

**Town of Los Altos Hills  
Sanitary Sewer Collection System Progress Report  
Contract Year 2015**

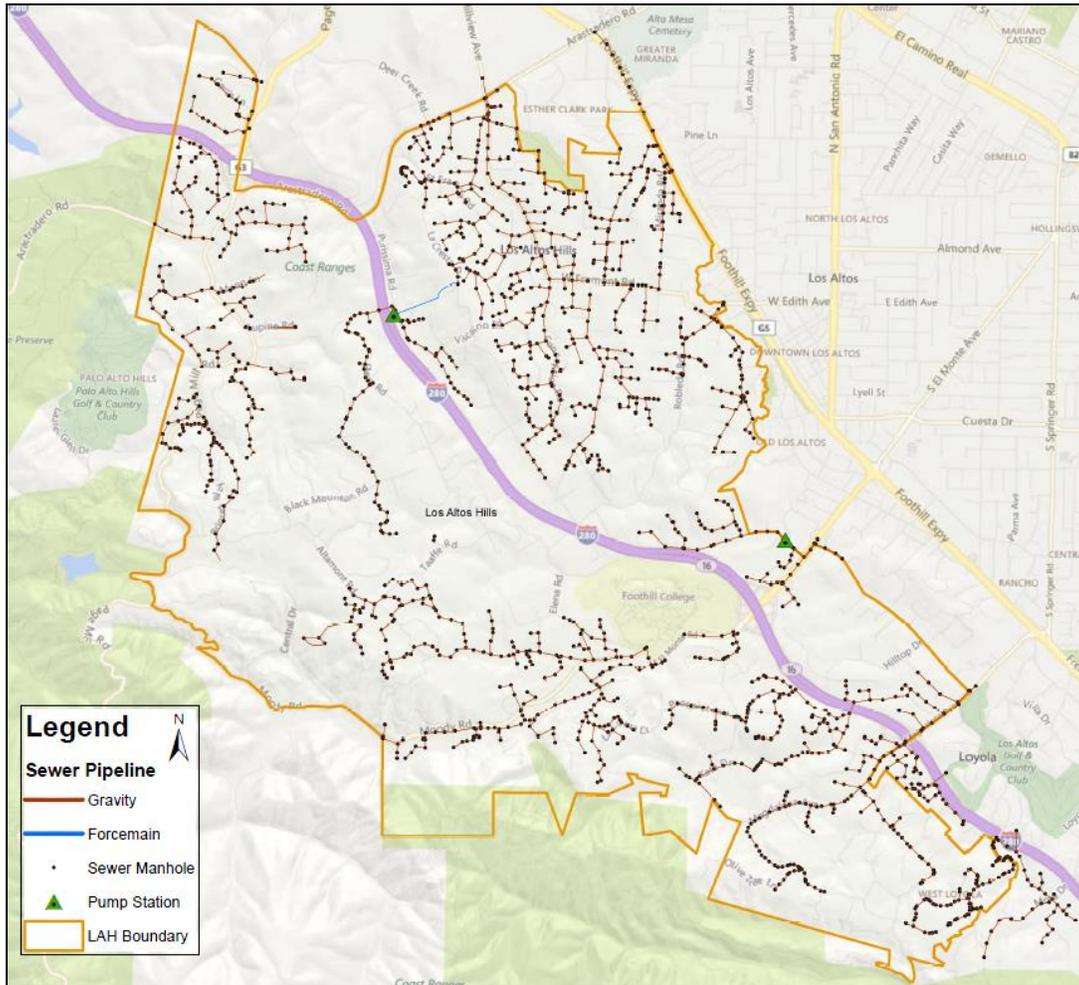
**Reporting Month: June 2016  
Report Date: September 19, 2016**

**I. INTRODUCTION**

Figure 1 shows the Town of Los Altos Hills sewer system.

- Area served: 8.8 square miles
- Miles of sewer pipelines: 55.78
- Number of residential parcels: 1,773
- Number of non-residential connections: 8

**Figure 1. Town of Los Altos Hills Sewer System**



**II. PUBLIC WORKS DIRECTOR/CITY ENGINEER HIGHLIGHTS**

**a. SEWER SYSTEM MAINTENANCE HIGHLIGHTS**

During the month of June 2016, the Town’s sewer maintenance contractor, West Bay Sanitary District (West Bay), completed all contract tasks on schedule. No significant issues were noted during cleaning and pump station inspection. During CCTV inspections, West Bay marked 10 pipes with structural grade 3 defects (described by NASSCO PACP as likely requiring action after 10 years) for follow up. Follow up will involve either repair/rehabilitation under a future CIP, or pipe patch by West Bay under their current maintenance contract. The actions flagged by West Bay are not urgent, and the Town is reviewing their collective field notes and prioritizing follow up actions.

During this month there were no reported SSOs in the Town’s collection system.

A summary of completed sewer maintenance tasks is provided in Table 1, below. More detailed information is provided later in this report, and is also shown in the attached maps.

