

SIENNA PLAT

INTEGRATED PEST MANAGEMENT PLAN (IPMP)

THURSTON COUNTY
RECEIVED
JUL 13 2022
BUILDING DEVELOPMENT CENTER

PURPOSE OF PLAN

This development lies within the Budd / Deschutes Watershed and within Category I and Aquifer Recharge Areas as defined by the local jurisdiction overseeing the natural resources of the region. The quality of these local water resources, associated wetlands and groundwater can be protected and maintained by you, the property owner, by exercising wise use and practices around your home and property. These practices (called Integrated Pest Management or IPM), reduce water use, reduce the amount of pollutants you use or reduce their chance of entering nearby natural water features. These practices include: landscape management around your home; the storage, disposal and handling of pesticides and other household products used; and maintenance of the community property within the development. Since this plan has been recorded as an attachment to the neighborhoods' covenants, conditions, and restrictions, you should have received a copy with your title documents. Property owners are responsible for following this plan within their own property and for the care and maintenance of community property on the site. A copy of this plan should be provided to landscape professionals who may be hired to work on private or community property.

LANDSCAPE MANAGEMENT

You can grow attractive, healthy lawns and use less water, pesticides and fertilizers. Every time you plant, water, fertilize or control pests in your lawn and garden, you can choose methods that protect your health and the health of our environment and aid in the improvement of the quality of the local water resources. Lawn and garden chemicals include some of the most hazardous products in the home. By switching to less-hazardous products as well as practicing conscientious management of your landscape, you help reduce the potentially harmful impact to the groundwater and natural resources of the region.

There are a number of measures a homeowner can exercise to aid in the prevention of pest and disease problems. In regard to your soil and plants, some typical measures are: proper landscape design; proper choice and location of plants; knowing your soil through soil testing and then building it to a healthy state; utilizing organic compost to encourage and maintain soil and plant health; aeration of lawn to provide good air circulation and soil drainage; good mowing practices; and proper pruning of plants. Further, it is wise to make regular observations of the health of your lawn and landscaping so that any problems can be spotted and identified. Be sure of your identification before choosing an action to control the pest or disease problem. Contact your local nursery for help in your identification (see list of resources below). You must also become aware of that threshold when action by you must be taken to prevent unacceptable damage by the pest or disease. The action to control the pest or disease should be the least toxic measures, yet effective, available to homeowners.

After applying the control, monitor and evaluate its effects for the purpose of assuring effectiveness for future problems.

APPENDIX A

Landscaping Techniques
Pest and Disease Control Techniques
Hazardous Household Products Data

Examples Of Common Household Products With Potentially Harmful Components	
Antifreeze (gasoline or coolant systems)	Metal Polishes
Automatic transmission fluid	Laundry soil and stain remover
Battery Acid (electrolyte)	Spot removers and dry cleaning fluid
Degreasers for driveways and garages	Other solvents
Degreasers for engines and metal	Rock salt (Halite)
Engine and radiator flushes	Refrigerants
Hydraulic fluid (brake fluid)	Bug and tar removers
Motor oils and waste oils	Household cleansers oven cleaners
Gasoline and jet fuel	Drain cleaners
Diesel fuel, kerosene, #2 heating oil	Toilet cleaners
Grease, lubes	Disinfectants
Rustproofers	Pesticides (all types)
Car wash detergents	Photochemicals
Car waxes and polishes	Printing ink
Asphalt and roofing tar	Wood preservatives (creosote)
Paints, varnishes, stains, dyes	Swimming pool chlorine
Paint and lacquer thinner	Lye or caustic soda
Paint and varnish removers, deglossers	Jewelry cleaners
Paint brush cleaners	

The compounds listed in the table below were listed in the EPA National Pesticide Survey's Leach List (1988). Many of these compounds are also found in common household products. Use of these compounds should be avoided. Product labels should be consulted before purchasing to check for these compounds.

