



CITY OF BREMERTON INTEGRATED VEGETATION MANAGEMENT PLAN

Developed in Coordination With
Kitsap County Noxious Weed Control Board &
Washington State University
Kitsap County Extension Agency

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This Plan is Consistent with Washington State Department of Agriculture and
Washington State Department of Ecology Policy and Complies with Chapter
17.10, 17.21 RCW and Chapter 16-228 WAC (Appendix IV-D R.7)

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CONTENTS

INTRODUCTION	05
Purpose	06
Goals	06
INTEGRATED VEGETATION MANAGEMENT PRINCIPLES	06
INTEGRATED VEGETATION MANAGEMENT IMPLEMENTATION	08
TARGET VEGETATION ZONES	10
Shoreline Buffer Zones	10
Sidewalks, Parking Lots, Hardscapes and Right of Way	12
Meadows/Open Space	15
Park Play Areas	16
LANDSCAPE ZONES	17
Buffer Zone	17
Turf	19
Urban Forestry / Utility Lands	21
Union River Watershed	23
Critical Aquifer Recharge Areas	25
Urban Trees	27
INTEGRATED PEST MANAGEMENT IN AN URBAN SETTING	29
Golf Courses Management	31
Trails	35
Newly Planted Areas in an Urban Setting	36
RODENTS AND OTHER VERTEBRATES	37
OPERATIONAL GUIDELINES	38
Certification	38
Herbicide Application Restrictions	38

Herbicide Application Equipment	39
Citizen Involvement	40
Justification for Herbicide/Pesticide Use	40
Allowable Herbicide/Pesticide Use	41
Pesticide Risk Reduction	41
Pesticide Selection and Methods	43
APPENDICES	
A: Reduced Risk Pesticides Approved for Use	47
B: Organic/Natural Pesticides Control Measures / Chart	60
C: Adopt-A-Spot Volunteer Job Description and Application	63
D: Pesticide Spill Standard Operating Procedure	66
E: Example of Newspaper Notice: Herbicide Application	69
F: No Spray Agreement	70
G: WSDA Pesticide Sensitive Individuals Registration Program	71
H: Reference Information	74

INTRODUCTION

The purpose of this Vegetation Management Plan (VMP) is to outline a five year program for managing invasive vegetation within the City of Bremerton, addressing a variety of landscape conditions in the city including but not limited to parks, rights of way and a golf course.

A secondary purpose of this plan is to provide guidance on management of nuisance rodents, other nuisance wildlife species, and insects using Integrated Pest Management (IPM) techniques.

This Management Plan has been compiled by the Kitsap County Noxious Weed Control Program for the City of Bremerton to address a need to communicate the intent, methods, and means for managing its diverse landscapes and the uses of those landscapes.

Bremerton has a responsibility to manage vegetation and pests for the safety, health and welfare of its residents, businesses and visitors. This plan implements City-wide policies relating to city owned properties within the City's corporate boundaries. The plan incorporates best practices for management and maintenance of rights-of-ways, parks, and other City managed lands. In addition, this plan addresses perspectives and concerns of neighbors and citizens by providing information about the vegetation and pest control measures the City uses.

The core focus of this plan is vegetation management for noxious weeds and other nuisance vegetation. Within the City, there are multiple discrete landscape zones that will be identified, according to vegetation types, patterns of use, and prominent geographic distinctions.

For each landscape zone, management areas and specific procedures will be identified and defined. These will delineate specific areas where particular, regular maintenance activities are needed to restore, maintain and/or nurture the targeted vegetation communities.

Invasive weeds pose an ecological threat to multiple systems and can cause structural issues to roads, sidewalks, and buildings. All living things modify their surroundings to a certain extent to accommodate their presence, but these plants pose specific problems. Noxious weeds by definition are aggressive invasive plants that are destructive and difficult to control. These nonnative plants affect the

environment, personal health, animal wellbeing, and the economy. Invasive plants threaten native plants and animal populations as well as desirable and beneficial land use. Plants like knotweed impact pavement, pipes, and septic tanks. Many other invasive plants like tansy, hogweed and poison hemlock are toxic plants that can cause sickness or even death.

Vegetation left uncut and/or in an unkempt stage may cause safety hazards, health hazards, fire hazards, and/or pest harborages, and thus constitute a public nuisance.

Purpose

The purpose of this plan is to provide guidelines for managing designated nuisance and noxious weeds that represent a threat to the continued economic, environmental, aesthetic and agricultural value of lands. This plan will provide for compliance with the Noxious Weed Control laws by detailing management options. The intent is to incorporate multiple control measures that are timely and economically feasible. This plan also provides a framework and specific information to landowners and agencies to assist in efforts in making wise weed control and prevention decisions.

Goals

- Provide Bremerton’s citizens and employees with clear expectations related to herbicide, fungicide, pesticide and rodenticide use within the context of an integrated plan, primarily focused on the management of noxious and nuisance vegetation within the City.
- Provide guidance on integrated approaches to promoting the Parks Department goals of enhancing the ecological integrity of parks and encouraging public accessibility.
- Promote stewardship and sustainability of desirable vegetation.
- Provide a standard to assess the function of the prescribed management processes.
- Provide guidance on invasive species management on shorelines to assist in the protection and enhancement of critical habitats.

INTEGRATED VEGETATION MANAGEMENT PRINCIPLES

Integrated Vegetation Management (IVM) is a system of managing plant communities that considers a combination of methods to control undesirable vegetation and includes cultural, mechanical, biological, and chemical methods of control. Vegetation management is critical to establishing desirable plant species. IVM

assists managers in improving the efficiency and cost effectiveness of vegetation management by utilizing the most appropriate and effective control methods based on individual site conditions.

The IVM decision-making process is to determine if, where, when, and how vegetation problems will be managed. The IVM program includes all potential vegetation control strategies, and uses non-chemical controls whenever possible.

IVM applies sound principles to chemical fertilizer application decisions and to other chemical application decisions, such as using minimum quantities, following product directions, and complying with all regulatory requirements. Appendix 1 to this plan contains a list of Reduced Risk Herbicides/Pesticides/Fungicides/Rodenticides approved for use.

The following four control methods, in order of preference, may be employed with the IVM program:

Cultural Control

Cultural control involves using sound horticultural practices to optimize plant health and to suppress insects, disease, and weed growth. Other cultural controls include site-appropriate design and the use of disease or drought-resistant plants.

Mechanical Control

Mechanical control involves using a variety of pest removal techniques, tools, and equipment for eliminating pests.

Biological Control

Biological control involves using agents that act as predators or parasites of pest species and using other beneficial organisms that improve plant health by enhancing soil quality.

Chemical Control

Chemical control involves applying various products such as herbicides, insecticides, fungicides, fertilizers, or other chemical compounds to a target pest as a means of control. Whenever pesticides or fertilizers are used, they must be applied according to the directions on the pesticide/fertilizer container label. Due to constantly changing labels, laws, and regulations, it is important to verify that the products used are appropriate for the intended application.

The list of chemicals at Appendix A is not limited, due to the changing nature of chemicals on the market. Applicators can determine the least toxic chemical by

referring to the signal word on the EPA approved label. Safety Data Sheets (SDS) for pesticides should be available at all times the chemical is being applied.

The Washington State Department of Agriculture sets the overall policy for pesticide use in the state of Washington. The approved chemical list can be viewed on the department's Web site at <http://www.agr.wa.gov>. All pesticide use procedures shall conform to the requirements of Chapter 17.21 RCW and Chapter 16-228 WAC (Appendix IV-D R.7).

The Washington Department of Ecology requires a special permit for all aquatic herbicide applications. This permit allows herbicide control for all listed noxious weeds within an aquatic environment and monitors impact levels on non-target plants. The following link contains more information:

http://www.ecy.wa.gov/Programs/wq/pesticides/final_pesticide_permits/noxious/noxious_index.html

INTEGRATED VEGETATION MANAGEMENT IMPLEMENTATION

IVM is recognized as a methodology that encompasses a range of industry-established best practices.