**Table 1. Summary of Completed Tasks (Contract Year August 2015 – July 2016)**

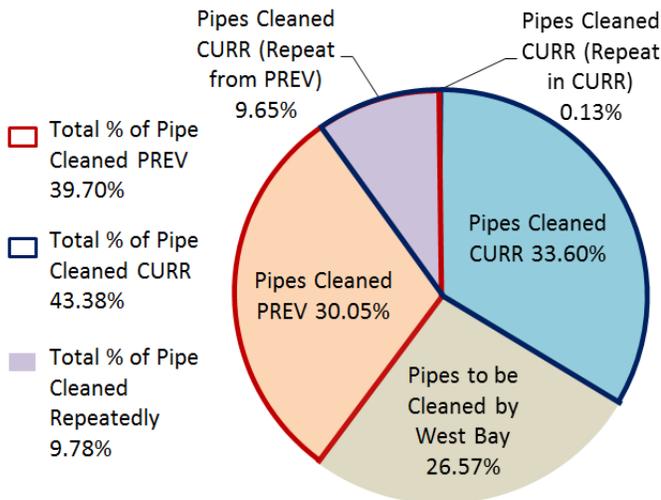
Task	Month of June 2016	Contract Year to Date	Compare to One Year Goal
Sewer Cleaning <ul style="list-style-type: none"> <li>• 36-month and 24-month Schedule</li> <li>• High Frequency (12- and 6-month)</li> <li>• Other, Unscheduled Cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• 1.47 miles</li> <li>• 0.42 miles</li> <li>• 0 miles</li> </ul>	<ul style="list-style-type: none"> <li>• 16.78 miles</li> <li>• 7.88 mile</li> <li>• 0 miles</li> </ul>	96.42% of Goal (91.67% of Time Elapsed)
Pump Station <ul style="list-style-type: none"> <li>• Preventive Maintenance</li> <li>• Unscheduled repairs</li> </ul>	<ul style="list-style-type: none"> <li>• 4X</li> <li>• 0X</li> </ul>	<ul style="list-style-type: none"> <li>• 46X</li> <li>• 2X</li> </ul>	91.67% of Goal
CCTV Inspection <ul style="list-style-type: none"> <li>• Routine Schedule (30 mos)</li> <li>• Other Unscheduled CCTV</li> </ul>	<ul style="list-style-type: none"> <li>• 1.39 miles</li> <li>• 0 miles</li> </ul>	<ul style="list-style-type: none"> <li>• 16.71 miles</li> <li>• 0.04 mile</li> </ul>	95.10% of Goal
SSO Response <ul style="list-style-type: none"> <li>• No. of SSOs – Sewer Main</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 5</li> </ul>	N/A

Cleaning

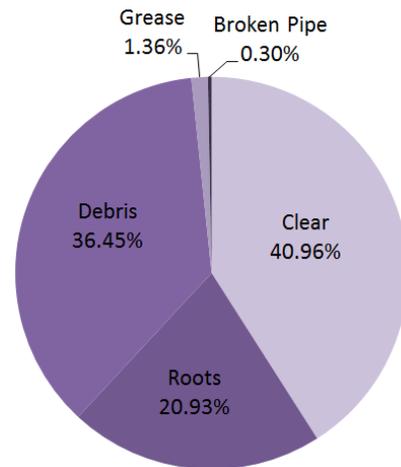
Figure 2a shows previous contract year (PREV) cleaning and current contract year (CURR) cleaning progress for the Town’s pipes. Since August 1, 2014, 73.43 percent of the pipes within the Town’s collection system have been cleaned. The cleaning progress percentages were re-calculated after revising the progress chart to show pipes that have been cleaned more than once in both previous and current contract year. These repeat cleaning instances are due to pipes on the high frequency cleaning schedule. Percentages are based on the number of pipe segments cleaned excluding repeat cleaning. Calculating percentages using the number of pipes is a more consistent approach compared to pipe lengths due to discrepancies between existing records and field observations.

Figure 2b shows cleaning results for the Town’s pipes for the current contract year only. These cleaning results represent 43.38 percent of the system. In the new contract year, 36.45 percent of the cleaned pipes had debris, 20.93 percent had roots, 1.36 percent had grease, and 40.96 percent were clear. Small amounts of broken pipe debris were encountered by cleaning crews in the previous months.

**Figure 2a. Cleaning Progress as of June 30, 2016**



**Figure 2b. Cleaning Results for the Current Year to Date. (Chart represents 43.38% of system).**



Prior to hiring West Bay, the Town did not have an aggressive and structured sewer pipe cleaning program. As a result, debris from prior years has been found inside the pipes. After West Bay cleans the entire system at least one time, the volume of debris in the system should decrease along with other cleaning issues.

During the previous contract year, West Bay had focused on cleaning pipes in the system that had high volumes of SSOs. As a result, there are fewer “Clear” pipes encountered in the system as shown in Tables 2 and 3. In the current contract year, cleaning, which has occurred on a branch by branch basis, shows more “Clear” pipe. However, roots and debris in the pipes have remained an issue in the Town’s collection system.

