



**ATTACHMENT L:**  
L2: SAMPLE O&M PLAN



## SVBX Post-Construction BMP Operations and Maintenance Guidelines



*A guide for the care and maintenance of the SVBX bioretention basins*



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## Background

The Santa Clara Valley Transportation Authority (VTA) Silicon Valley Berryessa Extension (SVBX) project consists of ten miles of track and two Bay Area Rapid Transit (BART) BART/VTA stations. Post-construction stormwater treatment facilities, including bioretention basins and tree well filters, were installed as part of the drainage features along some of the BART track and at both stations. Bioretention basins and tree well filters are permanent best management practices (BMPs) used to filter out pollutants from stormwater runoff discharging from the project. The runoff from the project travels via the storm drain system into local creeks that discharge to South San Francisco Bay.

Bioretention facilities are composed of a bottom layer of drainage rock with an underdrain/subdrain, and depending on the soil conditions, there may be an impermeable liner. A second layer of engineered soil (media) is placed over the rock with site specific plants. This is then topped with mulch. In some cases where irrigation was not available, plants were not installed and instead a bioretention grass seed was spread via hydroseed.

Tree wells consist of a subsurface concrete structure that contains a proprietary media to filter stormwater runoff along with a single tree. The proprietary media is used to obtain high flow rates through the tree well, and still filter out pollutants.

Both types of stormwater BMPs have a site-specific drainage management area (DMA), or area of runoff that they treat. The list of stormwater BMPs can be found in Appendix A.

## Stormwater Facility Operation and Maintenance Agreements

VTA will enter into Operation and Maintenance (O&M) Agreements with the City of San Jose and the City of Milpitas to each maintain the BMPs that treat runoff from their respective right-of-way. Maps showing the locations of VTA and City BMPs including the two station areas can be found in Appendix B.

## Records

The VTA O&M inspections and necessary maintenance will be performed by in-house VTA staff or contractors at VTA's discretion. Inspection and Maintenance checklists will be completed per in-house standard or contract requirements for each BMP. These will be submitted to the following address:

VTA Environmental Programs

Attn: Roy Molseed – VTA MS4 Stormwater Program Project Manager

3331 North First Street

San Jose, CA 95134

Oversight inspections will be performed by VTA Environmental Programs as part of the Municipal Stormwater (MS4) permit requirements. A sample inspection form is shown in Appendix C: Stormwater Facilities Inspection Form.

## Safety

Use of maintenance equipment shall be according to the manufacturer's procedures and instructions and according to VTA and Cal OSHA requirements.

### General Safety Guidelines

- Set up a safety perimeter and be aware of passing pedestrians, bicycles, and vehicles.
- Do not stand in the street when performing maintenance activities unless traffic control has safely blocked a lane.
- Make yourself visible. Wear bright colored clothing and a safety vest.



- Wear hard hats (as required), protective clothing, thick gloves, and sturdy shoes.
- Be aware when cutting plants and branches overhead or when working on an active construction site.
- Wear eye and ear protection.
- Be aware of broken glass, sharp objects, and other hazards.
- Be aware of needles and other biohazards. Use grabbers and gloves to remove needles and dispose of them properly.
- Be aware of loose material, standing water, tripping hazards, uneven ground, and other obstructions.
- Don't leave your tools unattended. Keep them out of the street and off the sidewalk so they don't pose a hazard to others.
- Perform maintenance on your facility during daylight hours and avoid peak traffic times.

## Tools

Ideal tools include: camera, edging Spade, trash bags, work gloves, plant and weed photo ID sheet, tarp/buckets/trash cans (to remove leaf litter/debris), high-visibility clothes/vest, push broom, wheelbarrow, hand trowel, rake, hoe, manhole cover hook or lifter (for opening grates), flat shovel, wrenches and other tools required to unbolt manhole cover and grate locks, hedge shears and loppers, hand weeding tools, and hori-hori.

## Maintenance of Bioretention Facilities

Bioretention facilities remove pollutants by filtering runoff slowly through an active layer of soil media. Dissipation rock placed at the inlets helps to prevent erosion of the mulch at the bioretention facilities. In addition, the media is held together by plant roots which help to biologically remediate some of the pollutants. To ensure continued effectiveness, regular maintenance is needed and consists of the following:

- a. Inspect the dissipation rock area at the inlets for channels, exposed soils, or other evidence of erosion. Clear any obstructions such as trash or debris and remove any accumulation of foreign sediment. Examine dissipation rock and replenish if necessary.
  - i. If the inlet is not a standard street drain inlet or a concrete structure, then inspect the transition area (from the paved treated area to the basin) for erosion.
  - ii. Inspect side slopes for evidence of instability or erosion and correct as necessary.
- b. Observe soil at the bottom of the bio-retention facilities for uniform percolation throughout. If portions of the planter do not drain within 24-72 hours after a storm event, the soil should be tilled and replanted.
- c. Confirm that check dams and flow spreaders are in place and level and that channelization within the bioretention facility is effectively prevented.
- d. Examine the vegetation to ensure that it is healthy and dense enough to provide filtering and to protect soils from erosion.
- e. Replenish mulch as necessary, remove accumulated leaves, trash and debris, prune shrubs or trees, and mow turf areas. When mowing, remove no more than 1/3 of the grass height. Confirm that



irrigation is adequate and not excessive. Replace dead plants and remove noxious and invasive weeds.

- f. Abate any potential vectors by filling holes in the ground in and around the bioretention facility and by insuring that there are no areas where water stands longer than 24-72 hours following a storm. If mosquito larvae are present and persistent, contact the Santa Clara County Vector Control for information and advice. Any mosquito larvicides should be applied only when absolutely necessary and only by a licensed individual or contractor.

Bioretention Facility Maintenance Table

Frequency	Observation	Maintenance Activity
Yearly	<ul style="list-style-type: none"> <li>• Inspect the bioretention facility mulch and media elevations.</li> </ul>	<ul style="list-style-type: none"> <li>• If mulch has floated to one side or media elevation is too low, adjust the elevations and re-spread the media.</li> </ul>
	<ul style="list-style-type: none"> <li>• Inspect the elevation of the dissipation rock.</li> </ul>	<ul style="list-style-type: none"> <li>• If the dissipation rock is spread out or sunk into the media, rearrange in front of the inlet or transition area between the paved area and the facility.</li> </ul>
	<ul style="list-style-type: none"> <li>• Inspect the growth of trees and look for trunk pitch.</li> </ul>	<ul style="list-style-type: none"> <li>• If tree is leaning, check the support pole connections, remove any large branches to offset weight, or replant if the pitch is too great to correct.</li> </ul>
Monthly	<ul style="list-style-type: none"> <li>• Inspect the bioretention facility for litter, debris, leaves, dead vegetation and anything else that might interfere with flow, filtration or growth of the plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove all litter, debris, leaves, dead vegetation, etc.</li> <li>• Replace dead vegetation as appropriate.</li> </ul>
	<ul style="list-style-type: none"> <li>• Inspect for growth of invasive plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove any invasive plants, weeds or shrubs by hand in the basin.</li> <li>• Do not apply herbicides or pesticide within the basin area, as they are a direct MS4 connection.</li> <li>• Spray minimum amount necessary to control pests near the basin. If pesticides must be used, then pesticide application is to be performed by a licensed professional pest control contractor trained in Integrated Pest Management (IPM)</li> </ul>



