



Appendix B: GIS and HM Maps of Sunnyvale Drainage System

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GIS and HM Maps of Sunnyvale Drainage System

These maps are to be used to:

1. Identify project location.
2. Identify storm drainage area and City storm drain facilities that the project will drain to for use on the site map prepared as part of the Storm water Management Plan.
3. Determine whether the project location is within a Potential HM Applicability Zone. (See Note 1 below.) If it is, limitations on the increase of peak storm water runoff discharge rates may apply. Post-development discharge of runoff flow and volume from these areas will occur at rates no greater than the pre-development rates.
4. Determine if the project is located within a Potential Infiltration Device Inclusion Zone (see Note 2 below). If it is, then infiltration devices could be used on the project site subject to the requirements of the Santa Clara Valley Water District (SCVWD). It is unlikely that projects located outside of the Inclusion Zone could have infiltration-type BMPs approved due to the heavy clay soil and depth to groundwater generally found in these areas. However, there may be some locations with tight soils where infiltration BMPs could be applied by installing an underdrain raised above a gravel layer sufficient to store the C.3.d amount of runoff. Applications will be reviewed on a case-by-case basis, depending on the documentation of soil type present, measured depth to groundwater, and design plans to determine if infiltration-type BMPs are appropriate. Infiltration devices proposed for these areas that do not meet the guidelines in Appendix D, Table D-1, are required to obtain SCVWD review and approval.

NOTE:

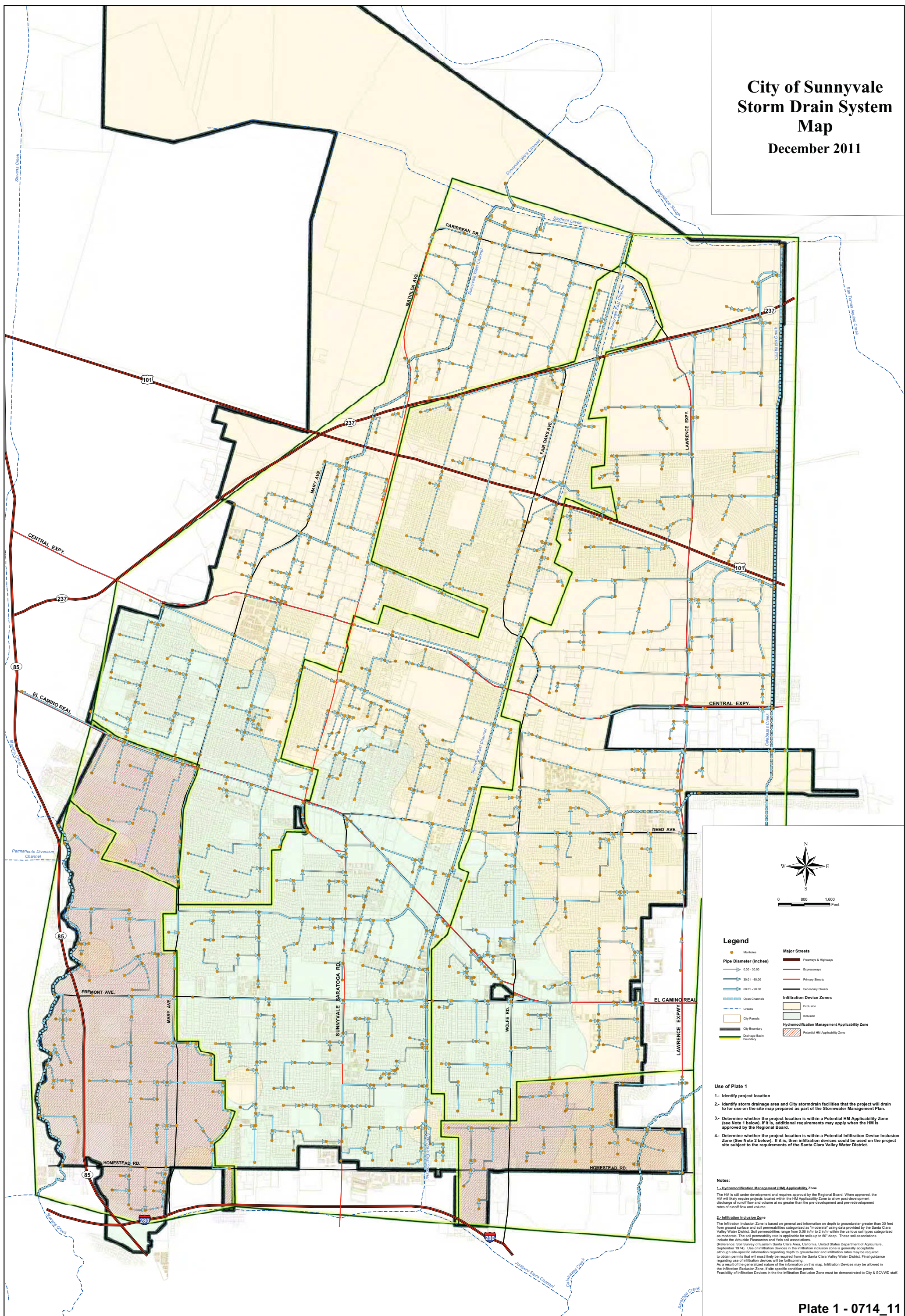
1. Hydromodification Management Applicability Zone – Two areas have been identified as HM Applicability Zones. One is located in the southeast corner of the City that has storm

drains that flow to Calabazas Creek and the second is located in the south west corner that has storm drains flowing to Stevens Creek (See pages B-12 and B-13). Some projects in these areas are required to meet HM Performance criteria. In the current HM implementation plan, all projects that are greater than 1-acre in size must implement the HM performance criteria. If off-site or in-stream controls are available for these projects to contribute to, then they can also be used to help meet the management objective. However, no regional or off-site HM control projects have been identified for Sunnyvale as of the writing of this manual.