Compounds with High Environmental Risk for Moving Into Groundwater	
Acephate	1,2-Dichloropropane
Amidrol	Cis-1,3-Dichloropropene
Atrazine	Trans-1,3-Dichloropropene
Baygon	Dieldrin
Bentazon	Dicamba
Carbaryl	Picloram
Chlorpyrifos	Pramitol
2,4-D	Simazine
DDDVP	2,4,5-T
Diazinon ¹	Trichlopyramine

¹ Diazinon will be banned by the year 2003 due to its health risks to children fish, birds, and drinking water. In the meantime there are several less-toxic pest control products available. The handbook "Grow Smart, Grow Safe – A consumer Guide to Lawn and Garden Product" rates fertilizers and pesticides by their toxicity or environmental impacts. This handbook can be obtained free of charge from the King County Hazardous Waste Management Program or the Washington Toxics Coalition.

seed meals (N and some P/K) and rock phosphates (P) are often recommended for both lawns and landscaping plants. These are preferred over synthetic fertilizers for a number of reasons. The various meals listed above are slow releasing and tend to be neutral in pH and are relatively water insoluble. This means that they tend to stay in the soil longer and are not as quickly leached out as their synthetic alternatives. Natural fertilizers often contain many naturally occurring micronutrients that are typically unavailable in synthetic fertilizers. Synthetic fertilizers can also contain inert ingredients (compounds added during manufacturing that are not listed as part of the active ingredients) that can be harmful to the environment. However, for both natural and synthetic fertilizers improper management and over application can cause serious impacts. When applying fertilizers, the application rate and timing is dependent upon the type of fertilizer used and soil needs. Some general notes to remember when fertilizing include:

- Avoid over-watering lawns immediately after applying fertilizer. It is better to water the lawn thoroughly a day or two before fertilizing, and then water briefly after the application to wash the fertilizer off the leaves and into the soil.
- Reduce the need for fertilizers by returning grass clippings to lawns. (In Western Washington, 4 pounds of nitrogen per 1,000 square feet per year, is usually a maximum application rate, 1 pound is often sufficient. Grass cycling (Leaving the cut grass on the lawn), can supply at least a quarter of what is needed by your lawn.)
- Test soils before applying fertilizers. (Simple soil test kits are available at most gardening centers.) In this region soils are naturally high in phosphate. Adding more through fertilizing is not only a waste of money it can also result in excess pollution of nearby waters. There are now phosphate-free lawn fertilizers available commercially that can provide a nitrogen and micronutrient source without contributing to excess phosphates in our environment.

An example of a well-balanced organic fertilizer mixture for lawn grass suggested by the Territorial Seed Company consists of 4 parts seed meal or fish meal (N); 1 part agricultural lime or dolomite (Ca); 1 part rock phosphate or 2 part bone meal (P); 2 part kelp meal (K); (all measurements by volume). This mixture would need to be adjusted based on results of site soil testing and nutrient content of the meals used. For more information on fertilizers refer to "Grow Smart, Grow Safe – A Consumers Guide to Lawn and Garden Products" by Phillip Dickey and the Washington Toxics Coalition.

Established native plants should require little in the way of fertilizing other than annual mulching. Although periodic fertilization will promote bloom of more traditional garden plants, you can still reduce fertilizer use through mulching and use natural fertilizers instead of synthetic types. As always the garden soil should be tested first to determine nutrient needs.

Watering

The key to a healthy lawn and plants is to encourage the roots to grow as deep into the soil as possible. That will make them more drought resistant later in the season. Infrequent, long irrigation, (i.e., wetting the soil to about 10 inches), is recommended to encourage deep roots. Frequent short watering cycles encourage shallow roots since they adapt to that condition by concentrating their roots in the upper layers of the soil.

Integrated pest management (IPM) is a holistic approach to pest and invasive plant control that consists of: monitoring the problem at hand; determining the injury and action level; correct timing of the solution; and selecting optimal strategies (as defined below) to carry out the solution. The first step is correct identification of the problem pest. Once this has been done, strategies to reduce or eliminate the specific pest can be applied. (A description of typical insect pests and their control is provided in Table A).

IPM practices takes into consideration that insects are a natural part of the environment. Therefore it is necessary to determine at what level of infestation they become a problem. Action usually occurs when there is an extensive unacceptable aesthetic change in the vegetation, and in some cases, when the health of an entire landscaped area is in jeopardy.

Optimal strategies are defined as:

- Least damaging to the natural environment and humans.
- Greatest probability of permanent reduction of the intended pest.
- Least disruptive to the natural pest controls at hand.

Pest control can be divided into three types: physical controls (traps, barriers, and hand removal), biological controls (beneficial insects or bacteria), and chemical. Detailed information on specific control techniques are described in table 'B'. These levels of controls are ordered from least to most disruptive to the natural system. All of these controls have advantages and disadvantages that must be taken into consideration prior to use.