Steps to implement Integrated Vegetation Management:

1. Ensure vegetation management is undertaken with a clear, measurable objective.
 - Identify the desired plant community composition. A description should include both preferred and acceptable species. Preferred species represent an ideal of prescribed outcome. Acceptable species reflect a functioning ecosystem but including vegetation that may arise from climatic or other forms of variability, altering plant community assembly over time.
 - Select species consistent with growing conditions on the site and coherent with the adjacent landscape. Plant species should be chosen based on their ability to survive on the site as indicated by:
 - Local soil conditions including compaction, texture, moisture and nutrients.
 - Climatic conditions including susceptibility to winter injury, slope and aspect.
 - Compatibility between species to ensure successful establishment of a range of species and life forms.

- Identify pests (including diseases and invasive or restricted noxious weed species) likely to be found on the specific site.
2. Make a vegetation management plan. The most effective plan is simple and concise, using a bullet format to outline objectives and identify likely actions or sequences of actions. The plan should identify specific and generic treatments. For example, should an unacceptably high density of low shrubs be identified on site (based on competitive interactions between tall shrubs and desired tree species) the plan would dictate specific treatments, such as single-stem, selective herbicide treatment. The plan should indicate a schedule for vegetation monitoring activities, including both timing and type of monitoring.
 3. Select objectives and plant species consistent with the goal of the target site. Choose and deploy vegetation management treatments that achieve the desired effect with minimum disruption to the rest of the plant community.
 4. Promptly treat before undesirable vegetation dominates the site. Promptness improves vegetation management effectiveness for several reasons:
 - Desirable or acceptable plant species are likely better able to take advantage of growing space opened by vegetation management if they have not been nearly overwhelmed by competitive interaction with undesirable species.
 - Most vegetation management treatments are more successful in controlling small individual plants than they are at controlling well established plants. This is particularly true when attempting to control root reproducing species like reed canary grass or Canada thistle.
 - Controlling undesirable plants after they have released seed will necessitate ongoing treatments until that seed bank is reduced, or desirable vegetation overtakes the site.
 5. Integrate treatments for success. Specific vegetation management treatments are generally more effective in achieving certain objectives. Effectiveness of vegetation management can be greatly increased by using a sequence of treatments to integrate effects into fully effective control. For example, when controlling root sprouting species herbicides that translocate only moderately well may provide broad spectrum control of population numbers but do not provide lasting control due to inability to translocate throughout the root system. In these circumstances using cultivation to break up root systems, waiting for re-sprouting then spraying with the herbicide is likely to yield far more robust control.

6. Monitor sites frequently, especially after treatments, to identify need for follow-up treatments. Monitoring helps ensure treatments were successful – for example, some herbicide treatments can fail during periods of climatic stress (extreme moisture or extreme drought). Linking monitoring methods to the objective will greatly improve the likelihood of success by timely identifying and dealing with any other issues that may have developed, helping ensure quick response to issues.

Integrated Vegetation Management identifies and implements an array of treatments. IVM then evaluates strengths and weaknesses of the control measures and makes adjustments to ensure the best control strategies. This Plan provides guidance on prescribing, integrating and deploying cost effective vegetation management. Special considerations will be taken in pesticide use providing specific guidance around regulatory requirements, safety, environmental protection and prescription. The following integrated prescriptions will provide the most consistent success over time in a cost effective manner.

TARGET VEGETATION ZONES

Below are examples of plant zones that are most commonly managed by City Staff. These sections contain information to help guide staff in successfully managing common invasive plants.

Shoreline Buffer Zones

Review the Bremerton Shoreline Master Plan before implementing control along these sensitive areas.

<http://www.ecy.wa.gov/programs/sea/shorelines/smp/mycomments/bremerton/restorationplan.pdf>

Vegetation management for shorelines must be in accordance with the City Shoreline Master plan and in accordance with Washington Department of Ecology's regulations. Government regulations protect water features. The Washington State Wetland Rating System sets procedures to determine wetland classes and function levels (Hruby 2004). The City of Bremerton regulations restrict the use of non-aquatic herbicides and fertilizer within 50 feet of water bodies within urban areas.

Integrated management decisions must specifically consider the impacts of activities on not just one part of the tidal shoreline but in all of parts of the system (i.e., upland, riparian buffer, intertidal wetlands, or littoral subaqueous lands). Integrated management adapts project design to local conditions in order to minimize cumulative adverse impacts to ecological services provided by the tidal shoreline

system. In general, shoreline management decisions that maximize positive ecological elements and minimize negative elements are best.

In general, control efforts should be placed in the following order: upland, riparian zones, and intertidal zones. Vegetation management in the shoreline buffer zones should follow all City Department of Community Development and Washington State regulations before any plant material is removed from these sites.

Control Methods for Shoreline Buffer Zones:

Cultural Controls:

- Plant non-invasive species
- Provide clean fill for any restoration site
- Provide clean plant material
- Provide native plants for cover to shade out invasive plants

Mechanical Controls:

- Physically remove invasive plants, using the least intrusive removal method. Movement of soil and sand may be detrimental to the integrity of the shoreline.
- Cut invasive plants frequently.

Chemical controls:

- Chemicals should be used judiciously and great care needs to be taken to reduce the risk of products moving into the water. Only use chemicals that are labeled for the use in aquatic areas.
- Use of a cut stump treatment may be necessary for aggressive invasive shrubs. Using cut stump treatments may reduce the negative impacts of soil disturbance.
- Foliar treatments are not advised unless dealing with noxious or aggressive invasive weeds.

Some invasive plants of concern along shorelines:

- Knotweed
- Butterfly bush
- Himalayan Blackberry
- Ivy
- Perennial Pepperweed
- Purple Loosestrife
- Non-native Grasses
 - Reed Canary grass

- Silver grass
- Ravenna grass
- Pampas grass
- Jubata grass
- Perennial sweet pea
- Birds foot trefoil
- Canada thistle
- Black locust
- Bull thistle
- Ox-eye daisy
- Perennial sow thistle
- Queen Anne's lace
- White and Yellow Sweet Clover
- Yellow Flag Iris
- Non-native cattails

All shoreline management should focus on restoration and protection of the biological integrity of the riparian area.

Sidewalks, Parking Lots, Hardscapes and Right of Way

Target vegetation along sidewalks and roadways is vegetation that includes public health nuisance vegetation, nuisance grass and weeds and vegetation posing a risk to safety.

Public Health Nuisance Vegetation

Public health nuisance vegetation includes vegetation that grows along public roads and sidewalks, is unsightly, and which may contribute to health problems. Nuisance vegetation growing within 10 feet of the Rights of Way (ROW) will be considered target vegetation.

Nuisance Grass & Weeds

Along the shoulders of roads, grass growth will be encouraged and maintained through mechanical mowing. However, in some instances grasses and weeds may grow in areas where control is limited to the use of herbicides. These areas include cracks in asphalt, brick, concrete, planting beds and along guardrails. In these instances, grass and weeds will become target vegetation if the stem density and height impacts established plantings, impedes movement, detracts from a well-maintained appearance, or hampers visibility and/or if the roots undermine asphalt, brick, concrete or other surface material used for pedestrian and vehicle travel.

Vegetation Posing a Risk to Safety

Vegetation that hampers visibility or impedes movement along sidewalks and streets is considered a risk to public safety. Control of public shade trees, shrubs and growths along public ways is important to maintain public safety. Plants interfering with traffic and visibility will be controlled by removing and/or hand cutting. However, due to topography, rate of growth, or physical characteristics, certain plant species and/or locations may require control by herbicides.