2. SCVWD Infiltration Inclusion Zone – The Infiltration Inclusion Zone is based on generalized information on depth to groundwater greater than 30 feet from ground surface and soil permeability categorized as “moderate” using data provided by the SCVWD. Soil permeability ranges from 0.06 in/hr to 2 in/hr within the various soil types are categorized as moderate. The soil permeability rate is applicable for soils up to 60 inches deep. These soil associations include the Arbuckle Pleasanton and Yolo soil associations. (Reference: Soil Survey of Eastern Santa Clara Area, California, United States Department of Agriculture, September 1974). Use of infiltration devices in the infiltration inclusion zone is generally acceptable although site-specific information regarding depth to groundwater and infiltration rates may be needed if a permit is required from the SCVWD. If a site is located within an infiltration exclusion zone, infiltration infeasibility may be claimed for the purposes of the LID feasibility analysis needed for BMP selection (see Appendix C.2).

Due to the generalized nature of the information on this map, infiltration devices may be allowed in the other areas, if site-specific conditions permit. The feasibility of infiltration devices at any location must be documented to City and approved by SCVWD staff.

December 2011



Legend

- Pipe Diameter (Inches)**
- 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Open Channels**
- Creeks
 - City Parcels
- City Boundary**
- Drainage Basin
- Freeways & Highways**
- Expressways
 - Primary Streets
 - Secondary Streets
- Infiltration Device Zones**
- Exclusion
 - Inclusion
- Hydromodulation Management Applicability Zone**
- Potential HM Applicability Zone

Use of Plate 1

- 1.- Identify project location
- 2.- Identify storm drainage area and City stormdrain facilities that the project will drain to for use on the site map prepared as part of the Stormwater Management Plan.
- 3.- Determine whether the project location is within a Potential HM Applicability Zone (see Note 1 below). If it is, additional requirements may apply when the HM is approved by the Regional Board.
- 4.- Determine whether the project location is within a Potential Infiltration Device Inclusion Zone (See Note 2 below). If it is, then infiltration devices could be used on the project site subject to the requirements of the Santa Clara Valley Water District.

Notes

Hydrofracturing Management (HIM) Applicability Zone

The HIM is still under development and requires approval by the Regional Board. When approved, the HIM will be used to determine whether hydraulic fracturing is necessary to maintain the production of oil and gas from a well. The HIM will be used to determine whether hydraulic fracturing is necessary to maintain the production of oil and gas from a well. The HIM will be used to determine whether hydraulic fracturing is necessary to maintain the production of oil and gas from a well.

2. Infiltration Inclusion Zone

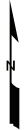
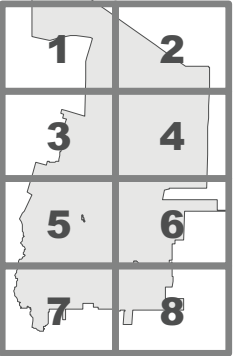
The Infiltration Inclusion Zone is based on generalized information on depth to groundwater greater than 50 feet below the surface and is "more liberal" than the "moderate" plan provided by the Santa Clara Valley Water District. Soil permeabilities range from 0.06 inch to 2 inch within the various soil types categorized in the Soil Survey of Santa Clara County, California, 1961. These soil permeabilities include the Aukland, Peninsular and Yolo soil associations.

As a result of the generalized nature of the information on this map, Infiltration Zones may be allowed in the Infiltration Exclusion Zone. A site specific condition permit.

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INDEX MAP

Legend

Manholes

Pipe Diameter (inches)

0.00 - 30.00

30.01 - 60.00

60.01 - 90.00

Creeks

City Parcels

City Boundary

Drainage Basins

Major Streets

Freeways & Highways

Expressways

Primary Streets

Secondary Streets

Infiltration Device Zones

Exclusion

Inclusion

Hydromodification Management Applicability Zone

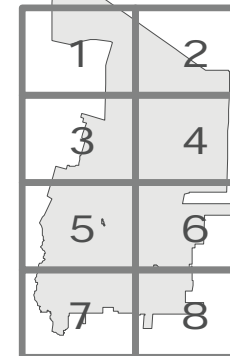
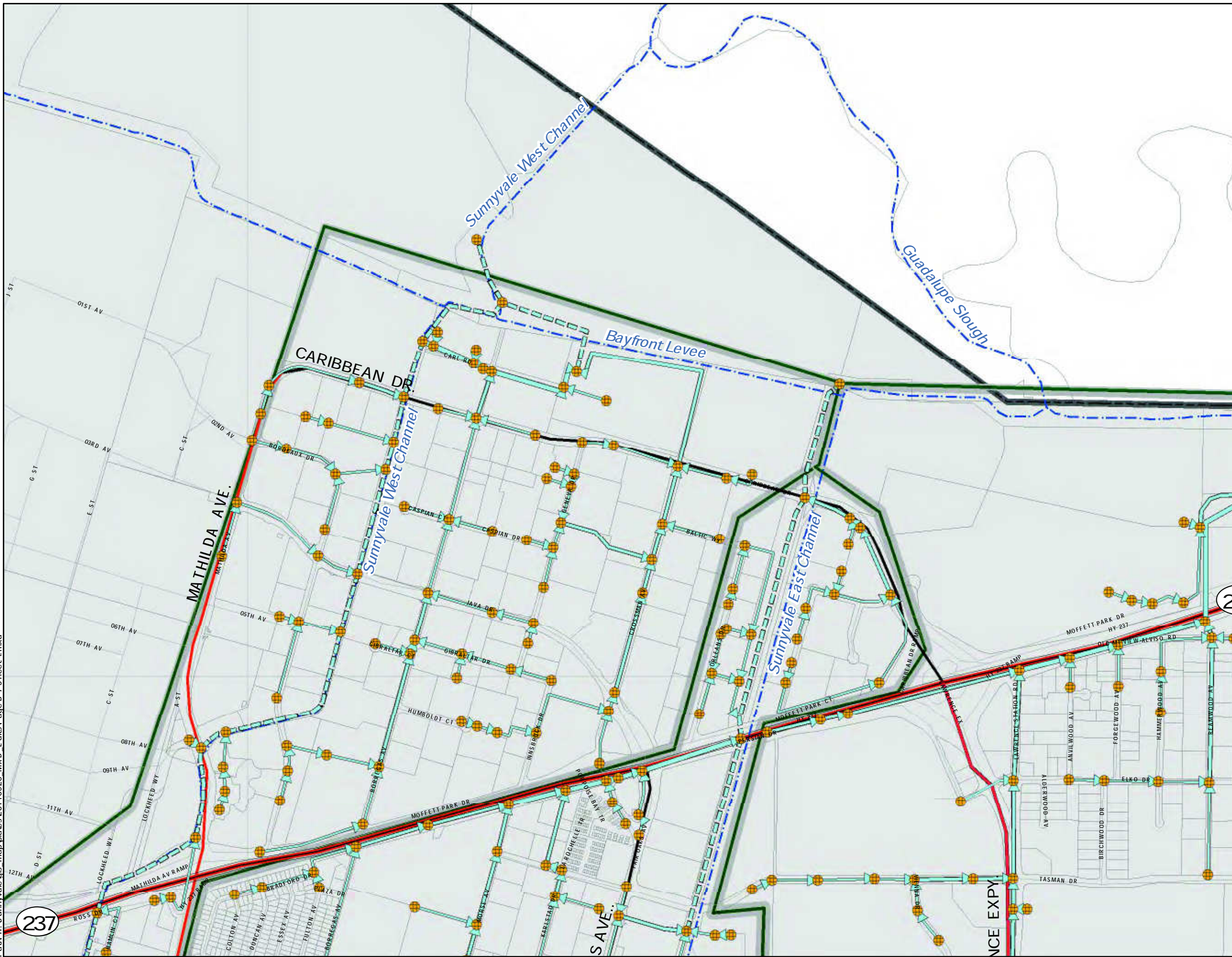
Potential HM Applicability Zone



