Sewer Area Study

TR No 53138

(FOR OUTLET POINTS **1** & **2**)

January 5, 2016 JN 99610-01

PC11775AS

SEWER AREA STUDY
APPROVED

APPROVED BY:_____ RCE NO. 70745 DATE 03/08/2016

CHECKED BY: Imelda Ng DATE 03/08/2016

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

THIS APPROVAL EXPIRES TWO YEARS FROM THE DATE OF APPROVAL

This approval is also subject to the City of Los Angela's conditional approval on pages 45-49

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I. INTRODUCTION/PROJECT DESCRIPTION

The purpose of this sewer area study is to determine the amount of sewage flow generated by the tract development using the Los Angeles County area study standard. TR 53138 is located in the unincorporated Chatsworth area of the County of Los Angeles north of the Ronald Reagan Freeway, between Canoga Avenue and Topanga Canyon Blvd. Sewage flows from this tract are discharged into the City of Los Angeles sewer systems. A separate Sewer Area Study was prepared per City of Los Angeles Standards to determine the adequacy of the existing sewer system. That Sewer Area Study was reviewed and approved by the City of Los Angeles on June 18, 2015. Sewage flows from this tract are discharged at two locations into the City of Los Angeles Sewer System. One point of discharge is Outlet Point No. 1 (intersection of Topanga Canyon Blvd and Poema Place), and the other point of discharge is at Outlet Point No. 2 (Canoga Avenue, south of Ronald Reagan Freeway). Discharge to Outlet Point No. 2 (Canoga Avenue Sewer System) was conditionally approved by the City of Los Angeles based on the offsite construction of an 8-inch sewer along Canoga Avenue from Candice Pl to Celtic St per the previously approved sewer study Report as stated in a letter dated June 18, 2015 (see Exhibit 8). Offsite requirement from the City of Los Angeles can be seen in Exhibit 1 page 2, and will be per separate permit through the City of Los Angeles. A will serve letter from LVMWD is included (see Exhibit 9).

This tract development (TR 53138) was included in and part of the approved Sewer Area Study for TR 53235 (PC #11834AS). A copy of this approved study is included for reference. Tributary areas to the North and West of Connection Point 1 were shown and included in PC #11834AS. SEA areas and zoning of these offsite areas remain consistent today as when this approval was made. The total outlet flows at Connection Point 1 will be slightly less than the flow previously approved since the number of lots contributing from this project (TR 53138) at Connection Point 1 have been reduced from 31 lots to 17 lots.

The proposed project, TR 53138, consists of a possible 325 residential lots, a recreation center, a sheriff substation, and 29 open space lots (which include a pocket park, a horse rest area, and a helispot). The onsite sewer system is all gravity flow. A portion of the sewer mainline from Poema Place to Canoga Avenue runs across slopes and through an 8’ wide multi-use trail per approval of LA County Sewer Maintenance District to eliminate the need of any sewer lift stations.

II. SEWER PIPE CAPACITY ANALYSIS

Sewer Pipe Capacity Analysis for Tract No 53138 Outlet Point No. 1

Sewage flows were calculated per County Standard using flow coefficient of 0.0012 cfs/unit or lot per direction from the County Engineers. The results are as follows:

The tabulated comparisons between the County and City methodologies are as follows:

Q = 0.61 cfs…….County Standard

Q = 0.71 cfs…….City Standard

The preceding tabulation shows that at Outlet Point No. 1, the city standard has a higher value than the county standard, therefore, the existing sewer systems are adequate.

This Sewer Area Study also includes sewage discharged from the Twin Lakes community shown in Area 12 & Area 15 in the enclosed map (see Exhibit 1).

The total unit/lot count north of Poema Place and west of Topanga Canyon Blvd per approved PC#11834AS and based on the County of Los Angeles Consolidated S.M.D map S-1224 (see Exhibit 5) is as tabulated below:

West of Topanga Cyn Blvd:

Tract 34108----------58 Units

Tract 44334----------202 Units

Tract 44327----------33 Lots

Tract 44335----------20 Units

Tract 33622----------18 Lots

Tract 42353----------57 Lots

Tract 53235----------65 Units

Non-Tract Property----------10 Lots

Subtotal----------463 Units/Lots

NOTE: Any future subdivision in these offsite properties is subject to provide an updated sewer area study.

East of Topanga Cyn Blvd:

Area 11----------17 Lots

Area 12, 15 & Sheriff --32 Lots [Twin Lakes, Sheriff (Office 1200sf = .0009 cfs -see calc)]

Subtotal----------49 Lots

TOTAL Unit/Lot count = 463 + 49 = 512 Units/Lots

The revised flow to Outlet No. 1 for **County** of Los Angeles Standard is:

Q = .0012 cfs (peak) x 512 units/lots = **0.61 cfs (peak)**

The revised flow to Outlet No. 1 for **City** of Los Angeles Standard is:

Q = 4 persons/lot x 512 lots x 90gpcd x 1.5472×10^{-6} cfs/gpd = 0.285 cfs (ave)

0.285 cfs x 2.5 (peak factor) + Sheriff = **0.71 cfs (peak)**

Sewer Pipe Capacity Analysis for Tract No 53138 Outlet Point No. 2

Sewage flows were calculated per County Standard using flow coefficient of 0.0012 cfs/unit or lot per direction from the County Engineers.

The tabulated comparisons between the County and City methodologies are as follows:

Q = 0.63 cfs…….County Standard

Q = 0.73 cfs…….City Standard

The preceding tabulation shows that at Outlet Point No. 2, the city standard has a higher value than the county standard. Since analysis downstream of these outlet points were done using the City standard, therefore the existing sewer systems are adequate provided that the recommendations in the City of Los Angeles approved Sewer Area Study are implemented.

This study takes into consideration 40 acres of undeveloped land directly to the North of said project in A-2-2 zoning equaling 20 potential lots. The Santa Monica Mountains Conservancy (SMMC) owns a 10' strip immediately to the north of the entire project boundary and over half of another 40 acres directly west of the previously mentioned 40-acres.. The ≤20 acres north of this line that is owned by private owners is included per zoning (A-2-2, 10 lots) in the event that this area is allowed to be developed in the future.

Area 1 includes the potential 10 offsite lots mentioned above, and Area 4 includes the 20 potential offsite lots mentioned above. All "Not A Part" (NAP) potential lots (per VTTM 53138) within the tract were included in this study and added to their respective areas. Area 8 includes one offsite lot that was included in the flow calculations (see Exhibit 1).

This Sewer Area Study also includes sewage discharge from the Twin Lakes Community as shown on the enclosed map (see Exhibit 1).

Areas upstream of Connection Point 2:

Area 1----------24 Lots (14 + 10 Offsite per zoning)
Area 2----------18 Lots
Area 3----------31 Lots
Area 4----------55 Lots (35 + 20 Offsite per zoning)
Area 5----------94 Lots
Area 6----------28 Lots
Area 7----------23 Lots + Rec Ctr (Auditorium 60 cap = .001cfs -see calc.)
Area 8----------59 Lots (58 + 1 Offsite)
Area 9----------4 Lots
Area 10----------2 Lots
Area 13----------157 Lots (130 + 27 per zoning)
Area 14----------31 Lots

TOTAL Unit/Lot count = 526 Units/Lots + Rec Ctr

The revised flow to Outlet No. 2 for **County** of Los Angeles Standard is:

Q = .0012 cfs (peak) x 526 units/lots + Rec Ctr = **0.63 cfs (peak)**

The revised flow to Outlet No. 2 for **City** of Los Angeles Standard is:

Q = 4 persons/lot x 526 lots x 90gpcd x 1.5472×10^{-6} cfs/gpd = 0.293 cfs (ave)

0.293 cfs x 2.5 (peak factor) + Rec Ctr = **0.73 cfs (peak)**

III. EXISTING SEWER SYSTEM DESCRIPTION

See attached LA City Sewer Area Study.

IV. CONCLUSION

Subsequent capacity calculations of pipes downstream showed the existing system is adequate to handle the additional flows.

In regards to the outlet approval, a letter dated June 18, 2015 from Mr. Ali Poosti, Division Manager, Wastewater Engineering Services Division, LA Sanitation states that there is sufficient capacity for the City of Los Angeles to accept the flows of this project with the construction of an 8-inch sewer along Canoga Avenue from Candice Pl to Celtic St. (See Exhibit 8).