Control Methods: Sidewalks, Parking Lots, Hardscapes and Right of Way

The decision to use a vegetation control technique will depend on evaluating the specific situation. Emphasis will be given to the control tactic that will address the vegetation problem in the most environmentally sound manner and in a way to minimize vegetation control in the long term.

Cultural Controls

- Sealing Cracks
- General Right of Way repairs (i.e. repaving, installing new sidewalk)
- Use of ground cover where appropriate (i.e. under guardrails)

Mechanical Controls

- Selective Pruning
Hand cutting consists of the mechanical cutting of target species using chainsaws and brush saws. Target species are cut as close to the ground as practical with stump heights usually not exceeding three inches. Hand cutting is used in order to protect environmentally sensitive sites or on target vegetation greater than twelve feet tall where herbicide uses is prohibited by regulation. Hand cutting is used on those restricted sites where terrain, site size or sensitivity renders mowing impossible or impractical. Hand cutting may be used at any time of the year.
- Ground Cutting
Selective trimming consists of the mechanical pruning of the tops or encroaching limbs of tall trees which may hamper access to the roadway. This trimming will be accomplished using aerial lifts mounted on trucks or tractors or, if terrain or obstructions prevent equipment access, by climbing crews.
- Mowing and Brush Cutting
Mowing and brush cutting consists of the mechanical cutting of target vegetation using machines. Depending upon the resources available, mechanical cutting may be using a homeowner type push mower, a large ride

mower, rotary brush mower, edgers and line trimmers. Selection of specific equipment is based on terrain, target vegetation size and equipment availability. Mowing and brush cutting will be used in most areas where terrain and target stem size permit efficient use of the equipment. Mowing shall be the principal vegetation control measure on the shoulders of roads. Mowing may be used at any time of the year except when weather precludes operations.

- Street Sweeping
Street sweeping may be used at any time of the year.

Chemical Controls

When chemical controls are deemed the best control method, citizens will be notified of the treatments. Notification will be sent to local newspapers and posted on the City Website (see Attachment E for an example of the news release). Citizens wishing to maintain locations without pesticides are welcome to sign up for the “Owner will maintain agreement” found on the City Website and in Appendix F of this document.

- Cut stump treatments
Cut stump treatments consist of mechanical cutting of target species using chain saws immediately followed by herbicide treatment applied with a squirt bottle, a hand pump sprayer, or painted on the freshly cut surface of the stump. The herbicide is limited to the freshly cut surface of the remaining stump. The cutting procedure is identical to that outlined in Hand Cutting. Cut stump application is preferred during the dormant period.
- Foliar treatments with low volume and low pressure equipment
Foliar treatments involve the selective application of an herbicide(s) diluted in water, to the foliage of the target vegetation. Foliar treatments use low pressure, below 60 psi at the nozzle, for application. Foliar treatments can be made using a hand pump sprayer or squirt bottles. The herbicide solution is applied to lightly wet the target plant. This technique has few limitations with the exception being reduced effectiveness on tall, high-density target vegetation. This technique is the preferred method for sidewalk, hardscapes and right of way nuisance vegetation.
- Foliar treatments with power equipment (high volume foliar)
Another foliar treatment uses tractor mounted application equipment that delivers the herbicide solution through hand held nozzles attached to a hose. The herbicide solution is sprayed to thoroughly wet the target vegetation using a water based herbicide mixture from a pressurized tank on the application vehicle. This technique is used along roadways that have good access where obstructions, terrain or site sensitivity does not exclude the equipment. Foliar

applications will take place when plants are in full leaf and actively growing and in accordance with the manufacturer's recommendations.

Meadows/ Open Space

Importance of Integrated Management for success – Ecological importance of meadows

Meadows are defined as a habitat that is vegetated primarily by grasses and other non-woody plants. Meadows play an important ecological role in supporting a host of wildlife and multiple wildflowers that support pollinators including bees. Meadows typically need continual human intervention to prevent them from reverting back to forest.

“Transitional” meadows

Transitional meadows are defined as a field, pasture, or other cleared land that is transitioning into more wildflower species that require minimal management. The grasses will eventually become shaded out when scrub and woody plants become well-established, aiding in the ecological transition back to a forest.

Meadows are often prone to infestations of invasive plants due to their open nature and the often limited management. Invasive weeds have the ability to invade a meadow and quickly take over, pushing out the desirable mixed grass and desirable wildflowers. The invasive vegetation often has lower forage value and has the ability to multiply quickly over short periods of time.

Invasive plants that are prone to invade areas may include but not limited to:

- Noxious Weeds
 - Scotch broom
 - Tansy ragwort
 - Common tansy
 - Reed Canary grass
 - Bull thistle
 - Canadian thistle
 - Milk thistle
 - Oxeye daisy
 - Hawkweed
 - Knotweed

- “New invaders”
 - Common comfrey
 - Yellow rocket (brassica)

- Cocklebur
- Western Salify
- Chicory

Removal of shrubby invasives in meadows

Most invasive shrubs will be removed through mowing but if invasive woody shrubs are allowed to grow beyond a manageable level through mowing, hand removal will be necessary. Broom and other tap rooted perennial shrubs can be removed with the weed wrench.

Selective herbicides may be used to spot treat densely infested areas of shrubs and broadleaf weeds. Herbicide use should be limited and should be targeted rather than just broadly applied. Herbicide management should use products that will not persist in the system. Herbicide applications should be done in early spring to address the new spring emergent plants.

Early detection and rapid response is key to reducing or eliminating any need for herbicide use in meadows. When new invaders are stopped before they can set seeds or move through vegetative growth, the meadow can thrive and provide ecologically significant habitat. This habitat is key for wildlife and is also beneficial for human enjoyment and interaction with the area.

A fully integrated plan for meadows will include mowing, targeted herbicide treatment and hand removal. Re-vegetation or enhancement may be necessary for full restoration. Reseeding may be necessary to promote a healthy meadow. Reseeding should be done in early spring or in fall and may best be accomplished with a no till drill to help preserve the existing vegetation. Make sure to not bring in any new invasive plants in the newly planted “mix” work to ensure that the mix is truly native.

Park Play Areas

Parks department mission statement:

Bremerton Parks and Recreation is committed to providing an array of Parks, Open Spaces, Trails and Recreational Opportunities that are responsive to citizens needs and build community through celebration and inclusion.

The following qualities represent the ecological values of Bremerton’s Parks and Recreation Department:

- Maintain and/or restore the ecological integrity of public parks
- Enhance the habitat for terrestrial and aquatic life
- Maintain open public spaces with minimal pesticide inputs

- Manage shoreline resources to protect and enhance habitat

Playgrounds

Play structures and lots are inspected twice a month. “Wood Carpet” mulch surrounding the play structures is replaced annually or as needed. Shrubs are pruned when forming an obstruction, for aesthetic purposes and for plant health reasons. Shrubs are planted or replaced in the fall.

Planting beds are mulched annually or as needed and inspected during the growing season (April – October), and during the off-season (November – March). Annual floral displays are installed twice a year and manual watering occurs during extended dry periods. Weed control in planting areas is accomplished by mechanical and/or chemical means as needed. Shrubs are pruned when forming an obstruction, for aesthetic purposes and for plant health reasons. Shrubs are planted or replaced in the fall. Perennials are pruned prior to the start of the next growing season. Leaf removal occurs in the fall.

Qualified, licensed staff will perform any chemical applications on parks and city owned properties. Licensed staff will also chemically control weed growth in hardscape areas in the downtown commercial area. The practices of Integrated Vegetation Management (IVM) will be considered when weed control measures become necessary. Reducing chemical use, without sacrificing effective control measures, is the preferred process.

Workload and limited resources indicate a need for effective weed control. While the city is sensitive to concerns of using chemical control, the City in conjunction with county experts, has determined that the economic benefits of using some chemical controls outweigh the potentially negative environmental effects. The City Public Works and Parks programs are not staffed to accomplish weed control entirely by hand.