0 250 500 1,000 Feet

City of Sunnyvale, California

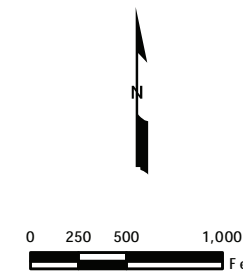
STORM DRAIN SYSTEM MAP



INDEX MAP

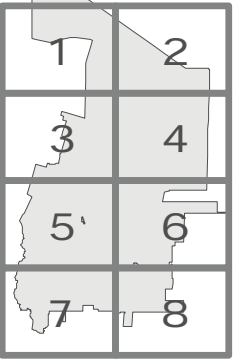
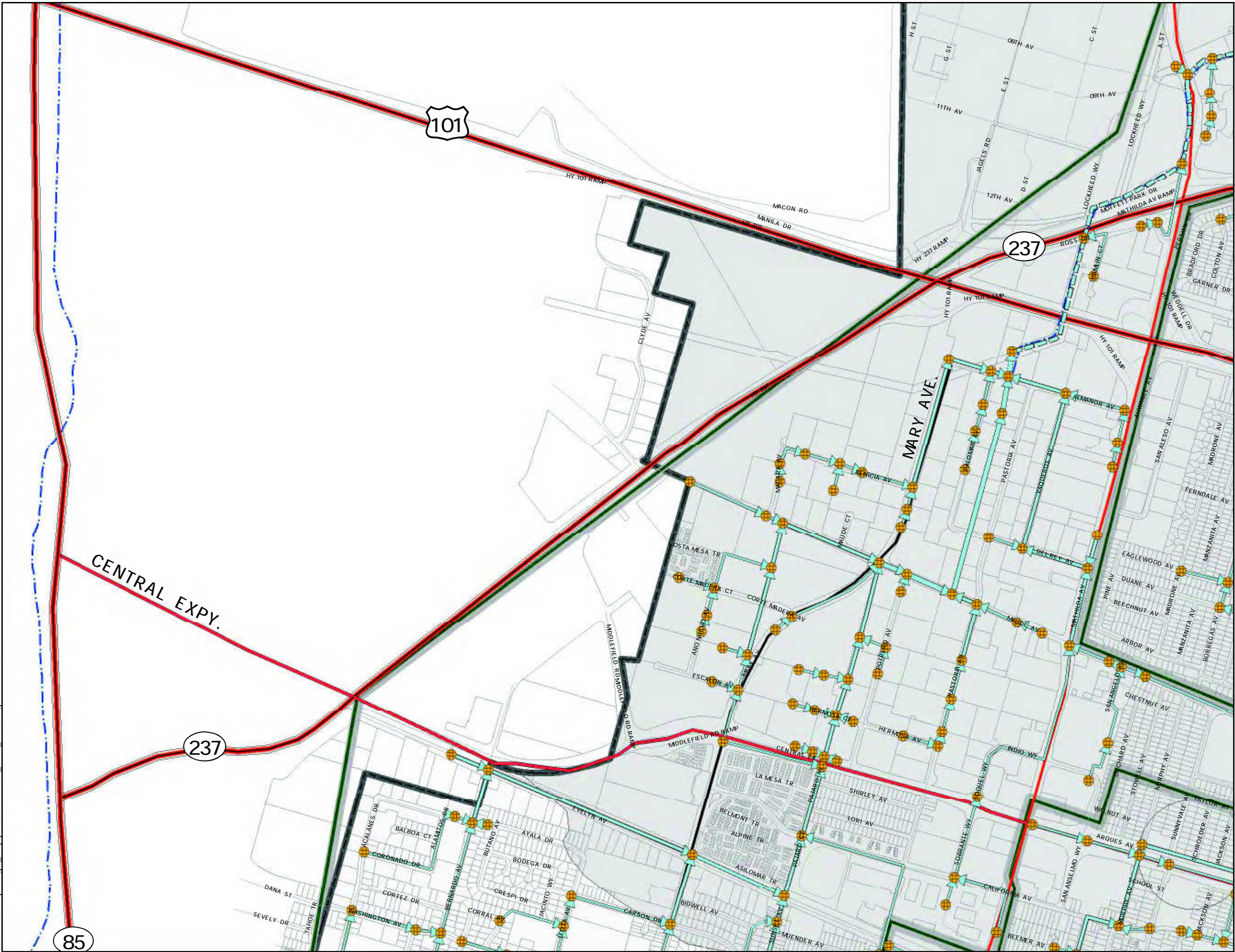
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- Manholes
- Pipe Diameter (inches)
 - 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Creeks
- City Parcels
- City Boundary
- Drainage Basins
- Major Streets
 - Freeways & Highways
 - Expressways
 - Primary Streets
 - Secondary Streets
- Infiltration Device Zones
 - Exclusion
 - Inclusion
- Hydromodification Management Applicability Zone
 - Potential HM Applicability Zone



