Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Attachment IV-1
Sizing for Volume-Based Treatment Controls

Section B — Sizing Volume-Based Treatment Controls based on the Adapted California Stormwater BMP Handbook Approach

The equation that will be used to size the BMP is:

BMP Volume = (Correction Factor) X (Unit Storage) X (Drainage Area to the BMP)

Step 1. Determine the drainage area for the BMP, A = _____ acres

Step 2. Determine percent imperviousness of the drainage area:

a. Estimate the amount of impervious surface (rooftops, hardscape, streets, and sidewalks, etc.) in the area draining to the BMP: _____ acres

b. % impervious area=(amount of impervious area/drainage area for the BMP)*100
% impervious area= **(Step 2a./Step 1)***100
% impervious area= _____%

Step 3. Determine from Figure 1 the mean annual precipitation (MAP_{site}) at the project site location: (see Section II. Step 4 for more explanation.)

MAP_{site} = _____inches

Step 4 Identify the reference rain gage closest to the project site from the following list and record the MAP_{gage}:

MAP_{gage} = _____inches

Reference Rain Gages	**Mean Annual Precipitation (MAP_{gage}) (in)**
San Jose Airport	13.9
Palo Alto	13.7
Gilroy	18.2
Morgan Hill	19.5

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Section B —Adapted California Stormwater BMP Handbook Approach (continued)

Step 5 Determine the rain gage correction factor for the precipitation at the site using the information from **Step 3** and **Step 4**.

Correction Factor = MAP_{site} (**Step 3**)/MAP_{gage} (**Step 4**)

Correction Factor = _____

Step 6. Identify representative soil type for the BMP drainage area.

a) Identify from Figure 1, the soil type that is representative of the pervious portion of the project shown here in order of increasing infiltration capability:

____ Clay ____ Sandy Clay ____ Clay Loam

____ Silt Loam ____ Loam

b) Does the site planning allow for protection of natural areas and associated vegetation and soils so that the soils outside the building footprint are not graded/compacted? ____

If your answer is no, and the soil will be compacted during site preparation and grading, the soil's infiltration ability will be decreased. Modify your answer to a soil with a lower infiltration rate (e.g., Silt Loam to Clay Loam or Clay).

Modified soil type: _____

7. Determine the average slope for the drainage area for the BMP: _____%

8. Determine the unit basin storage volume from sizing curves.

a) Slope ≤ 1%

Use the figure entitled "Unit Basin Volume for 80% Capture, 1% Slope" corresponding to the nearest rain gage: Figure 2-A, B, C, or D for San Jose, Palo Alto, Gilroy and Morgan Hill, respectively. Find the percent imperviousness of the drainage area (see answer to **Step 2**, above) on the x-axis. From there, find the line corresponding to the soil type (from **Step 6**), and obtain the unit basin storage on the y-axis.

Unit Basin Storage for 1% slope ($UBS_{1\%}$) =_____(inches)

b) Slope ≥ 15%

Use the figure entitled "Unit Basin Volume for 80% Capture, 15% Slope" corresponding to the nearest rain gage: Figure 3-A, B, C, or D for San Jose, Palo Alto, Gilroy and Morgan Hill, respectively. Find the percent imperviousness of the drainage area (see

answer to **Step 2**, above) on the x-axis. From there, find the line corresponding to the soil type (from **Step 6**), and obtain the unit basin storage on the y-axis.

Unit Basin Storage for 15% slope ($UBS_{15\%}$) = _____(inches)

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c) Slope > 1% and < 15%

Find the unit basin volumes for 1% and 15% using the techniques in **Steps 8a** and **8b** and interpolate by applying a slope correction factor per the following formula:

$UBS_x = UBS_{1\%} + (UBS_{15\%} - UBS_{1\%})*(x\%-1\%) / (15\% - 1\%)$
= (**Step 8a**) + (**Step 8b- Step 8a**) * (x%-1%)/(15%-1%)

Where UBS_x= Unit Basin Storage volume for drainage area of intermediate slope, x %

Unit Basin Storage volume (USB_x) = _____(inches)
(corrected for slope of site)

9. Size the BMP, using the following equation:

BMP Volume = Rain Gage Correction Factor * Unit Basin Storage Volume * Drainage Area

BMP Volume = (**Step 5**) * (**Step 8** unit storage) * (**Step 1** Drainage area) * 1 foot/12 in.