		techniques (see list of VTA approved pesticides in Appendix D).
	<ul style="list-style-type: none"> <li>Inspect the condition of plantings. Plantings must be maintained in a healthy condition without use of conventional fertilizers or pesticides. Grass must be of sufficient density and health to provide filtration and to protect from erosion.</li> <li>Inspect the condition of other vegetation found in the bioretention facility. Vegetation must be of sufficient density and health to provide filtration and protect from erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Reseed bare spots and mow as necessary.</li> </ul>
Before each rainy season (early October or prior to significant storm)	<ul style="list-style-type: none"> <li>Look for any obstructions that will prevent water from flowing into the bioretention facility such as: trash/debris and vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Remove obstructions, clean up litter and maintain vegetation.</li> </ul>
	<ul style="list-style-type: none"> <li>Inspect bioretention facilities. Look for gullies, washouts, evidence of uncontrolled surface water flow or any other evidence of erosion in the bioretention facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Replacement soil to be placed by hand tools only and avoid compaction. Any basin compaction should be due to watering only.</li> </ul>
	<ul style="list-style-type: none"> <li>Determine whether the bioretention facility is draining correctly (i.e. drains in less than 24-72 hours after a storm event). Inspect adjacent infrastructure, such as retaining walls, curbs and pavement for signs of failure caused by water intrusion into the surrounding soil. This is a sign of poor drainage from the bioretention facility.</li> </ul>	<ul style="list-style-type: none"> <li>Determine the cause of poor drainage (i.e. siltation of engineered soil mix, blocked subdrains, blocked catch basin, blocked storm drain) and repair.</li> </ul>
	<ul style="list-style-type: none"> <li>Inspect each subdrain where it enters the catch basin to see whether the subdrain pipe is dry or is clogged. Ensure that the subdrain is flowing by testing with water from the cleanout end.</li> </ul>	<ul style="list-style-type: none"> <li>If water does not flow through the subdrain, rod or flush the line to ensure flow.</li> </ul>





	<ul style="list-style-type: none"> <li>Inspect all subdrain cleanouts. Ensure that all cleanout caps are present. Look for obstructions, debris, trash, leaves, vegetation, etc., growing inside the subdrain or covering the cleanout.</li> </ul>	<ul style="list-style-type: none"> <li>Remove any obstructions by hand (if near the cleanout entrance) or by flushing (with pressurized water) if too far down the pipe. Replace missing caps and secure to prevent unauthorized removal or accidental displacement.</li> </ul>
	<ul style="list-style-type: none"> <li>Inspect the entire storm drain system from the upstream end to the outfall, including all catch basins. Observe the flow of water. Any evidence of ponding in the catch basins may indicate a blockage or high groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Find and remove any obstructions. Flushing (with pressurized water) may be necessary.</li> </ul>
	<ul style="list-style-type: none"> <li>Inspect all catch basins. Look for obstructions, vegetation, debris, litter, sediment, etc. blocking the catch basins.</li> </ul>	<ul style="list-style-type: none"> <li>Remove obstructions and clean drain inlets and catch basins.</li> </ul>
After the first heavy rain (a rain event more than 0.5")	<ul style="list-style-type: none"> <li>Determine whether the bioretention facility is draining correctly. Look for standing water or soggy, saturated soil. Look for holes containing standing water that encourage mosquitoes. This is a sign of poor drainage from the bioretention facility. Water should drain from bioretention planter within 24-72 hours. After 72 hours, there should be no patches of standing water. Bioretention facility should drain evenly.</li> </ul>	<ul style="list-style-type: none"> <li>Determine the cause of poor drainage (i.e. siltation of engineered soil mix, blocked subdrains, blocked catch basin, blocked storm drain) and repair. Fill holes containing water with proper soil mix. Tilling of soil mix may be required, after several years, the soil medium may become impermeable because of silt deposition, in which case removal and replacement of the soil mix and rock material will be required.</li> </ul>
Before each dry season and each month throughout the dry season (April to October)	<ul style="list-style-type: none"> <li>Test the irrigation system. Observe whether all ground cover areas within the bioretention facilities are receiving the correct amount of water. Observe whether excessive irrigation is creating flow in the subdrains (irrigation should not create any flow in the subdrain)</li> </ul>	<ul style="list-style-type: none"> <li>Clean out all plugged sprinkler heads and filters. Straighten any displaced sprinkler heads. Replace any damaged sprinkler heads. Adjust for direction and throw distance. Prevent over spray into catch basin. Set the sprinkler timer to provide enough water, depending on the anticipated weather, until the next irrigation inspection. Reduce the watering time if excess water flows from the subdrains.</li> </ul>



<p>When the bioretention facility is reaching its estimated replace date (10-15 years)</p>	<ul style="list-style-type: none"> <li>• Bioretention facilities are failing to drain and normal maintenance activities have failed to rectify problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Thorough inspection of bioretention facilities by a licensed professional (i.e. landscape contractor, landscape architect, civil engineer, etc.), replacement of failed components and repair of bioretention facilities to design specifications per the details developed by a registered professional.</li> </ul>
	<ul style="list-style-type: none"> <li>• Observe if tree roots are exposed, or if tree is in poor health.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace tree as needed.</li> </ul>

**Tree Well Maintenance Guidelines**

Tree well maintenance visits are scheduled seasonally, once after winter rains and once in the fall to prepare for coming storms.

**Maintenance Visit Summary**

The SVBX project uses Filterra® tree wells. Maintaining a tree well and surrounding area includes:

1. Inspect drainage area and flow-line draining to tree well.
2. Remove tree grate and erosion control stones.
3. Remove debris, trash, and mulch in tree well.
4. Replace mulch with manufacturer’s approved mulch only (Gro-Well Premium Black Colored Mulch).
5. Check tree health, and prune or replace as necessary.
6. Clean area around tree well.
7. Complete log/documentation of maintenance.

**Maintenance Tools, Safety Equipment and Supplies**

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing, safety hats and shoes, and barricades when working near traffic. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs. ea.). Most visits require minor trash removal and a replenishment/replacement of mulch may be necessary.





## Filterra® Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.



### 1. Inspection of Filterra® and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes   no
Damage to Box Structure	yes   no
Damage to Grate	yes   no
Is Bypass Clear	yes   no

If yes answered to any of these observations, record with close-up photograph (numbered).



### 2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra® box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes   no
Cups/ Bags	yes   no
Leaves	yes   no
# of Buckets Removed	_____



### 3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra® engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra® media (not top soil or other) to recharge to a 9" distance

Record on Maintenance Report the following:

Distance of Bottom of Top Slab (inches)	_____
# of Buckets of Media Added	_____



**4. Mulch replacement**

- Please see mulch specifications.
- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Ensure correct repositioning of erosion control stones by the Filterra® inlet to allow for entry of trash during a storm event.
- Replace Filterra® grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.



**5. Plant health evaluation and pruning or replacement as necessary**

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	_____	(ft)
Width at Widest Point	_____	(ft)
Health		alive   dead
Damage to Plant		yes   no
Plant Replaced		yes   no



**6. Clean area around Filterra®**

- Clean area around unit and remove all refuse to be disposed of appropriately.