City of Sunnyvale, California

STORMDRAIN SYSTEM
MAP



INDEX MAP

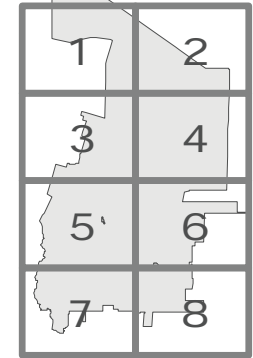
Legend

- Manholes
- Pipe Diameter (inches)
 - 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Creeks
- City Parcels
- City Boundary
- Drainage Basins
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City of Sunnyvale, California

STORMDRAIN SYSTEM MAP

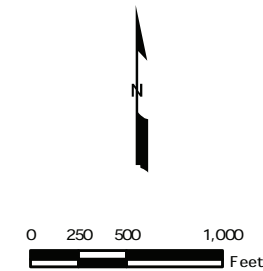
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INDEX MAP

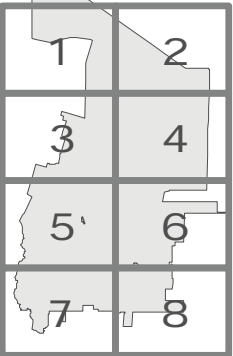
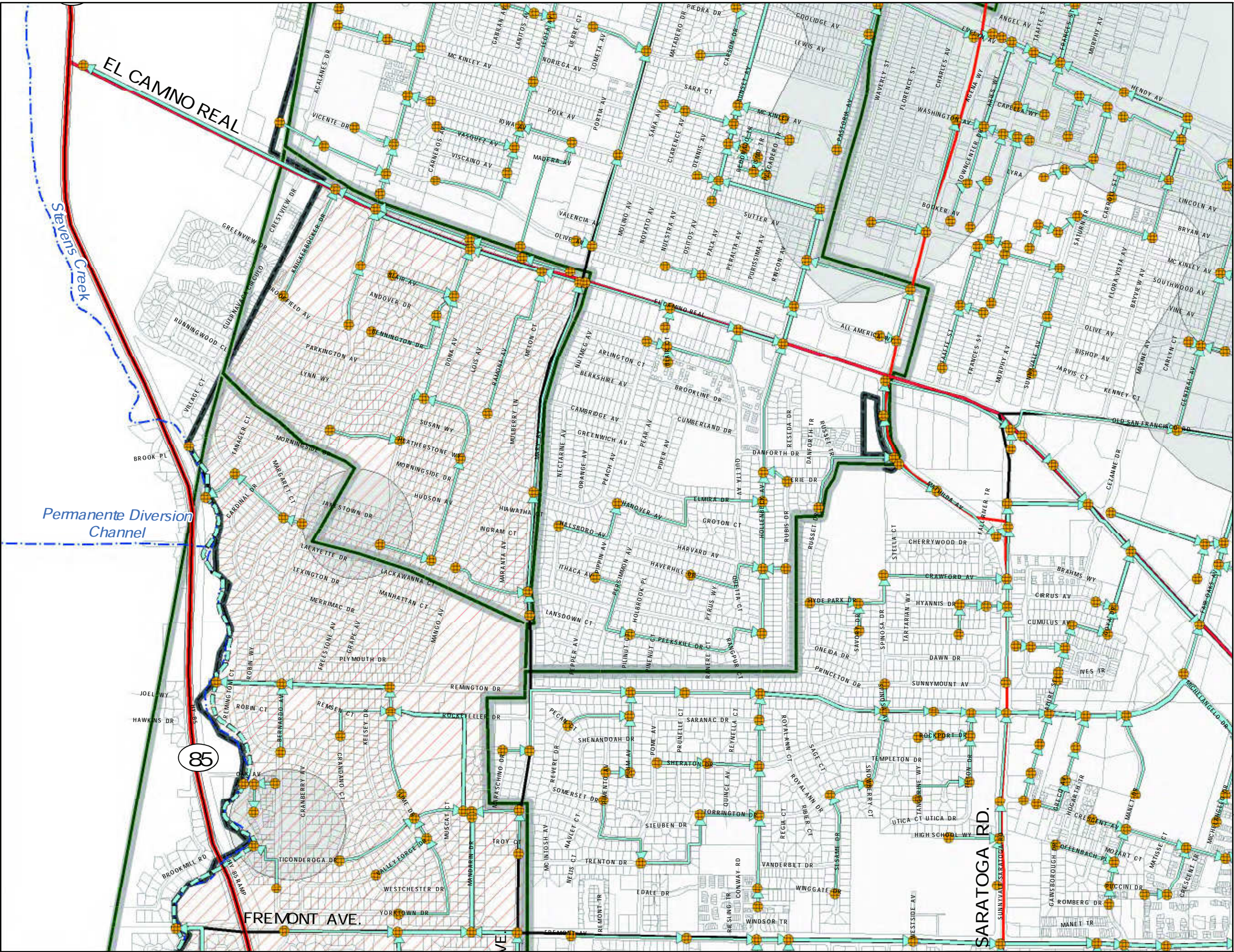
Legend