Early Infestation

Early infestations are defined as small areas of coverage and / or new less dense populations of the pest (e.g. a few plants in a small area). The goal is to catch the problem pest at this stage before it leads to an advanced infestation. It is recommended that these early infestations be dealt with by using physical controls. Physical controls are by far the least invasive of all the insect control methodologies. If physical controls alone proves ineffective, then appropriate biological controls should be utilized. Biological controls include predatory insects and bacteria. The high effectiveness of these types of controls has been proven within the last thirty years, and remains as some of the best, less invasive forms of pest control. Chemical controls are generally not recommended for infestations of this level.

Advanced Infestation

Advanced infestations are defined as large areas of unacceptable aesthetic changes to vegetation due to insects or diseases. When dealing with advanced infestations it is recommended that biological controls be utilized first. If these methods fail then it is recommended that botanical and mineral (organic or synthesized) insecticide / fungicide controls (i.e. chemical controls) be implemented. These controls should be applied properly at levels intended to bring the target problem back to a level that can subsequently be managed with the physical and biological controls. Unwise use could lead to an upset in the natural ecological balance of the system and result in wetland and water quality impacts.

TABLE A

Potential Insect Pests and Their Control

The following table describes some of the common insect pests, the type of damage they create and possible methods for their control. Correct identification of the pest is the first step to selecting an appropriate control strategy. The local WSU Cooperative Extension office should be contacted to help with accurate identification of insect pests.

Host	Description	Damage	Remedy
Aphids (<i>Acyrtosiphon pisum</i> , <i>Aphis fabae</i> , <i>Eriosoma lanigerrum</i> , <i>Myzus persicae</i>)			
Many plant species, particularly new plantings.	Soft bodied, pear shaped less than 1/10 inch long, purple; red; light green; to dark green, winged or wingless with a pair of tubes at the end of their abdomen (spray a fluid as a defense mechanism), eggs laid in the fall and hatch the following spring, immediately the nymphs begin feeding by piercing plant tissue to get sap.	Attack new plant growth, particularly succulent herbaceous plant species. Reduce plant vigor, which subsequently allows other pests / diseases to proliferate. Attract ants (aphids extract more plant sap than needed and ants enjoy the plant sap, and in return protect the aphids from various predators).	Physical barriers (sticky traps and Teflon tape). Dusting of diatomaceous earth kills soft bodied adults. Natural predators include lacewings, ladybugs, and trichogramma wasps (can be purchased or attracted naturally by planting species in the Umbelliferae family (Queen Anne's lace, dill, fennel, and carrot). Large colonies can be removed by applying insecticidal soap (low toxicity preparations are available in ready-mixed form in most plant nurseries).
Cutworm (<i>Noctuidae</i>)			
Turfgrass, tender plant species.	1 to 2 inches long; grayish or brown larval stage of the moth. Adult moth is gray or brownish with paler hind wings (1 – 1.5 inches long). Eggs usually laid in the soil, pupae or young larval stage during the winter.	Feed on plant shoots at the soil level, cutting stems at or below ground level.	At dusk, apply simple bait or equal parts hardwood sawdust, wheat bran, and enough molasses for gooy texture (traps insects so they are unable to burrow back into the ground and become easy prey to predators (trichogramma wasps and predatory nematode species – can be purchased and have no negative effects on humans)). Planting resistant perennial rye grasses is helpful in reducing populations. When all else fails, an application of <i>Bacillus thuringiensis</i> (BT) is very effective (caution must be used with BT because it will attack any larvae form in the soil, even non-target species).
Sod Webworm / Fall Webworm (<i>Hyphantria cunea</i>)			
Turfgrass, Lonicern, Malus, Prunus, Salix, Viburnum Spp and other hardwoods	1-inch long, pale green or yellow covered with long silky hairs attached to small humps. Adult is white with brown spots with a 2-inch wingspan. Hair covered eggs are laid in masses on the underside of leaves.	Make nests on the ends of branches and feed on the leaves.	The best long-term cure, in lawn grasses, is to plant resistant grass species. Insect predators such as trichogramma wasps are also helpful. Finally, if no other option is available, an application of BT to the troubled area is effective, but as stated above affects non-target species.
White Grubs (The grubs of Scarab Beetles, June Bugs, Rose an other Chafers, and Asiatic and Oriental beetles)			
Turfgrass	C-shaped bodies measure	Grubs feed in grass	Diatomaceous earth is effective in