**7. Complete paperwork**

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.



## Filterra® Tree Box Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.

*Maintenance is ideally to be performed twice annually.*



Appendix A: Bioretention Basins and Tree Well Index

<b>VTA Post-Construction Stormwater Treatment Areas – Construction Nomenclature</b>			
<b>SVBX Silicon Valley Berryessa Extension (Basins from North to South down the alignment)</b>			
<b>SVBX Alignment Location</b>	<b>Type of treatment</b>	<b>VTA BMP#:</b>	<b>Map#:</b>
South of 237, Industrial Rd (STA 289+70 to 296+68, on exhibit )	Bioretention Basin	ID- BR-01	Exhibit 5c
Piper Drive (STA 359+70 to 364+00)	Bioretention Basin	PR-BR-02	Exhibit 5d
<b>Milpitas Station/Parking Garage</b>			
Series of basins along the Montague Bus entrance	Bioretention Basin	MS-BR-03	Exhibit 4
North West Basin in the Bus Circle	Bioretention Basin	MS-BR-04	Exhibit 4
North side of the parking structure	Bioretention Basin	MS-BR-05	Exhibit 4
Northeast side of the parking structure	Bioretention Basin	MS-BR-06	Exhibit 4
East side of the parking structure	Bioretention Basin	MS-BR-07	Exhibit 4
Long basin along South Milpitas Blvd VTA bus entrance	Bioretention Basin	MS-BR-08	Exhibit 4
South of Milpitas Station along VTA bus entrance	Bioretention Basin	MS-BR-09	Exhibit 4
Large basin south of the bike locker (Fenced off)	Bioretention Basin	MS-BR-10	Exhibit 4
Between the VTA bus circle entrance and exit	Bioretention Basin	MS-BR-11	Exhibit 4
North of the VTA bus circle exit	Bioretention Basin	MS-BR-12	Exhibit 4
First basin along handicap parking in southern lot	Bioretention Basin	MS-BR-13	Exhibit 4
Second basin back of sidewalk in southern lot	Bioretention Basin	MS-BR-14	Exhibit 4
Third basin back of sidewalk in southern lot	Bioretention Basin	MS-BR-15	Exhibit 4
Fourth basin back of sidewalk in southern lot (Three sections)	Bioretention Basin	MS-BR-16	Exhibit 4
Basin that goes the southern and eastern sides of the southern lot	Bioretention Basin	MS-BR-17	Exhibit 4
Milpitas Station Kiss and Ride (North)	Filtterra® Tree Well Box	MS-TW-01	Exhibit 4
Milpitas Station Kiss and Ride (Middle)	Filtterra® Tree Well Box	MS-TW-02	Exhibit 4
Milpitas Station Kiss and Ride (South)	Filtterra® Tree Well Box	MS-TW-03	Exhibit 4
<b>SVBX Alignment Location</b>			
North Sierra Lundy (STA 486-60 to 488+40)	Bioretention Basin	SL-BR-18	Exhibit 5g
Berryessa MOW at MSE (STA 509+29 to 514+24 –STA 518+05 to 519+71)	Bioretention Basin	MW-BR-19	Exhibit 5g
<b>Berryessa Station/Parking Garage</b>			
East Lot (Northern Basin)	Bioretention Basin	BE-BR-20	Exhibit 3
East Lot (Middle Basin)	Bioretention Basin	BE-BR-21	Exhibit 3
East Lot (Southern Basin)	Bioretention Basin	BE-BR-22	Exhibit 3