LANDSCAPE ZONES

Buffer Zone

A buffer zone is a landscape area which serves to visually obstruct views from abutting uses. For this document these “zones” will be defined as the areas along parking areas, and between roadways and “edge” areas, including street medians. These areas are predominantly shrub areas with some small trees. These sites are prone to high traffic, litter, and damage due to cars and foot traffic.

These areas are prone to small annual weeds. Due to the close proximity of all of the desirable plants, management will be difficult and will be mostly focused on hand removal. Integrated management could include the use of mulch to suppress new growth of annual weeds. Crop competition will also be a useful management tool.

These zones are widespread throughout the city. Management may be time consuming and labor intensive. The first line of defense will be at the time of design and installation. During design there should be care taken for the types of plants that are chosen for the site and also there should be a plan to help the plants to establish quickly, including ensuring the topsoil and mulch are as free as possible from invasive weed seeds. Establishing the desirable plants quickly will provide for shading out and pushing out of invasive weeds. Caution should be taken to choose plants that are not prone to disease, as these buffer zones are high plant stress areas and can be prone to attracting invasive and nuisance weeds. The following describes integrated vegetation management techniques for buffer zones:

Woody Trees and Shrub Beds

Densely shaded plantings reduce weeds. Pre-plant weed control is not as critical as in other types of plantings. It is often necessary to combine treatments for complete weed control. Control perennial weeds before planting (although control may be possible after planting); use geotextile fabrics with a shallow layer of mulch or use a thick layer of mulch without a geotextile base; use a pre-emergent herbicide, if needed, and supplement with spot applications of post-emergent herbicides and/or hand-weeding. Perennial weeds may be controlled by manual removal, spot applications of glyphosate or, in some instances, dormant-season application of pre-emergent herbicides. Escaped weeds may be controlled manually or with spot applications of post-emergent herbicides.

Woody Ground Cover Beds

Woody mature ground covers should exclude most weeds; however, weed encroachment during establishment is likely. Control perennial weeds before planting, although perennial grasses may be selectively controlled with selective grass herbicides. Annual weeds may be controlled with mulch plus a pre-emergent herbicide, supplemented with some hand-weeding. Use geotextiles where possible but do not use them where ground covers are expected to root and spread. After planting, it is difficult to make spot applications of nonselective herbicides without injuring desirable plants. Post-emergent control of most annual and perennial grasses is possible.

Annual Flower Beds

A closed canopy will help shade out many weeds. Periodic cultivations -will suppress many weeds. Control perennial weeds before planting and carefully select flower species for weed management compatibility. Annual weeds may be controlled with mulches, pre-emergent herbicides, frequent cultivation, and/or hand-weeding. Perennial grasses can be selectively controlled grass-selective herbicides, but other perennial weeds cannot be selectively controlled after planting. Geotextiles generally are not useful because of the short-term nature of the planting. Avoid nonselective herbicides after planting.

Herbaceous Perennial Beds

Weed management options in herbaceous perennial beds are similar to those for annual flowers, except (1) it is more important to eradicate perennial weeds as there will be no opportunity to cultivate or renovate the bed for several years; and (2) fewer species are included on herbicide labels. Control perennial weeds before planting; use geotextiles where possible; use mulches with a pre-emergent herbicide; and supplement with hand-weeding.

Mixed Plantings of Woody and Herbaceous Plants

Weed management is complex because of the diversity of species. Different areas of the bed could receive different treatments. Site preparation is critical because post plant herbicide choices are few. Plant the woody species first; control perennial weeds in the first two growing seasons, then introduce the herbaceous species. Plant close together to shade the entire area. Another option may be to define use-areas within the bed that will receive similar weed management programs.

Turf

Turf areas include park lawn areas and athletic fields. A variety of pest issues may affect each turf type and location, therefore pest management practices may vary accordingly.

The turf-growing season usually begins about April and continues through October, depending on weather conditions; maintenance frequency depends on use. Right-of-way turf is maintained mainly by mowing every other week during the growing season. Athletic field maintenance includes weekly mowing, core aeration, fertilization, seeding, irrigation, weed control, soil testing, and repair.

Pest tolerance thresholds will need to be set based on impacts and aesthetics. There will always be some level of weed, insect, and disease pests. Staff will make a

decision on the pest tolerance based on available staff time along ecological and aesthetic requirements. Many pests may be controlled through keeping turf healthy and well maintained. The following summarizes controls for broadleaf, insects, disease, and grass for various turf areas:

Weed control

Broadleaf weeds in turf are generally tolerated to an extent. When control is deemed necessary, the following method should be followed:

- Monitoring of watering practices
- Fertilization
- Aeration
- Top-dressing
- Over-seeding

Through cultural practices, park turf should be healthier and more competitive with many broadleaf weeds. When broadleaf weeds exceed an acceptable level, then Chemical control may be used. When using herbicides follow these guidelines:

- The least toxic, least residual pesticide should be used for spot treatments (selection based on referring to EPA approved label.)
- General broadcast treatments should be avoided and only used when other control methods fail.
- Timing of such applications should be made to avoid contact with the public to the maximum extent possible.
- The site that has been treated should be posted.

Insect Control

Chemical control is to be used only in limited circumstances in high-visibility/high-use park turf areas and according to the following guidelines:

- Chemical applications should be spot treatments directed specifically at the turf areas containing the pest.
- The preferred initial choice for application in high-use areas is the safest, least toxic product available.

Disease Control

Disease in general park turf is typically tolerated and not actively controlled; the following guidelines should be observed:

- In high-use/high-visibility park turf areas, disease should be controlled by performing sound turf cultural practices that may include the selective use of approved pesticides.

- Pesticides may be used as a part of the management strategy to control disease in park turf areas. Pesticides used will come from the list of Reduced Risk Pesticides approved for use. Staff will follow all pesticide regulations.

Grass Trimming Control

The control of grass growing along fence lines and around trees, bollards, posts, and other landscape features may be necessary. Careful employment of grass control techniques is especially important around trees where impacts from mower line trimmers and other damage can lead to tree loss. The following are acceptable grass trimming management practices:

- Grass is carefully trimmed using gas-powered string trimmers or push-type lawn mowers. Herbicide applications are performed periodically to provide pre-emergent control of weed and grass seed not yet germinated.
- Herbicide applications to control existing weeds and grass should only be used minimally.
- Concrete mow strips are sometimes a good alternative to herbicide application or grass trimming; however, the installation of such mow strips is expensive and usually beyond the resources available.

Turf Maintenance Program Criteria

The City will consider the following criteria when selecting turf maintenance strategies:

- Human health and safety
- Minimal impact on the natural controls for the particular pest
- Minimal negative impacts to non-target organisms
- Minimal environmental damage
- Maximize potential for long term control
- Be operationally effective and feasible
- Be cost effective in the short and long term

Urban Forestry/Utility Lands

Bremerton manages its forest lands in accordance with Washington DNR standards and regulations. Refer to the “Forest Management Strategies” document created in the Forestland Management Plan. (<http://www.ruraltech.org/projects/bremerton/>). Management strategies can also be informed through the “*State of Urban Forestry in Puget Sound*” (http://www.forterra.org/files/Urban_Forest_Regional_White_Paper.pdf).

All parts of a tree—roots, stems, foliage, shoots and terminal leaders—are vulnerable to attack by pests. Pests also include invasive plants and the pressures these plants

pose to desirable vegetation. Pest damage can range from slight damage that has no effect on the value of the harvested product to severe damage that stunts or kills the trees or reduces their market value. Tree pests include insects and mites, diseases, weeds, vertebrates, and nematodes. Managing tree pests effectively should be based on thorough consideration of ecological and economic factors. The pest, its biology, and the type of damage are some of the factors that determine which control strategies and methods, if any, should be used. Pest management decisions largely determine the degree and amount of pesticide used. Ultimately, pest management decisions represent a compromise between the value of the product, the extent of the pest damage, the relative effectiveness and cost of the control measures, and the impact on the environment.