TABLE B

PHYSICAL, BIOLOGICAL AND CHEMICAL CONTROL TECHNIQUES

Physical Controls						
Control Name	Description	Mode of Action	Use	Advantages	Disadvantages	Pest
Diatomaceous earth	Skeletal remains of diatoms with tiny barbs.	Tiny barbs shred soft-bodied insects.	Dust foliage	Natural pest control. Effective.	Can be an irritant to human lungs.	Aphids, grubs, mealybugs, mites, white flies, and slugs
Sticky Barrier (Tanglefoot Tangle Trap)	A band of non-toxic sticky material	Insects permanently stick to material.	Wrap trunks with tape.	Non-toxic. Easy to use.	Traps beneficial insects too. Use in conjunction with other controls	Root weevils and ants
Sticky Traps (Biolure, Yellow Sticky Traps, Safer Flying Insect Traps)	Hanging traps with sticky material.	Insects permanently stick to material.	Placed near problem areas.	Non-toxic. Easy to use.	Numerous traps needed to cover a large area. Aesthetic. Traps beneficial insects too.	Aphids and white flies
Teflon (Surefire Insect Tape)	White Teflon tape.	Tape caused insects to slide off the stems when they try to walk over it.	Applied to rhododendrons and other woody species	Non-toxic and highly effective.	Unattractive if visible	Root weevils, and ants

TABLE B – continued

Botanical and Mineral Insecticide / Fungicide Controls						
Control Name	Description	Mode of Action	Use	Advantages	Disadvantages	Pest Controlled
Insecticidal Soap Ringers	Liquid spray.	Washes away protective coating on insect surface. Disrupts normal membrane function.	Spray directly onto insect, must be sufficiently wet. Can damage foliage.	Biodegradable. Relatively non-toxic. High effectiveness.	Toxic to fish and other aquatic species. Can damage foliage. May require numerous treatments.	Soft bodied insects such as aphids, mealybugs, white flies, and mites
Horticultural Oil / Dormant Oil Sprays (Scotch Dextol)	Liquid oily spray. <u>Do not</u> use Bordeaux mixtures of dormant oils as they contain copper or arsenate of lead and are highly toxic.	Smothers insects and impairs respiration.	Apply spray carefully. Apply in late winter or very early spring, when no foliage is present.	Low toxicity to humans. Tends to be biodegradable.	Toxic to fish. Flammable. Kills all insects. Damages foliage.	Aphids, red spiders, thrips, mealybugs, white fly, pear psylla, scale insects and mites
*Pyrethrum / Pyrethrin / Pyrethroids (Raid, BP)	Pyrethrum / Pyrethrin: powder derived from flowers of Chrysanthemum. Pyrethroids: Synthesized Pyrethrin	Paralysis to the central nervous system, specifically the sodium channels.	Spray on insects or affected foliage.	Rapidly degraded by sunlight. Quick / direct eradication.	Toxic to all insects. Moderately toxic to humans and other mammals. Highly toxic to fish. Inert ingredients may be toxic or flammable.	aphids and other soft bodied insects
*Rotenone (Bonide Dragon)	Liquid derived from tropical plants.	Stomach poisoning and contact action. Interferes with electron transport chains.	Spray or dust on insects or affected foliage.	Highly effective. Fast breakdown.	Extremely toxic to fish, avoid contact with water bodies.	Left eating caterpillars and beetles
*Ryanla (Natural Grow)	Powder derived from roots of South American plant Ryanla speciosa	Stomach poisoning, specifically the calcium channels and muscles. Dust on insects or affected foliage.	Dust on insects or affected foliage.	Less damaging to environment than synthetic insecticides.	Ryanla is only recommended when all other forms of pest control have failed	Corn borers, cranberry fruitworm, codling moth, oriental fruitmoth, cotton boll worm
Sulfur (Safer)	Premixed spray on liquid.	Forms sulfide and inhibits enzymes.	Apply to leaf surface, top and bottom.	Naturally derived. Less toxic than most fungicides	Can cause eye irritation. Action only preventative in nature.	Powdery mildew, black spot, rust, scab, and damping off virus
* Use only when all other forms of pest control have proven ineffective.						

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BMPs for Landscaping and Lawn/ Vegetation Management

Description of Pollutant Sources: Landscaping can include grading, soil transfer, vegetation removal, pesticide and fertilizer applications, and watering. Stormwater contaminants include toxic organic compounds, heavy metals, oils, total suspended solids, coliform bacteria, fertilizers, and pesticides.