SEWER AREA STUDY FLOW CALCULATIONS

TRACT 53138

FLOW COEFFICIENT = 0.0012 CFS/UNIT OR LOT

AREA 1 : 24 LOTS (14 + 10 OFFSITE) ON SCHINDLER WAY @ SULLIVAN WAY

Q_1 = 0.0012 X 24 = 0.0288 CFS

8" PIPE @ 5.0% SLOPE, MAX DISCHARGE = 2.71 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.355 CFS, 1.355 > 0.0288 OK

AREA 1-2 : 42 LOTS ON SULLIVAN WAY (WORST CASE)

Q_{1-2} = 0.0012 X 42 = 0.0504 CFS

8" PIPE @ 0.4% SLOPE, MAX DISCHARGE = 0.76 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.38 CFS, 0.38 > 0.0504 OK

AREA 1-3 : 75 LOTS ON SULLIVAN WAY @ BULLFINCH (WORST CASE)

$Q_{1-3} = Q_{1-2}+Q_3$ = 0.0504+(0.0012 X 31) = 0.0876 CFS

8" PIPE @ 0.4% SLOPE, MAX DISCHARGE = 0.76 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.38 CFS, 0.38 > 0.0876 OK

AREA 4 : 55 LOTS ON SULLIVAN WAY (WORST CASE)

Q_4 = 0.0012 X 55 = 0.066 CFS

8" PIPE @ 7.0% SLOPE, MAX DISCHARGE = 3.25 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.63 CFS, 1.63 > 0.066 OK

AREA 5 : 94 LOTS ON KOENIG WAY @ BULLFINCH (WORST CASE)

Q_5 = 0.0012 X 94 = 0.1128 CFS

8" PIPE @ 5.0% SLOPE, MAX DISCHARGE = 1.82 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.91 CFS, 0.91 > 0.1128 OK

AREA 1-6 : 250 LOTS ON BULLFINCH @ POEMA (WORST CASE)

$Q_{1\text{-}6} = Q_{1\text{-}3} + Q_4 + Q_5 + Q_6 = 0.0876+0.066+0.1128+(0.0012 \text{ X } 28) = 0.300$ CFS

8" PIPE @ 3.0% SLOPE, MAX DISCHARGE = 2.13 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.07 CFS , 1.07 > 0.300 OK

AREA 1-7 : 273 LOTS + REC CTR ON TRAIL TO CANOGA (WORST CASE)

REC CTR = 60 SEAT AUDITORIUM X 5G/SEAT X 2.5 PEAK /646272

CONVERSION = 0.001 CFS

$Q_{1\text{-}7} = Q_{1\text{-}6} + Q_7$ + Rec Ctr = 0.300 + (0.0012 X 23) + 0.001 = 0.3286 CFS

8" PIPE @ 0.6% SLOPE, MAX DISCHARGE = 0.95 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.48 CFS , 0.48 > 0.3286 OK

AREA 8 : 58 LOTS + 1 OFFSITE ON CANOGA (WORST CASE)

$Q_8 = 0.0012 \text{ X } 59 = 0.0708$ CFS

8" PIPE @ 5.0% SLOPE, MAX DISCHARGE = 2.75 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.38 CFS , 1.38 > 0.0708 OK

AREA 9 : 4 LOTS ON POEMA PL @ CANOGA (WORST CASE)

$Q_9 = 0.0012 \text{ X } 4 = 0.0048$ CFS

8" PIPE @ 3.0% SLOPE, MAX DISCHARGE = 2.13 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.07 CFS , 1.07 > 0.0048 OK

AREA 8-10 : 65 LOTS ON CANOGA (WORST CASE)

$Q_{8\text{-}10} = Q_8 + Q_9 + Q_{10} = 0.0708+0.0048+(0.0012 \text{ X } 2) = 0.0780$ CFS

8" PIPE @ 6.0% SLOPE, MAX DISCHARGE = 2.75 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.38 CFS , 1.38 > 0.0780 OK

AREA 1-10, 14 : 369 LOTS ON POEMA PL @ CANOGA (WORST CASE)

$Q_{1\text{-}10,14} = Q_{1\text{-}7} + Q_{8\text{-}10} + Q_{14} = 0.3286+0.0780+(31 \text{ X } 0.0012) = 0.4438$ CFS

8" PIPE @ 0.76% SLOPE, MAX DISCHARGE = 1.05 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.525 CFS , 0.525 > 0.4438 OK

AREA 13 : 130 LOTS + 22 PER ZONING IN TWIN LAKES @ CANOGA (WORST CASE)

431971 SF OF WHICH 348982=A-1-1 (8.0 LOTS), 82989=R-1-6000 (13.8 LOTS)

Q_{13} = 0.0012 X 152 = 0.1824 CFS

8" PIPE @ 0.4% SLOPE, MAX DISCHARGE = 0.77 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.39 CFS , 0.39 > 0.1824 OK

ALL CONNECTION POINT 2 (WORST CASE)

$Q_{1\text{-}10,14} + Q_{13}$ = 0.4438 + 0.1824 = 0.6262 CFS

8" PIPE @ 5.0% SLOPE, MAX DISCHARGE = 2.75 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 1.38 CFS , 1.38 > 0.6262 OK

AREA 11 : 17 LOTS ON JOHNSON WAY @ POEMA PL (WORST CASE)

Q_{11} = 0.0012 X 17 = 0.0204 CFS

8" PIPE @ 2.4% SLOPE, MAX DISCHARGE = 1.90 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.95 CFS , 0.95 > 0.0204 OK

AREA 11-12,15 : 46 + SHERIFF ON POEMA PL @ TOPANGA (WORST CASE)

AREA 15 = 18 LOTS AND SHERIFF (*1200 SF OFFICE X 200GPD/1000SF X 2.5 PEAK/646272 CONVERSION TO CFS = .0009CFS*)

$Q_{11\text{-}12,15} = Q_{11} + Q_{12,15}$ = 0.0204 + [(0.0012 X 11) + (0.0012 X 18) + 0.0009 SHERIFF] = 0.0561 CFS

8" PIPE @ 0.4% SLOPE, MAX DISCHARGE = 0.77 CFS (SEE CALC PRINTOUT)

½ FLOW ALLOWED = 0.39 CFS , 0.39 > 0.0561 OK

ALL CONNECTION POINT 1 @ EX. MH 1 TO EX. CITY ON TOPANGA (WORST CASE)

OFFSITE 463 UNITS + $Q_{11\text{-}12,15}$ = (463 X 0.0012) + 0.0561 = 0.61 CFS

12" PIPE @ 1.68% SLOPE, MAX DISCHARGE = 4.81 CFS (SEE CALC PRINTOUT) ½ FLOW ALLOWED = 2.41 CFS , 2.41 > 0. 61 OK

Worksheet for Area 1: 24 Units (Incl 10 Offsite) on Schindler @Sullivan

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	0.67	ft
Discharge	0.03	ft³/s

Results

Normal Depth	0.06	ft
Flow Area	0.01	ft²
Wetted Perimeter	0.39	ft
Hydraulic Radius	0.04	ft
Top Width	0.37	ft
Critical Depth	0.08	ft
Percent Full	8.5	%
Critical Slope	0.01294	ft/ft
Velocity	2.01	ft/s
Velocity Head	0.06	ft
Specific Energy	0.12	ft
Froude Number	1.81	
Maximum Discharge	2.71	ft³/s
Discharge Full	2.48	ft³/s
Slope Full	0.00002	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	8.49	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 1&2: 42 Lots on Sullivan (worst case)

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Diameter	0.67	ft
Discharge	0.05	ft³/s

Results

Normal Depth	0.13	ft
Flow Area	0.05	ft²
Wetted Perimeter	0.61	ft
Hydraulic Radius	0.08	ft
Top Width	0.53	ft
Critical Depth	0.10	ft
Percent Full	19.2	%
Critical Slope	0.01106	ft/ft
Velocity	1.07	ft/s
Velocity Head	0.02	ft
Specific Energy	0.15	ft
Froude Number	0.63	
Maximum Discharge	0.76	ft³/s
Discharge Full	0.70	ft³/s
Slope Full	0.00004	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	19.22	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 1-3: 73 Lots on Sullivan @Bullfinch

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Diameter	0.67	ft
Discharge	0.09	ft³/s

Results

Normal Depth	0.17	ft
Flow Area	0.07	ft²
Wetted Perimeter	0.70	ft
Hydraulic Radius	0.10	ft
Top Width	0.58	ft
Critical Depth	0.13	ft
Percent Full	24.7	%
Critical Slope	0.00955	ft/ft
Velocity	1.29	ft/s
Velocity Head	0.03	ft
Specific Energy	0.19	ft
Froude Number	0.67	
Maximum Discharge	0.77	ft³/s
Discharge Full	0.71	ft³/s
Slope Full	0.00009	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	24.68	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 4: 35 Lots, & 20 Offsite on Bullfinch

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.07000	ft/ft
Diameter	0.67	ft
Discharge	0.07	ft³/s