High frequency pipe cleaning and chemical root control program are two measures that the Town is implementing as a result of the cleaning issues in the system. In addition, the ongoing Capital Improvement Program that aims to replace pipes in the worst structural condition will also aid in addressing these issues in the system. Some of these pipes that have the worst structural defects also contribute to presence of debris and roots in the system.

**Table 2. Cleaning Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe Cleaning Result	Previous Contract Year (39.70% of System Cleaned)	Current Contract Year (43.38% of System Cleaned)
Clear	17.86%	40.96%
Roots	26.32%	20.93%
Debris	54.23%	36.45%
Other	1.59%	1.66%
<b>Total</b>	100% of Cleaned Pipes	100% of Cleaned Pipes

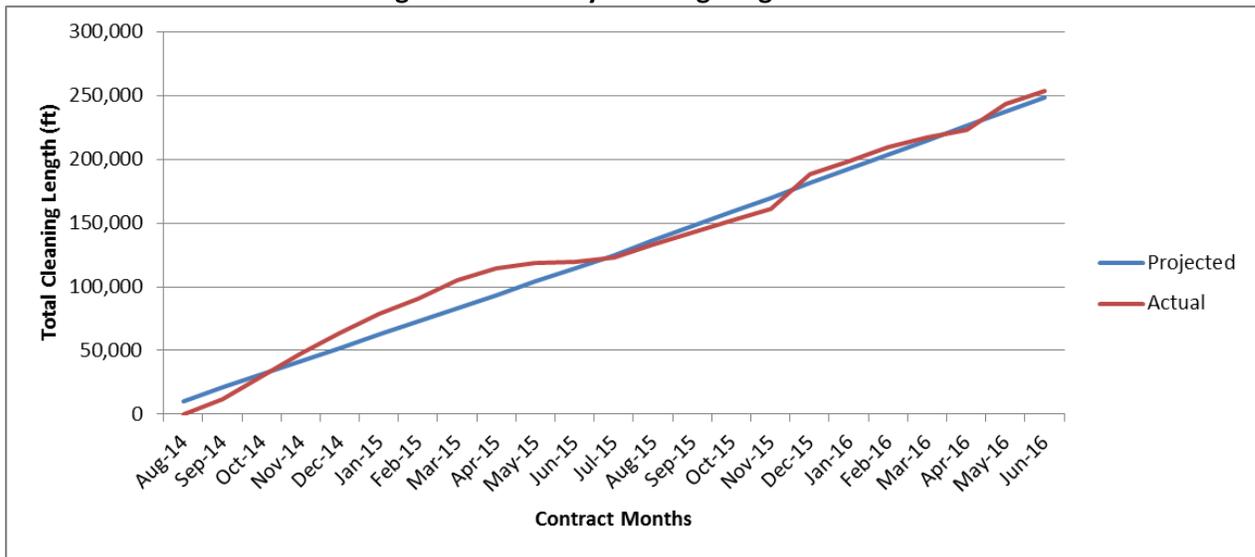
*Note: The sum of the previous contract year percentage (39.70%) and current contract year (43.38%) is not the total percentage of unique pipes cleaned in the system to date. There is a 9.65% overlap between the 2 contract years because of the pipes that have been cleaned more than once due to High Frequency cleaning schedule.*

**Table 3. Cleaning Results TO DATE by Percent of Pipe Segments**

Pipe Cleaning Result	Previous and Current Contract Year (73.43% of System Cleaned)
Clear	29.74%
Roots	23.55%
Debris	45.08%
Other	1.63%
<b>Total</b>	100% of Cleaned Pipes

Figure 3 shows West Bay cleaning progress since they started maintaining the Town’s sanitary sewer collection system in August 2014. West Bay has been effective in meeting each year’s total cleaning footage goal on average, as projected in the previous and current contract.

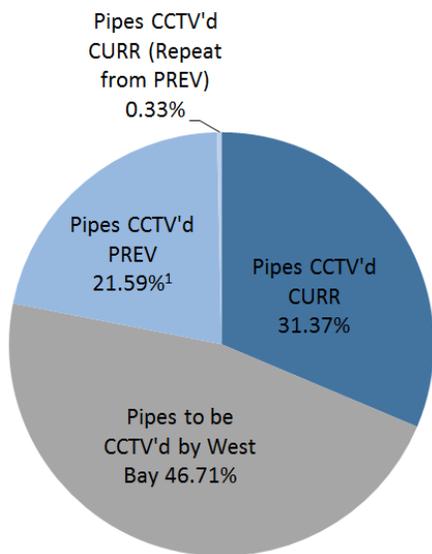
**Figure 3. West Bay Cleaning Progress**



CCTV Inspection

Figure 4 shows the progress of CCTV inspection performed by West Bay in the Town’s system. Percentages are shown based on the number of pipe segments inspected instead of pipe length. As of June 2016, 53.29 percent of the system has been inspected. Of the 53.29 percent, 31.70 percent was inspected during the current contract year including several pipes inspected from the previous contract year.