Lawn and vegetation management can include control of objectionable weeds, insects, mold, bacteria and other pests with chemical pesticides and is conducted commercially at commercial, industrial, and residential sites. Examples include weed control on golf course lawns, access roads, and utility corridors and during landscaping; sap stain and insect control on lumber and logs; rooftop moss removal; killing nuisance rodents; fungicide application to patio decks, and residential lawn/plant care. Toxic pesticides such as pentachlorophenol, carbamates, and organometallics can be released to the environment by leaching and dripping from treated parts, container leaks, product misuse, and outside storage of pesticide contaminated materials and equipment. Poor management of the vegetation and poor application of pesticides or fertilizers can cause appreciable stormwater contamination.

Pollutant Control Approach: Control of fertilizer and pesticide applications, soil erosion, and site debris to prevent contamination of stormwater.

Develop and implement an Integrated Pest Management Plan (IPM) and use pesticides only as a last resort. If pesticides/herbicides are used they must be carefully applied in accordance with label instructions on U.S. Environmental Protection Agency (EPA) registered materials. Maintain appropriate vegetation, with proper fertilizer application where practicable, to control erosion and the discharge of stormwater pollutants. Where practicable grow plant species appropriate for the site, or adjust the soil properties of the subject site to grow desired plant species.

Applicable Operational BMPs for Landscaping:

- Install engineered soil/landscape systems to improve the infiltration and regulation of stormwater in landscaped areas.
- Do not dispose of collected vegetation into waterways or storm drainage systems.

Recommended Additional Operational BMPs for Landscaping:

- Conduct mulch-mowing whenever practicable
- Dispose of grass clippings, leaves, sticks, or other collected vegetation, by composting, if feasible.

- Store pesticides in enclosed areas or in covered impervious containment. Ensure that pesticide contaminated stormwater or spills/leaks of pesticides are not discharged to storm drains. Do not hose down the paved areas to a storm drain or conveyance ditch. Store and maintain appropriate spill cleanup materials in a location known to all near the storage area.
- Clean up any spilled pesticides and ensure that the pesticide contaminated waste materials are kept in designated covered and contained areas.
- The pesticide application equipment must be capable of immediate shutoff in the event of an emergency.
- Do not spray pesticides within 100 feet of open waters including wetlands, ponds, and streams, sloughs and any drainage ditch or channel that leads to open water except when approved by Ecology or the local jurisdiction. All sensitive areas including wells, creeks and wetlands must be flagged prior to spraying.
- As required by the local government or by Ecology, complete public posting of the area to be sprayed prior to the application.
- Spray applications should only be conducted during weather conditions as specified in the label direction and applicable local and state regulations. Do not apply during rain or immediately before expected rain.

Recommended Additional Operational BMPs for the use of pesticides:

- Consider alternatives to the use of pesticides such as covering or harvesting weeds, substitute vegetative growth, and manual weed control/moss removal.
- Consider the use of soil amendments, such as compost, that are known to control some common diseases in plants, such as Pythium root rot, ashy stem blight, and parasitic nematodes. The following are three possible mechanisms for disease control by compost addition (USEPA Publication 530-F-9-044):
 1. Successful competition for nutrients by antibiotic production;
 2. Successful predation against pathogens by beneficial microorganism; and
 3. Activation of disease-resistant genes in plants by composts.

Installing an amended soil/landscape system can preserve both the plant system and the soil system more effectively. This type of approach provides a soil/landscape system with adequate depth, permeability, and organic matter to sustain itself and continue working as an effective stormwater infiltration system and a sustainable nutrient cycle.

adverse effects to the host plant or to humans. Endophytic grasses are commercially available and can be used in areas such as parks or golf courses where grazing does not occur. The local Cooperative Extension office can offer advice on which types of grass are best suited to the area and soil type.

- Use the following seeding and planting BMPs, or equivalent BMPs to obtain information on grass mixtures, temporary and permanent seeding procedures, maintenance of a recently planted area, and fertilizer application rates: Temporary Seeding, Mulching and Matting, Clear Plastic Covering, Permanent Seeding and Planting, and Sodding as described in Volume II).
- Selection of desired plant species can be made by adjusting the soil properties of the subject site. For example, a constructed wetland can be designed to resist the invasion of reed canary grass by layering specific strata of organic matters (e.g., compost forest product residuals) and creating a mildly acidic pH and carbon-rich soil medium. Consult a soil restoration specialist for site-specific conditions.
- Aerate lawns regularly in areas of heavy use where the soil tends to become compacted. Aeration should be conducted while the grasses in the lawn are growing most vigorously. Remove layers of thatch greater than 3/4-inch deep.
- Mowing is a stress-creating activity for turfgrass. When grass is mowed too short its productivity is decreased and there is less growth of roots and rhizomes. The turf becomes less tolerant of environmental stresses, more disease prone and more reliant on outside means such as pesticides, fertilizers and irrigation to remain healthy. Set the mowing height at the highest acceptable level and mow at times and intervals designed to minimize stress on the turf. Generally mowing only 1/3 of the grass blade height will prevent stressing the turf.