Results

Normal Depth	0.08	ft
Flow Area	0.02	ft²
Wetted Perimeter	0.46	ft
Hydraulic Radius	0.05	ft
Top Width	0.42	ft
Critical Depth	0.12	ft
Percent Full	11.3	%
Critical Slope	0.01031	ft/ft
Velocity	3.00	ft/s
Velocity Head	0.14	ft
Specific Energy	0.22	ft
Froude Number	2.33	
Maximum Discharge	3.25	ft³/s
Discharge Full	2.97	ft³/s
Slope Full	0.00006	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	11.31	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 5: 94 Lots on Koenig @Bullfinch

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.02200	ft/ft
Diameter	0.67	ft
Discharge	0.11	ft³/s

Results

Normal Depth	0.12	ft
Flow Area	0.05	ft²
Wetted Perimeter	0.60	ft
Hydraulic Radius	0.08	ft
Top Width	0.52	ft
Critical Depth	0.15	ft
Percent Full	18.6	%
Critical Slope	0.00920	ft/ft
Velocity	2.49	ft/s
Velocity Head	0.10	ft
Specific Energy	0.22	ft
Froude Number	1.49	
Maximum Discharge	1.82	ft³/s
Discharge Full	1.67	ft³/s
Slope Full	0.00013	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	18.61	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 1-6: 240 Lots on Bullfinch @Poema

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03000	ft/ft
Diameter	0.67	ft
Discharge	0.30	ft³/s

Results

Normal Depth	0.18	ft
Flow Area	0.08	ft²
Wetted Perimeter	0.74	ft
Hydraulic Radius	0.11	ft
Top Width	0.60	ft
Critical Depth	0.25	ft
Percent Full	27.4	%
Critical Slope	0.00821	ft/ft
Velocity	3.83	ft/s
Velocity Head	0.23	ft
Specific Energy	0.41	ft
Froude Number	1.86	
Maximum Discharge	2.13	ft³/s
Discharge Full	1.95	ft³/s
Slope Full	0.00076	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	27.39	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 1-7: 273 Lots & Rec onTrail @Canoga (worst)

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00600	ft/ft
Diameter	0.67	ft
Discharge	0.33	ft³/s

Results

Normal Depth	0.29	ft
Flow Area	0.14	ft²
Wetted Perimeter	0.96	ft
Hydraulic Radius	0.15	ft
Top Width	0.66	ft
Critical Depth	0.27	ft
Percent Full	43.0	%
Critical Slope	0.00818	ft/ft
Velocity	2.27	ft/s
Velocity Head	0.08	ft
Specific Energy	0.37	ft
Froude Number	0.86	
Maximum Discharge	0.95	ft³/s
Discharge Full	0.87	ft³/s
Slope Full	0.00090	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	42.95	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 8: 58 Lots & 1 Offsite on Canoga @Poema

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	0.67	ft
Discharge	0.07	ft³/s

Results

Normal Depth	0.08	ft
Flow Area	0.03	ft²
Wetted Perimeter	0.48	ft
Hydraulic Radius	0.05	ft
Top Width	0.44	ft
Critical Depth	0.12	ft
Percent Full	12.5	%
Critical Slope	0.01007	ft/ft
Velocity	2.77	ft/s
Velocity Head	0.12	ft
Specific Energy	0.20	ft
Froude Number	2.04	
Maximum Discharge	2.75	ft³/s
Discharge Full	2.51	ft³/s
Slope Full	0.00007	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	12.54	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 9: 4 Lots on Poema @Canoga

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03000	ft/ft
Diameter	0.67	ft
Discharge	0.00	ft³/s

Results

Normal Depth	0.03	ft
Flow Area	0.01	ft²
Wetted Perimeter	0.28	ft
Hydraulic Radius	0.02	ft
Top Width	0.27	ft
Critical Depth	0.03	ft
Percent Full	4.4	%
Critical Slope	0.02388	ft/ft
Velocity	0.89	ft/s
Velocity Head	0.01	ft
Specific Energy	0.04	ft
Froude Number	1.12	
Maximum Discharge	2.13	ft³/s
Discharge Full	1.95	ft³/s
Slope Full	0.00000	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	4.37	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 8-10: 65 Lots on Canoga

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.06000	ft/ft
Diameter	0.67	ft
Discharge	0.08	ft³/s

Results

Normal Depth	0.08	ft
Flow Area	0.03	ft²
Wetted Perimeter	0.49	ft
Hydraulic Radius	0.05	ft
Top Width	0.44	ft
Critical Depth	0.13	ft
Percent Full	12.6	%
Critical Slope	0.01001	ft/ft
Velocity	3.04	ft/s
Velocity Head	0.14	ft
Specific Energy	0.23	ft
Froude Number	2.23	
Maximum Discharge	3.01	ft³/s
Discharge Full	2.75	ft³/s
Slope Full	0.00008	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	12.57	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 1-10, 14: Area 1-10 & 31 Lots on Canoga Ave

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00760	ft/ft
Diameter	0.67	ft
Discharge	0.44	ft³/s

Results

Normal Depth	0.32	ft
Flow Area	0.16	ft²
Wetted Perimeter	1.02	ft
Hydraulic Radius	0.16	ft
Top Width	0.67	ft
Critical Depth	0.31	ft
Percent Full	47.7	%
Critical Slope	0.00823	ft/ft
Velocity	2.70	ft/s
Velocity Head	0.11	ft
Specific Energy	0.43	ft
Froude Number	0.96	
Maximum Discharge	1.05	ft³/s
Discharge Full	0.96	ft³/s
Slope Full	0.00164	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	47.75	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 13: 130 Ex. Lots & 22 Lot per Zoning (worst)

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00600	ft/ft
Diameter	0.67	ft
Discharge	0.18	ft³/s

Results

Normal Depth	0.21	ft
Flow Area	0.10	ft²
Wetted Perimeter	0.80	ft
Hydraulic Radius	0.12	ft
Top Width	0.62	ft
Critical Depth	0.20	ft
Percent Full	31.9	%
Critical Slope	0.00854	ft/ft
Velocity	1.89	ft/s
Velocity Head	0.06	ft
Specific Energy	0.27	ft
Froude Number	0.85	
Maximum Discharge	0.95	ft³/s
Discharge Full	0.87	ft³/s
Slope Full	0.00030	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	31.85	%
Downstream Velocity	Infinity	ft/s

Worksheet for Connection Point 2: All upstream to Ex MH

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	0.67	ft
Discharge	0.63	ft³/s

Results

Normal Depth	0.23	ft
Flow Area	0.11	ft²
Wetted Perimeter	0.84	ft
Hydraulic Radius	0.13	ft
Top Width	0.64	ft
Critical Depth	0.37	ft
Percent Full	34.6	%
Critical Slope	0.00870	ft/ft
Velocity	5.77	ft/s
Velocity Head	0.52	ft
Specific Energy	0.75	ft
Froude Number	2.47	
Maximum Discharge	2.75	ft³/s
Discharge Full	2.51	ft³/s
Slope Full	0.00315	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	34.65	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 11: 17 Lots on Johnson @Poema

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.02400	ft/ft
Diameter	0.67	ft
Discharge	0.02	ft³/s

Results

Normal Depth	0.06	ft
Flow Area	0.01	ft²
Wetted Perimeter	0.40	ft
Hydraulic Radius	0.04	ft
Top Width	0.37	ft
Critical Depth	0.06	ft
Percent Full	8.5	%
Critical Slope	0.01422	ft/ft
Velocity	1.40	ft/s
Velocity Head	0.03	ft
Specific Energy	0.09	ft
Froude Number	1.26	
Maximum Discharge	1.90	ft³/s
Discharge Full	1.74	ft³/s
Slope Full	0.00001	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	8.53	%
Downstream Velocity	Infinity	ft/s

Worksheet for Area 11-12, 15 & Sheriff: 47 Lots @ Ex. MH on Topanga

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Diameter	0.67	ft
Discharge	0.06	ft³/s

Results

Normal Depth	0.13	ft
Flow Area	0.05	ft²
Wetted Perimeter	0.62	ft
Hydraulic Radius	0.08	ft
Top Width	0.54	ft
Critical Depth	0.11	ft
Percent Full	20.0	%
Critical Slope	0.01072	ft/ft
Velocity	1.11	ft/s
Velocity Head	0.02	ft
Specific Energy	0.15	ft
Froude Number	0.64	
Maximum Discharge	0.77	ft³/s
Discharge Full	0.71	ft³/s
Slope Full	0.00005	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	20.05	%
Downstream Velocity	Infinity	ft/s

Worksheet for Connection Pt 1: All upstream to Ex. MH on Topanga

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01680	ft/ft
Diameter	0.83	ft
Discharge	0.57	ft³/s

