EcoTechServices, Inc.SM

Landscape Maintenance Guide for Low Water-Use Landscapes

Installation Information

Homeowner Name: _____

Project Address: _____

City: _____

Completion Date: _____

Plant Warranty: _____

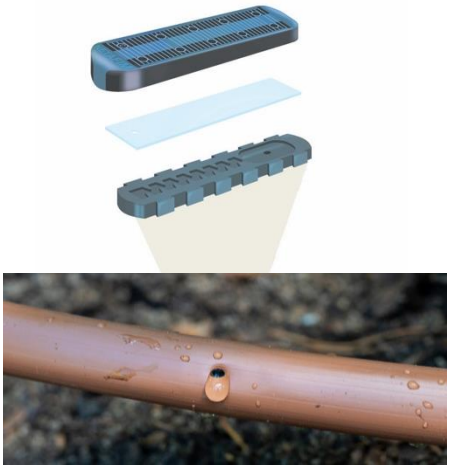
Irrigation Warranty: _____

Table of Contents

Congratulations on removing your turf and transitioning to a low-water use landscape! By making this change, you're not only saving water but also contributing to a more sustainable and eco-friendly environment. Proper maintenance is essential to ensure your new landscape thrives while minimizing water usage. Here's a guide to help you take care of your low-water use landscape.

1. Irrigation:

- Maintaining a drip irrigation system in a low-water use landscape is essential for water efficiency, plant health, cost savings, environmental benefits, system longevity, optimal performance, and compliance with regulations. Regular inspection, cleaning, and adjustment of your drip system will ensure that it continues to function effectively and sustainably over time. Here are some tips on how to properly maintain your drip irrigation system.



Perform Regular Inspections:

- Check the entire system regularly, especially at the beginning and end of each watering season, for leaks, clogs, or damaged components.
- Look for wet spots or puddles, which may indicate leaks or issues with the emitters.

Clean Filters:

- Drip irrigation systems typically have filters to prevent clogging. Clean or replace these filters as needed to maintain proper water flow.
- Unscrew the drip filter and clear the mesh screen of dirt and debris.

Clear Clogs:

- If you notice reduced water flow or clogging in emitters or tubing, flush the system to clear any debris.
- Open the manual flush valve and run the drip zone for a short time to remove debris. If you have an automatic flush valve, unscrew the top and check for any obstructions before running the zone to remove debris from the line.

Manual Flush Valve

Automatic Flush Valve

Drip Irrigation Repairs:

- Check your irrigation system regularly for leaks, clogs, or broken drip tubing.

EcoTech typically installs Netafim brand drip irrigation materials, but similar fitting items can be found at Irrigation Supply stores (Ewing, Site One, etc.), the irrigation section of your local supply store, or online retail stores.

Couplings

Drip Tubing

Drip Tube Cutter

EcoTech will typically install Netafim Techline CV in a "ring" around each plant, using (4) 0.9 GPH emitter, connecting each ring with Blank tubing.

- Cuts, tears, or gashes in the drip tubing are typically repair by cutting the tubing with drip tube cutters (you may also use pruners or a utility knife), inserting a coupling, and pushing the open ends of the tubing onto the fitting. This type of repair is called a splice and should work in most instances.

- Similarly, expanding your drip irrigation system to include additional plants is just as simple. Cut into the drip tubing and insert a TEE fitting. Push the open ends of the tubing onto the fitting and add a new drip irrigation line.

Locate Damage

Cut Tubing

Insert Coupling and Reattach

Irrigation Scheduling

- Adjust your watering schedule based on the season and weather conditions. Plants may need more frequent watering during hot, dry weather and less frequent watering during cooler, wetter seasons.

    - Different plants have varying water requirements based on factors such as their species, size, stage of growth, and environmental conditions. Research the specific watering needs of each type of plant you have in your garden or landscape.

    - Consider environmental factors such as temperature, humidity, sunlight exposure, and soil type. These factors can affect how quickly moisture evaporates from the soil and how much water your plants need.

    - Check your irrigation controller's user manual for instructions on how to properly adjust your settings. Some controllers use a dial and button on the controller's face, while others are easily adjusted through an app on your phone or tablet.

Below are general guidelines to establish a typical irrigation schedule based on EcoTech's drip irrigation installations. EcoTech installs four (4) 0.9 gallon per hour drip emitters around each of the installed plants, which puts out approximately 1-gallon of water in a 15-minute period.

Plant Type	**Optimal Run Time**	**Days per week (Winter)**	**Days per week (Fall/Spring)**	**Days per week (Summer)**
Desert Adapted (succulents)	5 minutes	0	1 – 2	2 - 3
Ground Cover	15 minutes	1	2	3 - 4
Low Water Use Shrubs	15 – 20 minutes	1	2	3 - 4
Medium Water Use Shrubs	20 – 30 Minutes	1	2	3 - 4
Trees	45 – 60 minutes	1	2	3

Sometimes, you may have multiple plant types on a single irrigation zone… that's ok!
To compensate, you can always add additional emitters to plant types that require more water!

Irrigation Valves

- Maintaining irrigation valves is essential for maximizing water efficiency, preserving landscape health and aesthetics, and minimizing water waste and associated costs. Regular inspection, testing, and timely repairs or adjustments are key components of effective irrigation valve maintenance.

    - Periodically inspect all the irrigation valves in your system. Look for any signs of damage, wear, or leaks. Check for debris or obstructions around the valve area.

    - Dirt, debris, and sediment can accumulate inside the valves and filters, affecting their performance. Regularly clean the valves and filters to prevent clogs and blockages. Use a soft brush or cloth to remove any buildup.

    - Inspect the valves for any signs of leaks, such as puddles or wet spots around the valve area. Check the valve components, including seals and gaskets, for wear or damage that could cause leaks. Replace any damaged parts as needed.

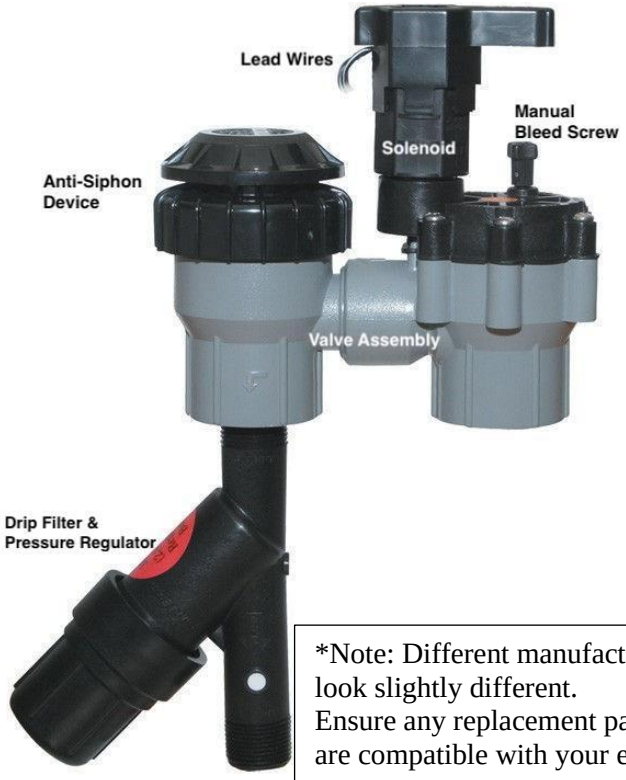
    - Test the operation of each valve to ensure that it opens and closes properly. Turn on each zone or station in your irrigation system using the controller and observe the valves as they activate. Listen for any unusual sounds or vibrations that could indicate a problem.