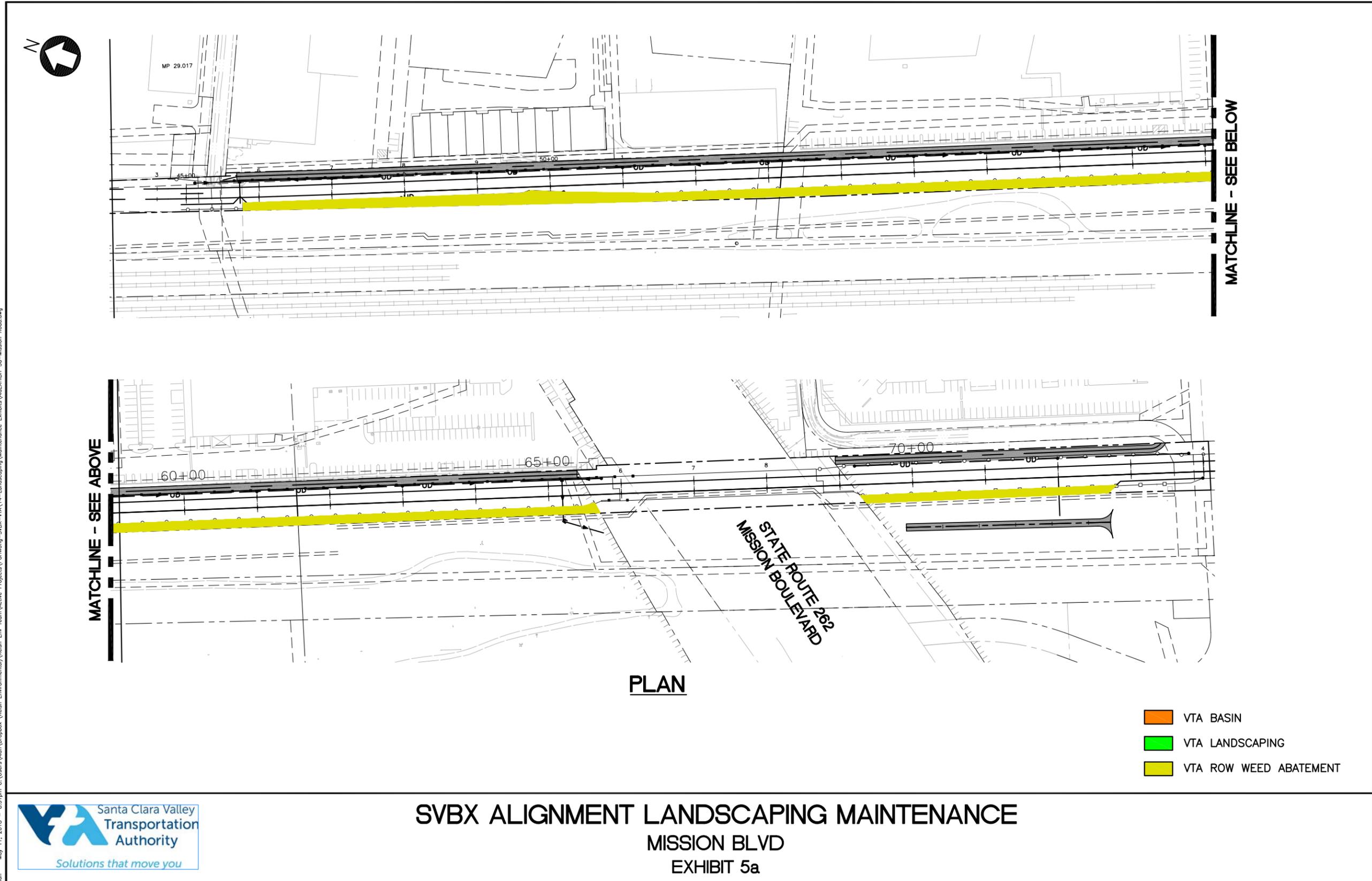


Mabury Bus Entrance Road (Second basin in from Mabury)	Bioretention Basin	BE-BR-23	Exhibit 3
East Basin along the parking structure	Bioretention Basin	BE-BR-24	Exhibit 3
Basin north of generator house	Bioretention Basin	BE-BR-25	Exhibit 3
Southern basin in front of station	Bioretention Basin	BE-BR-26	Exhibit 3
Northern basin in front of station	Bioretention Basin	BE-BR-27	Exhibit 3
Large basin along VTA bus circle	Bioretention Basin	BE-BR-28	Exhibit 3
Basin southwest of the bridge entrance	Bioretention Basin	BE-BR-29	Exhibit 3