Results

Normal Depth	0.27	ft
Flow Area	0.15	ft²
Wetted Perimeter	1.00	ft
Hydraulic Radius	0.15	ft
Top Width	0.77	ft
Critical Depth	0.33	ft
Percent Full	32.1	%
Critical Slope	0.00719	ft/ft
Velocity	3.78	ft/s
Velocity Head	0.22	ft
Specific Energy	0.49	ft
Froude Number	1.51	
Maximum Discharge	2.88	ft³/s
Discharge Full	2.64	ft³/s
Slope Full	0.00081	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	32.10	%
Downstream Velocity	Infinity	ft/s

Worksheet for OFFSITE Canoga (worst)

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	0.67	ft
Discharge	0.63	ft³/s

Results

Normal Depth	0.23	ft
Flow Area	0.11	ft²
Wetted Perimeter	0.84	ft
Hydraulic Radius	0.13	ft
Top Width	0.64	ft
Critical Depth	0.37	ft
Percent Full	34.9	%
Critical Slope	0.00876	ft/ft
Velocity	5.78	ft/s
Velocity Head	0.52	ft
Specific Energy	0.75	ft
Froude Number	2.46	
Maximum Discharge	2.70	ft³/s
Discharge Full	2.47	ft³/s
Slope Full	0.00325	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	34.93	%
Downstream Velocity	Infinity	ft/s

Worksheet for OFFSITE Topanga (worst) Ex. MH 1 to Ex. LA City Sewer

Project Description

Friction Method	Kutter Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01680	ft/ft
Diameter	1.00	ft
Discharge	0.61	ft³/s

Results

Normal Depth	0.26	ft
Flow Area	0.16	ft²
Wetted Perimeter	1.07	ft
Hydraulic Radius	0.15	ft
Top Width	0.88	ft
Critical Depth	0.32	ft
Percent Full	25.8	%
Critical Slope	0.00658	ft/ft
Velocity	3.80	ft/s
Velocity Head	0.22	ft
Specific Energy	0.48	ft
Froude Number	1.56	
Maximum Discharge	4.81	ft³/s
Discharge Full	4.42	ft³/s
Slope Full	0.00035	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	25.82	%
Downstream Velocity	Infinity	ft/s

EXHIBIT 1

10 OFFSITE (20ac. @ A 2-2)

20 OFFSITE (40 ac. @ A 2-2)

10' MOUNTAINS RECREATION & CONSERVATION AUTHORITY EASMT

10' MOUNTAINS RECREATION & CONSERVATION AUTHORITY EASMT

AREA 2
18 LOTS

AREA 1
14 LOTS & 10 OFFSITE

AREA 4
35 LOTS & 20 OFFSITE

AREA 3
31 LOTS

AREA 5
94 LOTS

AREA 6
28 LOTS

AREA 8
58 LOTS & 1 OFFSITE

AREA 9
4 LOTS

AREA 7
23 LOTS
& REC CTR

AREA 10 &
2 EX LOTS

AREA 11
17 LOTS

AREA 12
11 LOTS

AREA 13
130 LOTS + 22 POSSIBLE

AREA 14
31 LOTS

AREA 15
19 LOTS

OS

NOT A PART

NOT A PART OF THIS SUBDIVISION

TWIN LAKES

Q=0.029
AREA 1

Q=0.050 CFS
AREAS 1-2

Q=0.066 CFS
AREA 4

Q=0.088 CFS
AREAS 1-3

Q=0.113 CFS
AREA 5

Q=0.300 CFS
AREAS 1-6

Q=0.071 CFS
AREA 8

Q=0.005 CFS

Q=0.020 CFS
AREA 11

Q=0.056 CFS
AREAS 11-12, 15 & SHERIFF

Q=0.034 CFS
AREA 11-12

Q=0.018 CFS
AREA 15

Q=0.329 CFS
AREAS 1-7

Q=0.037 CFS
AREA 14

Q=0.406 CFS
AREAS 1-10

Q=0.444 CFS
AREAS 1-10, 14

Q=0.188 CFS
AREA 13

Q=0.626 CFS
AREAS 1-10, 13-14

OFFSITE LOT

SEE EXHIBIT 5
Q=0.71 CFS
TRIBUTARY AREA
LA COUNTY MH #2 PER N-1224

CONNECTION POINT 1
ALSO INCLUDED ON
CITY OF LA SEWER STUDY
LISTED AS MH #35505001

CONNECTION POINT 2
SEE CITY OF LA
SEWER STUDY

AREAS 12-15 ARE PART
OF TWIN LAKES

118 FREEWAY

CALTRANS R.W.

SCALE: 1"=400'

TG: 480 7-A,B, 500 1-A,B

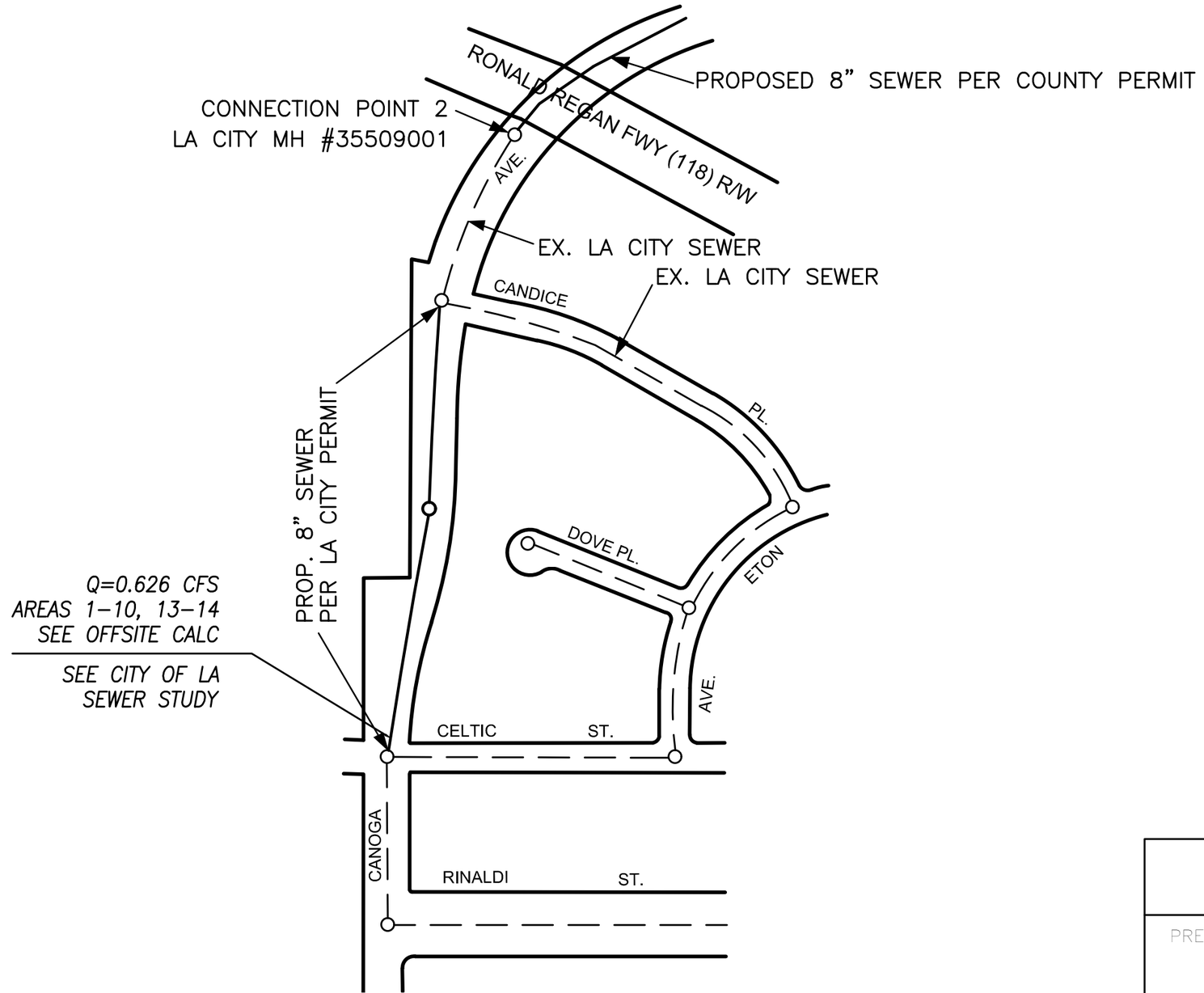
SEWER AREA STUDY
TRACT NO 53138

PREPARED BY:

UNITED CIVIL, INC.
30141 AGOURA ROAD, SUITE 215
AGOURA HILLS, CA 91301
PH: (818) 707-8648
FAX: (818) 707-8649

SIEW HUAT NG
R.C.E. 46026 EXP. 12-31-2016

DATE: 12/23/2015



SCALE: 1"=200'

TG: 480 7-A,B, 500 1-A,B

SEWER AREA STUDY
TRACT NO 53138

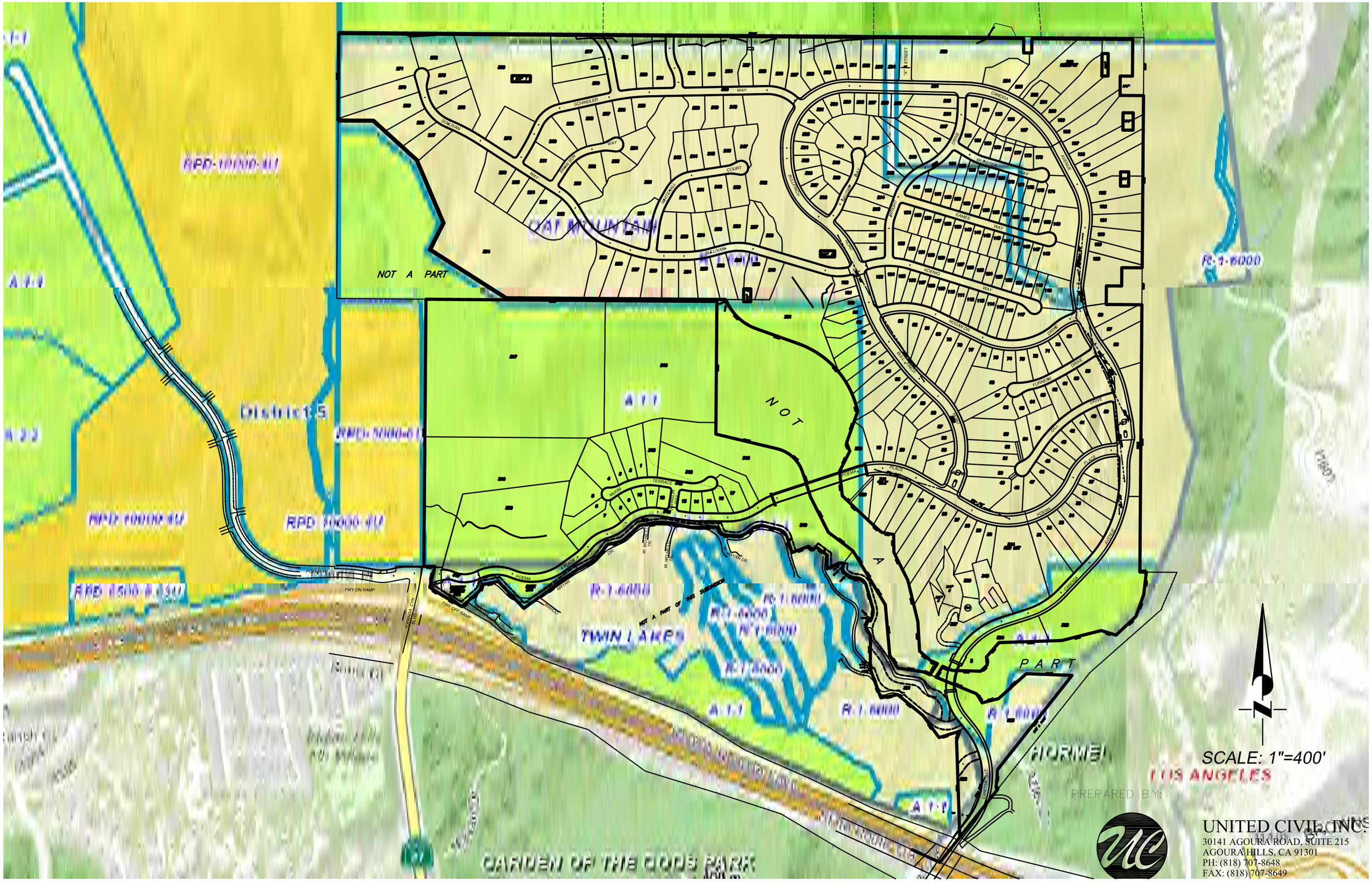
PREPARED BY:

UNITED CIVIL, INC.
30141 AGOURA ROAD, SUITE 215
AGOURA HILLS, CA 91301
PH: (818) 707-8648
FAX: (818) 707-8649

SIEW HUAT NG
R.C.E. 46026 EXP. 12-31-2016

DATE: 12/23/2015

EXHIBIT 2



PREPARED BY:

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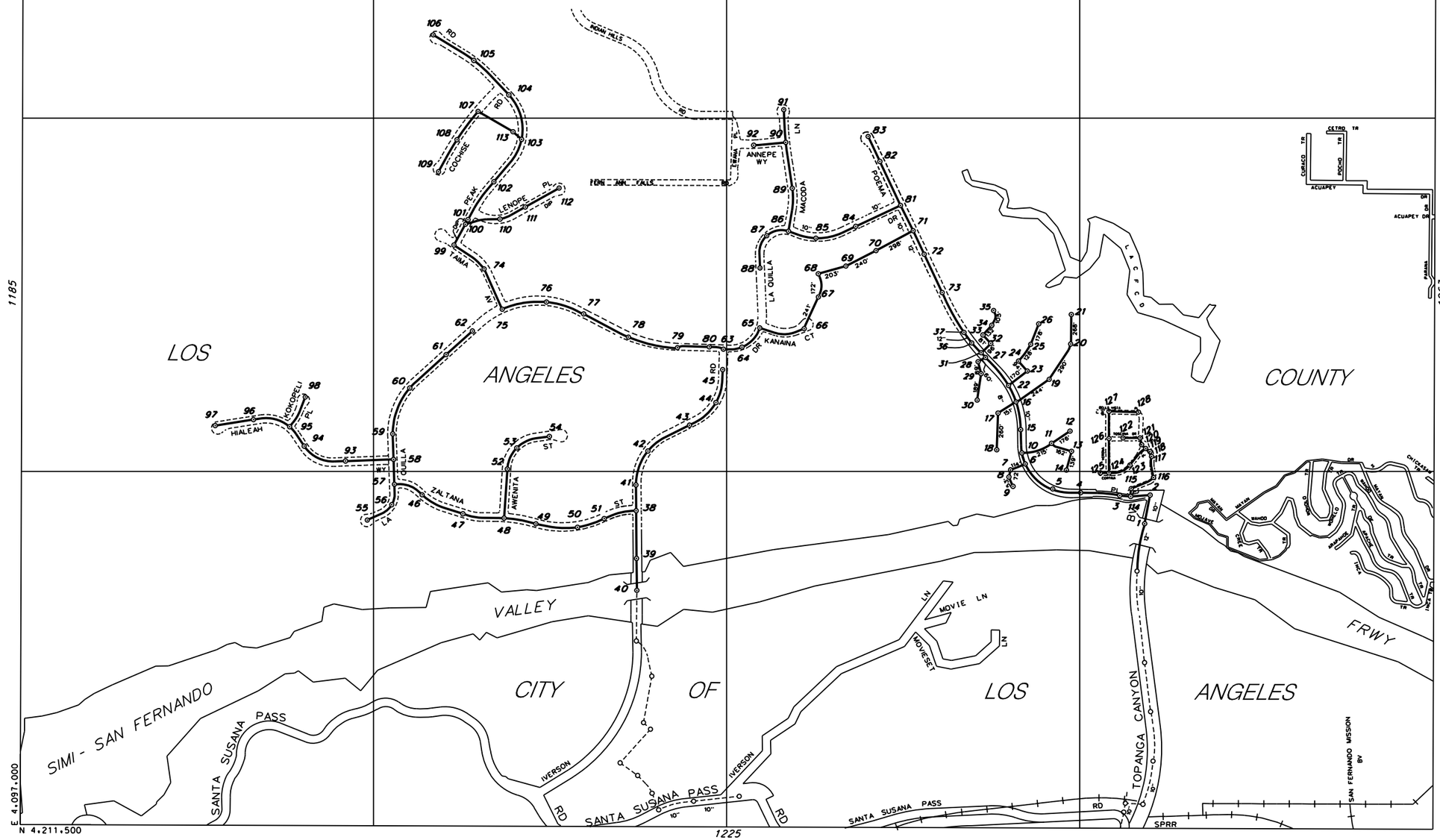
AGOURA HILLS, CA 91301
PH: (818) 707-8648
FAX: (818) 707-8649

EXHIBIT 3

1223

211
212



THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

N
AUTOMATED GRAPHICS

METERS
0 50 100 200 250
0 200 400 600 800
FEET

LEGEND

- CLAY SEWERS MAINTAINED BY SMD, 8" UNLESS OTHERWISE NOTED
- PLASTIC SEWERS
- CONCRETE SEWERS
- CLAY SEWERS, LINED
- CEMENT SEWERS, LINED
- FORCE MAINS
- SEWERS NOT MAINTAINED BY SMD
- TRUNK SEWERS
- CITY BOUNDARY
- STANDARD MANHOLE
- DROP MANHOLE
- SHALLOW MANHOLE
- TRAP MANHOLE
- WEIR MANHOLE
- C.O. CLEANOUT
- L.H. LAMP HOLE
- PUMP STATION

TOTAL MH'S THIS MAP: 128

MAP REV
10-02-13

DATA BASE REV
01-07-88

CONSOLIDATED S.M.D.