When monitoring or scouting an area, examine the center of the area as well as the margins. Note competition levels among trees and other plants. Note types, quantity, and location of weeds. Look for signs of animal activity. Check a representative sample of trees for signs and symptoms of insect and disease problems. Inspect all parts of the tree, from top to bottom and from branch tips to trunk. Depending on the pest, the use of traps or microscopic examination may improve the information gathered by visual examination.

Trained staff will determine the threshold level for implementing the correct tools within integrated vegetation management strategies.

Cultural management

- Good site selection,
- Planting resistant varieties,
- Selective pruning.

Cultural techniques can make it less likely that the pest will survive, colonize, grow, or reproduce. Cultural management can be very effective in preventing pests from building to unacceptable levels.

Mechanical management

- Tillage
- Mowing

Biological management

Biological controls include beneficial predators, parasites and pathogens that kill pests. There are many more known natural enemies of insect pests than there are

natural enemies of disease pests. Biological weed control is generally aimed at non-native introduced weeds.

Examples: Ladybugs, lacewings and certain mites are common predators of other insects. Some tiny wasps and some fly species are parasites of other insects. Many beneficial parasites are host specific and do not control a wide range of pests. Parasites and predators are often very effective at keeping insect pests at low levels. Insects are also affected by a variety of bacterial, fungal, and viral diseases that affect only insects. Biological control organisms are very sensitive to pesticides. Pesticide applications to control a pest may have the unwanted side effect of wiping out part of the natural predator and parasite population along with the pest. This, in turn, may cause a population explosion of a different pest in the void left by the predators and parasites.

Chemical control

Pesticides are a very important tool in IVM when large pest populations threaten high-value trees. Knowledge of the pest's life cycle, selection of an appropriate pesticide, proper timing of the application, and use of the right application equipment will improve coverage and effectiveness. Products approved for use are listed in Appendix A.

In addition, judicious use of approved herbicides will be implemented to control invasive weeds including but not limited to:

- Scotch broom
- Butterfly bush
- Holly
- English Ivy
- Tansy Ragwort
- Clematis
- Thistles
- Yellow and White Sweet Clover

Union River Watershed

Bremerton's strict Watershed Control Program allows Union River drinking water supply to remain one of the few systems in the country allowed to be unfiltered. Watershed protection is the first and most critical component to protecting Bremerton's water supply. It is much healthier, easier, more economical and environmentally sound to protect water quality than to treat it to remove contaminants after the fact. Without diligent safeguarding of the hydrologic boundary and other lands near the Union River Reservoir, Bremerton would lose its unfiltered status and

be required to build a water filtration plant estimated to cost \$32 million with \$600,000/year additional operation and maintenance costs.

Vegetation management is critical to the protection of the Union River Watershed.

Any vegetation management must comply with all state and regional laws to ensure the safety of drinking water and provide resource integrity.

Cultural Controls

- Control of trespassing
- Proper sanitation of areas
- Use of proper plants

Mechanical control

- Physically remove plants prior to seed set
- Cut shrubs
- Dig out roots
- Mow

Examples: Cut Blackberry down to the ground when plants re-sprout from the root masses; grub out the roots and dispose of them properly. Scotch broom when mowed frequently will stay at manageable levels.

Biological control

- Biological control is not recommended and would only be used in a critical situation under highly controlled circumstances.

Chemical control

- Chemical controls are not recommended; if absolutely necessary would be used as an emergency procedure under highly controlled circumstances, and in a limited area.

The entire hydrologic boundary of the Union River Reservoir and West Branch basin is a "No Pesticide Zone" (see Figure 1). No pesticide applications will be made in the designated "No Pesticide Zone" as determined by staff and Washington Law.

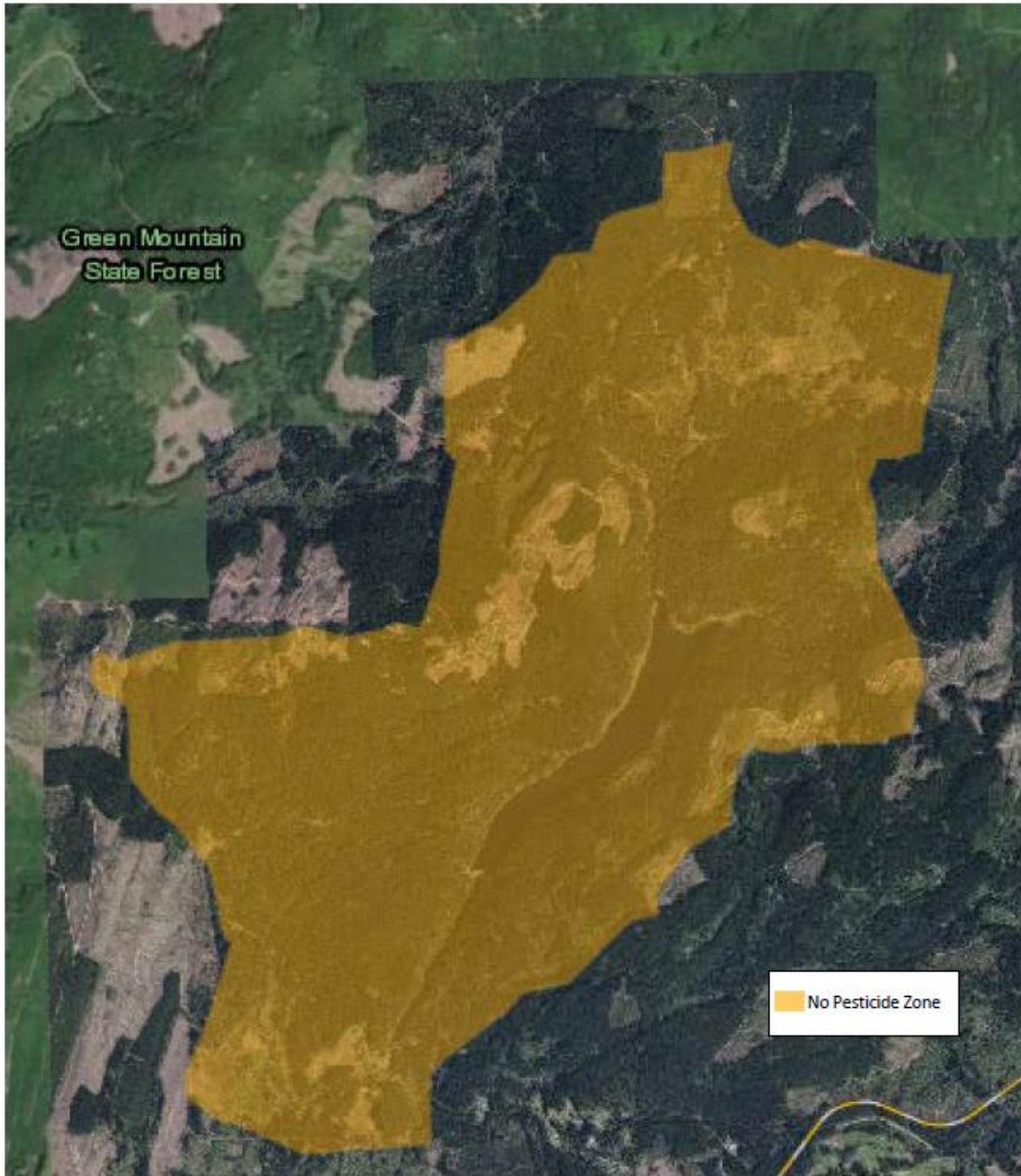


Figure 1. Union River Watershed No Pesticide Zone. (*Chapter 246-290-135 Washington Administration Code – Source Water Protection and Bremerton Municipal Code 15.02.210(b) – Contamination*)

Critical Aquifer Recharge Areas

Critical aquifer recharge areas contribute to the recharge of aquifers, springs, and/or wells and are susceptible to contamination of water supplies through infiltration of

pollutants through the soil. A significant portion of the City's drinking water comes from groundwater supplies in aquifers.