- Manholes
- Pipe Diameter (inches)
 - 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Creeks
- City Parcels
- City Boundary
- Drainage Basins
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City of Sunnyvale, California

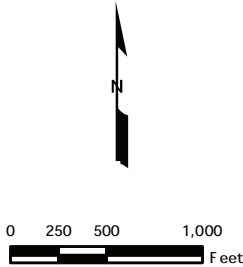
STORMDRAIN SYSTEM
MAP



INDEX MAP

Legend

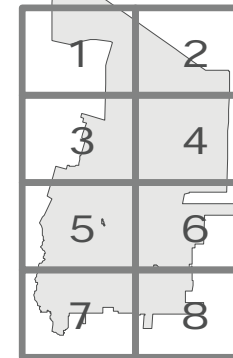
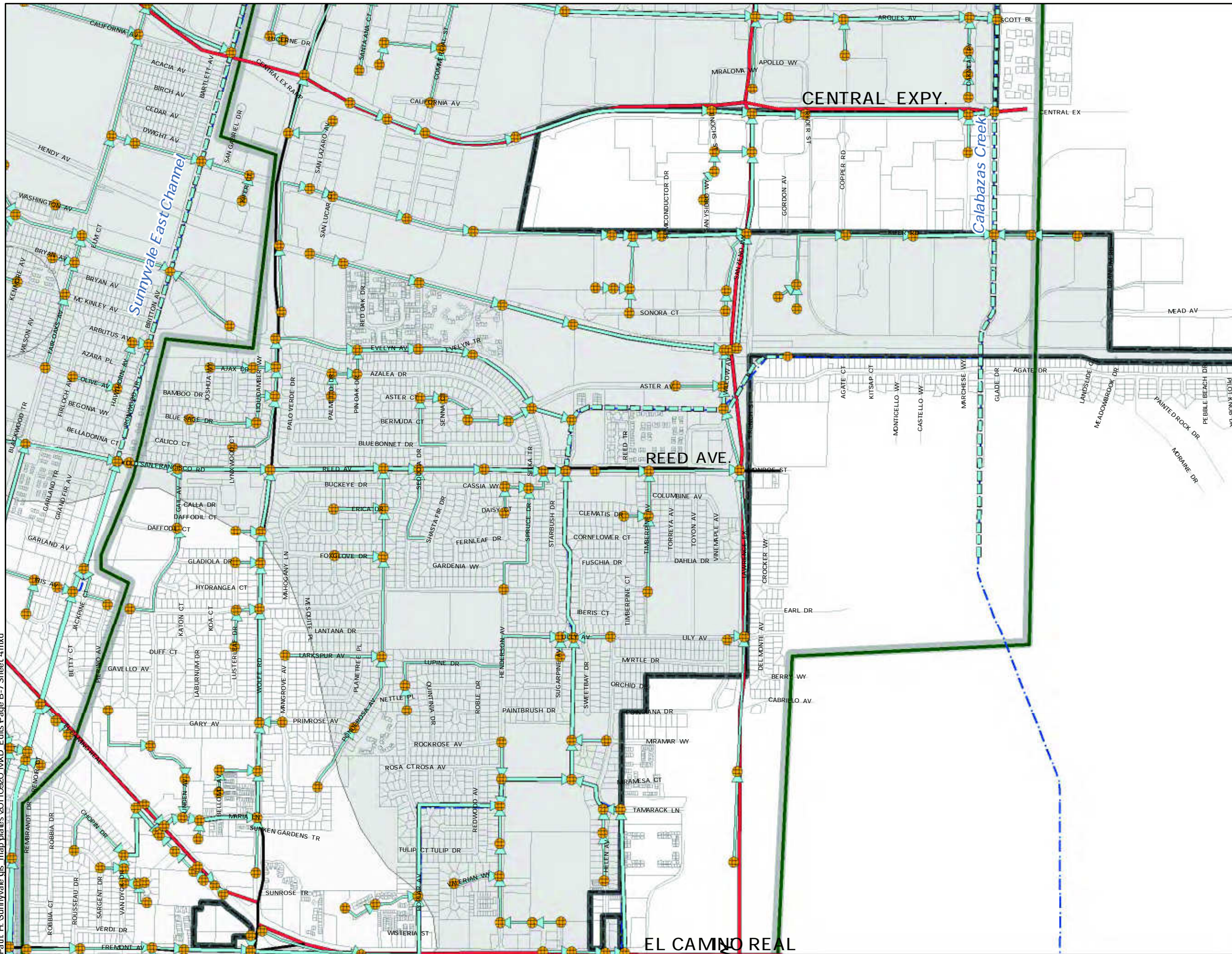
- Manholes
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City of Sunnyvale, California

STORMDRAIN SYSTEM MAP

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INDEX MAP

Legend

- Manholes
- Pipe Diameter (inches)
 - 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Creeks
- City Parcels
- City Boundary
- Drainage Basins

Major Streets

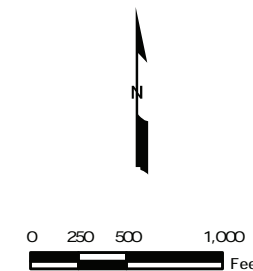
- Freeways & Highways
- Expressways
- Primary Streets
- Secondary Streets

