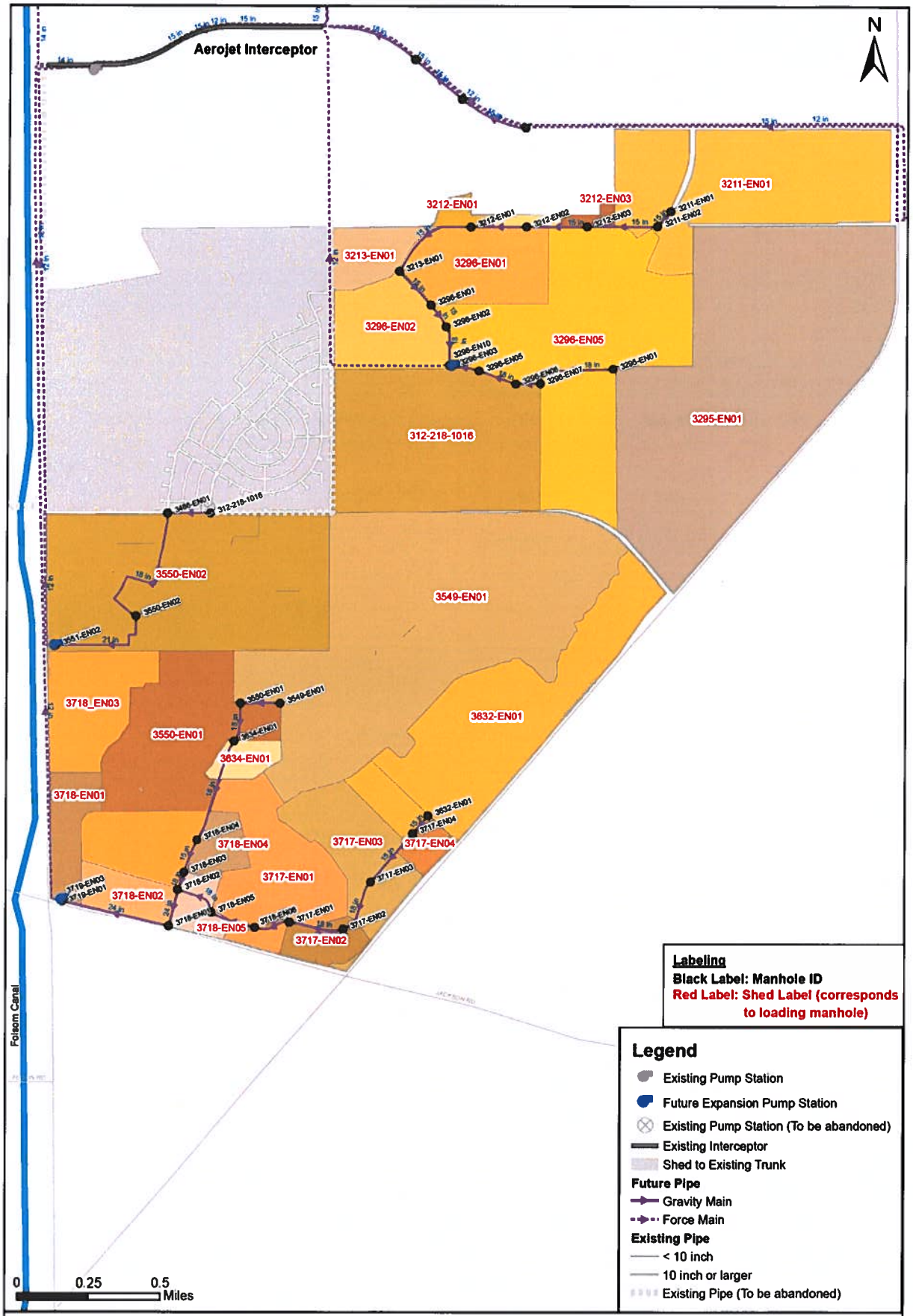
Sewer Shed Map - Area 2

Buildout Expansion Plan

FIGURE A.3-6

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

BR East Rancho

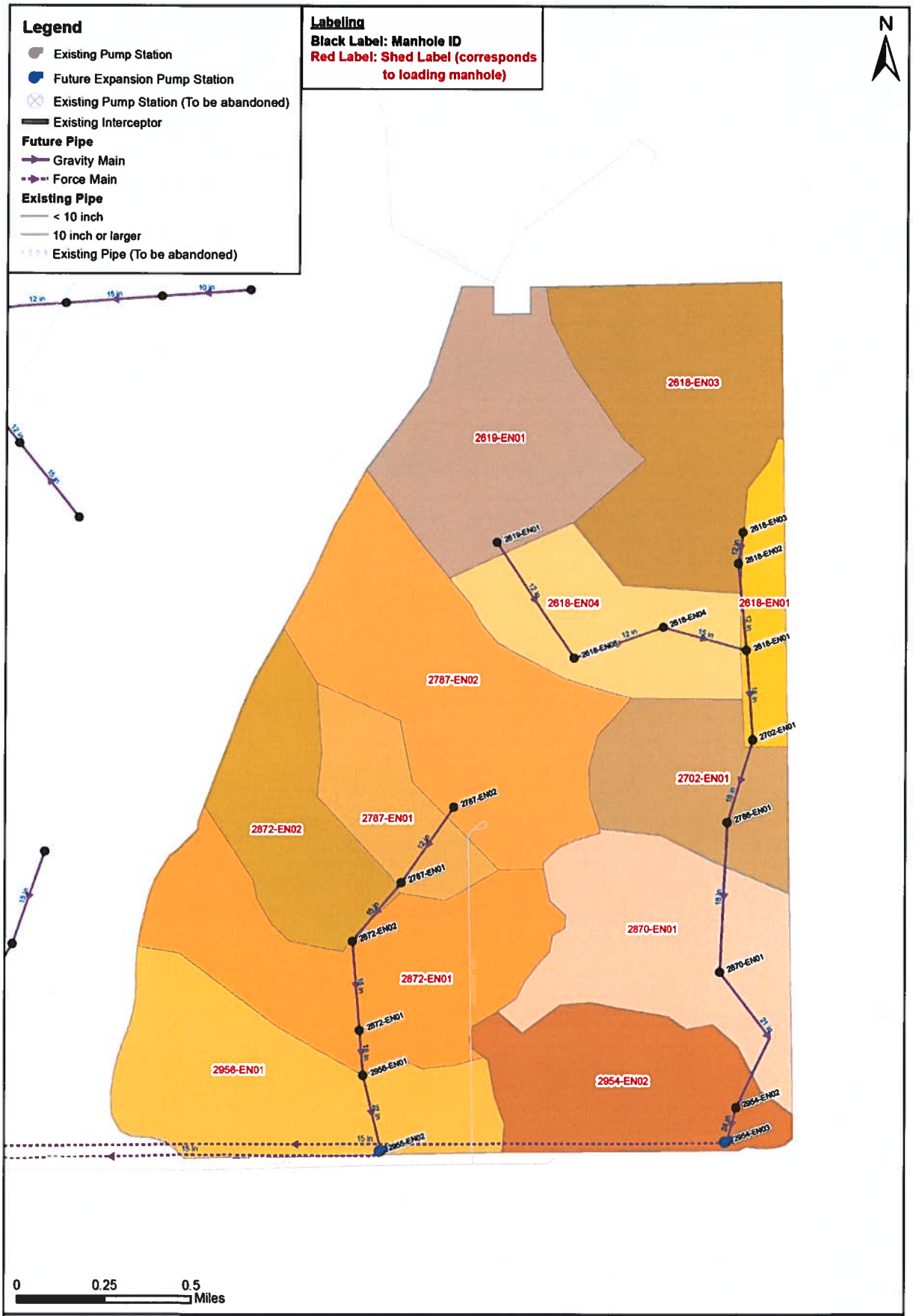
Sewer Shed Map - Area 3

Buildout Expansion Plan

FIGURE A.3-7

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

BR East Rancho

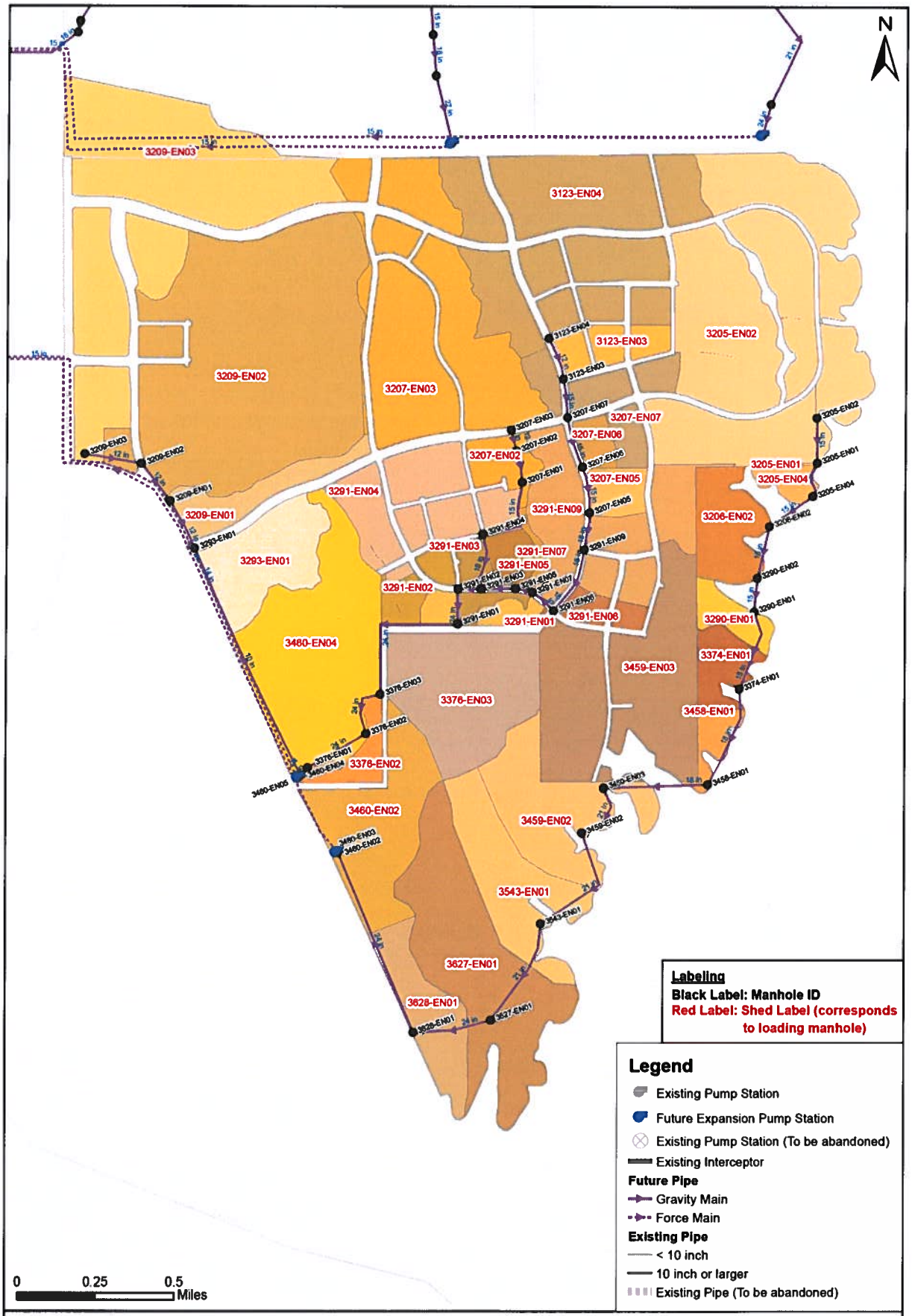
Sewer Shed Map - Area 4

Buildout Expansion Plan

FIGURE A.3-8

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016



SASD SYSTEM CAPACITY PLAN - 2015 UPDATE

BR East Rancho

Sewer Shed Map - Area 5

Buildout Expansion Plan

FIGURE A.3-9

SACRAMENTO AREA SEWER DISTRICT

Updated: 3/18/2016

From: Lewis. Yadira [mailto:lewisy@sacsewer.com]
Sent: Friday, August 10, 2018 2:31 PM
To: Tom Cassera <tcassera@ctaes.net>
Cc: Murray. Ken <murrayke@sacsewer.com>
Subject: Sewer Studies

Good afternoon Mr. Cassera,

I have provided a link below to the following sewer studies:

- Montelena
- Cordova Hills
- Arista Del Sol

Please let me know if I can assist you further. Thank you.

Yadira Lewis, P.E.
Assistant Engineer
Sacramento Area Sewer District
10060 Goethe Road
Sacramento, CA 95827
(916) 876-6336
lewisy@sacsewer.com
www.sacsewer.com

SACRAMENTO AREA
SEWER DISTRICT

From: Lewis. Yadira [mailto:lewisy@sacsewer.com]
Sent: Monday, September 17, 2018 3:38 PM
To: Tom Cassera <tcassera@ctaes.net>
Cc: Murray. Ken <murrayke@sacsewer.com>
Subject: RE: The Ranch level 1 - RE: Sewer Studies

Hi Tom,

Thank you for the follow-up email. SASD's modeling section has confirmed there is available capacity in the Aerojet Interceptor under existing conditions. Assuming the S132 pump station will be replaced by a Regional San facility that will not cause back-ups to the Aerojet Interceptor, the model predicts minor surcharging in the Aerojet Interceptor under buildout conditions. Thank you.

-Yadira

From: Lewis. Yadira [mailto:lewisy@sacsewer.com]
Sent: Tuesday, September 04, 2018 6:55 AM
To: Tom Cassera <tcassera@ctaes.net>
Cc: Murray. Ken <murrayke@sacsewer.com>
Subject: RE: The Ranch level 1 - RE: Sewer Studies

Good morning Tom,

Allow me to verify this with SASD's modeling department. I will let you know what they say as soon as possible. Thank you.

-Yadira

From: tcassera@ctaes.net [mailto:tcassera@ctaes.net]
Sent: Friday, August 31, 2018 1:36 PM
To: Lewis. Yadira <lewisy@sacsewer.com>
Cc: Murray. Ken <murrayke@sacsewer.com>
Subject: The Ranch level 1 - RE: Sewer Studies

Hi Yadira,

I working on Level 1 sewer Study for The Ranch.

In review of the reports you forwarded, ADS sewer study based assumptions on "downstream Aerojet 2 Interceptor has capacity without surcharge conditions as verified by SASD and SCRSD".

Is that assumption still valid?

Thanks,

Tom Cassera, PE, QSD
CTA Engineering & Surveying