Anti-Siphon Valve Components

Waterproof Wire Nuts

Solenoid

Diaphragm



*Note: Different manufacturers parts may look slightly different.
Ensure any replacement parts you purchase are compatible with your existing valves.

Anti-Siphon Valve Troubleshooting

Valve Fails to Open:	Check if the valve is receiving power. Ensure that the electrical connection to the solenoid is secure and that there are no issues with the controller. Ensure the connections are secure with waterproof wire nuts.
	Inspect the solenoid for damage or debris that may be preventing it from functioning properly. Clean or replace the solenoid as needed.
	Verify that the water supply to the valve is fully open. Check for any blockages or restrictions in the supply line.
Valve Fails to Close:	Ensure that the solenoid is functioning correctly and receiving power. If the solenoid is damaged or malfunctioning, replace it.
	Check for debris or obstructions inside the valve that may be preventing the diaphragm from closing properly. Clean the valve and remove any blockages.
	Inspect the diaphragm for tears or damage. If the diaphragm is compromised, replace it with a new one.
Water Leakage from the Valve:	Check for leaks around the valve body and connections. Tighten any loose fittings and replace damaged seals or gaskets.
	Ensure that the valve is installed in the correct orientation and that the anti-siphon feature is functioning properly. If the anti-siphon feature is compromised, replace the valve.
	Inspect the diaphragm for tears, holes, or damage. Replace the diaphragm if necessary.
Valve Does Not Fully Shut Off:	Check for debris or sediment inside the valve that may be preventing it from closing completely. Clean the valve and remove any obstructions.
	Inspect the diaphragm and valve seat for damage or wear. Replace any worn or damaged components.
	Adjust the flow control on the valve, if available, to reduce the flow rate and help the valve shut off completely.
Water Spraying from the Anti-Siphon Vent:	Ensure that the anti-siphon vent is not clogged with debris or obstructed in any way. Clean the vent to allow for proper air intake.
	Verify that the valve is installed at the correct height above the highest sprinkler head to allow for adequate venting and prevent backflow.

Water Spraying from the Anti-Siphon Vent: (cont.)	Check for leaks in the valve body or connections that may be causing water to spray from the vent. Repair any leaks and replace damaged components if necessary.
Valve Not Activating According to Schedule:	Check the irrigation controller programming to ensure that the valve is set to operate at the correct times and durations.
	Inspect the wiring connections between the controller and the valve solenoid. Repair any damaged wires or connections and ensure they are properly secured.
	Test the valve manually to verify that it is functioning correctly. If the valve fails to activate manually, troubleshoot the electrical or mechanical components as needed.
Low Water Pressure or Flow:	Check for obstructions or blockages in the valve, supply lines, or irrigation pipes that may be restricting water flow. Clear any debris or sediment from the system.
	Verify that the water supply to the valve is fully open and that there are no restrictions in the supply line.
	Inspect the filter screen on the valve inlet for clogs or buildup. Clean or replace the filter screen as needed.
Valve Not Holding Pressure:	Inspect the valve body, fittings, and connections for leaks. Tighten any loose fittings and replace damaged seals or gaskets.
	Check the diaphragm and valve seat for damage or wear that may be causing leaks. Replace any worn or damaged components.
	Ensure that the valve is installed correctly and that all components are properly aligned and seated.

EcoTech's Irrigation Warranty

- If EcoTech has installed your drip irrigation system, it should be noted that all parts and labor of your irrigation system are under warranty for a period of one-year. Please feel free to reach out to your EcoTech representative, or call customer service at (626) 335-1500 should you have any issues that you cannot resolve. After the one-year warranty, a service charge may be applicable to your repairs.

2. Plant & Tree Care:

Plant Maintenance

- In most cases, unless otherwise requested, EcoTech chooses drought-tolerant plants that require minimal water once established. Native plants are often excellent climate appropriate choices for low-water landscapes.

    - EcoTech recommends watering newly planted material deeply and regularly until they become established; a period of approximately 2 to 3 weeks. Afterward, reduce watering frequency as the roots develop.

- Prune plants as needed to promote healthy growth and maintain desired shape. Remove dead or diseased branches promptly.

Pruning - Cutting or trimming parts of a plant to promote healthy growth, maintain a desired shape, or improve overall appearance.

Deadheading - Removing spent or faded flowers from plants to encourage the growth of new buds.

Before pruning

A well-shaped plant after pruning

- Most of the plants installed will need minimal maintenance for the first 12 months post-installation. Below you will find pruning recommendations for various types of plant material, once established.

Plant Type	Photo	Mature Size	When to Prune	How to Prune
Succulents (Aloe, Agave, Sedum, Echeveria, Jade Plant, Blue Chalksticks)		Various sizes, depending on type	Active growing season; Spring or Early Summer. Avoid pruning during winter/dormant period.	Remove dead or dry stems & leaves. Trim leggy stems or overgrowth. Remove or transplant pups from base of plant.
Cacti (Barrel Cactus, Prickly Pear, Fence Post, Saguaro		Various sizes, depending on type	Active growing season; Spring or Early Summer. Avoid pruning during winter/dormant period.	Remove dead or diseased sections, overgrown or misshapen growth. Remove or transplant pups.

Low-Water Use Shrubs (Lavender, Rosemary, Sages, Manzanita)		Average 3 to 5 feet wide, and 2 to 4 feet tall	Dormant season (late Winter or early Spring) or after flowering.	Remove dead or diseased branches, thin out overgrowth, shape up plant, and promote flowering by removing old wood and dead flowers
Ornamental Grasses (Deer Grass, Sedges, Fountain Grass, Mat Rush, Feather Grass,)		Smaller plants: 12 to 18 inches Larger Plants: 3 to 5 feet	Late Winter or Early Spring, before new growth emerges	Remove dead foliage, cut down to a mound approx. 6 to 12 inches above ground. Optionally, divide overcrowded clumps
Drought-Tolerant Perennials (Yarrow, Lantana, Sea Thrift, Penstemon, Coneflower, Verbena)		Varies; Low Perennials 1 to 2 feet, Tall Perennials 3 to 4 feet	After flowering or during dormant season (which can vary by type)	Remove spent flowers (deadheading) as well as dead or diseased growth. Trim back leggy growth and trim to desired shape.
Native & Mediterranean Plants (Ca Poppy, Kangaroo Paw, Ca Fuchsia, Ca Lilac, Coyote Brush, Cypress, Bougainvillea)		Typically, 3 to 4 feet wide, some up to 8+ feet	Late Winter or Early Spring and after flowering	Remove dead or diseased growth. Cut back to desired size & shape. Thin out crowded/dense branches.

- **Additional Plant Care Tips:**

    - Understand the sunlight requirements of your plants and place them in appropriate locations based on their needs (full sun, partial shade, or full shade)
    - Provide support, such as stakes, trellises, or cages, for tall or heavy plants to prevent them from leaning or toppling over.
    - Protect sensitive plants from frost or extreme heat with frost cloth, shade cloth, or other protective coverings.
    - Prune away dead or yellowing leaves to maintain plant health and appearance.
    - Clean and disinfect gardening tools regularly to prevent the spread of pests and diseases.
    - Pay attention to your plants and observe their growth, appearance, and behavior regularly.
    - Respond promptly to any signs of stress, nutrient deficiencies, or pest and disease issues.
    - Show your plants some love and attention—they'll reward you with healthy growth and beautiful blooms!