**Figure 4. CCTV Inspection Results as of June 30, 2016**



Note: <sup>1</sup>This percentage in addition to Pipes CCTV'd CURR (repeat from PREV) is the total percentage of pipes CCTV'd in the previous contract year.

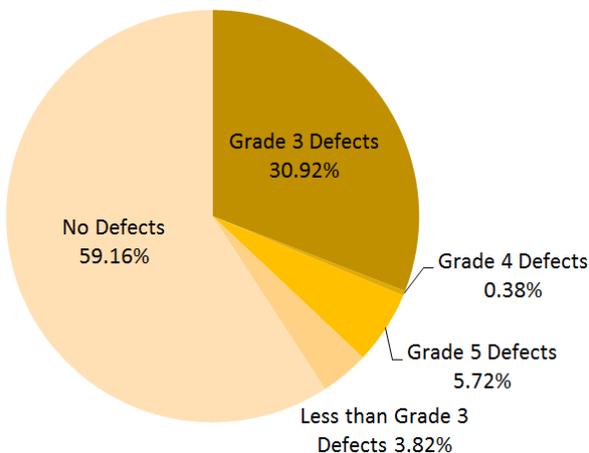
As part of West Bay’s CCTV Operations, pipes with NASSCO PACP Grade 4 or 5 Operations and Maintenance (O&M) defects are placed on the hot spot list. Pipes on the hot spot list receive a more frequent cleaning schedule of 12 and 6 months. Cleaning these pipes more frequently will help address these O&M defects before they affect the pipe’s structural condition. It will also help prevent potential blockages inside the pipes. These pipes showing Grade 4 or 5 O&M defects will remain on the hot spot list until the O&M issues are resolved. The hot spot list is maintained by West Bay outside of the Lucity database. West Bay continues to update the hot spot list in Lucity on a monthly basis, and plans to complete uploading of the entire high frequency schedule by July 31, 2016. The remaining 46.71 percent of pipes in the system have not been inspected by West Bay, and will be inspected on their contracted schedule.

Figures 5a and 5b show structural and O&M defects found during the current contract year. These charts reflect results for 31.70 percent of the system.

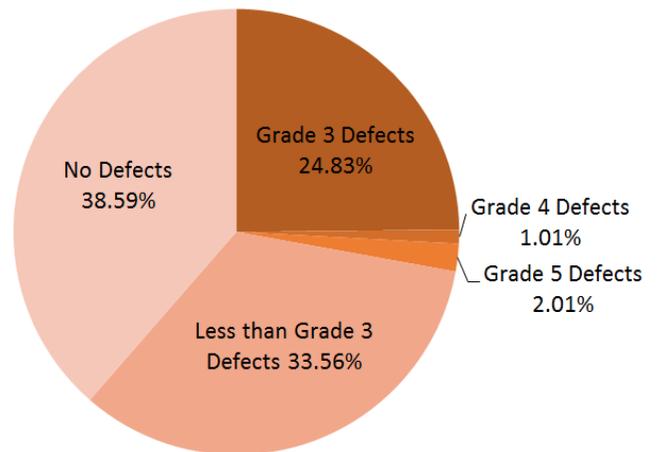
During this period, 59.16 percent of inspected pipes had no structural defects, 34.74 percent had Grade 3 or better structural defects, and 6.10 percent had Grade 4 or 5 structural defects.

From the pipes inspected this new contract year, 3.02 percent have NASSCO PACP O&M Grade 4 and 5 defects. In addition, 58.39 percent of the inspected pipes have been recorded to have Grade 3 or lower defects not including the 38.59 percent that have no defects.

**Figure 5a. CCTV Inspection Results CURR August 2015 – June 30, 2016 (Structural). (Chart represents 31.70% of system).**



**Figure 5b. CCTV Inspection Results CURR August 2015 – June 30, 2016 (O&M). (Chart represents 31.70% of system).**



The current contract year focused CCTV operations on Branch 5 of the system, which had the largest number of prior SSO locations. As a result, West Bay encountered more pipes in the system having NASSCO PACP Structural Grade 5 defects compared to the previous year as shown in Table 4 and 6. West Bay also performed CCTV operations for Branches 3, 6, and pipes in Branch 2 of the system that have not been CCTV'd. The CCTV results, combined with West Bay's field follow up notes, have been used to develop the Capital Improvement Program to address the most critical pipes with Grade 4 and 5 structural issues.

The O&M CCTV results are summarized in Tables 5 and 7. In the previous contract year, West Bay prioritized video inspection in lines with known issues (based on existing maintenance records and Town's understanding of the system) and those lines with incomplete videos. As a result of this approach, more pipes with the worst NASSCO PACP O&M Grade (4 or 5) results were encountered by West Bay in the previous year compared to the current contract year. However, the number of pipes with minor O&M defects has generally remained the same. The Town should continue to be aggressive with its sewer pipe cleaning and CCTV program to ensure that these O&M pipe defects are addressed in a proactive manner.