Wellhead Protection Areas

The primary goals of groundwater wellhead protection regulations are to protect groundwater quality by maintaining the quantity of recharge, avoiding or limiting land use activities that pose potential risk of aquifer contamination, and to minimize or avoid adverse impacts to groundwater protection areas in compliance with the Federal Safe Drinking Water Act, Washington Administrative Code, and the requirements of the Wellhead Protection Program.

Twin Lakes Area

Twin Lakes is a surface expression of the Twin Lakes Aquifer and is hydraulically connected to City drinking water wells 15, 17, 18, 19, and 20. This area is also the aquifer recharge area for Wells 18 and 20.

The City's critical areas ordinance BMC 20.14 420 (a) categorizes the following as Category I Critical Aquifer Recharge Areas:

Areas inside the five (5) year time-of-travel zone for Group A water system wells.

Ten (10) year time-of-travel zones in wellhead protection areas, when a well draws its water from an aquifer that is at or above sea level and is without an overlying protective impermeable layer.

BMC 20.14.430(b) prohibits the following in Category I Critical Aquifer Recharge Areas:

Use or storage of pesticides listed as "State restricted use pesticides" by Chapter 16-228 WAC.

Any use of pesticides, and use of fertilizers above agronomic rates, within one thousand six hundred (1,600) feet of Twin Lakes.

These Category 1 Restricted Areas are shown in Figures 2 through 6.

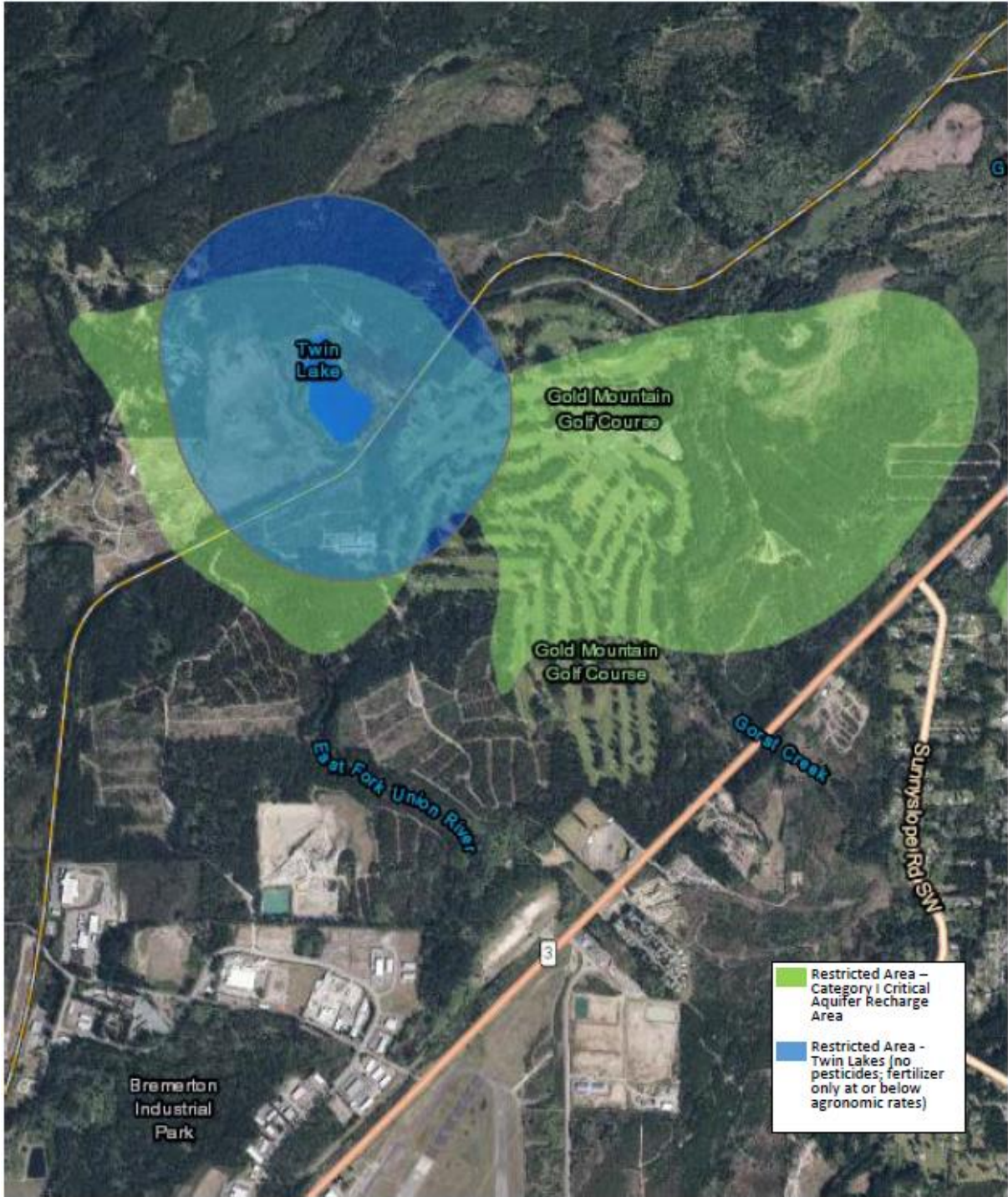


Figure 2. West Bremerton Restricted Areas - Based on Twin Lakes 1600-ft buffer and 10-year time-of-travel zones for Wells 15, 17, 18R, 19 & 20, which are not protected by an overlying protective impermeable layer. (2019 Wellhead Protection Plan Update, USGS Kitsap Groundwater Model, BMC 20.14.400 Critical Aquifer Recharge Areas)