Full Sun	**Part Sun**	**Part Shade**	**Full Shade**
Minimum of 6 hours	4 to 6 hours	2 to 4 hours	0 to 2 hours
In the open or on the south facing side of structures.	East or West side of structures or trees. No direct South facing sun.	Under a tree canopy that receives dappled sunlight.	Under a full canopy, or completely covered in shade by structures

Tree Maintenance

- Proper tree care is essential for homeowners as it has numerous benefits. It helps maintain or increase property value by enhancing the aesthetic appeal of the landscape. Additionally, it promotes tree health, reduces safety risks such as falling branches, and contributes to a healthier environment by improving air quality and providing shade. Investing time and effort in tree care not only preserves the beauty of the landscape but also supports sustainable practices and enhances the overall quality of life for homeowners.

    - **Watering:** Proper watering is crucial, especially for young trees or during dry periods. Water deeply but infrequently to encourage deep root growth. Water at the base of the tree, not on the foliage, and avoid overwatering, which can lead to root rot.
    - **Pruning:** Regular pruning is essential to remove dead, diseased, or damaged branches. Prune during the dormant season to promote healthy growth and shape the tree as needed. Use proper pruning techniques and tools to avoid causing unnecessary stress or damage to the tree.
    - **Protecting Roots**: Avoid compacting the soil around the tree's root zone, as this can suffocate roots and hinder water and nutrient uptake. Keep heavy equipment and foot traffic away from the root area. Consider using root barriers for trees planted near pavements or structures.
    - **Support and Staking:** Young or newly planted trees may require staking for support until they establish strong root systems. Use proper staking materials and techniques to avoid damaging the tree and remove stakes once the tree can stand on its own.
    - **Professional Assistance:** If you're unsure about any aspect of tree care or if your tree requires specialized care (such as large pruning tasks or pest control), consult with a certified arborist. They can provide expert advice and ensure proper care to maintain tree health and longevity.

< Poor Tree Care

vs

Proper Tree Care >

3. Soil Management:

- Maintaining soil health is essential for promoting plant growth, conserving water, cycling nutrients, supporting biodiversity, mitigating climate change, preventing erosion, and protecting the environment. By adopting soil-friendly practices your gardening and landscaping activities, you can contribute to healthier soils and more resilient landscapes.

Soil Amendments

- Incorporate organic matter such as compost, well-rotted manure, or leaf mulch to increase soil organic content, improve drainage in clay soils, and enhance water retention in sandy soils.

    - If/when EcoTech performs the turf removal at your property, we will take note of your soil's health & structure. If your property has a dense clay soil, we may partially amend your soil by adding and tilling in some organic matter.

Mulch & Groundcovers

- Apply a layer of organic mulch, such as wood chips, bark mulch, or shredded leaves, around native plants to suppress weeds, retain soil moisture, and regulate soil temperature. Mulch also helps improve soil structure as it decomposes and adds organic matter to the soil over time. Consider using drought-resistant ground covers to minimize soil erosion and weed growth while conserving water.

- EcoTech's typical installation practice include the installation of mulch or other groundcovers within the landscape. Some of these groundcovers deteriorate or need to be touched up over time.

Mulch: Mulch will break down over time, adding organic matter and nutrients back into the soil. As the color fades from sun exposure, consider raking or turning over the mulch to maintain a fresh appearance. As bare soil becomes exposed install additional mulch to keep the soil evenly covered. Lower cost shredded mulch may last anywhere from one to two years, whereas bark nuggets may last between 4 to 6 years but costs more upfront.

Decomposed Granite: Decomposed Granite, or DG, is a sturdier material that can last for several years with minimal maintenance. EcoTech opts to used DG with an added stabilizer that, when wetted and compacted, forms a sturdy bond that can last for years. It can, however, be susceptible to washout from heavy rains or water run-off. It can be touched up by adding a small amount of stabilized DG, wetting, and recompacting with a tamper.

Crushed Rock: Another long-lasting groundcover option is crushed rock, which comes in various sizes and colors. While costing more initially, crushed rock can last indefinitely. It may become dirty over time but can be rinsed off with a garden hose. Most common sizes include 3/8" pea gravel and 3/4" crushed rock. Larger sizes are also available and are often used within dry riverbeds and rock gardens.

- **Avoid Compaction!** Minimize soil compaction by avoiding heavy foot traffic or machinery in planting areas. Compacted soil restricts root growth and inhibits water infiltration and drainage. Use stepping-stones or designated pathways to prevent soil compaction in high-traffic areas of the landscape.

- Minimize soil disturbance by avoiding excessive tilling or digging in native plant beds. Disturbing the soil disrupts beneficial soil organisms, such as earthworms and beneficial microbes, and can lead to soil erosion and nutrient loss.

- Monitor your native landscape regularly for signs of soil erosion, compaction, or nutrient deficiencies. Address any issues promptly by adding organic amendments, adjusting watering practices, or incorporating erosion control measures as needed.

Fertilization

- Select a fertilizer that is specifically formulated for low-water use plants or for the types of plants in your landscape. Look for slow-release or organic fertilizers that provide a steady supply of nutrients over time without causing excessive growth or nutrient leaching.

- Fertilize native plants in the early spring before the growing season begins. This allows the plants to take up nutrients as they start to actively grow. Avoid fertilizing during periods of drought or extreme heat, as this can stress the plants.

- Follow the recommended application rates provided on the fertilizer label. Drought tolerant plants generally require less fertilizer, so it's important not to overapply. Applying too much fertilizer can lead to nutrient imbalances and harm the plants.

- Apply the fertilizer evenly around the base of the plants, avoiding direct contact with the foliage. Water the area thoroughly after fertilizing to help the nutrients penetrate the soil and reach the plant roots.

    - EcoTech installs each of our plants with a slow-release fertilizer tablet to assist in plant establishment. It is recommended not to apply additional fertilizer until the first Spring after at least 10 months of establishment. After establishment, an organic fertilizer with lower nitrogen content (N) relative to phosphorus (P) and potassium (K) should be used.

    - By following these soil maintenance practices, you can create and maintain a healthy soil environment that supports the growth and vitality of native plants in their landscape. Healthy soil is the foundation of a thriving ecosystem, providing essential nutrients, water retention, and habitat for beneficial soil organisms.

4. Weed Control:

Controlling weed growth in a drought-tolerant landscape is essential for conserving water, promoting healthy plant growth, preventing soil erosion, reducing maintenance efforts, enhancing aesthetics, preventing weed spread, and supporting native plant communities. By implementing effective weed control measures, you can maintain a beautiful and sustainable landscape that thrives even in challenging environmental conditions.

- Weeds compete with desirable plants for water, nutrients, and sunlight. By controlling weed growth, you can ensure that the water they use for irrigation is directed towards the plants they want to thrive in their landscape.

    - EcoTech installs drip rings arounds each of the plants that we install, so as to water only at the base of newly installed plant material. This helps to reduce water use and inhibit weed growth between plantings. EcoTech also installs a pre-emergent in the bare soil spaces to combat weed growth post-installation.

Preventative Measures

Mulching: Applying a layer of organic mulch, such as wood chips, bark, or straw, around plants and in garden beds helps to suppress weed growth by depriving weeds of sunlight, inhibiting seed germination, and helping to retain soil moisture.

Proper Plant Spacing: Plant flowers, shrubs, and groundcovers densely to shade out weeds and minimize bare soil areas where weeds can establish.