**Table 4. Structural CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe Structural Grade	Previous Contract Year (21.92% of System CCTV'd)	Current Contract Year (31.70% of System CCTV'd)
Grade 5	2.29%	5.72%
Grade 4	0.28%	0.38%
Grade 3 or Less	97.43% includes 65.71% with no defects	93.90% includes 59.16% with no defects
<b>Total</b>	100% of CCTV'd Pipes	100% of CCTV'd Pipes

*Note: The sum of the previous contract year percentage (21.92%) and current contract year (31.70%) is not the total percentage of unique pipes in the system inspected. There is a 0.33% overlap between the 2 years because of the pipes that have been CCTV'd more than once. VWHA is working with West Bay to determine the reason for these repeat inspections.*

**Table 5. O&M CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe O&M Grade	Previous Contract Year (21.92% of System CCTV'd)	Current Contract Year (31.70% of System CCTV'd)
Grade 5	7.11%	2.01%
Grade 4	0.61%	1.01%
Grade 3 or Less	92.28% includes 23.17% with no defects	96.98% includes 38.59% with no defects
<b>Total</b>	100% of CCTV'd Pipes	100% of CCTV'd Pipes

*Note: The sum of the previous contract year percentage (21.92%) and current contract year (31.70%) is not the total percentage of unique pipes in the system inspected. See note on Table 4.*

**Table 6. Structural CCTV Results TO DATE by Percent Pipe Segments**

Pipe Structural Grade	Previous and Current Contract Year (53.29% of System CCTV'd)
Grade 5	4.35%
Grade 4	0.34%
Grade 3 or Less	95.31% (includes 61.78% with no defects)
<b>Total</b>	100% of CCTV'd Pipes

**Table 7. O&M CCTV Results TO DATE by Percent Pipe Segments**

Pipe O&M Grade	Previous and Current Contract Year (53.29% of System CCTV'd)
Grade 5	4.32%
Grade 4	0.83%
Grade 3 or Less	94.85% (includes 31.62% with no defects)
<b>Total</b>	100% of CCTV'd Pipes

Figure 6 shows West Bay’s CCTV progress since they started maintaining the Town’s sanitary sewer collection system in August 2014. West Bay has consistently exceeded the CCTV inspection goal as projected in previous and current contract years.

**Figure 6. West Bay CCTV Progress**



During this month, routine maintenance was conducted at Purissima and O’Keefe pump stations. There were no issues observed during West Bay’s weekly inspections.

SSO Review

Table 8 shows SSOs to date by cause. During this month, there were no reported SSO within the Town’s Sewer Collection System.

Over the past 5 years, the predominant cause of SSOs has been roots. However, as indicated by the reduced number of SSOs in 2015, the use of chemical root control, combined with improved sewer maintenance methods in place by West Bay, have reduced root-related issues within the Town’s sewer system.

**Table 8. SSOs to June 30 2016, by Cause**

Cause of SSOs	2016	2015	2014	2013	2012
Root Intrusion	1	5	16	9	10
Debris	0	1	1	2	0
Grease	0	0	0	0	0
Structural	0	0	1	0	1
Pump Station Failure	0	0	0	0	1
Other	0	1	0	1	2
<b>Total SSOs/yr</b>	<b>1</b>	<b>7</b>	<b>18</b>	<b>12</b>	<b>14</b>

Attachment I include maps providing additional information on cleaning and CCTV inspection results, and SSOs.

**b. Summary of Meetings Held during Reporting Month**

There were no meetings held during this reporting month.

**c. Computerized Maintenance Management System (CMMS) Updates**

During the reporting month, routine input of cleaning and CCTV inspection progress to date was added to the CMMS.

**d. Geographic Information System (GIS) and Progress on Manhole Data Collection**

West Bay has stated that they are updating the Town's GIS mapping maintenance system on a regular basis. The most recent GIS update received by VWHA/the Town was dated February 2, 2016.

**e. Maintenance Planning**

West Bay has continued to implement the agreed maintenance plan from previous discussions with the Town and VWHA.

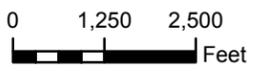
**f. Other**

Table 9 provides updates and progress on the Town's sewer system management activities that are completed in addition to operations, maintenance, and SSO response.