Irrigation:

- The depth from which a plant normally extracts water depends on the rooting depth of the plant. Appropriately irrigated lawn grasses normally root in the top 6 to 12 inches of soil; lawns irrigated on a daily basis often root only in the top 1 inch of soil. Improper irrigation can encourage pest problems, leach nutrients, and make a lawn completely dependent on artificial watering. The amount of water applied depends on the normal rooting depth of the turfgrass species used, the available water holding capacity of the soil, and the efficiency of the irrigation system. Consult with the local water utility, Conservation District, or Cooperative Extension office to help determine optimum irrigation practices.

BMPs for Maintenance of Stormwater Drainage and Treatment Systems

Description of Pollutant Sources: Facilities include roadside catch basins on arterials and within residential areas, conveyance systems, detention facilities such as ponds and vaults, oil and water separators, biofilters, settling basins, infiltration systems, and all other types of stormwater treatment systems presented in Volume V. Roadside catch basins can remove from 5 to 15 percent of the pollutants present in stormwater. When catch basins are about 60 percent full of sediment, they cease removing sediments. Oil and grease, hydrocarbons, debris, heavy metals, sediments and contaminated water are found in catch basins, oil and water separators, settling basins, etc.

Pollutant Control Approach: Provide maintenance and cleaning of debris, sediments, and oil from stormwater collection, conveyance, and treatment systems to obtain proper operation.

Applicable Operational BMPs:

Maintain stormwater treatment facilities according to the O & M procedures presented in Section 4.6 of Volume V in addition to the following BMPs:

- Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O & M are needed.
- Promptly repair any deterioration threatening the structural integrity of the facilities. These include replacement of clean-out gates, catch basin lids, and rock in emergency spillways.
- Ensure that storm sewer capacities are not exceeded and that heavy sediment discharges to the sewer system are prevented.
- Regularly remove debris and sludge from BMPs used for peak-rate control, treatment, etc. and discharge to a sanitary sewer if approved by the sewer authority, or truck to a local or state government approved disposal site.
- Clean catch basins when the depth of deposits reaches 60 percent of the sump depth as measured from the bottom of basin to the invert of the lowest pipe into or out of the basin. However, in no case should there be less than six inches clearance from the debris surface to the invert of the lowest pipe. Some catch basins (for example, WSDOT Type 1L basins) may have as little as 12 inches sediment storage below the invert. These catch basins will need more frequent inspection and cleaning to prevent scouring. Where these catch basins are part of a stormwater collection and treatment system, the system owner/operator may choose to concentrate maintenance efforts on downstream control devices as part of a systems approach.

ATTACHMENT "A" (CONTINUED)

Maintenance Checklist for Energy Dissipators

Frequency	Drainage System Feature	√	Problem	Conditions to Check For	Conditions That Should Exist
A	Rock pad		Missing or moved rock	Only one layer of rock exists above native soil in area 5 square feet or larger, or any exposure of native soil.	Replace rock to design standard.
A	Rock-filled trench for discharge from pond		Missing or moved rock	Trench is not full of rock.	Add large rock (\pm 30 lb. each) so that rock is visible above edge of trench.
M	Dispersion trench		Pipe plugged with sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed.
M			Perforations plugged.	Over $\frac{1}{4}$ of perforations in pipe are plugged with debris and sediment.	Clean or replace perforated pipe.
M,S			Not discharging water properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench). Intent is to prevent erosion damage.	Trench must be redesigned or rebuilt to standard. Elevation of lip of trench should be the same (flat) at all points.
M,S			Water flows out top of "distributor" catch basin	Maintenance person observes water flowing out during any storm less than the design storm or it is causing or appears likely to cause damage.	Facility must be rebuilt or redesigned to standards. Pipe is probably plugged or damaged and needs replacement.
M,S			Receiving area over-saturated.	Water in receiving area is causing or has potential of causing landslide.	Stabilize slope with grass or other vegetation, or rock if condition is severe.

If you are unsure whether a problem exists, please contact Jurisdiction and ask for technical assistance.