Healthy Soil: Maintain healthy soil by amending it with organic matter, such as compost, to improve soil structure and fertility. Healthy soil supports vigorous plant growth, which can help shade out and outcompete weeds.

Manual Removal

Hand-Pulling: Regularly inspect the landscape for weeds and manually remove them by pulling them out at the base, ensuring to remove the entire root system to prevent regrowth.

Use Tools: For larger or tougher weeds, use hand tools such as a garden hoe, weed puller, or hand cultivator to loosen the soil and remove weeds more easily.

Cultural Practices

Mowing: In areas where you may still have grass, keep lawns mowed regularly to prevent weeds from setting seed and spreading. Set the mower blade to the appropriate height to encourage healthy grass growth and shade out weed seedlings.

Proper Watering: Water plants deeply and infrequently to encourage deep root growth in desirable plants and reduce moisture availability for weed growth.

Herbicide Use

Selective Herbicides: Use selective herbicides that target specific types of weeds without harming desirable plants. Read and follow the label instructions carefully and apply herbicides when weeds are actively growing for optimal effectiveness.

Spot Treatment: Apply herbicides selectively to individual weeds or weed-infested areas rather than broadcasting over the entire landscape to minimize environmental impact.

Organic Options: Consider using organic herbicides or herbicidal soaps as alternatives to synthetic chemicals for weed control, especially in vegetable gardens or areas where chemical use is restricted.

Nonselective Herbicide An herbicide intended to eradicate any plant material it is applied to.	**Selective Herbicide** An herbicide intended to eradicate a specific type of plant matter.
Post-Emergent Herbicide An herbicide intended to eradicate currently living plant material**.** Typically sprayed directly onto foliage.	**Pre-Emergent Herbicide** An herbicide intended to neutralize weed seeds and prevent them from germinating. Typically applied to the soil and watered in.

There are many different herbicides available from both retail and specialty stores to assist in eradicating weeds from your landscape. The table below will cover several recommended products along with their trade names, active ingredients, and best method of use.

Product	Similar Products	Active Ingredients	For use on:	When to apply:
Sedgehammer+ 	Promote Permit Sedge Ender Empero	Halosulfuron-methyl	Controlling & eradicating Nut Sedge. Pulling nut sedge will only cause further growth & spreading.	Apply to actively growing nutsedge. Ttakes several applications over the course of a few weeks.
Fusilade II 	Ornamec Fusion Grass-B-Gon	Fluazifop-P-butyl	Controlling & eradicating grasses that grow up and through your plants and shrubs.	Apply as needed to actively growing grasses within shrubs and plant material
Speedzone 	Trimec Triplet Surge Weed-Free Zone Battleship III Momentum FX2	Carfentrazone-ethyl 2,4-D Mecoprop-p Dicamba	Controlling & eradicating broadleaf weeds without harming surrounding turf.	Apply as needed to actively growing weeds within your lawn
Roundup Pro Max 	Ortho Groundclear Bonide KleenUp Spectracide Weed & Grass Killer	Glyphosate	Used to eradicate any & all living plant material	Apply as needed to living plant material
Dimension 270G 	Dimension 2EW Barricade 65WG Quali-Pro Dithiopyr 40WSB Hi-Yield Dimension	Dithiopyr	Helps to keep broadleaf seeds from germinating in your soil	Apply seasonally, in early Spring and early Fall

Tips for Herbicide Application

1. Follow Label Instructions: Carefully read and follow the instructions on the herbicide label. The label provides important information on proper application rates, timing, safety precautions, and any specific instructions for your particular herbicide.

2. Choose the Right Herbicide: Select an herbicide that is appropriate for your specific weed problem and the type of plants in your landscape.

3. Timing is Key: Apply herbicides when weeds are actively growing for optimal effectiveness. This is typically during the spring and early summer months when weeds are actively growing and before they have a chance to set seed.

4. Watch the Weather: Pay attention to weather conditions when planning herbicide applications. Avoid applying herbicides during windy conditions to prevent drift, and avoid applying if rain is expected within 24 hours to ensure the herbicide has time to dry and be absorbed by the plants.

5. Use Proper Equipment: Use the appropriate equipment for herbicide application, such as sprayers or spreaders, and calibrate them correctly according to the label instructions. Ensure that equipment is clean and in good working condition to avoid uneven application or equipment malfunction.

6. Protect Yourself and Others: Wear appropriate personal protective equipment (PPE), such as gloves, long sleeves, long pants, and eye protection, when handling and applying herbicides. Keep children and pets away from treated areas until the herbicide has dried completely.

7. Avoid Overapplication: Use herbicides sparingly and only apply them to areas where weeds are present. Overapplication can lead to wasted product, environmental damage, and unnecessary exposure to chemicals.

8. Clean Up Properly: After applying herbicides, clean all equipment thoroughly to prevent cross-contamination and accidental exposure.

9. Consider Non-Chemical Alternatives: Whenever possible, consider non-chemical methods of weed control, such as hand-pulling or mulching. These methods can be effective and may reduce the need for herbicide use.

10. Monitor and Follow Up: Keep an eye on treated areas and monitor for weed regrowth. Follow up with additional applications as needed, but avoid over-treating areas unnecessarily.

5. Pest and Disease Management:

Keeping a drought-tolerant or native landscape free of pests and diseases is essential for preserving water resources, supporting biodiversity, maintaining aesthetic appeal, promoting plant health, and reducing chemical inputs. By adopting proactive pest and disease management practices, you can enjoy the many benefits of a beautiful, resilient, and environmentally friendly landscape.

- Select drought-tolerant and native plants that are well-suited to your local climate, soil conditions, and growing environment. Choose plants that are naturally resistant to pests and diseases whenever possible. Diversity in plant selection can also help prevent the spread of pests and diseases.

    - EcoTech does their best to select plant types that are native, or compatible, to your specific location.

- Maintain optimal growing conditions for your plants by providing adequate sunlight, water, and soil drainage. Follow best practices for planting, watering, mulching, and fertilizing to promote strong root growth and overall plant health. Avoid overwatering, as excessive moisture can create conditions conducive to fungal diseases.

- Keep your landscape clean and free of debris, weeds, and dead or diseased plant material that can harbor pests and diseases. Regularly remove fallen leaves, trimmings, and other organic matter to reduce habitat for pests and pathogens. Properly dispose of plant debris to prevent the spread of disease.

- Keep a close eye on your landscape plants for signs of pest infestations or disease symptoms, such as yellowing leaves, wilting, spotting, or abnormal growth. Early detection allows for prompt intervention and prevents problems from escalating. Regularly inspect plants, especially those that are more susceptible to pests and diseases.

Above are photo examples of typical plant diseases

Implement Integrated Pest Management (IPM)

Adopt an IPM approach that combines cultural, mechanical, biological, and chemical control methods to manage pests and diseases effectively while minimizing environmental impact. Use non-chemical control methods such as hand-picking pests, pruning affected plant parts, and introducing beneficial insects or natural predators.

- If pest or disease problems arise, choose the least toxic and most targeted treatment options available. Select pesticides that specifically target the pest or disease in question and follow label instructions carefully. Avoid broad-spectrum pesticides that may harm beneficial insects and disrupt the natural balance of the ecosystem.

- Attract and support natural predators such as birds, ladybugs, lacewings, and predatory insects that feed on pest insects. Provide habitat elements such as native plants, water sources, and shelter to encourage beneficial wildlife to establish and thrive in your landscape.

- Stay informed about common pests and diseases that affect your landscape plants and learn to recognize their signs and symptoms. Educate yourself about sustainable gardening practices and IPM techniques to effectively manage pest and disease problems while minimizing environmental impact.