**Table 9. Staff Support Activities Summary of Progress**

Staff Support Activities	Progress and Comments	Future Milestones	Date Scheduled	Date Completed
Sewer System Management Plan	<ul style="list-style-type: none"> <li>SSMP update was completed and adopted by Council. No formal actions will be required for the next five years, other than the SSMP audit to be completed every two years.</li> </ul>	<ul style="list-style-type: none"> <li>Biennial audit</li> </ul>	<ul style="list-style-type: none"> <li>May 2018</li> </ul>	
2016 Sewer CIP	<ul style="list-style-type: none"> <li>The Town's risk model has been completed. Based on risk model results, a repair list was developed for the CIP.</li> <li>VWHA submitted the final document for the CIP that includes input from both the Town and West Bay.</li> <li>The City Council awarded the construction contract on May 19, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>Project Construction</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>
Cleaning and CCTV programs	<ul style="list-style-type: none"> <li>West Bay continues to perform cleaning and CCTV of pipes in Branch 2 of the system.</li> </ul>	<ul style="list-style-type: none"> <li>Complete Year 2 Contract</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2016</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>
2015-16 Hot Spot program	<ul style="list-style-type: none"> <li>West Bay has added pipes to the High Frequency (hot spot) list on an ongoing basis following their matrix, to address pipes that have maintenance issues including pipes where an SSO has occurred.</li> </ul>	<ul style="list-style-type: none"> <li>Upload all High Frequency Schedule in Lucity</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2016</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>
Sanitary Sewer Master Plan	<ul style="list-style-type: none"> <li>West Bay has collected MH data this month and will continue this work over the next several months. Master Plan development will follow data collection.</li> <li>V&amp;A has completed collecting rainfall data. VWHA is analyzing the collected data and will prepare a summary, including an evaluation of dry weather flow allocation per connected parcel. Draft report is anticipated to be completed in July 2016, with a final report in August 2016.</li> </ul>	<ul style="list-style-type: none"> <li>Master Plan RFP</li> <li>Average Flow Calculation Draft Report</li> </ul>	<ul style="list-style-type: none"> <li>September 2016</li> <li>August 2016 for FM Report. Other activities are ongoing.</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> <li>In Progress</li> </ul>