Infiltration Device Zones

- Exclusion
- Inclusion

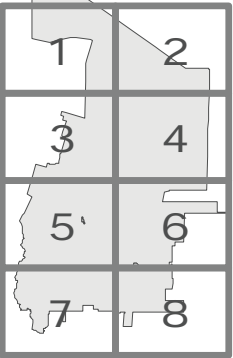
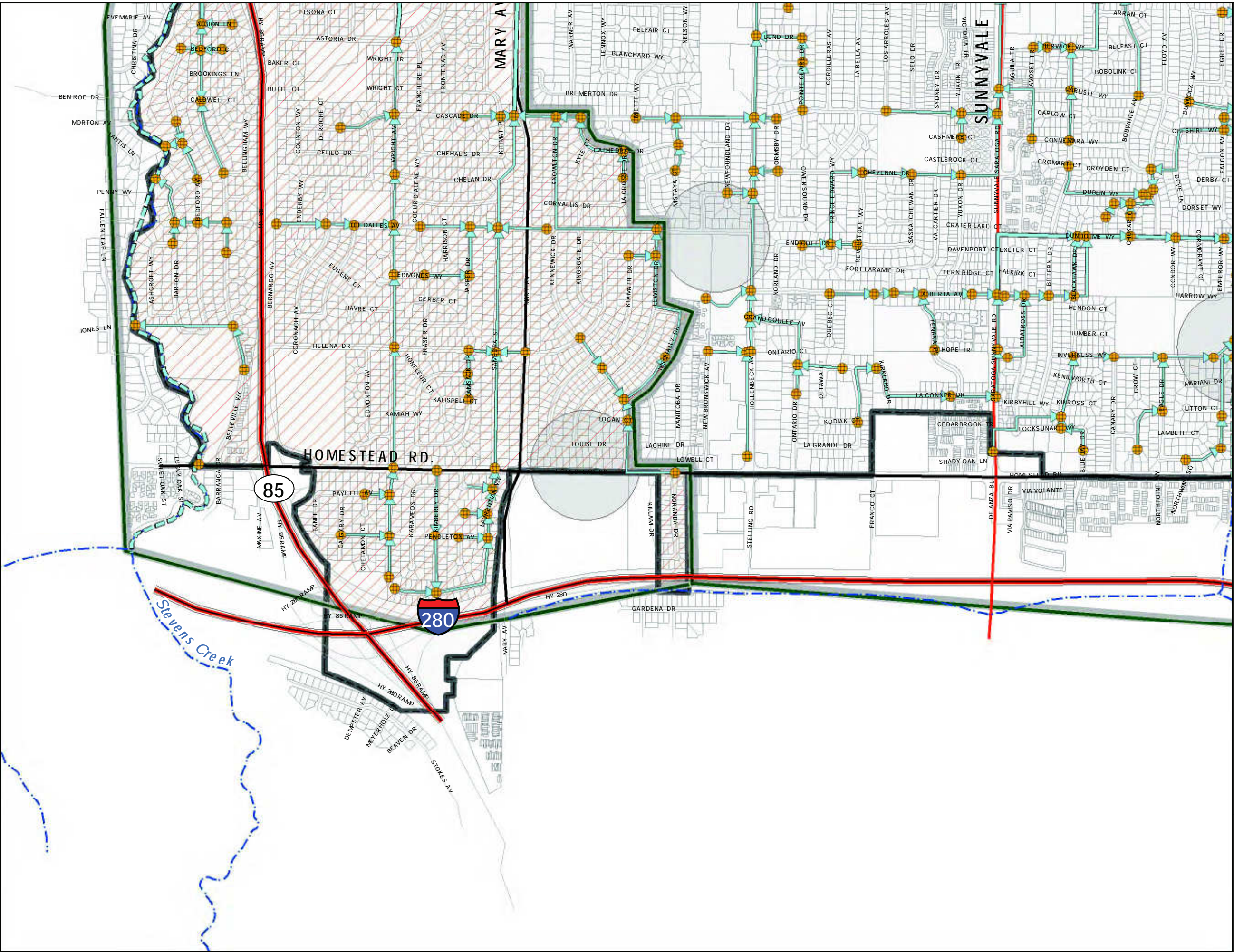
Hydromodification Management Applicability Zone