Common Pest Insects in Drought-Tolerant Landscapes

Aphids: Aphids are small, soft-bodied insects that feed on the sap of plants. They can infest a wide range of plants, including many native and drought-tolerant species. Aphids reproduce quickly and can cause damage by sucking sap, curling leaves, and transmitting plant diseases.

Whiteflies: Whiteflies are tiny, moth-like insects that feed on plant sap. They are particularly problematic in California's warm, dry climate. Whiteflies can cause yellowing, wilting, and stunted growth in affected plants.

Spider Mites: Spider mites are tiny arachnids that feed on plant sap by piercing leaf tissue and sucking out the juices. They are common pests in dry, dusty conditions and can cause stippling, yellowing, and webbing on plant leaves.

Thrips: Thrips are tiny, slender insects that feed on plant sap by rasping the surface of leaves and flowers. They can cause silvering, stippling, and distortion of affected plant parts. Thrips are common pests of many ornamental and native plants in California.

Scale Insects: Scale insects are small, immobile pests that attach themselves to plant stems and leaves, sucking sap from the plant. They can cause yellowing, wilting, and stunted growth. Scale insects are often found on a variety of woody plants, including many native species.

Caterpillars: Various caterpillar species may feed on the leaves of native and drought-tolerant plants, causing defoliation and damage. Caterpillars of moths and butterflies can be especially problematic in gardens with host plants for their larvae.

Snails and Slugs: Snails and slugs are mollusks that feed on plant leaves, stems, and fruits, leaving behind slime trails and irregular feeding damage. They are more active during cool, moist conditions and can be particularly problematic in coastal areas.

Pesticides for Native Pests and Diseases

Insecticidal Soaps: Insecticidal soaps are low-toxicity pesticides made from potassium salts of fatty acids. They are effective against soft-bodied insects such as aphids, mealybugs, and spider mites, while posing minimal risk to beneficial insects, wildlife, and the environment. Always follow label instructions for proper application and to avoid damage to sensitive plants.

Horticultural Oils: Horticultural oils, such as neem oil or mineral oil, suffocate and disrupt the feeding and reproductive processes of many insect pests. They are effective against a wide range of pests, including scales, aphids, and mites, while being relatively non-toxic to humans, pets, and beneficial insects when used as directed.

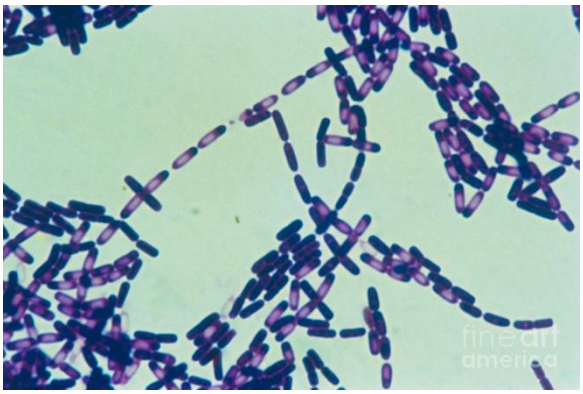
Botanical Insecticides: Botanical insecticides are derived from natural plant extracts and contain compounds that repel, deter, or disrupt the behavior of pest insects. Examples include pyrethrin, derived from chrysanthemum flowers, and rotenone, derived from the roots of certain tropical plants. These products can be effective against a variety of insect pests but should be used with caution to avoid harming non-target organisms.

Microbial Insecticides: Microbial insecticides contain living microorganisms, such as bacteria, fungi, or viruses, that infect and kill specific insect pests. Examples include Bacillus thuringiensis (Bt), a naturally occurring bacterium that targets caterpillars, and Beauveria bassiana, a fungus that infects and kills various insect pests. These products are often highly specific to the target pest and have minimal impact on non-target organisms.

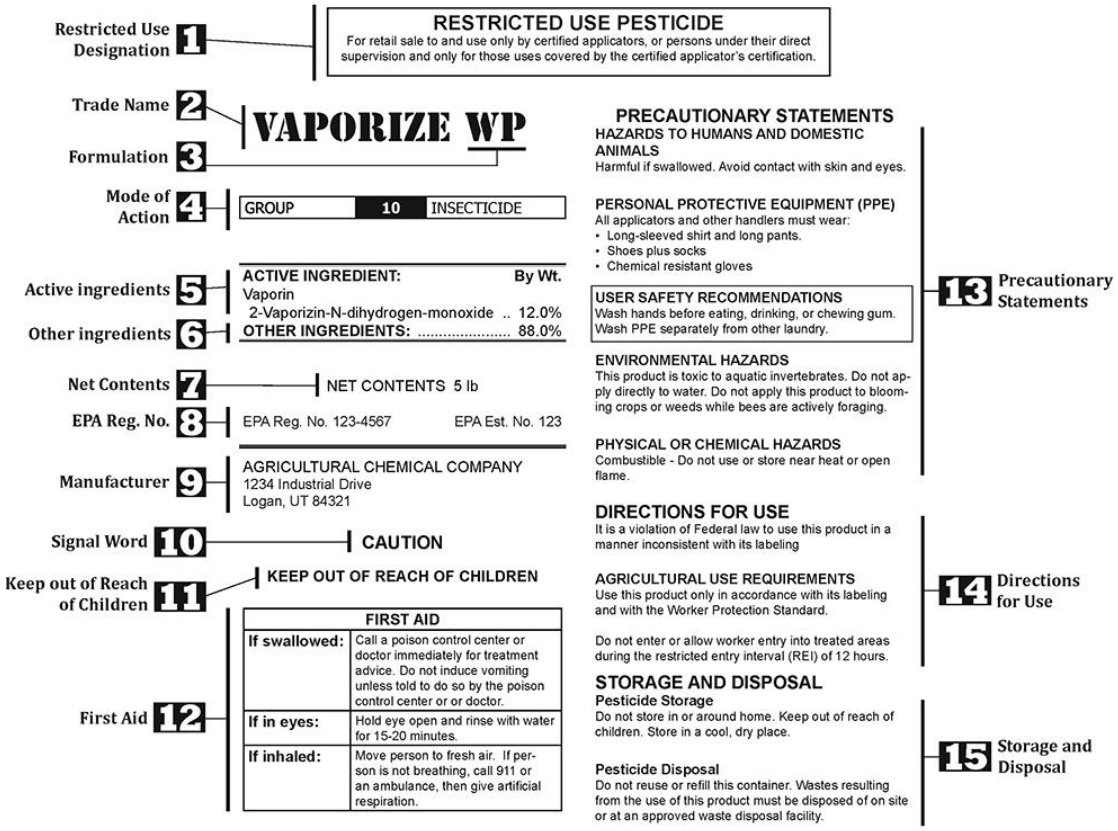
Biological Controls: Biological control agents, such as predatory insects, parasitic wasps, and predatory mites, can be introduced or augmented to help control pest populations naturally. These beneficial organisms feed on pest insects or their eggs, reducing pest numbers without the need for chemical pesticides. Biological controls are often used as part of an integrated pest management (IPM) approach to pest management.

Copper Fungicides: Copper fungicides are commonly used to control fungal diseases such as powdery mildew, downy mildew, and bacterial leaf spot in native landscapes. Copper compounds disrupt fungal cell membranes and inhibit spore germination and growth. While copper can be toxic to fish and aquatic organisms, it is relatively low in toxicity to humans, mammals, and most beneficial insects.