BMP Volume = _____ acre-feet

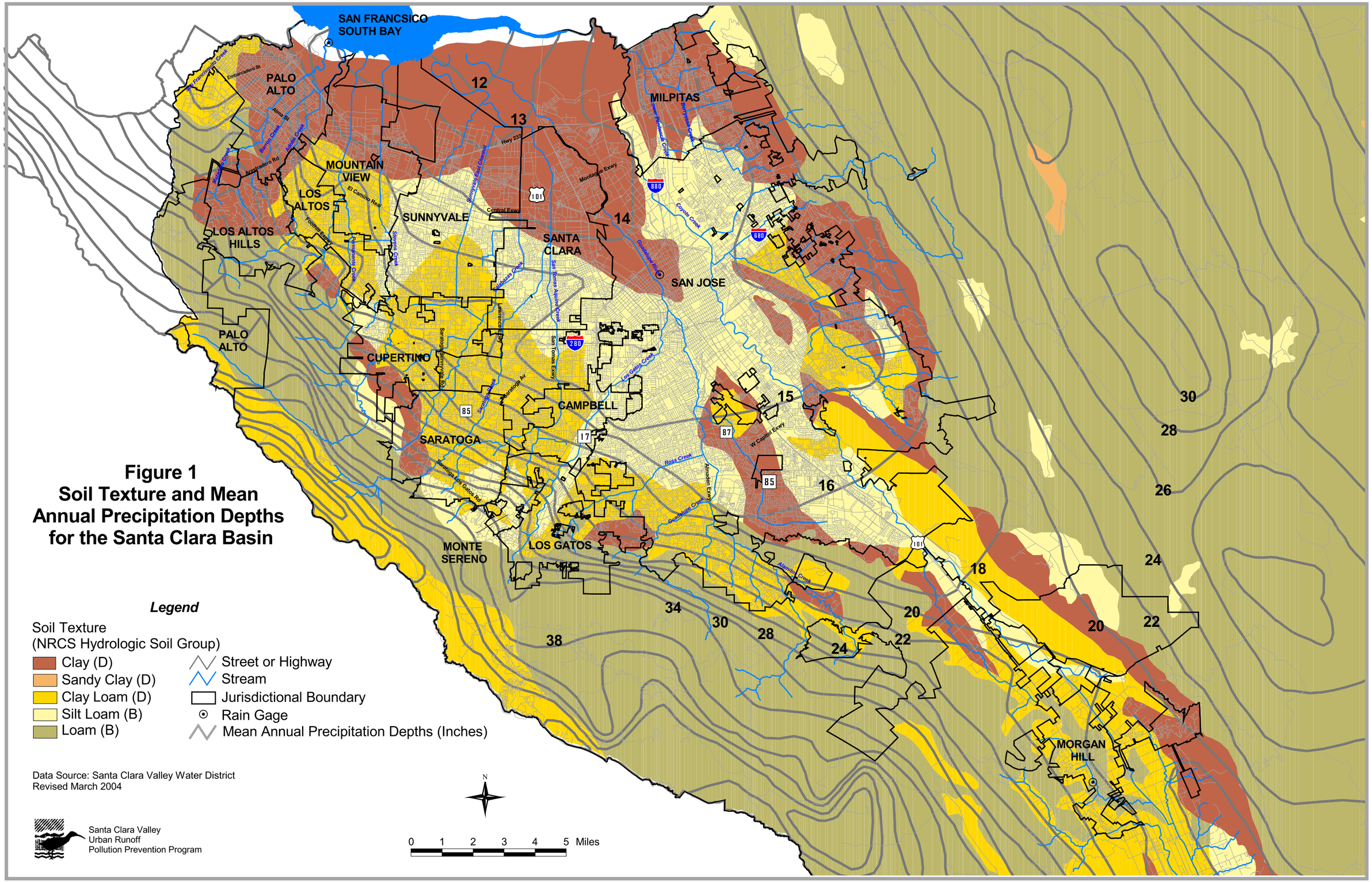

Figure 1
Soil Texture and Mean Annual Precipitation Depths for the Santa Clara Basin