# Town of Los Altos Hills Sanitary Sewer Collection System Map Sewer Basins (Branches)

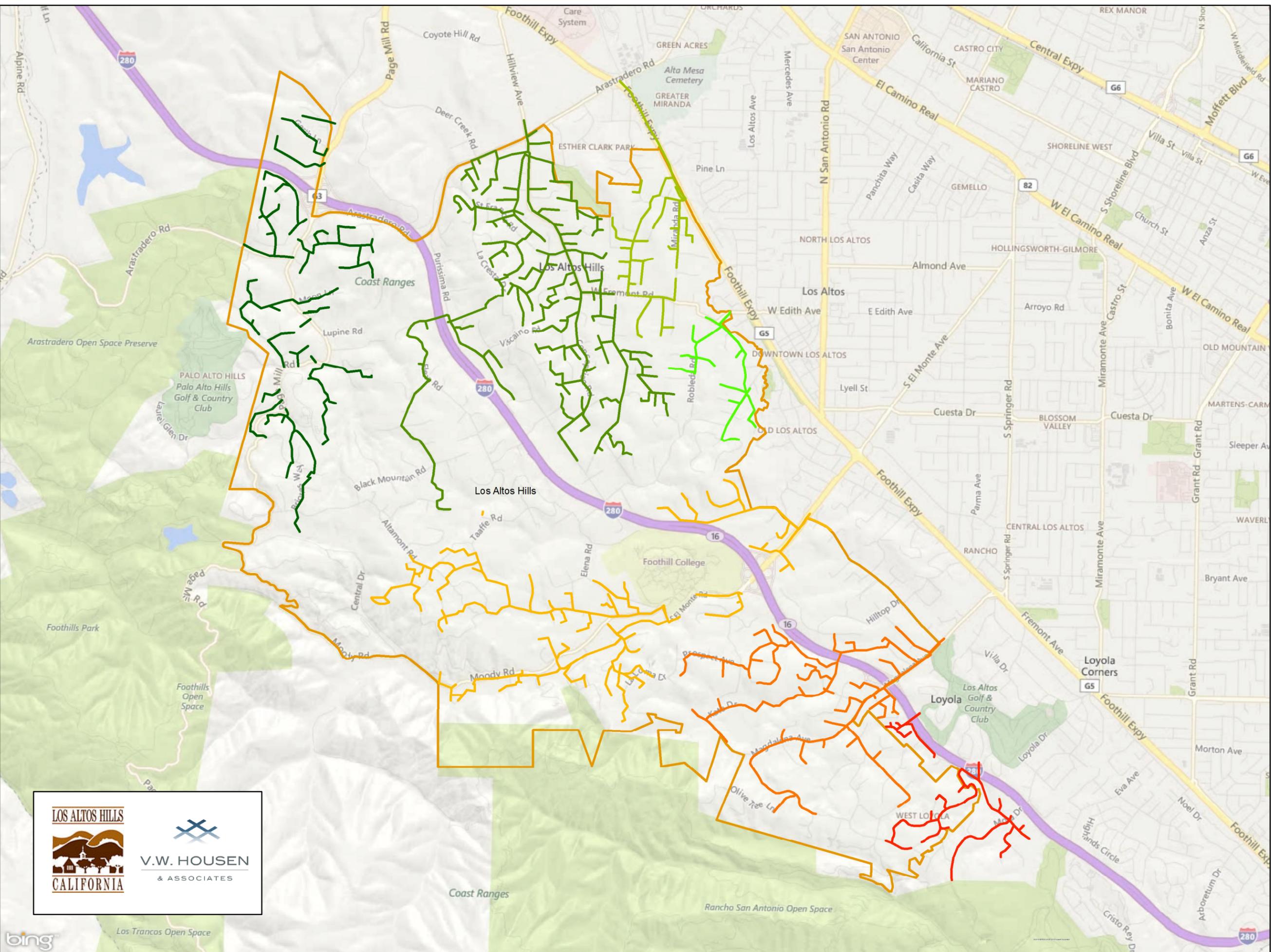


## Legend

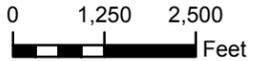
- Branch 1
- Branch 2
- Branch 3
- Branch 4
- Branch 5
- Branch 6
- Branch 7
- LAH Boundary

LOS ALTOS HILLS  
CALIFORNIA

V.W. HOUSEN  
& ASSOCIATES



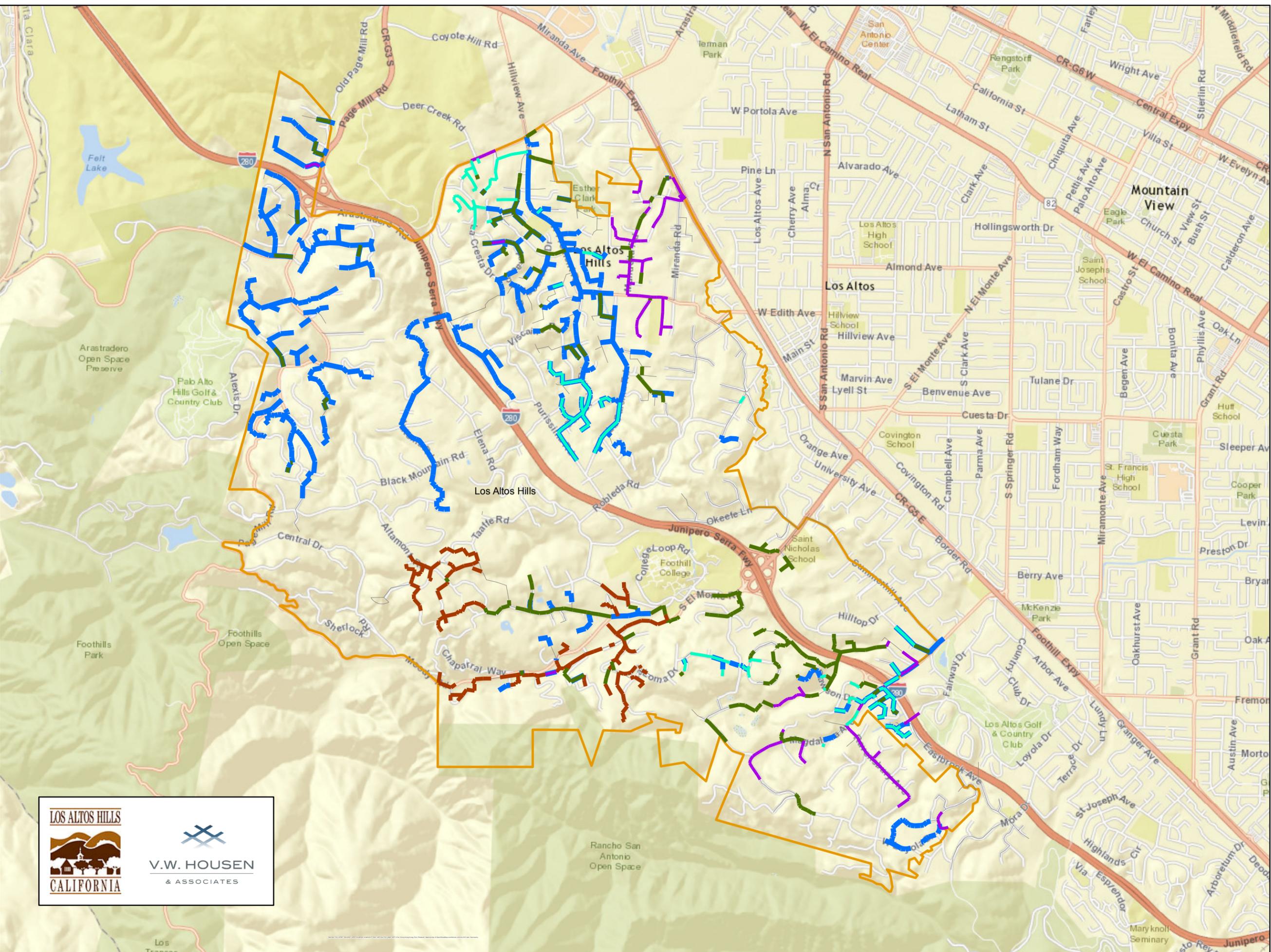
Town of Los Altos Hills  
 Sanitary Sewer Collection System Map  
 Pipes Cleaned from Aug 2014 - June 2016