Bacillus Subtilis: Bacillus subtilis is a naturally occurring bacterium that produces antifungal compounds effective against a variety of fungal diseases, including powdery mildew, gray mold, and bacterial leaf spot. It is considered a low-risk pesticide and can be used as part of an integrated pest management (IPM) approach to disease control in native landscapes.



Note: Before using any pesticide in a native landscape, always carefully read and follow the label instructions for proper application, dosage, safety precautions, and environmental considerations. Whenever possible, prioritize non-chemical control methods and choose products that are least harmful to beneficial insects, wildlife, and the environment. Additionally, consider consulting with a local extension service or master gardener program for personalized recommendations and guidance based on your specific location and conditions.



Sample Pesticide Label

6. Sustainable Practices:

Sustainable practices within a drought-tolerant landscape are essential for conserving water, protecting the environment, supporting biodiversity, and building climate resilience. By embracing sustainability principles in their landscape management, homeowners can create beautiful, resilient, and environmentally friendly outdoor spaces that enhance quality of life for themselves and future generations.

- Opt for native plants in your landscaping, as they typically require less water, fertilizer, and pesticides compared to non-native species. They also support local wildlife and biodiversity.

- Design your landscape to minimize water usage through techniques such as strategic plant placement, soil amendment, and efficient irrigation systems.

- Install rain barrels or cisterns to collect rainwater from gutters and downspouts. This harvested water can then be used for watering plants, reducing the need for municipal water.

- Plant trees strategically to provide shade in the summer and windbreaks in the winter, which can reduce heating and cooling costs for your home.

- Consider reducing the size of your lawn or replacing it with low-maintenance alternatives like native groundcovers, meadows, or drought-tolerant grasses.

- Use locally-sourced, permeable materials such as gravel, permeable pavers, or natural stone for paths, driveways, and patios. This allows rainwater to infiltrate the soil instead of running off, reducing erosion and stormwater runoff. Group plants with similar water needs together to optimize irrigation efficiency.

- Create habitats for local wildlife by incorporating features like birdhouses, bat boxes, butterfly gardens, and pollinator-friendly plants. This promotes biodiversity and ecological balance in your landscape.

- Start a compost pile or bin to recycle organic waste from your yard and kitchen. Compost enriches the soil, reduces the need for chemical fertilizers, and decreases the amount of waste sent to landfills.

- Install energy-efficient outdoor lighting fixtures, such as solar-powered or LED lights, to minimize electricity usage and light pollution.

7. Regular Maintenance Tasks:

By performing these regular maintenance tasks on both the drought-tolerant landscape and drip irrigation system, homeowners can ensure that their landscape remains healthy, beautiful, and water-efficient throughout the year. Regular maintenance helps prevent problems, conserve water, and promote the long-term sustainability of the landscape.

1. **Inspect Plants Regularly**:
    - Walk through your landscape regularly to inspect plants for signs of pests, diseases, or stress.
    - Look for yellowing leaves, wilting, discoloration, or any unusual growth patterns.
    - Remove any dead or diseased plant material promptly to prevent the spread of pests and diseases.
2. **Prune and Trim Plants**:
    - Prune back overgrown or leggy growth to maintain a tidy appearance and encourage healthy growth.
    - Remove dead or damaged branches, spent flowers, and any crossing or rubbing branches.
    - Prune plants to maintain their natural shape and size, avoiding excessive pruning that can weaken or damage the plant.
3. **Weeding and Mulching**:
    - Regularly remove weeds from the landscape beds to prevent competition for water and nutrients.
    - Apply a layer of organic mulch, such as wood chips or bark mulch, around plants to suppress weeds, retain soil moisture, and regulate soil temperature.
    - Refresh mulch as needed to maintain a consistent layer and prevent it from decomposing too quickly.
4. **Monitor Soil Moisture**:
    - Check soil moisture regularly by inserting your finger into the soil near plants.
    - Water deeply and infrequently, allowing the soil to dry out slightly between waterings to encourage deep root growth.
    - Adjust watering frequency and duration based on weather conditions, plant needs, and soil moisture levels.
5. **Inspect Drip Irrigation System**:
    - Check the drip irrigation system regularly for leaks, clogs, or damaged components.
    - Inspect drip emitters, tubing, fittings, and valves for signs of wear or deterioration.
    - Flush the system periodically to remove debris and mineral buildup that can clog emitters and reduce water flow.
6. **Adjust Irrigation Schedule**:
    - Monitor plant water needs and adjust the irrigation schedule as necessary to provide adequate moisture without overwatering.

- Consider factors such as weather conditions, plant type, soil type, and seasonal changes when setting irrigation schedules.
- Use a smart irrigation controller or moisture sensor to automate watering and optimize water efficiency.

7. **Fertilize Sparingly**:
    - Drought-tolerant plants typically require minimal fertilization, as they are adapted to low-nutrient conditions.
    - Use slow-release or organic fertilizers sparingly, applying them according to the specific needs of the plants and following manufacturer instructions.
8. **Check for Pest and Disease Problems**:
    - Monitor plants for signs of pest insects, such as aphids, scale insects, or spider mites.
    - Inspect leaves, stems, and flowers for signs of fungal diseases, such as powdery mildew or leaf spot.
    - Use integrated pest management (IPM) techniques to manage pest and disease problems, including cultural, mechanical, and biological controls.

Other Maintenance Tips

- Mow lawn areas infrequently, if at all, to conserve water and promote a more natural look.
- Edge lawn borders and pathways to maintain a neat appearance and prevent overgrowth into other areas.
- Clean debris from hardscape surfaces regularly to prevent clogging of drainage systems and weed growth.

By following these maintenance guidelines, you can enjoy a beautiful and thriving low-water use landscape while conserving water and promoting environmental sustainability. Remember that every landscape is unique, so adapt these recommendations to suit your specific plants, climate, and soil conditions. Enjoy your new landscape!

Appendix A

Plant Type Guide

The following is a list of common plants used by EcoTech Services, separated by Plant Type as called out in the Plant Care Table of Section 2. Use this to identify pruning tips for the various plants installed within your landscape.

Botanical Name	Common Name	Native?
Succulents		
Adromischus cristatus	Sticks on Fire	Ca Native
Aeonium arboreum	Aeonuium	
Aeonium 'Zwartkop'	Aeonium Black Rose	
Agave attenuata	Foxtail Agave	Ca Native
Agave americana	Century Plant	
Agave 'Blue Glow'	Blue Glow Agave	
Agave filifera	Thread Agave	Ca Native
Agave parryi	Artichoke Agave	
Aloe arborescens	Torch Aloe	Ca Native
Calandrinia grandiflora	Rock Purslane	Ca Native
Crassula ovata	Jade Plant	Ca Native
Dasylirion wheeleri	Desert Spoon	
Dudleya pulverulenta	Chalk Dudleya	Ca Native
Hesperaloe parviflora	Red Yucca	Ca Native
Hesperaloe parviflora 'Brake Lights'	Brakelights Red Yucca	Ca Native
Kalanchoe daigremontiana	Mother of Thousands	
Sedum spp.	Stonecrop	Ca Native
Sempervivum spp.	Henn and Chicks	Ca Native
Senecio rowleyanus	String of Pearls	Ca Native
Senecio Serpens	Blue Chalksticks	Ca Native
Cacti		
Coryphantha alversonii	Foxtail Cactus	Ca Native
Cylindropuntia bernardina	Cholla Cactus	Ca Native
Echinocactus grusonii	Golden Barrel Cactus	
Escobaria chlorantha	Desert pincushion cactus	Ca Native
Ferocactus cylindraceus	Barrel Cactus	Ca Native
Lophocereus marginatus	Mexican Fencepost Cactus	Ca Native
Opuntia basilaris	Beavertail Prickly Pear	Ca Native
Opuntia littoralis	Coastal Prickly Pear	Ca Native