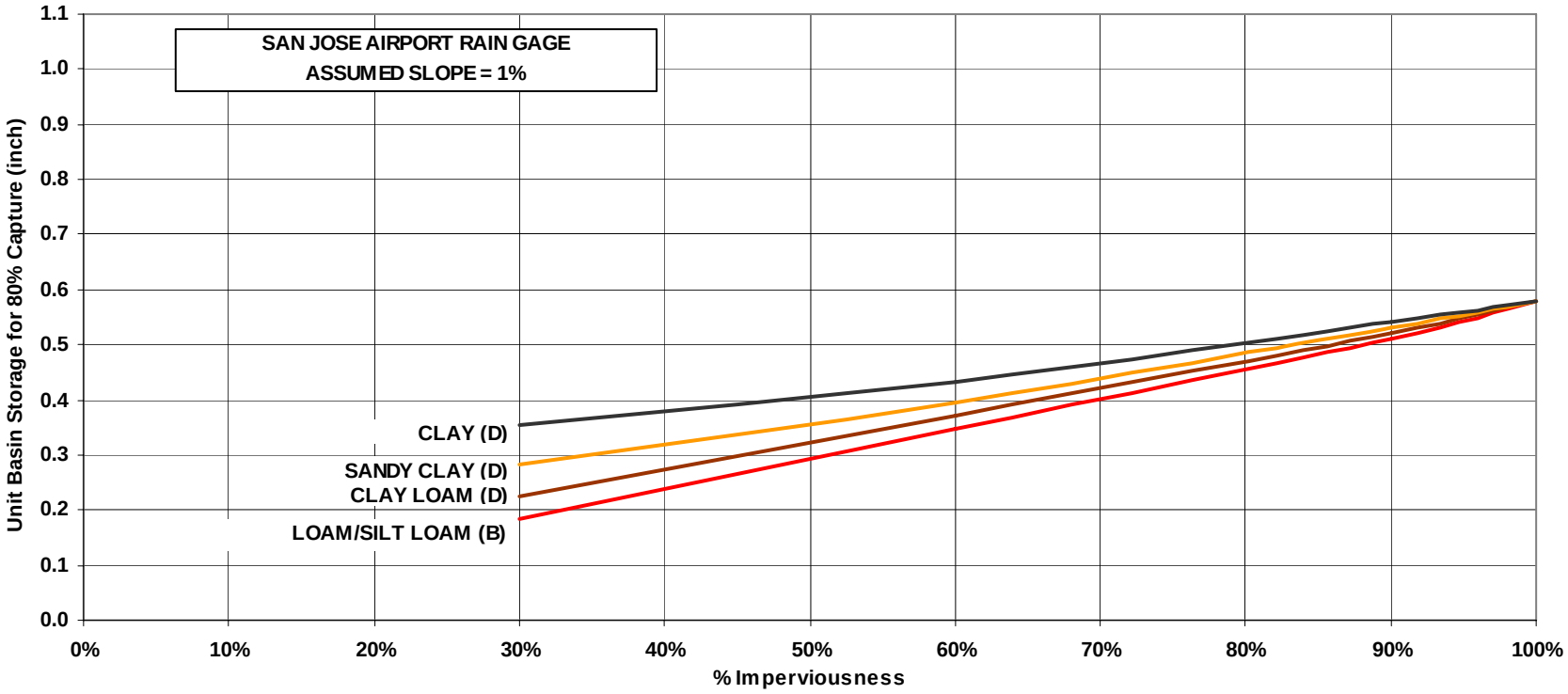

Figure 2-A Unit Basin Volume for 80% Capture - <u>San Jose Airport Rain Gage</u>