Basin inside of the BART Police Zone Facility	Bioretention Basin	BE-BR-30	Exhibit 3
Adjacent to Upper Penitencia Creek, under the BART Tracks (STA 523+80 to 525+00)	Bioretention Basin	BE-BR-31	Exhibit 3
Adjacent to Mabury, under the BART Tracks (STA 547+27.35-548+32.33)	Bioretention Basin	BE-BR-32	Exhibit 3



## Appendix B: Facilities Map

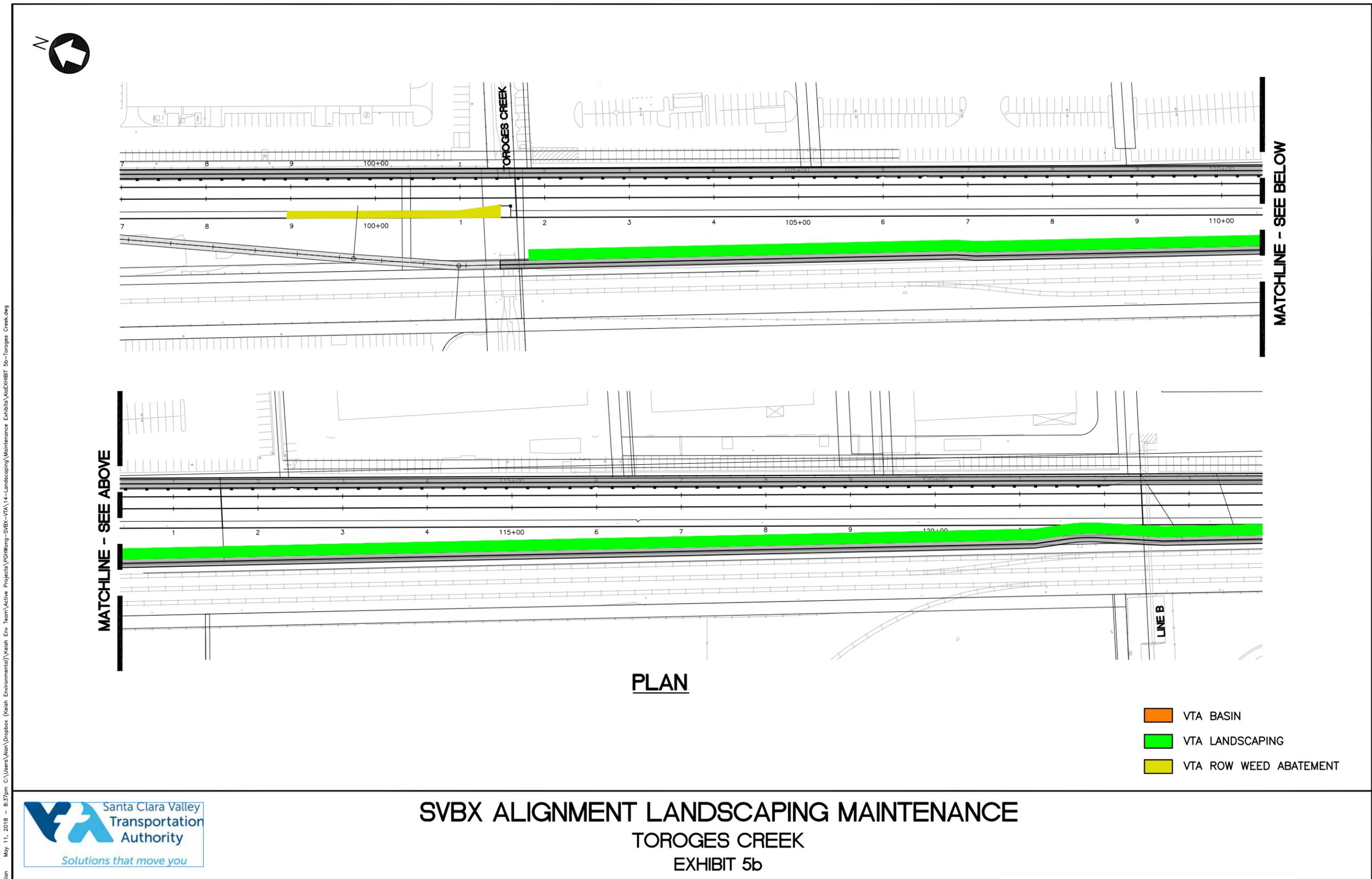




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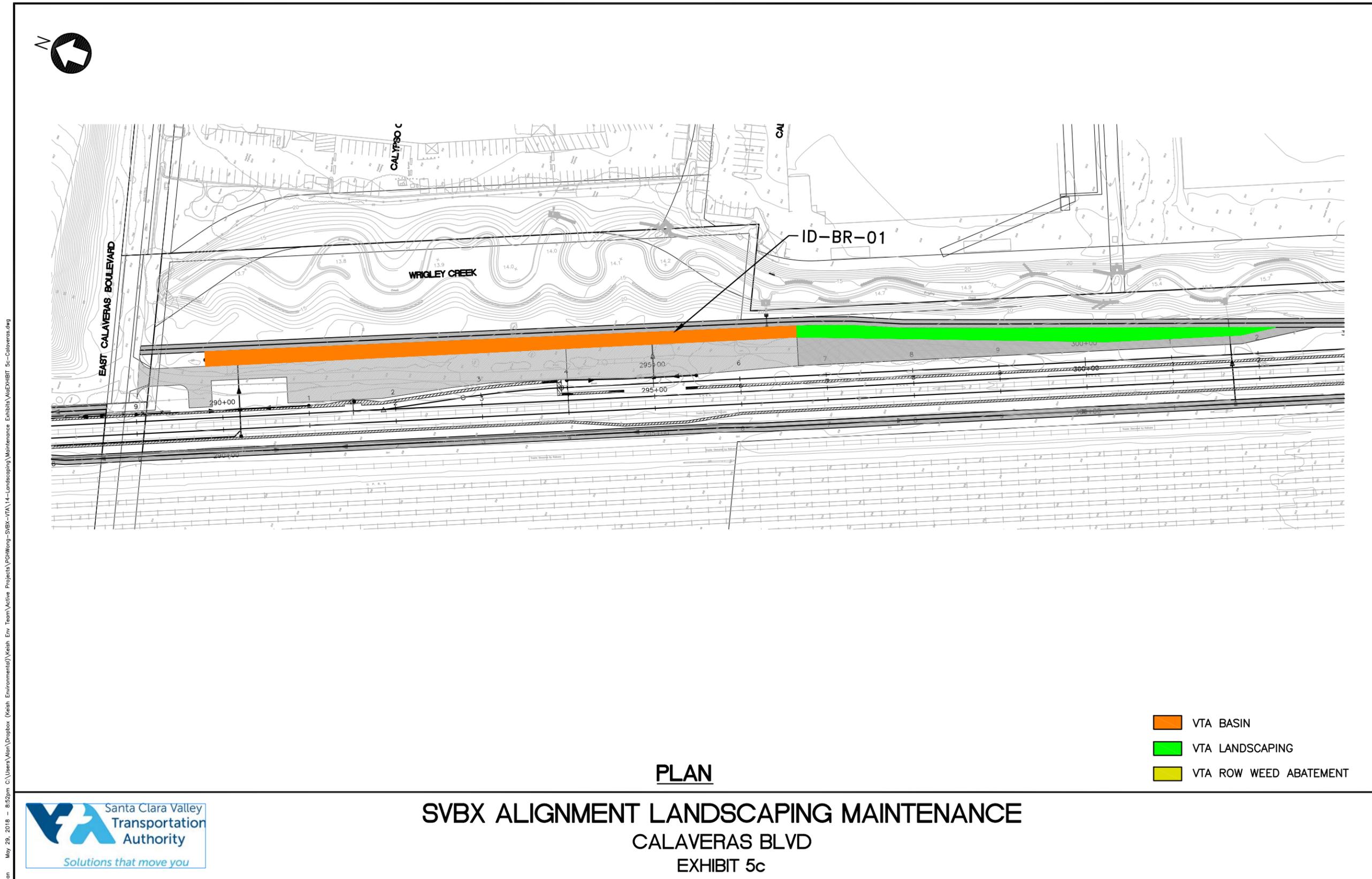
**SVBX ALIGNMENT LANDSCAPING MAINTENANCE**  
**MISSION BLVD**  
**EXHIBIT 5a**