Comments:

Key

A = Annual (March or April preferred)

M = Monthly (see schedule)

S = After major storm

ATTACHMENT "A" (CONTINUED)

Maintenance Checklist for Ponds

Frequency	Drainage System Feature	√	Problem	Conditions to Check For	Conditions That Should Exist
M,S	General		Trash & debris build-up in pond.	Dumping of yard waste such as grass clippings and branches into basin. Unsightly accumulation of non-degradable materials such as glass, plastic, metal, foam and coated paper.	Remove trash & debris and dispose as pre-scribed by City Waste Management Section.
M,S			Trash rack plugged or missing	Bar screen over outlet more than 25% covered by debris or missing.	Replace screen. Remove trash and debris and dispose as prescribed by City Waste Management Section.
M			Poisonous vegetation	Any poisonous vegetation in which may constitute a hazard to the public. Examples of poisonous vegetation include: tansy ragwort, poison oak, stinging nettles, devils club.	Remove poisonous vegetation. Do not spray chemicals on vegetation without obtaining guidance from the Cooperative Extension Service and approval from the City.
M,S			Fire hazard or pollution	Presence of chemicals such as natural gas, oil, and gasoline, obnoxious color, odor, or sludge noted.	Find sources of pollution and eliminate them. Water is free from noticeable color, odor, or contamination.
M			Vegetation not growing or is overgrown.	For grassy ponds, grass cover is sparse and weedy or is overgrown. For wetland ponds, plants are sparse or invasive species are present.	For grassy ponds, selectively thatch, aerate, and reseed ponds. Grass cutting unnecessary unless dictated by aesthetics. For wetland ponds, handplant nursery-grown wetland plants in bare areas. Contact the Cooperative Extension Service for direction on invasive species such as purple loosestrife and reed canary grass. Pond bottoms should have uniform dense coverage of desired plant species.
M			Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents destroyed and dam or berm repaired. Contact the Thurston County Health Department for guidance.
M			Insects	When insects such as wasps and hornets interfere with maintenance activities, or when mosquitoes become a nuisance.	Insects destroyed or removed from site. Contact Cooperative Extension Service for guidance.
A			Tree growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, or equipment movements). If trees are not interfering with access, leave trees alone.	Trees do not hinder maintenance activities. Selectively cultivate trees such as alders for firewood.
M	Side slopes of pond		Erosion on berms or at entrance/exit	Check around inlets and outlets for signs of erosion. Check berms for signs of sliding or settling. Action is needed where eroded damage over 2 inches deep and where there is potential for continued erosion.	Find causes of erosion and eliminate them. Then slopes should be stabilized by using appropriate erosion control measure(s): e.g., rock reinforcement, planting of grass, compaction.
M	Storage area		Sediment buildup in pond	Accumulated sediment that exceeds 10% of the designed pond depth. Buried or partially buried outlet structure probably indicates significant sediment deposits.	Sediment cleaned out to designed pond shape and depth; pond re-seeded if necessary to control erosion.

ATTACHMENT "A" (CONTINUED)

Maintenance Checklist for Conveyance Systems (Pipes, Ditches, and Swales)

Frequency	Drainage System Feature	√	Problem	Conditions to Check For	Conditions That Should Exist
M,S	Pipes		Sediment & debris	Accumulated sediment that exceeds 20% of the diameter of the pipe.	Pipe cleaned of all sediment and debris.
M			Vegetation	Vegetation that reduces free movement of water through pipes.	All vegetation removed so water flows freely through pipes.
A			Damaged (rusted, bent, or crushed)	Protective coating is damaged; rust is causing more than 50% deterioration to any part of pipe.	Pipe repaired or replaced.
M				Any dent that significantly impedes flow (i.e., decreases the cross section area of pipe by more than 20%).	Pipe repaired or replaced.
M				Pipe has major cracks or tears allowing groundwater leakage.	Pipe repaired or replaced.
M,S	Open ditches		Trash & debris	Dumping of yard wastes such as grass clippings and branches into basin. Unsightly accumulation of non-degradable materials such as glass, plastic, metal, foam and coated paper.	Remove trash and debris.
M			Sediment buildup	Accumulated sediment that exceeds 20% of the design depth.	Ditch cleaned of all sediment and debris so that it matches design.
A			Vegetation	Vegetation (e.g., weedy shrubs or saplings) that reduces free movements of water through ditches.	Water flows freely through ditches. Grassy vegetation should be left alone.
M			Erosion damage to slopes	See Ponds Checklist.	See Ponds Checklist.
A			Rock lining out of place or missing (if applicable)	Maintenance person can see native soil beneath the rock lining.	Replace rocks to design standard.
Varies	Catch basins			See Catch Basins Checklist.	See Catch Basins Checklist.
M,S	Swales		Trash & debris	See above for Ditches.	See above for Ditches.
M			Sediment buildup	See above for Ditches.	Vegetation may need to be replanted after cleaning.
M			Vegetation not growing or overgrown	Grass cover is sparse and weedy or areas are overgrown with woody vegetation.	Aerate soils and reseed and mulch bare areas. Maintain grass height at a minimum of 6 inches for best storm water treatment. Remove woody growth, recontour, and reseed as necessary.
M,S			Erosion damage to slopes	See Ponds Checklist.	See Ponds Checklist.
M			Conversion by home-owner to incompatible use	Swale has been filled in or blocked by shed, woodpile, shrubbery, etc.	If possible, speak with homeowner and request that swale area be restored. Contact City to report problem if not rectified voluntarily.