Low Water-Use Shrubs

Arctostaphylos 'John Dourley'	John Dourley Manzanita	Ca Native
Arctostaphylos densiflora 'Howard McMinn'	Howard McMinn Manzanita	Ca Native
Arctostaphylos edmundsii 'Carmel Sur'	Carmel Sur Manzanita	Ca Native
Arctostaphylos uva-ursi 'Point Reyes'	Point Reyes Bearberry	Ca Native
Baccharis piluaris 'Pigeon Point'	Coyote Brush	Ca Native
Calliandra eriophylla	Pink Fairy Duster	
Calliandra haematocephala	Pink Powderpuff	
Callistemon 'Little John'	Dwarf Bottle Brush	
Carissa macrocarpa	Natal Plum	
Ceanothus gris. horiz. 'Diamond Hts'	Diamond Heights Creeper	
Ceanothus gris. horiz. 'Yankee Point'	Yankee Point Ceanothus	
Encelia farinosa	Brittle Bush	Ca Native
Eriogonum cinereum	Ashyleaf Buckwheat	Ca Native
Eriogonum fasciculatum	California Buckwheat	Ca Native
Eriogonum fasciculatum 'Dana Point'	California Buckwheat	Ca Native
Eriogonum fasciculatum 'Warriner Lytle'	California Buckwheat	Ca Native
Eriogonum grande var rubescens	San Miguel Island Red Buckwheat	Ca Native
Heteromeles arbutifolia	Toyon	Ca Native
Juniperus horizontalis 'Wiltonii'	Blue Rug Juniper	Ca Native
Lantana 'New Gold'	Trailing Lantana	
Lantana camara 'Radiation'	Radiation Bush Lantana	
Lantana montevidensis	Trailing Lantana	
Rhamnus californica 'Eve Case'	California Coffeeberry	Ca Native
Rhamnus californica 'Mound San Bruno'	Coffeeberry	Ca Native
Rosmarinus officinalis 'Huntington Carpet'	Trailing Rosemary	
Rosmarinus officinalis 'Roman Beauty'	Compact Rosemary	
Rosmarinus officinalis 'Tuscan Blue'	Upright Rosemary	
Salvia 'Aromas'	Aromas Sage	
Salvia 'Bees Bliss'	Creeping Sage	
Salvia 'Celestial Blue'	Sage Hybrid	
Salvia 'Pozo Blue'	Pozo Blue Sage	
Salvia apiana	White Sage	Ca Native
Salvia apiana 'Compacta'	Compact White Sage	Ca Native
Salvia chamaedryoides	Germander Sage	
Salvia clevelandii	Cleveland Sage	
Salvia clevelandii 'Winifred Gilman'	Winifred Gilman Sage	
Salvia greggii 'Balmirpink' White	Autumn Sage	
Salvia greggii 'Furmans Red'	Autumn Sage	
Salvia leucantha	Mexican Bush Sage	Ca Native

Salvia leucantha 'Midnight'	Midnight Sage	Ca Native
Salvia leucantha 'Santa Barbara'	Santa Barbara Sage	Ca Native
Salvia luecophylla 'Point Sal'	Purple Sage	Ca Native
Sphaeralcea ambigua	Desert Mallow	Ca Native
Westringia fruticosa 'Blue Gem'	Australian Rosemary	Ca Native
Westringia fruticosa 'Low Horizon'	Australian Rosemary	Ca Native
Westringia fruticosa 'Morning Light'	Australian Rosemary	Ca Native
Westringia fruticosa 'Mundi'	Australian Rosemary	Ca Native

Ornamental Grasses

Carex pansa	Dune Sedge	Ca Native
Carex tumulicola	Berkely Sedge	Ca Native
Dianella 'BluTopia'	BluTopia Flax Lily	
Dianella revoluta 'Little Rev'	Little Rev Flax Lily	Ca Native
Festuca californica	California Fescue	Ca Native
Festuca glauca	Blue Fescue	
Festuca 'Elijah Blue'	Elijah Blue Fescue	Ca Native
Festuca rubra	Red Fescue	Ca Native
Festuca 'Siskiyou Blue'	Siskiyou Blue Fescue	Ca Native
Juncus patens 'Carmens Grey'	California Grey Rush	Ca Native
Juncus textilis	Basket Rush	Ca Native
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye	Ca Native
Leymus triticoides 'Grey Down'	Creeping Wild Rye	Ca Native
Muhlenbergia capillaris	Pink Muhly Grass	
Muhlenbergia rigens	Deer Grass	Ca Native
Pennisetum 'Fireworks'	Fireworks Fountain Grass	
Pennisetum setaceum 'Rubrum'	Purple Fountain Grass	Ca Native