N-1224

T: 500 A-1

2007.2009.1224

N-1224

EXHIBIT 4

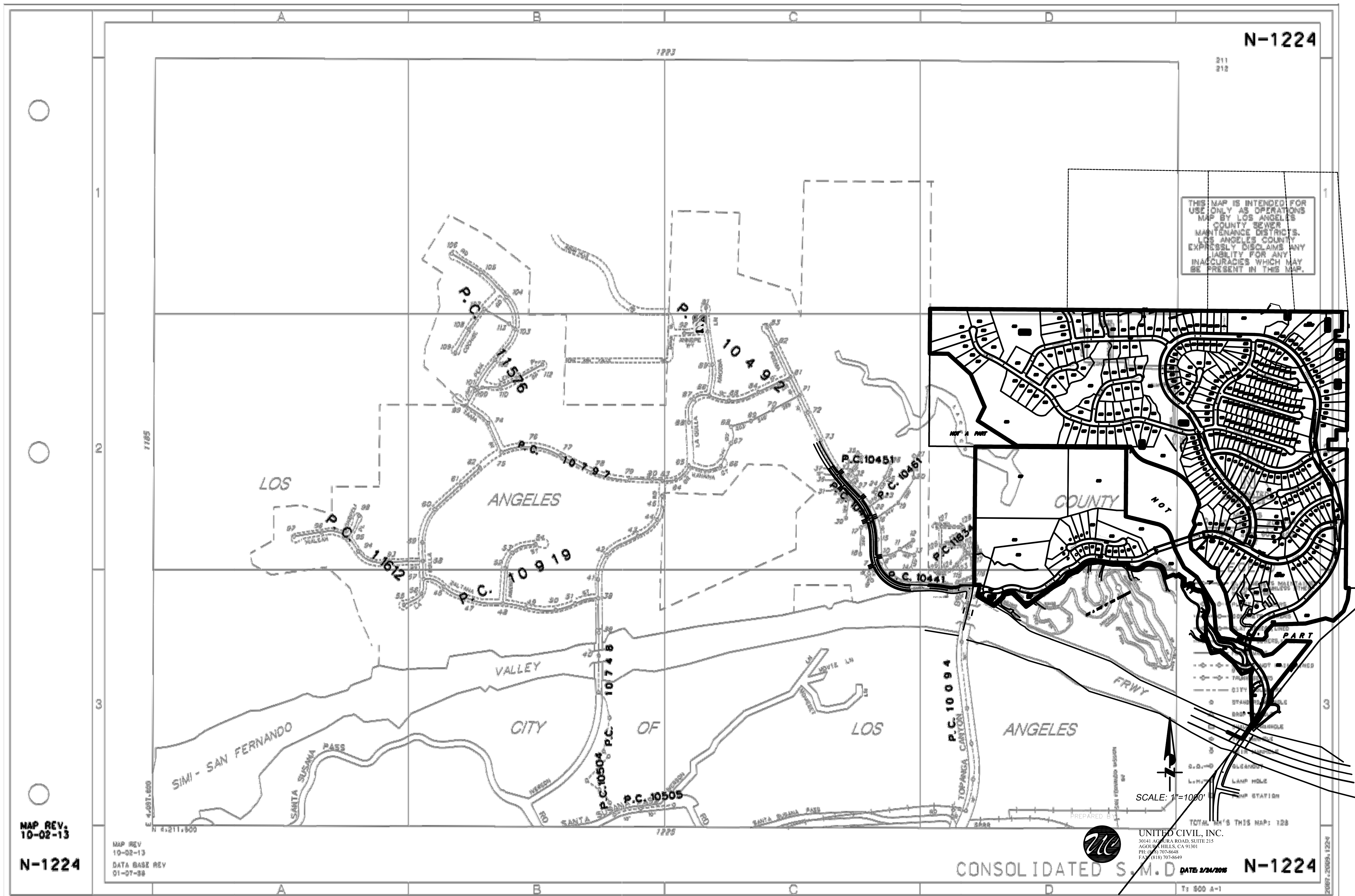

N-1224
THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.
LOS ANGELES
COUNTY
CITY OF LOS ANGELES
SIMI - SAN FERNANDO VALLEY FRWY
P.C. 11576
P.C. 10492
P.C. 10797
P.C. 11612
P.C. 10919
P.C. 10748
P.C. 10504
P.C. 10505
P.C. 10451
P.C. 10461
P.C. 10441
P.C. 10094
TOPANGA CANYON
SANTA SUSANA PASS
NOT A PART
SCALE: 1"=1000'
TOTAL MH'S THIS MAP: 128
MAP REV. 10-02-13
N-1224
MAP REV 10-02-13
DATA BASE REV 01-07-98
PREPARED BY:
UNITED CIVIL, INC.
30141 AGOURA ROAD, SUITE 215
AGOURA HILLS, CA 91301
PH: (818) 707-8648
FAX: (818) 707-8649
CONSOLIDATED S.M.D.
DATE: 2/24/2016
N-1224
T: 500 A-1

EXHIBIT 5

S-1224

UNDEVELOPED AREA
SEA ZONE
516 Ac.
(SEE TOPO MAP FOR COMPLETE AREA BDRY AND MAP SHOWING PORTION OF COUNTY OF LOS ANGELES GENERAL PLAN (ADOPTED NOV. 25, 1980)

RIDGELINE

TR34108

TR42353

10 LOTS

DEVELOPED AREA

(14)
A=138.08 Ac.
R-1 ZONE
112 LOTS

TR44327
TR44327-01

RIDGELINE

LOS ANGELES COUNTY

TR44335 PC 10451

TR44334

PROP. TRACT 53235
(16)
65 DU.
A=13.17 Ac.

(15)

TR34108

TR38622

VALLEY

SIMI - SAN FERNANDO

SANTA SUSANA PASS

CITY OF LOS ANGELES

TOPANGA CANYON

FRWY.

E 4,097,500

1225

THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

AUTOMATED GRAPHICS

METERS 0 50 100 200 250
FEET 0 200 400 600 800

LEGEND

- CLAY SEWERS MAINTAINED BY SMD, 8"-UNLESS OTHERWISE NOTED
- PLASTIC SEWERS
- CONCRETE SEWERS
- SEWERS NOT MAINTAINED BY SMD
- TRUNK SEWERS
- CITY BOUNDARY
- STANDARD MANHOLE
- DROP MANHOLE
- SHALLOW MANHOLE
- TRAP MANHOLE
- RCP MANHOLE

S-1224

MAP REV
06-25-98
DATA BASE REV
01-07-88

CONSOLIDATED S.M.D. S-1224

RECEIVED
JUN 19 2006
PROCESSING CENTER
LAND DEVELOPMENT DIVISION

SEWER AREA STUDY
APPROVED
APPROVED BY: MTH RCE NO. DATE 6/22
CHECKED BY: DATE 6/22/06
COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER
RAMY F. AWAD
No. 41729
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