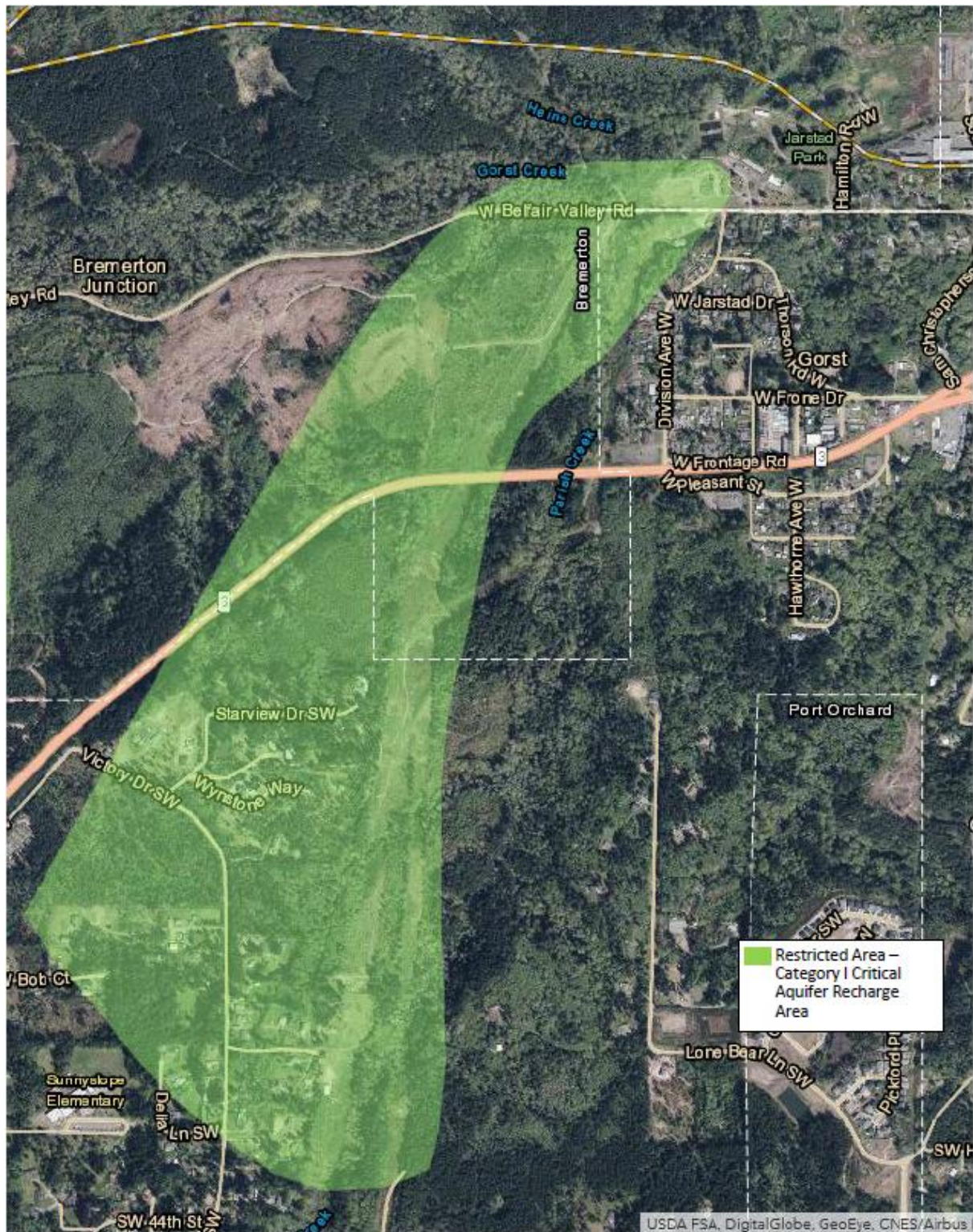


Figure 3. West Bremerton Restricted Areas - Based on 10-year time-of-travel zone for Well 22, which is not protected by an overlying protective impermeable layer. (2019 Wellhead Protection Plan Update, USGS Kitsap Groundwater Model, BMC 20.14.400 Critical Aquifer Recharge Areas)

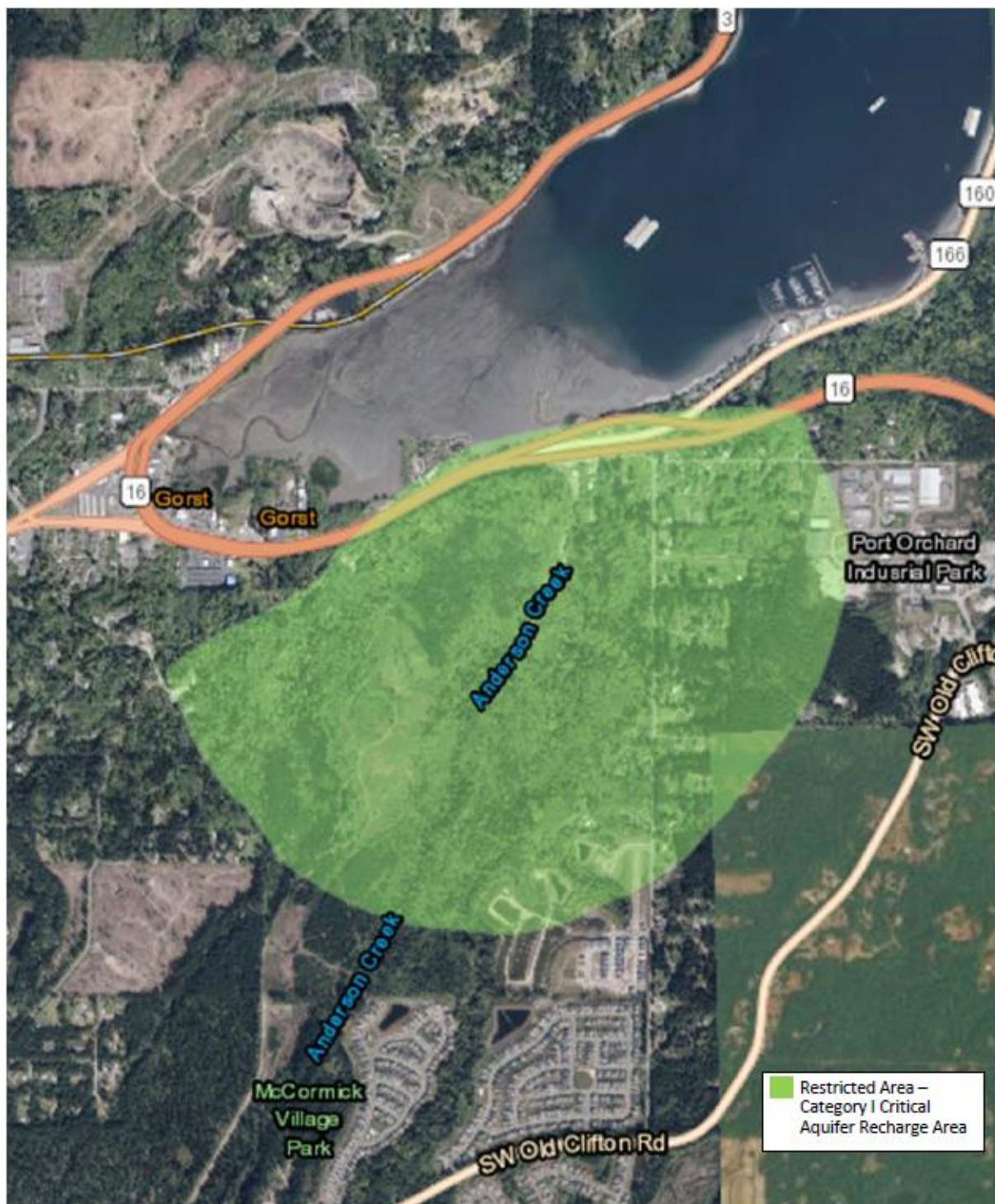


Figure 4. Anderson Creek Restricted Area – based on 5-year time-of-travel zone for Wells 1R, 2R, 3, 6R, 7 & 8, which are protected by an overlying protective impermeable layer. (2019 Wellhead Protection Plan Update, USGS Kitsap Groundwater Model, BMC 20.14.400 Critical Aquifer Recharge Areas)

City of Bremerton Water Utility Policy - *Application of Pesticides, Herbicides, or Fertilizer in Critical Aquifer Recharge Areas* provides further guidance and limited exception near the Twin Lakes area specifically for the U.S. Navy and the City Forestry Division and Gold Mountain Golf Course as follows:

Within the ballast of the railroad track ONLY (12' on either side of the center of the track) the following herbicides may be used for weed control:

- Glyphosate product
- Acetic Acid not to exceed 20%
- Pelargonic Acid

For Scotch Broom control a manual cut stem treatment with Garlon 3 amine formulation (no kerosene) may be used when removal by physical means is not sufficient.

All pesticide use will follow the agency's Integrated Pest Management Plan.

No later than February 28 of each year, a report of the previous year's pesticide, herbicide and fertilizer use detailing type, amount, and area of application will be submitted to:

Water Utility Manager
City of Bremerton
100 Oyster Bay Avenue N
Bremerton, WA 98312

If monitoring data indicate an accumulation of associated pollutants in groundwater, the City reserves the right to revoke the exceptions above.

Any removal or killing of weeds not described above must be performed mechanically, manually or by other non-chemical methods such as steam. Mulching can be an effective weed deterrent.

Urban Trees

Urban trees should be managed in a manner that keeps citizens safe and the trees healthy.