- Potential HMA Applicability Zone



City of Sunnyvale, California

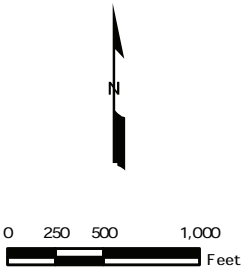
STORMDRAIN SYSTEM
MAP



INDEX MAP

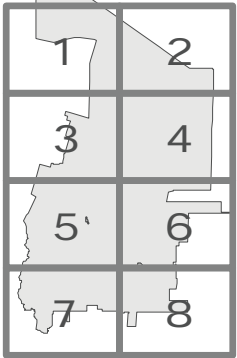
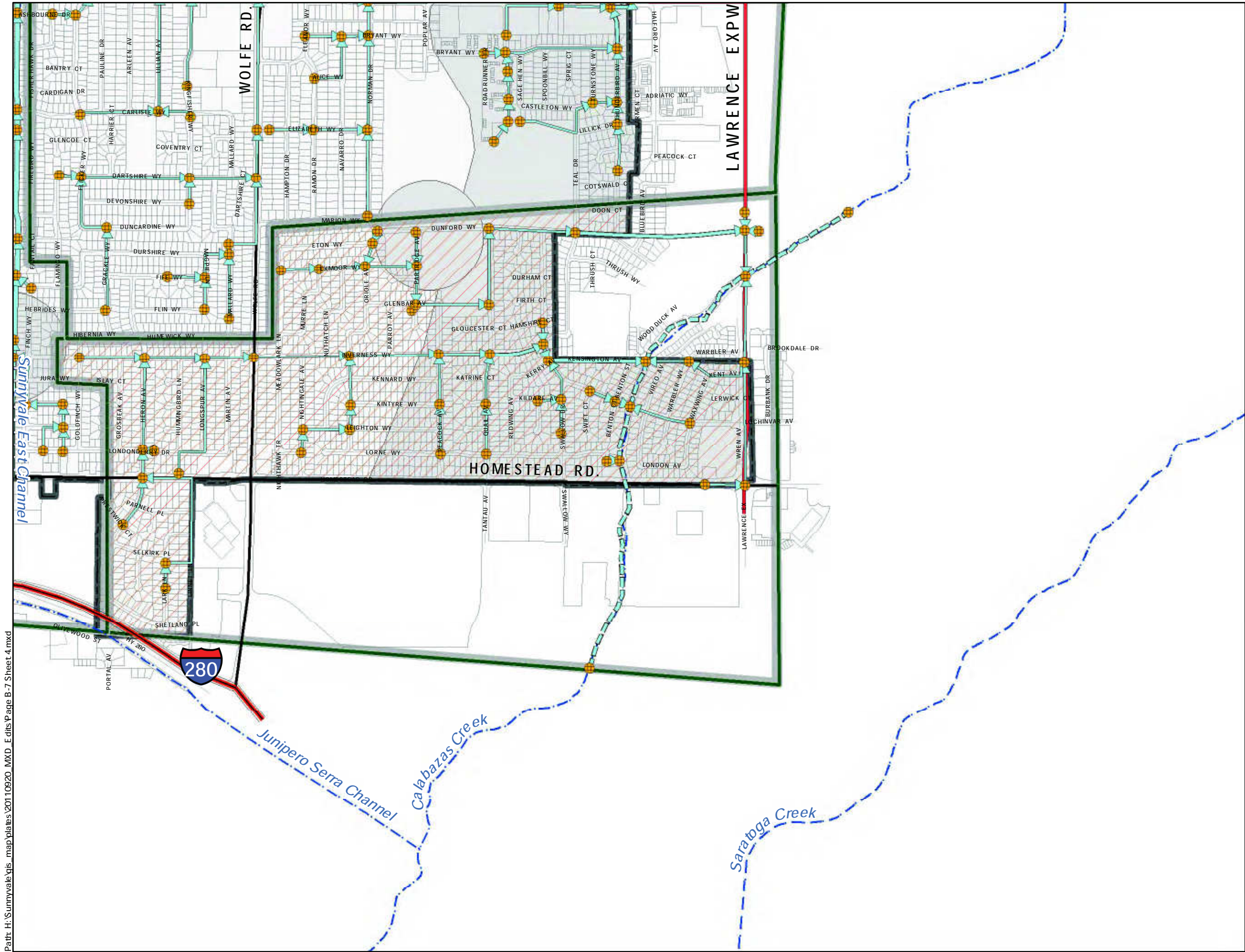
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City of Sunnyvale, California