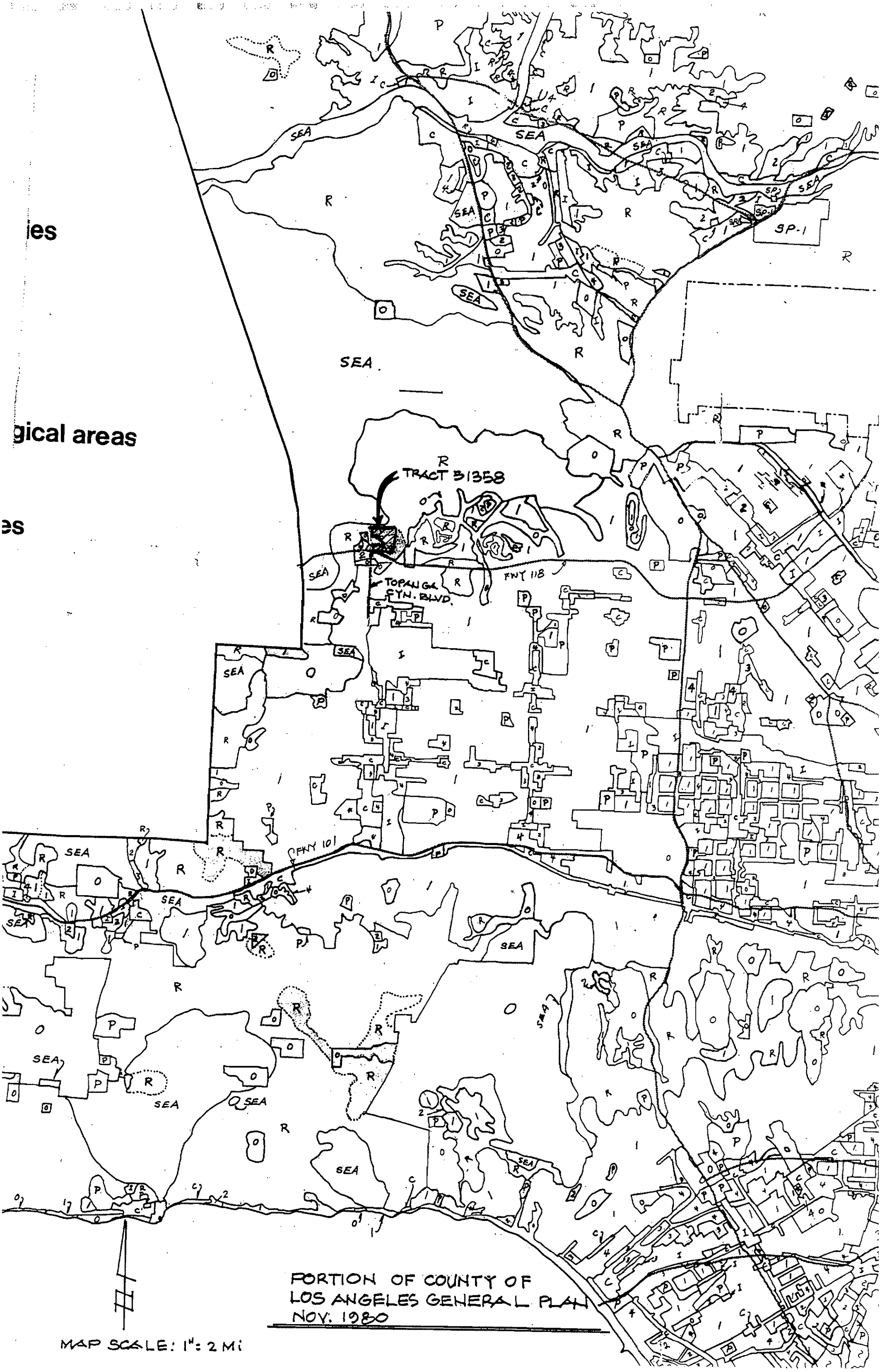
6/19/06

EXHIBIT 6

ies

gical areas

es



PORTION OF COUNTY OF
LOS ANGELES GENERAL PLAN
NOV. 1980

MAP SCALE: 1" = 2 Mi

EXHIBIT 7

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SEWER AREA STUDY APPROVED

APPROVED BY: _____ RCE NO. _____ DATE 6.22.06

CHECKED BY: _____ DATE 6.22.06

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

MAP SCALE: 1"=600'

JN 2004125 FEB. 8, 2005

RECEIVED
JUN 19 2006
PROCESSING SECTION
LAND DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER
RAMY F. AWAD
No. 41729
Exp. 9-31-08
CIVIL
STATE OF CALIFORNIA

6/19/06

EXHIBIT 8

WASTEWATER ENGINEERING SERVICES DIV.
2714 MEDIA CENTER DRIVE
LOS ANGELES, CA 90065
FAX: (323) 342-6210
(323) 342-6211

June 18, 2015

File: SC.CE.

Mr. Matthew Sawyer, Project Engineer
UNITED CIVIL INC
30141 Agoura Road, Suite 215
Agoura Hills, CA 91301

Dear Mr. Sawyer:

DEERLAKE TRACT 53138 LOS ANGELES COUNTY-REQUEST FOR WASTEWATER SERVICE INFORMATION

This is in response to your April 14, 2015 letter requesting a review of your proposed mixed-use project which resides within the Las Virgenes Municipal Water District boundary for sewer and water service but then connects to the City of Los Angeles sewer systems at the north end of Canoga Ave and Topanga Canyon Blvd, Los Angeles, CA 91311. LA Sanitation has conducted a preliminary evaluation of the potential impacts to the wastewater and stormwater systems for the proposed project.

WASTEWATER REQUIREMENT

LA Sanitation, Wastewater Engineering Services Division (WESD) is charged with the task of evaluating the local sewer conditions and to determine if available wastewater capacity exists for future developments. The evaluation will determine cumulative sewer impacts and guide the planning process for any future sewer improvements projects needed to provide future capacity as the City grows and develops.

Projected Wastewater Discharges for the Proposed Project:

Type Description	Average Daily Flow per Type Description (GPD/UNIT)	Proposed No. of Units	Average Daily Flow (GPD)
Proposed: Point (1)			
Residential: 3-BDRMS	230/ DU	30	6,900
Residential: 4-BDRMS	275/ DU	17	4,675
Sheriff Station	120 GPD/1000 SQ.FT	1,100 SQ.FT	132
Total			**11,707**
Proposed: Point (2)			
Residential: 3-BDRMS	230/ DU	217	49,910
Residential: 4-BDRMS	275/ DU	165	45,375

Residential: 5-BDRMS	320/ DU	65	20,800
Residential: 6-BDRMS	365/ DU	70	25,550
Recreation Center	200 GPD/1000 SQ.FT	4,340 SQ.FT	868
Total			**142,503**
Net Total			**154,210**

SEWER AVAILABILITY

The sewer infrastructure in the vicinity of the proposed project includes two (2) discharge routes. Discharge Route (1) starts with an existing 10-inch line on Topanga Canyon Blvd for Point (1). The flow from the 10-inch line on Topanga Canyon Blvd passes into an 18-inch line on Shoup Ave before feeding into the 21-inch line on Topanga Canyon Blvd. Discharge Route (2) starts with an existing 8-inch line on Canoga Ave for Point (2). The flow from the 8-inch line on Canoga Ave passes into an 18-inch line on Topanga Canyon Blvd and then to another 18-inch line on Nordhoff St. On Canoga Ave the flow from the 21-inch line on Topanga Canyon Blvd from Point (1) join the flow from the 18-inch line on Nordhoff St from Point (2) to feed a 24-inch line before discharging into a 30-inch sewer line on Roscoe Blvd. Figure 1 shows the details of the sewer system within the vicinity of the project. The current flow level (d/D) in some of the lines cannot be determined at this time without additional gauging.

The current approximate flow level (d/D) and the design capacities at d/D of 50% in the sewer system are as follows:

Pipe Diameter (in)	Pipe Location	Current Gauging d/D (%)	50% Design Capacity
Point (1) Route			
10	Topanga Canyon Blvd.	*	1.63 MGD
18	Shoup Ave.	24	2.67 MGD
21	Topanga Canyon Blvd.	20	2.93 MGD
Point (2) Route			
8	Canoga Ave.	*	978,324 GPD
8	Eton Ave.	18	397,199 GPD
10	Canoga Ave.	24	509,236 GPD
18	Topanga Canyon Blvd.	28	1.84 MGD
18	Nordhoff St.	27	2.18 MGD
Point (1) & Point (2)			
24	Canoga Ave.	25	6.07 MGD
30	Roscoe Blvd.	32	6.74 MGD
30	Roscoe Blvd.	38	6.74 MGD

* No gauging available

Based on the estimated flows, it appears the sewer system might be able to accommodate the total flow for your proposed project based on the following;

- Construction of 8-inch sewer along Canoga Avenue from Candice Pl to Celtic St per the sewer study Report
- Additional requirements such as installation of gauging equipment may be required in order for the City to Bill for Sewer Service Charges.
- Operation of the pumping infrastructure at P1 will not be in the Jurisdiction of the City.

Further detailed gauging and evaluation will be needed as part of the permit process to identify a specific sewer connection point. If the public sewer has insufficient capacity then the developer will be required to build sewer lines to a point in the sewer system with sufficient capacity. A final approval for sewer capacity and connection permit will be made at that time. Ultimately, this sewage flow will be conveyed to the Hyperion Treatment Plant, which has sufficient capacity for the project.

If you have any questions, please call Kwasi Berko of my staff at (323) 342-1562.