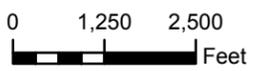
**Legend**

-  Prev Yr (Aug14 - Jul15)
-  Qtr 1 (Aug15-Oct15)
-  Qtr 2 (Nov15 - Jan16)
-  Qtr 3 (Feb16 - Apr16)
-  Qtr 4 (May16 - Jun16)
-  Sewer Pipeline
-  LAH Boundary



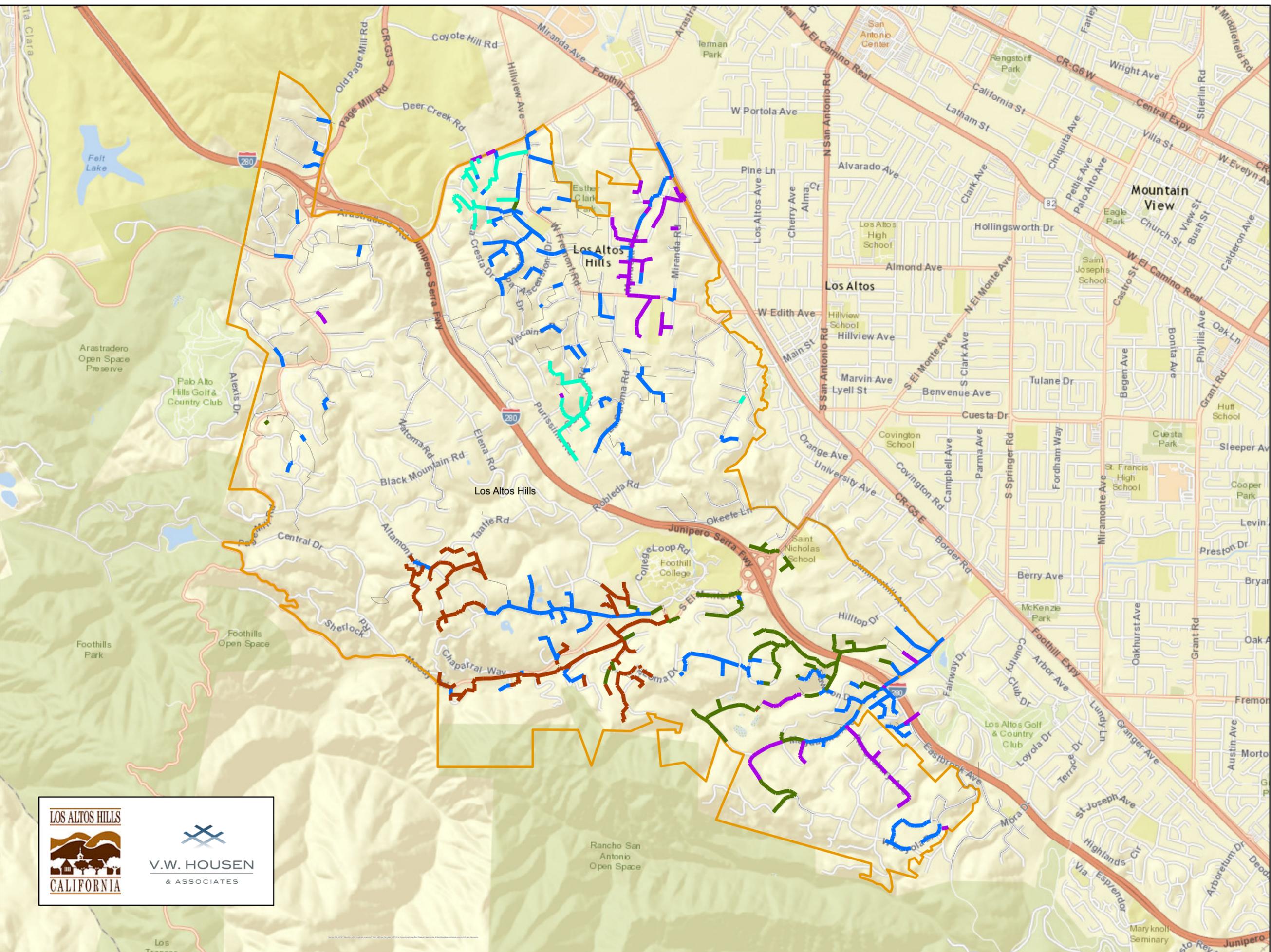


Town of Los Altos Hills  
 Sanitary Sewer Collection System Map  
 Pipes CCTV'd from Aug 2014 - June 2016

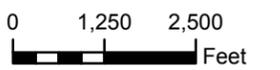


**Legend**

- Prev Yr (Aug14 - Jul15)
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- Qtr 3 (Feb16 - Apr16)
- Qtr 4 (May16 - Jun16)
- Sewer Pipeline
- LAH Boundary



# Town of Los Altos Hills Sanitary Sewer Collection System Map SSOs from 2013 - June 2016



**Legend**

- ▲ 2015-2016 SSOs (all Cat 3)
- 2013-2014 SSOs
- Sewer Pipeline
- LAH Boundary