ATTACHMENT "A" (CONTINUED)

Maintenance Checklist for Fencing/Shrubby Screen/Other Landscaping

Frequency	Drainage System Feature	√	Problem	Conditions to Check For	Conditions That Should Exist
M	General		Missing or broken parts/dead shrubbery	Any defect in the fence or screen that permits easy entry to a facility.	Fence is mended or shrubs replaced to form a solid barrier to entry.
M,S			Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets.	Replace soil under fence so that no opening exceeds 4 inches in height.
M			Unruly vegetation	Shrubby is growing out of control or is infested with weeds.	Shrubby is trimmed and weeded to provide appealing aesthetics. Do not use chemicals to control weeds.
A	Wire fences		Damaged parts	Posts out of plumb more than 6 inches.	Posts plumb to within 1½ inches of plumb.
A				Top rails bent more than 6 inches.	Top rail free of bends greater than 1 inch.
A				Any part of fence (including posts, top rails, and fabric) more than 1 foot out of design alignment.	Fence is aligned and meets design standards.
A				Missing or loose tension wire.	Tension wire in place and holding fabric.
A				Missing or loose barbed wire that is sagging more than 2¼ inches between posts.	Barbed wire in place with less than ¾-inch sag between posts.
A				Extension arm missing, broken, or bent out of shape more than 1½ inches.	Extension arm in place with no bends larger than ¾ inch.
A			Deteriorated paint or protective coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.	Structurally adequate posts or parts with a uniform protective coating.
M			Openings in fabric	Openings in fabric are such that an 8-inch diameter ball could fit through.	No openings in fabric.

If you are unsure whether a problem exists, please contact the **Jurisdiction** and ask for technical assistance.

Comments:

Key

A = Annual (March or April preferred)

M = Monthly (see schedule)

S = After major storm

ATTACHMENT "A" (CONTINUED)

Maintenance Checklist for Access Roads/Easements

Frequency	Drainage System Feature	√	Problem	Conditions to Check For	Conditions That Should Exist
One Time	General		No access road exists	If ponds or other drainage system features needing maintenance by motorized equipment are present, either an access road or access from public streets is required.	Determine whether an easement to drainage feature exists. If yes, obtain City permits and construct gravel (or equal) access road. If not, report lack of easement to City attention.
M			Blocked roadway	Debris which could damage vehicle tires (glass or metal).	Roadway free of debris which could damage tires.
A				Any obstructions which reduce clearance above road surface to less than 14 feet.	Roadway overhead clear to 14 feet high.
A				Any obstructions restricting the access to less than 15 feet width.	Construction removed to allow at least a 15-foot-wide access.
A,S	Road Surface		Settlement, potholes, mush spots, ruts	When any surface defect exceeds 6 inches in depth and 6 square feet in area. In general, any surface defect which hinders or prevents maintenance access.	Road surface uniformly smooth with no evidence of settlement, potholes, mush spots, or ruts. Occasionally application of additional gravel or pit-run rock will be needed.
M			Vegetation in road surface	Woody growth that could block vehicular access. Excessive weed cover.	Remove woody growth at early stage to prevent vehicular blockage. Cut back weeds if they begin to encroach on road surface.
M,S	Shoulders and ditches		Erosion damage	Erosion within 1 foot of the roadway more than 8 inches wide and 6 inches deep.	Shoulder free of erosion and matching the surrounding road.

If you are unsure whether a problem exists, please contact Jurisdiction and ask for technical assistance.

Comments:

Key

A = Annual (March or April preferred)

M = Monthly (see schedule)

S = After major storm