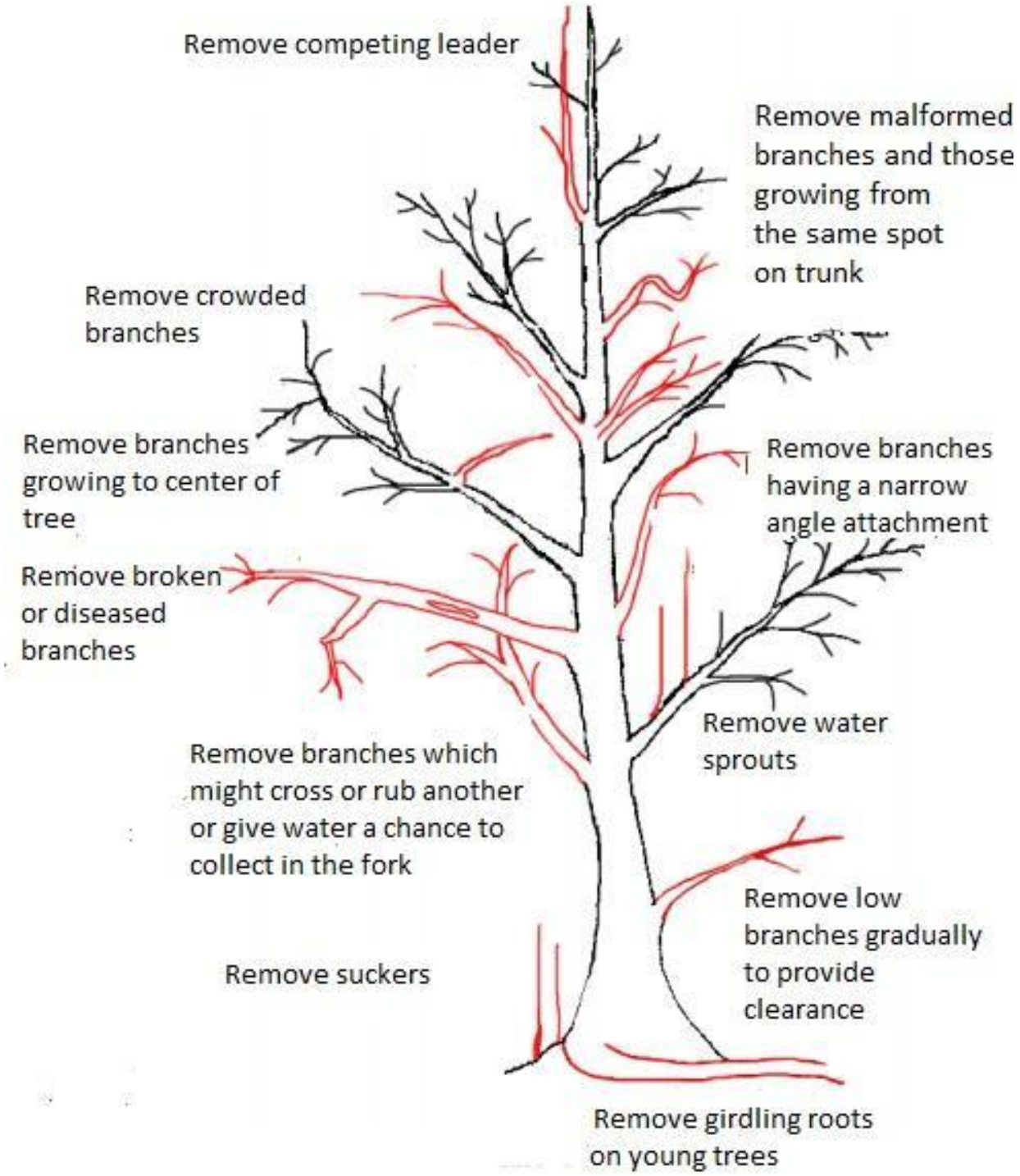
Drought-Tolerant Perennials

Ceanothus 'Concha'	California Wild Lilac	Ca Native
Ceanothus 'Dark Star'	Dark Star Ceanothus	Ca Native
Ceanothus 'Joyce Coulter'	California Wild Lilac	Ca Native
Ceanothus 'Julia Phelps'	Julia Phelps California Lilac	Ca Native
Dietes iridiodes	Fortnight Lily	
Diplacus aurantiacus	Bush Monkeyflower	
Dymondia margaretae	Silver Carpet	
Encelia californica	Coast Sunflower	Ca Native
Epilobium canum	California Fuchsia	Ca Native
Erigeron glaucus	Seaside Daisy	Ca Native
Eriogonum umbellatum	Sulfur Flower	Ca Native
Eschscholzia californica	California Poppy	Ca Native

Gaura lindheimero	White Gaura	Ca Native
Gazania spp.	African Daisy	
Hechera maxima	Island Alum Root	Ca Native
Iris douglasiana	Douglas Iris	Ca Native
Lavandula angustifolia 'Munstead'	English Lavender	Ca Native
Lavandula x inermedia 'Provence'	Provence Lavender	
Lavandula x intermedia	Lavender Grosso	Ca Native
Lomandra longifolia 'Breeze'	Dwarf Mat Rush	
Lysiloma watsonii	Feather Bush	Ca Native
Mimulus x 'Jelly Bean Yellow'	Yellow Monkeyflower	Ca Native
Mumulus 'Very White'	Verity White Monkey Flower	
Penstemon heterophyllus 'Margarita BOP'	Foothill Beardtongue	Ca Native
Penstemon spectabilis	Royal Penstemon	Ca Native
Phlomis fruticosa	Jerusalem Sage	Ca Native
Santolina chamaecyparissus 'Grey'	Lavender Cotton	Ca Native
Senecio cineraria	Dusty Miller	Ca Native
Sisyrinchium bellum	Blue-eyed Grass	Ca Native
Symphoricarpos mollis	Creeping Snowberry	
Tradescantia pallida 'Purpurea'	Purple Heart	Ca Native
Verbena lilacina 'De la Mina'	Lilac Verbena	

Appendix B

Residential Tree Pruning Guide



Appendix C

Landscape Maintenance Calendar

January	**February**	**March**
- Prune dormant trees and shrubs. - Plant bare-root trees and roses. - Apply dormant spray to fruit trees if needed. - Start planning and preparing for spring planting.	- Continue pruning deciduous trees and shrubs before new growth begins. - Plant cool-season vegetables and flowers. - Apply pre-emergent herbicides to prevent weed growth. - Check irrigation systems for leaks or inefficiencies.	- Begin regular mowing and fertilizing of lawns. - Plant warm-season annuals and vegetables. - Control weeds before they become established. - Inspect and repair irrigation systems.
April	**May**	**June**
- Continue planting summer-blooming bulbs and perennials. - Prune spring-flowering shrubs after they bloom. - Monitor for pests and diseases; treat as necessary. - Adjust irrigation schedules as temperatures rise.	- Mulch garden beds to conserve moisture and suppress weeds. - Deadhead flowers to encourage continuous blooming. - Check for signs of water stress in plants and adjust irrigation. - Fertilize container plants and hanging baskets.	- Harvest fruits and vegetables as they ripen. - Monitor for signs of pests like aphids and caterpillars. - Provide shade and water for sensitive plants during heatwaves. - Apply summer lawn fertilizer if needed.
July	**August**	**September**
- Water deeply but less frequently to promote deep root growth. - Prune dead or damaged branches on trees and shrubs. - Watch for signs of powdery mildew and treat as necessary. - Mulch around trees and shrubs to conserve moisture.	- Continue harvesting summer crops and herbs. - Start planning fall planting and prepare garden beds. - Check and clean outdoor lighting fixtures. - Adjust irrigation to account for decreasing daylight hours.	- Plant cool-season vegetables and herbs. - Divide and transplant perennials as needed. - Control pests like snails and slugs. - Fertilize lawns and overseed if necessary.
October	**November**	**December**
- Prune and shape hedges and shrubs. - Plant native and drought-tolerant plants. - Clean gutters and downspouts to prepare for winter rains. - Mulch garden beds to protect plants from temperature fluctuations.	- Rake leaves and add them to compost or use as mulch. - Plant winter annuals for color. - Reduce watering frequency as temperatures cool. - Inspect and service irrigation systems before winter.	- Plant bare-root fruit trees and roses. - Prune dormant trees and shrubs for structure. - Apply organic mulch to insulate soil and prevent erosion. - Clean and store garden tools and equipment for winter.

Appendix D

EcoTech's Typical Installation Procedures

1. Herbicide Spray – In most cases, a technician will be scheduled approximately 7 to 14 days prior to beginning construction to apply an herbicide to assist with eradicating the existing turf. This step is crucial to reduce potential turf grow back in the newly renovated landscape.

2. Turf Removal & Grading – This is the beginning of your landscape transformation. EcoTech will use a combination of machinery and manual labor to removing your eradicated turf and properly grade the remaining soil to 2-inches below your surrounding hardscape.

3. Stormwater Retention Feature – During this phase, EcoTech will further grade out any areas of the landscape where a dry riverbed, rock garden, or rain garden may be installed. Following this, EcoTech will install any landscape boulders or rock material. If your landscape requires the installation of Decomposed Granite pathways or landscape edging that will typically be installed during this phase as well.

4. Planting & Irrigation – Once the previous materials have been installed, EcoTech will concurrently install your plant material along with irrigation materials. A drip ring with (4) 0.9 gallon-per-hour emitters will be installed around each one or five-gallon plant. Any trees that may be installed will receive larger drip rings, containing additional drip emitters, for deeper watering.

5. Groundcover – The final phase of your landscape transformation. EcoTech will install your groundcover materials (mulch, decomposed granite, gravel) and perform a final grade of the landscape. Before leaving, EcoTech will adjust your irrigation schedule to accommodate your new low-water use plants, provide you with this booklet, and answer any questions you may have about your new landscape!