**SVBX ALIGNMENT LANDSCAPING MAINTENANCE**  
**TOROGES CREEK**  
**EXHIBIT 5b**



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**PLAN**

**SVBX ALIGNMENT LANDSCAPING MAINTENANCE**

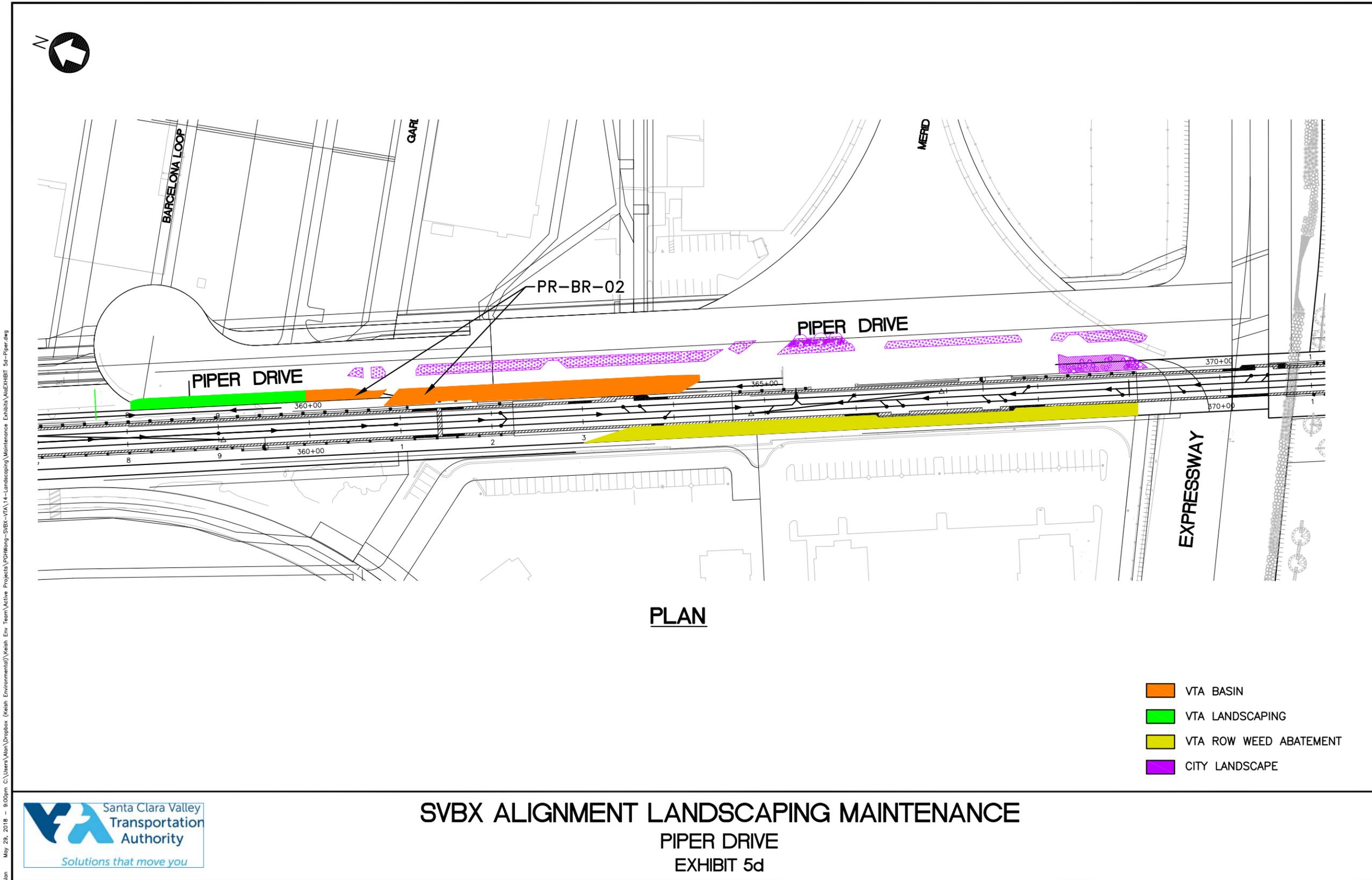
**CALAVERAS BLVD**

**EXHIBIT 5c**

- VTA BASIN
- VTA LANDSCAPING
- VTA ROW WEED ABATEMENT



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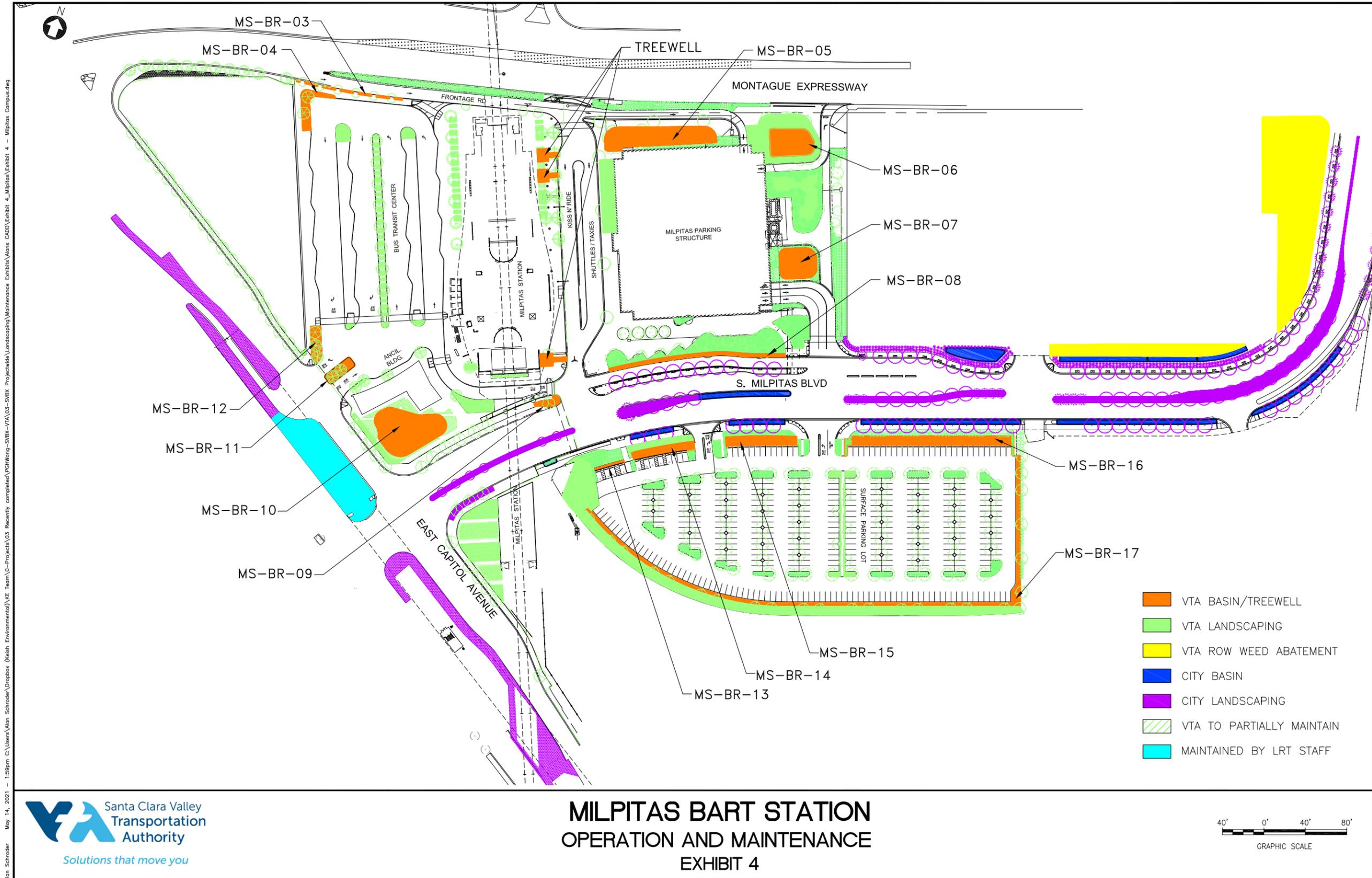
## SVBX ALIGNMENT LANDSCAPING MAINTENANCE

PIPER DRIVE

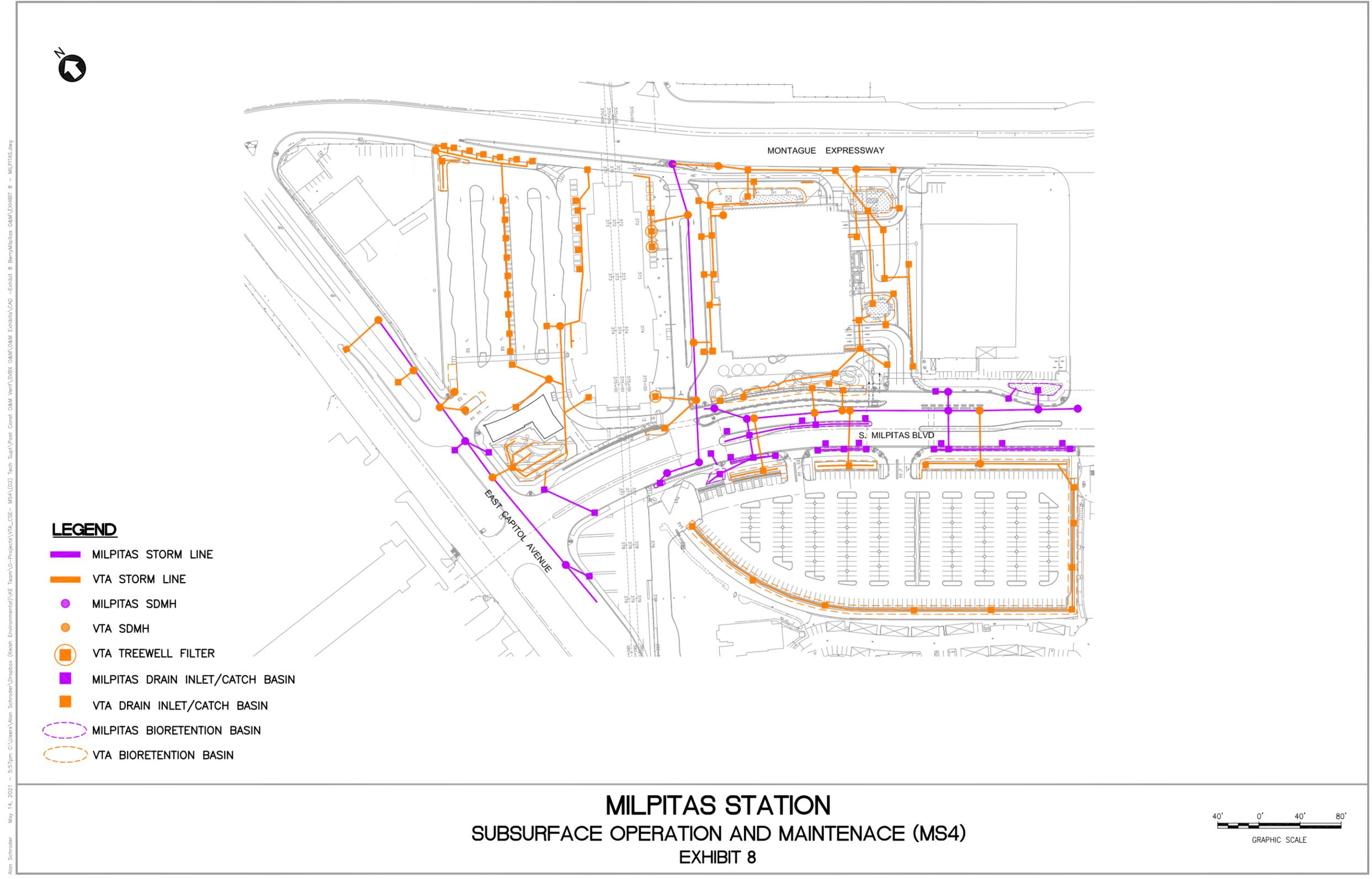
EXHIBIT 5d



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 Alan Schroder



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Appendix D: VTA Approved Pesticides