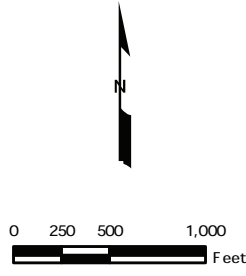
STORM DRAIN SYSTEM
MAP



INDEX MAP

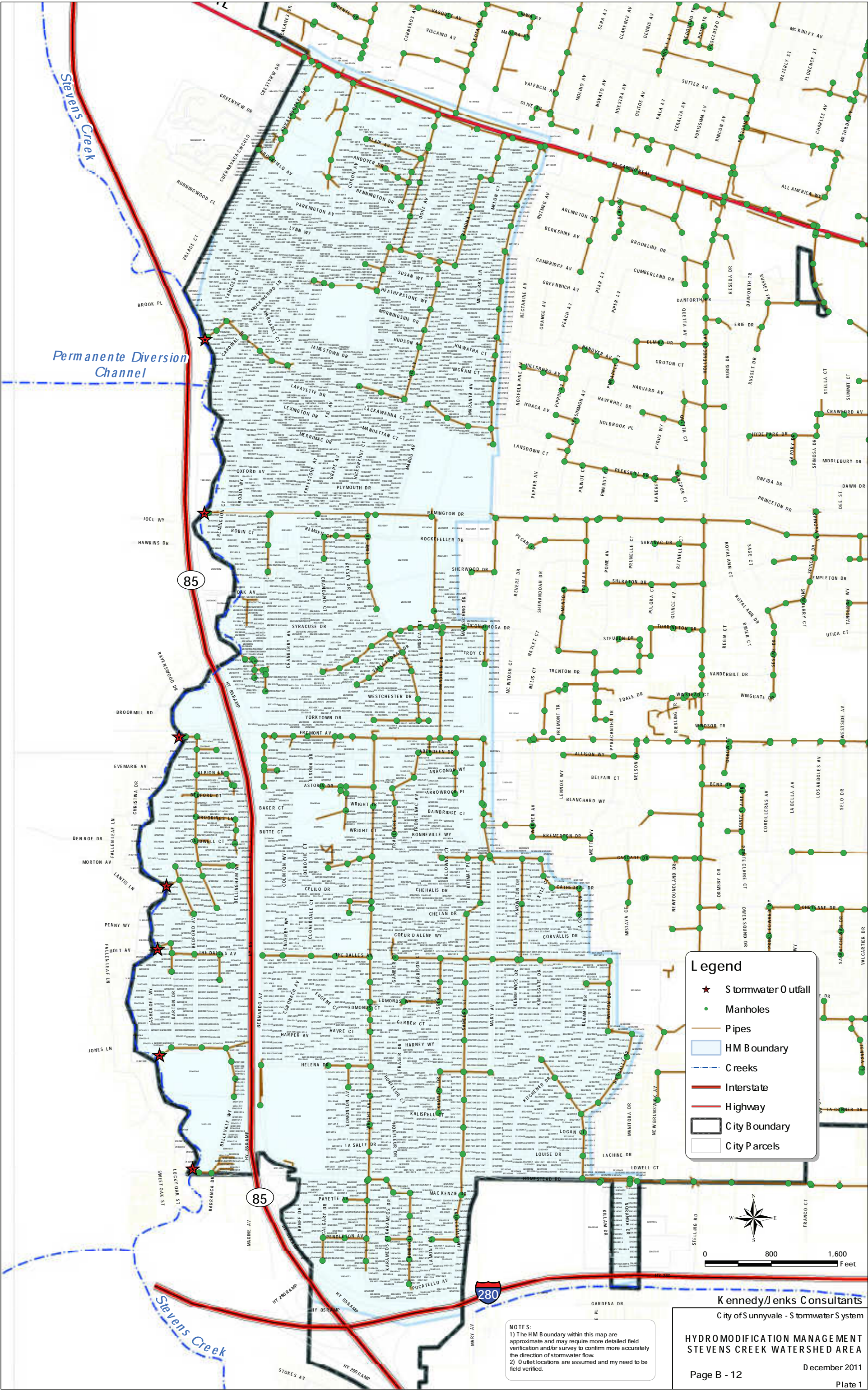
Legend

- Manholes
- Pipe Diameter (inches)
 - 0.00 - 30.00
 - 30.01 - 60.00
 - 60.01 - 90.00
- Creeks
- City Parcels
- City Boundary
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- Major Streets
 - Freeways & Highways
 - Expressways
 - Primary Streets
 - Secondary Streets
- Infiltration Device Zones
 - Exclusion
 - Inclusion
- Hydromodification Management Applicability Zone
 - Potential HM Applicability Zone



City of Sunnyvale, California

STORM DRAIN SYSTEM
MAP



Legend

- ★ Stormwater Outfall
- Manholes
- Pipes
- HM Boundary
- - - Creeks
- Interstate
- Highway
- City Boundary
- City Parcels



0 800 1,600 Feet

Kennedy/Jenks Consultants
City of Sunnyvale - Stormwater System

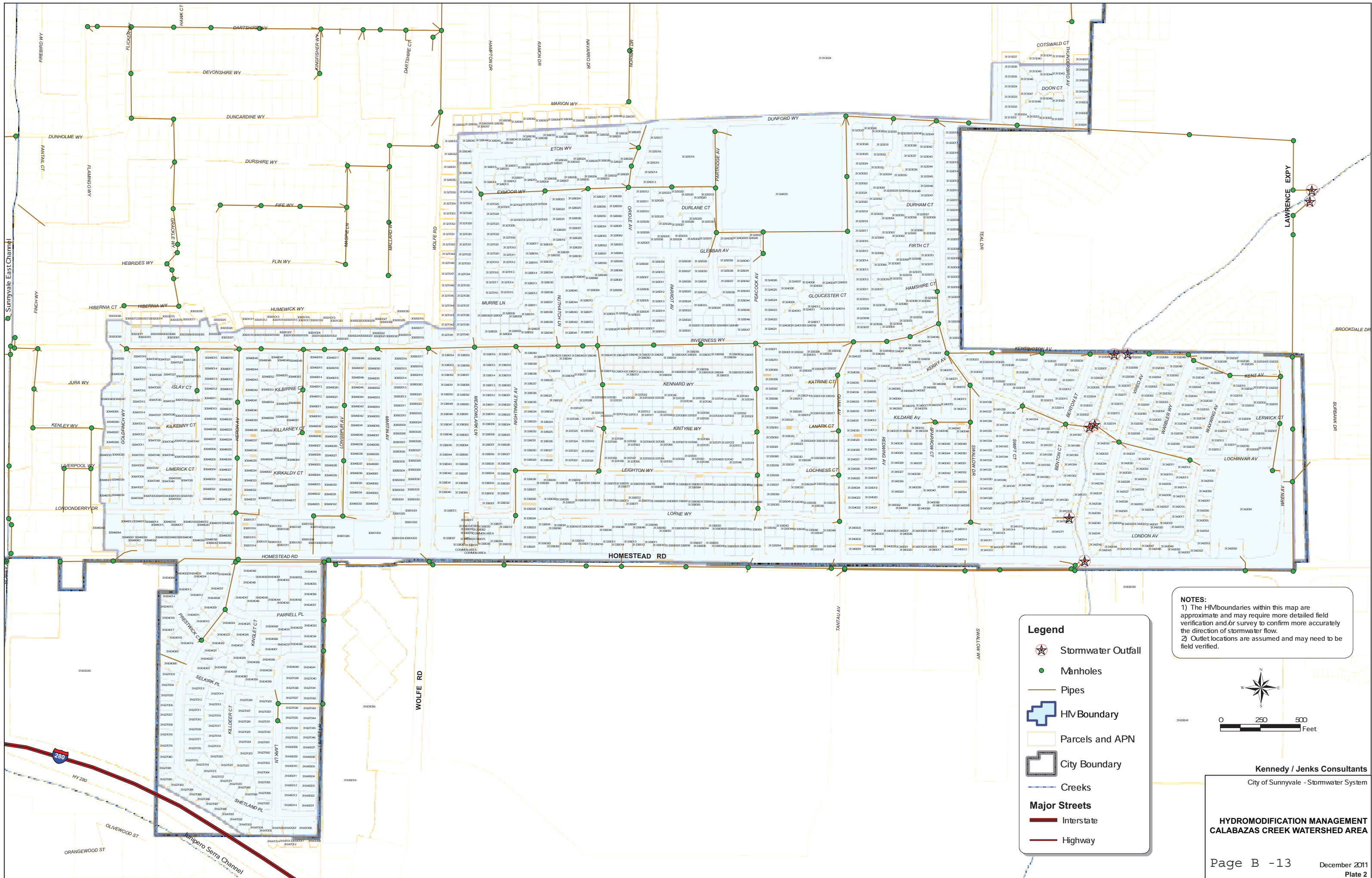
HYDROMODIFICATION MANAGEMENT
STEVENS CREEK WATERSHED AREA

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December 2011

Plate 1

NOTES:
1) The HM Boundary within this map are approximate and may require more detailed field verification and/or survey to confirm more accurately the direction of stormwater flow.
2) Outlet locations are assumed and may need to be field verified.



NOTES:
1) The HIV boundaries within this map are approximate and may require more detailed field verification and/or survey to confirm more accurately the direction of stormwater flow.
2) Outlet locations are assumed and may need to be field verified.

Legend

- Stormwater Outfall
- Manholes
- Pipes
- HIV Boundary
- Parcels and APN
- City Boundary
- Creeks
- Major Streets**
 - Interstate
 - Highway