STORMWATER REQUIREMENTS

The LA Sanitation, Watershed Protection Division (WPD) is charged with the task of ensuring the implementation of the Municipal Stormwater Permit requirements within the City of Los Angeles. We anticipate the following requirements would apply for this project.

POST-CONSTRUCTION MITIGATION REQUIREMENTS

The project requires implementation of stormwater mitigation measures. These requirements are based on the Standard Urban Stormwater Mitigation Plan (SUSMP) and the recently adopted Low Impact Development (LID) requirements. The projects that are subject to SUSMP/LID are required to incorporate measures to mitigate the impact of stormwater runoff. The requirements are outlined in the guidance manual titled "*Development Best Management Practices Handbook – Part B: Planning Activities*". Current regulations prioritize infiltration, capture/use, and then biofiltration as the preferred stormwater control measures. The relevant documents can be found at: www.lastormwater.org. It is advised that input regarding SUSMP requirements be received in the early phases of the project from WPD's plan-checking staff.

GREEN STREETS

The City is developing a Green Street Initiative that will require projects to implement Green Street elements in the parkway areas between the roadway and sidewalk of the public right-of-away to capture and retain stormwater and urban runoff to mitigate the impact of stormwater runoff and other environmental concerns. The goals of the Green Street elements are to improve the water quality of stormwater runoff, recharge local ground water basins, improve air quality, reduce the heat island effect of street pavement, enhance pedestrian use of sidewalks, and encourage alternate means of transportation. The Green Street elements may include infiltration systems, biofiltration swales, and permeable pavements where stormwater can be easily directed from the streets into the parkways and can be implemented in conjunction with the SUSMP/LID requirements.

CONSTRUCTION REQUIREMENTS

The project is required to implement stormwater control measures during its construction phase. All projects are subject to a set of minimum control measures to lessen the impact of stormwater pollution. In addition for projects that involve construction during the rainy season that is between October 1 and April 15, a Wet Weather Erosion Control Plan is required to be prepared. Also projects that disturb more than one-acre of land are subject to the California General Construction Stormwater Permit. As part of this requirement a Notice of Intent (NOI) needs to be filed with the State of California and a Storm Water Pollution Prevention Plan (SWPPP) needs to be prepared. The SWPPP must be maintained on-site during the duration of construction.

If there are questions regarding the stormwater requirements, please call Kosta Kaporis at (213) 485-0586, or WPD's plan-checking counter at (213) 482-7066. WPD's plan-checking counter can also be visited at 201 N. Figueroa, 3rd Fl, Station 18.

SOLID RESOURCE REQUIREMENTS

The City has a standard requirement that applies to all proposed residential developments of four or more units or where the addition of floor areas is 25 percent or more, and all other development projects where the addition of floor area is 30 percent or more. Such developments must set aside a recycling area or room for onsite recycling activities. For more details of this requirement, please contact Daniel Hackney of the Special Project Division at (213)485-3684.

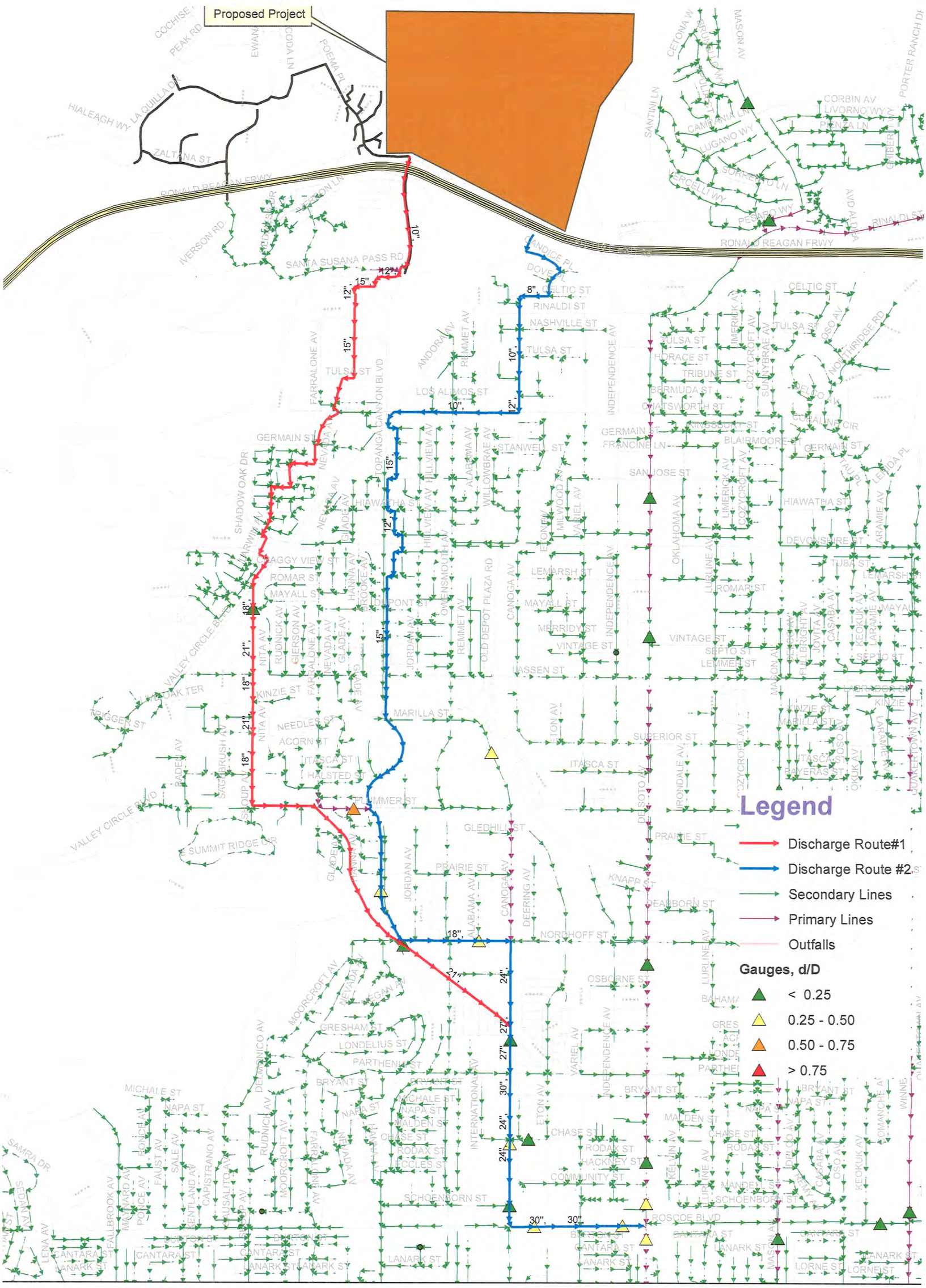
Sincerely,

Ali Poosti, Division Manager
Wastewater Engineering Services Division
LA Sanitation

KB\AP:tn

Attachment: Figure 1 – Sewer Map

c: Kosta Kaporis, LASAN
Daniel Hackney, LASAN
Eduardo Perez, LASAN
Susan Rocha, LASAN



Wastewater Engineering Services Division
Bureau of Sanitation
City of Los Angeles

FIGURE 1
Deerlake Tract 53138
Los Angeles County
Sewer Map

EXHIBIT 9

LAS VIRGENES MUNICIPAL WATER DISTRICT
EST. 1958

Dedicated to Providing Quality
Water & Wastewater Service

HEADQUARTERS
4232 Las Virgenes Road
Calabasas, CA 91302
(818) 251-2100
Fax (818) 251-2109

WESTLAKE
FILTRATION PLANT
(818) 251-2370
Fax (818) 251-2379

TAPIA WATER
RECLAMATION FACILITY
(818) 251-2300
Fax (818) 251-2309

RANCHO LAS VIRGENES
COMPOSTING FACILITY
(818) 251-2340
Fax (818) 251-2349

www.LVMWD.com

MEMBER AGENCY OF THE
METROPOLITAN WATER
DISTRICT
OF SOUTHERN CALIFORNIA

January 5, 2016

CONDITIONAL STATEMENT OF SEWER SERVICE

TO WHOM IT MAY CONCERN:

SUBJECT: T 53138 Deerlake

This is to advise you that the above tract sewer service will be served by Las Virgenes Municipal Water District.

This project will be assured of connection to the sewer system of the district only if the proponent satisfies all terms and conditions for service as set forth in the district's Code.

Sincerely,

Joanne Bodenhamer
Planning & New Development Technician

P.C. 10094 PAGE 5

REVIEWED BY: FCM DATE: 6/3/86

NO L.A. COUNTY CHARGE FOR CONNECTIONS
SEE L.V.M.W.D. FOR CONNECTION CHARGES
DOUBLE SCALE

51767