VTA APPROVED GENERAL USE PESTICIDES						
Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
Actinovate	Fungicide	73314-1	<i>Streptomyces lydicus</i> WYEC 108	Least hazardous (Tier III)	Least Limited	
Advion Ant Bait Arena (Dupont)	Insecticide	352-664	Indoxacarb 0.1%	Least hazardous (Tier III)	Least Limited	
Advion Ant Gel (Dupont)	Insecticide	352-746	Indoxacarb 0.05%	Least hazardous (Tier III)	Least Limited	
Advion Cockroach Bait Arena (Dupont)	Insecticide	352-668	Indoxacarb 0.5%	Least hazardous (Tier III)	Least Limited	
Advion Cockroach Gel Bait (Dupont)	Insecticide	352-652	Indoxacarb 0.6%	Least hazardous (Tier III)	Least Limited	
Agri-Fos Systemic Fungicide	Fungicide	71962-1	Potassium phosphite 45.8%	Least hazardous (Tier III)	Least Limited	For use on high-value Coast Live Oaks ( <i>Quercus agrifolia</i> ) susceptible to <i>Phytophthora</i> , or in experiments with <i>Phytophthora</i> control.
Alligare Rotary 2 SL	Herbicide	81927-6	Imazapyr, isopropylamine salt 28%	More hazardous (Tier II)	More Limited	Alternative to Tier I herbicides. Use caution with adjoining desirable vegetation.
Aquamaster (Roundup Custom) Herbicide	Herbicide	524-343	Glyphosate, isopropylamine salt 53.8%	Most hazardous (Tier I)	Most Limited	<b>Subject to "Limitations on most restricted herbicides"</b> Other limitations: For aquatic uses, use for emergent plants in ponds, lakes, drainage canals, and areas around water or within watershed areas.
Avenger	Herbicide	82052-1	d-Limonene 60%	Least hazardous (Tier III)	More Limited	Burndown herbicide. Not for use near water.

\*For products exempt from US EPA registration (usually 'Generally Regarded as Safe'), SF creates its own product code.

\*\*A product's tier ranking reflects *hazard* (the possibility of harm) but not *risk* (probability of harm). It does not include consideration of likely exposure.

\*\*\*Use limitation type is an informal rating of *risk* (probability of harm), determined by considering a product's hazard tier rating, formulation, likely exposure, and typical uses.

Excerpt from 2017 San Francisco Reduced-Risk Pesticide List



VTA APPROVED GENERAL USE PESTICIDES						
Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
<b>xxe</b>	Herbicide	70299-20	nonanoic acid, 61%	More hazardous (Tier II)	More Limited	Burndown herbicide.
<b>zatin XL</b>	Insecticide	70051-27	Azadirachtin 3%	Most hazardous (Tier I)	More Limited	For greenhouses and established plants for interiorscapes. Do not apply on flowering plants when bees are active. USE UP EXISTING STOCKS - Azatrol is safer alternative.
<b>zatrol EC Insecticide</b>	Insecticide	2217-836	Azadirachtin (2328) 1.2%	More hazardous (Tier II)	More Limited	For greenhouses and established plants for interiorscapes. Do not apply on flowering plants when bees are active.
<b>acillus thuringiensis insecticides (excluding mosquito control)</b>	Insecticide	Various	<i>Bacillus thuringiensis</i> (various subspp.)	Least hazardous (Tier III)	Least Limited	
<b>estYet Cedarcide</b>	Insecticide	exemptprod- 009	Cedarwood oil, amorphous silica	Least hazardous (Tier III)	Least Limited	
<b>ioLink Buffer &amp; enetrant</b>	Adjuvant	exemptprod- 010	Citric acid 20%, garlic extract 7%	More hazardous (Tier II)	Least Limited	
<b>ond Spreader-Sticker</b>	Adjuvant	34704-50033	Synthetic carboxylated latex 50%, primary aliphatic oxyalkylated alcohol 10%	Least hazardous (Tier III)	Least Limited	
<b>imexa Insecticide dust</b>	Insecticide	73079-12	Amorphous silica gel 100%	Least hazardous (Tier III)	Least Limited	Only for use on rat mites, bedbugs, lice, and yellowjackets in walls when nonchemical techniques prove ineffective.

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
3 Silicone actant	Adjuvant	1050775- 50025 [INACTIVE]	Polymethyl-siloxane, nonionic	Least hazardous (Tier III)	More Limited	
1petitor	Adjuvant	2935-50173	Ethyl oleate	Least hazardous (Tier III)	Least Limited	
serve SC Turf and amental	Insecticide	62719-291	Spinosad 11.6%	More hazardous (Tier II)	Least Limited	For use as a last resort in greenhouses. If feasible, alternate with other products to avoid the development of resistance Use on high value ornamentals only.
ter Ridder	Mammal repellant	50932-10	Oil of black pepper 0.48%	Least hazardous (Tier III)	Least Limited	
ug Turbo	Nematicide	70310-5	Fats & glyceridic oils margosa 65.8%, azadirachtin 0.7%	More hazardous (Tier II)	Least Limited	
our	Mammal repellant	exemptprod-015	White pepper 3%, white mineral oil 87%, silica 10%	Least hazardous (Tier III)	Least Limited	
Exempt/Essentria Wasp and Hornet r	Insecticide	exemptprod-007	2-phenethyl propionate 2%, rosemary oil 3%	Least hazardous (Tier III)	Least Limited	Preferred alternative to Wasp Freeze but may not act quick enough during late summer, when yellowjackets are most aggressive. Consider digging up nest and baiting with honey evening to attract raccoons.
tar II Insect Growth ulator (Enstar 5E)	Insecticide	2724-476	S-kinoprene 64.1%	More hazardous (Tier II)	More Limited	USE UP EXISTING STOCKS. For use only in nurseries and on roses.
entria IC3	Insecticide	exemptprod-013	Rosemary oil 10%, geraniol 5%, peppermint oil 2%, wintergreen oil, white mineral oil, vanillin, polyglyceryl oleate	Least hazardous (Tier III)	Least Limited	
ta	Herbicide	67702-26	Iron HEDTA 26.52%	Most hazardous (Tier I)	More Limited	USE UP EXISTING STOCKS.
ion 4 Ultra	Herbicide	62719-527	Triclopyr, butoxyethyl ester 60.45%	Most hazardous (Tier I)	Most Limited	<b>Subject to "Limitations on most restricted herbicides"</b> Use for targeted treatments of high profile or highly invasive ex via dabbing or injection. May use for targeted spraying only when dabbing or injection are not feasible. HIGH PRIORITY FIND ALTERNATIVE