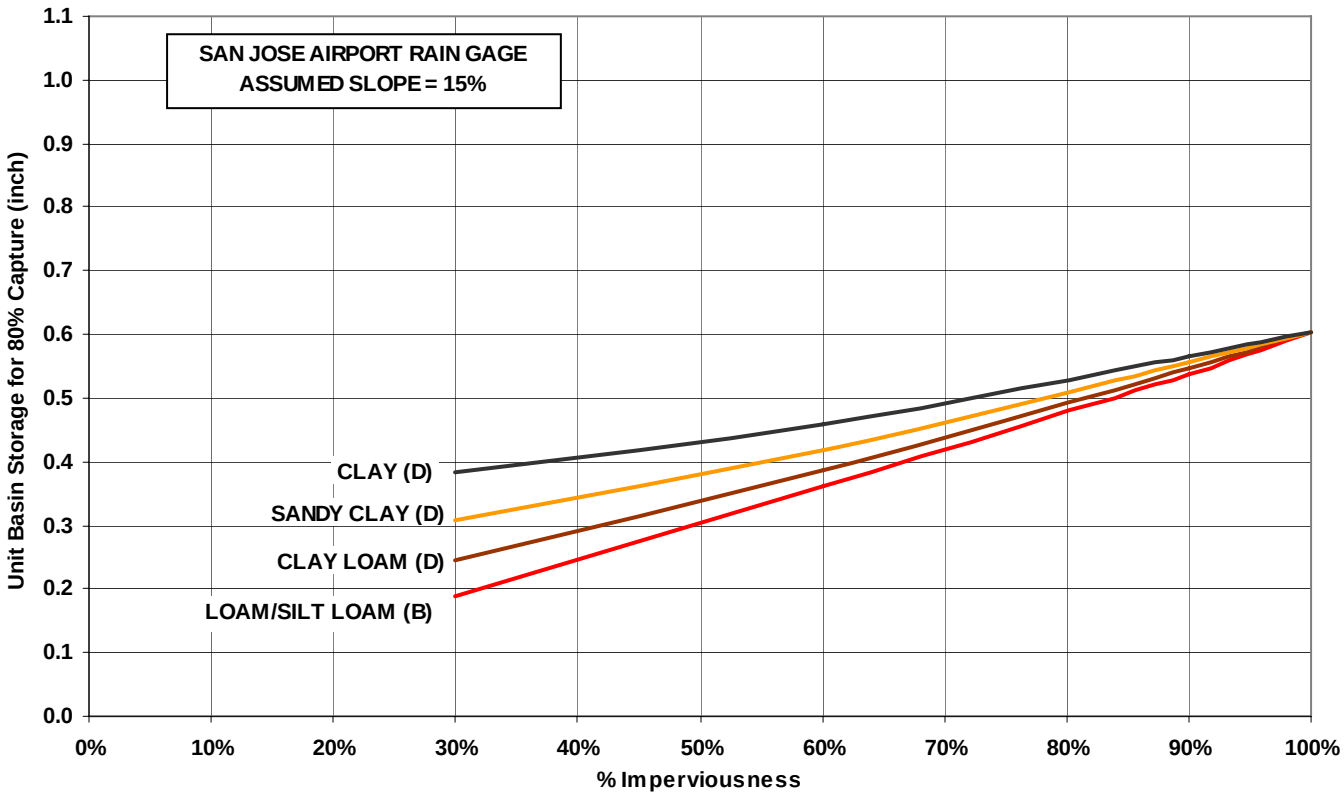

Figure 3-A Unit Basin Volume for 80% Capture - <u>San Jose Airport Rain Gage</u>