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
<b>Gentrol Point Source Roach Control Device</b>	Insecticide	2724-469	Hydroprene 96%	Least hazardous (Tier III)	Least Limited	
<b>Habitat</b>	Herbicide	241-426	Imazapyr, isopropylamine salt, 28%	More hazardous (Tier II)	More Limited	Alternative to Tier I herbicides. Use caution with adjoining desirable vegetation.
<b>Intice Thiquid Ant Bait</b>	Insecticide	73079-7	Borax, 5%	Most hazardous (Tier I)	Least Limited	
<b>M-pede Insecticide/Fungicide</b>	Insecticide	62719-515	Potash soap 49%	More hazardous (Tier II)	More Limited	Nursery, specialty gardens, and Africanized Honey Bees.
<b>Maxforce FC Magnum Roach Killer Bait Gel</b>	Insecticide	432- 1460	Fipronil 0.05%	More hazardous (Tier II)	More Limited	Not for use in outdoor areas with potential rain exposure
<b>Maxforce FC Professional Insect Control Ant Bait Stations</b>	Insecticide	432-1256	Fipronil 0.01%	More hazardous (Tier II)	More Limited	Not for use in outdoor areas with potential rain exposure
<b>Maxforce FC Professional Insect Control Roach Bait Stations</b>	Insecticide	432-1257	Fipronil 0.05%	More hazardous (Tier II)	More Limited	Not for use in outdoor areas with potential rain exposure
<b>Maxforce FC Professional Insect Control Roach Killer Bait Gel</b>	Insecticide	432-1259	Fipronil 0.01%	More hazardous (Tier II)	More Limited	Not for use in outdoor areas with potential rain exposure
<b>Milestone</b>	Herbicide	62719-519	Aminopyralid, triisopropanolamine salt (5928) 40.6%	More hazardous (Tier II)	More Limited	For invasive species in natural areas or parklands where other alternatives are ineffective, especially for invasive legumes and composites such as yellow star thistle and purple star thistle.
<b>Milestone VM Plus</b>	Herbicide	62719-572	Aminopyralid, triisopropanolamine salt, 2%; Triclopyr, triethylamine salt, 16%	More hazardous (Tier II)	More Limited	Use only for cut stump or injection
<b>Nufarm Polaris Herbicide</b>	Herbicide	228-534	Imazapyr, isopropylamine salt, 28%	More hazardous (Tier II)	More Limited	Alternative to Tier I herbicides. Use caution with adjoining desirable vegetation.

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
OhYeah!	Insecticide	exemptprod-002	Sodium lauryl sulfate	Least hazardous (Tier III)	Least Limited	
Orange Guard	Insecticide	61887-1	D-limonene 5.8%	More hazardous (Tier II)	More Limited	Soap spray is preferred for removing ant trails. Minimize use in enclosed areas due to scent. Potential aquatic hazard - do not apply directly to water.
Organocide	Insecticide	exemptprod-010	Sesame oil 5%	Least hazardous (Tier III)	Least Limited	
Oust XP Herbicide (DuPont)	Herbicide	352-601	Sulfometuron-methyl 75%	More hazardous (Tier II)	Most Limited	For use only on airport operational areas subject to FAA requirements.
Pentrabark	Adjuvant	83416-50001	Polyalkyleneoxide modified heptamethyltrisiloxane	Least hazardous (Tier III)	More Limited	
Prescription Treatment Brand Perma-Dust	Insecticide	499-384	Boric acid 35%, petroleum distillates-hydrotreated light 10%, HFC-134A, 1,1 difluoroethane	Most hazardous (Tier I)	More Limited	Use in situations where adhesion of dust is important and non-aerosol boric acid products are ineffective.
Prescription Treatment Brand Wasp-Freeze Wasp and Hornet Killer Formula 1	Insecticide	499-362	Phenothrin 12%, d-trans allethrin .129%, CO2	Most hazardous (Tier I)	Most Limited	Use only when a concern for public safety, and in situations where use of EcoExempt product is inadequate or unsafe.
Roundup Promax Herbicide	Herbicide	524-579	Glyphosate, isopropylamine salt 48.7%	Most hazardous (Tier I)	Most Limited	<b>Subject to "Limitations on most hazardous herbicides"</b> Use of Aquamaster + Competitor is preferred except in situations where rainfastness is needed.
Shake-Away Coyote Urine Repellant Granules	Mammal repellent	exemptprod-014	Coyote urine 5%, limestone 95%	Least hazardous (Tier III)	Least Limited	
Sluggo Slug and Snail Bait	Molluscicide	67702-3	Phosphoric acid, iron(3+) salt (1:1) 1%	Least hazardous (Tier III)	Least Limited	
Spraytech Oil	Insecticide	65328-50001	Soybean oil	More hazardous (Tier II)	Least Limited	
Stalker herbicide	Herbicide	241-398	Imazapyr, isopropylamine salt 28%	More hazardous (Tier II)	More Limited	Alternative to Tier I herbicides. Use caution with adjoining desirable vegetation. USE UP EXISTING STOCK

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
<b>Terro Ant Killer II, Terro Ant Killer II Liquid Ant Baits, Terro-PCO Liquid Ant Bait</b>	Insecticide	149-8	Sodium tetraborate decahydrate 5.4%	Most hazardous (Tier I)	Least Limited	

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VECTOR CONTROL PRODUCTS						
Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
<b>Agnique MMF-G</b>	Mosquito control - other	7969-333	Poly(oxy-1,2-ethanediyl),alpha-isodecyl-omega-hydroxy-phosphate 32%	More hazardous (Tier II)	More Limited	Use for late instar mosquito larvae and pupae, in combination with microbial products. USE UP REMAINING STOCK
<b>BVA2 Mosquito Larvicide</b>	Mosquito control - other	70589-1	Highly refined petroleum distillate (mineral oil)	More hazardous (Tier II)	More Limited	Use as a pupacide for public health mosquito treatments.
<b>Confrac All-Weather Blox</b>	Rodenticide	12455-79	Bromadiolone 0.005%	Most hazardous (Tier I)	Most Limited	HIGH PRIORITY FOR REMOVAL. USE UP EXISTING STOCKS. For use only in San Francisco International Airport Terminal Areas, or for commercial lessees on city properties that are not adjacent to natural areas. In commercial establishments, use of product shall be a last resort after other, less-toxic measures have been implemented, including sanitation and trapping, and <b>only where a significant public health hazard is recognized by the SF Dept. of Public Health.</b> In all cases, monitoring shall be used whenever feasible to minimize rodenticide use.
<b>Mosquito control - microbial</b>	Mosquito control - microbial	Various	<i>Bacillus thuringiensis</i> (Berliner or Israelensis) or <i>Bacillus sphaericus</i>	Least hazardous (Tier III)	Least Limited	Any microbial mosquito larvicide with active ingredients <i>Bacillus thuringiensis</i> (Berliner or Israelensis) or <i>Bacillus sphaericus</i> is categorized as Least limited.
<b>Mosquito control products - IGRs</b>	Mosquito control - IGRs	Various	<i>S-Methoprene (5026)</i>	Least hazardous (Tier III)	More Limited	Use for tanks with limited access, or other areas where frequent treatments are infeasible. For City catchment basins, microbial products are preferred. Not for use in estuarine environments except under control of San Mateo Mosquito Abatement District.
<b>Rodent control - diphacinone block baits</b>	Rodenticide	Various	<i>Diphacinone</i>	More hazardous (Tier II)	More Limited	See Site-Specific Limitations. For rat control only in situations with high public health concerns, where trapping is infeasible. In all cases, monitoring shall be used whenever feasible to minimize rodenticide use. HIGH PRIORITY TO FIND ALTERNATIVE.

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations
<b>Top Gun All Weather Bait Block Rodenticide</b>	Rodenticide	67517-66	<i>Bromethalin 0.01%</i>	Most hazardous (Tier I)	Most Limited	For use only in City-owned sewer lines, San Francisco International Airport Terminal Areas, or for commercial lessees on city properties that are not adjacent to natural areas. In commercial establishments, use of product shall be a last resort after other, less-toxic measures have been implemented, including sanitation and trapping, and only where a significant public health hazard is recognized by the San Francisco Dept. of Public Health. In all cases, monitoring shall be used whenever feasible to minimize rodenticide use.

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