- Inventory and assessments should include a map illustrating topography and vegetation.
- Trees that are proposed for removal and/or pruning must be designated and identified
- Tree health requires some maintenance and a plan that includes tasks for pruning.
- Topping of trees should be discouraged
- No trees should be removed from public lands solely for private views

Refer to Bremerton Municipal Code 13.10 “Municipal trees”

<http://www.codepublishing.com/wa/bremerton/html/Bremerton13/Bremerton1310.html#13.10.090>

Trees are aesthetically pleasing, contribute to wildlife habitat, provide shade and shelter from the weather, and help clean the air of pollutants. Because trees are often very large and tall, accessing and managing pests and disease may present unique challenges.

- Urban Tree Pest Tolerance Thresholds:
 - Some insect and disease pests in trees are to be expected.
 - Insect or disease pests in selected, high-value specimen trees may require control measures.
- Physical Tree Damage Control:
 - Tree loss damage most often occurs when construction equipment, mowing equipment, or string trimmers repeatedly strike trees. Damaged bark may result in tree loss. Damage may be controlled by observing the following guidelines:
 - Removing turf from around the tree base to create tree mulch rings 3 to 4 feet in diameter can substantially reduce damage caused by mowers and trimmers.
 - With tree mulch rings, pruning should be conducted for tree health reasons and for hazard reduction in conformance with the International Society of Arboriculture standards.
- Insect Control:

- Conditions may make it less desirable to attempt controlling insect pests in large trees. Aerial spray equipment often involves a high probability of the applied pesticide leaving the area due to wind drift. When insect pests are to be controlled in trees, the following measures should be used:
 - Trees highly susceptible to specific insect pests may be removed from the landscape and replaced with resistant species.
 - The portion of the tree affected by the insect (such as tent caterpillars) can be physically removed, eliminating the pest.
 - An insecticide may be applied to control a specific insect pest only in certain situations. Such situations include pests on specimen-quality trees, in high-visibility locations, or where the presence of the pest threatens the life of the tree. When pesticide applications are made, product drift should be controlled.
 - Injection technology may allow for systemic control of certain insect pests with minimal or no impact to human or environmental health.

Example: Tent caterpillar and webworm tents

Tent caterpillar and webworm tents may not require insecticide treatment. Pruning out the branches and twigs with egg masses on them during the dormant season may be less time consuming and less costly as applying pesticides. If some egg masses are missed, then prune and destroy the tents containing the caterpillars when the tents are still small. Dormant oil sprays may be applied from January until the middle of February to kill the eggs as well. Insecticide sprays applied to control other pests will control young tent caterpillars. Fall webworm usually appears after harvest so control isn't necessary unless populations are high; spot treatments of infested bushes are effective. To conserve and encourage natural enemies, apply insecticides only if the action threshold is reached and then select the most benign and narrow spectrum materials available.

- Disease Control
 - Tree diseases may lead to a tree becoming a hazard to the public or the surrounding environment. The following control measures may be appropriate under certain conditions:
 - Trees susceptible to particular diseases may be removed from the landscape and replaced with disease resistant varieties.
 - When possible, parts of trees affected by disease should be pruned out and properly disposed of to stop the spread of disease within the tree and to adjacent trees.
 - An appropriate fungicide may be applied to control a specific disease pathogen only in certain cases. These cases include specimen-quality

- trees in high-visibility park locations where the presence of the disease compromises public safety or threatens the life of the tree.
- Pesticide applications should not be made unless the potential for product drift can be controlled.
 - Injection technology may allow for systemic control of certain disease in trees pests with minimal or no impact to human or environmental health.
 - Examples of diseases of concern include but are not limited to: Sudden Oak Death.
 - Root rots, stem and branch cankers, branch dieback, wood decay and foliage diseases of Madrone trees.
 - Many urban trees are susceptible to multiple root rots. Control Recommendations may be to agelessly remove the diseased trees to prevent the spread to healthy trees.
- Invasive species control:
 - Trees are susceptible to negative impacts due to invasive plant pressures. Many invasive plants may cause physical damage to trees. Examples of invasive weeds species of concern include but are not limited to:
 - English Ivy
 - English Holly
 - Tree of Haven
 - Clematis
 - Control recommendations for woody invasive may include physical removal in combination with minor cut stump herbicide treatments.

INTEGRATED PEST MANAGEMENT IN AN URBAN SETTING

A variety of integrated pest management strategies have been proven effective for use in urban arenas against disease, insects, and invasive plants:

Cultural

- Proper sanitation is the first line of defense
- Elimination of favorable breeding sites will greatly reduce the possibility of infestation for a wide variety of insect pests and help control the spread of disease.
- Choosing landscape plant cultivars with built-in resistance can reduce pest problems and help control the spread of disease.
- Proper plant selection to shade out invasive plants.

Mechanical

- Using physical barriers or traps and altering pest habitat can help diminish pest pressure.
- Some ant and roach traps contain no pesticides at all but lure pests by way of a food-attractant onto an adhesive. Some traps rely on pheromones and other scents to attract insects such as Japanese beetle traps.
- Window screens and caulking are examples of commonly used physical barriers that are inexpensive and readily available.
- The alteration of pest habitat has also been used in mosquito control programs by draining water from their breeding sites.

Biological

- Use of parasites and even some diseases targeted at specific pest populations.
- Use of insects to control insect pests
Examples: lady beetles, lacewings and beneficial wasps that provide control of insect pests when incorporated with a variety of plants in a landscape.
- Use of Bacerra to control insect pests
Examples: *Bacillus thuringiensis* is a bacteria that produces a protein that is toxic to many species of insects including cabbage loopers, leaf rollers, fungus gnat larvae and mosquito larvae. There are also biological nematicides on the market for control of soil-inhabiting plant parasitic nematodes in turfgrass. Some natural control products containing pyrethrins are also available for use both indoors and outdoors because of their relative safety.
- Use of insects to control weeds
Examples: use of cinnabar Moth and flea beetles to control tansy. Use of the scotch broom seed weevil to reduce seed set.

Chemical

The use of chemical pesticides is often needed when other, non-chemical practices are not effective. If pesticides have to be used to prevent or suppress a pest outbreak, it is important to use one that's as specific to the pest as possible

- Cut stump where possible
- Low pressure Foliar applications

Evaluation

Evaluation of treatment results is crucial in determining if your pest management program is working. A successful IVM program needs to answer the questions of what worked, what didn't work and what requires revision, improvement or

elimination. Evaluating your IVM program will help you determine not only the social and environmental benefits of your actions but the financial benefits as well.

Golf Course Management

Golf Course management must take into account environmental stewardship while providing quality recreational opportunities. Staff is committed to optimizing the management practices through Integrated Vegetation Management.

There are several examples and options for use of multiple methods of control. The key is to enhance natural plant resistance and optimize health and vigor of turf. The use of integrated management provides guidance for staff to make the best management decisions.

Objectives

- Minimize potential hazards to human and environmental health
- Provide optimal course playing conditions
- Minimize the amount of chemical applications while optimizing application efficacy
- Enhance communication with co-workers, golfers, golf course management, and outside agencies regarding agronomic and pest management practices
- Control operating costs and maximize budget restrictions with proper planning and execution
- Provide easy access to essential information on pest biology, control, agronomic guidelines, and monitoring tools and references
- Apply fertilizer only at agronomic rates

Golf Course management will provide its Annual Fertilizer & Pesticide/Herbicide report to the Water Utility Manager as stipulated in the previous section, **Critical Aquifer Recharge Areas**.

Turfgrass Areas

Turfgrass areas are broken into three to four different management sub-zones that consist of greens, tees/fairways, rough, and native areas. The greens consist of a combination of genetically modified turfgrass varieties.

Turfgrass Management Practices

Turfgrass area management involves the largest demand on the labor force, requiring greater than 90% of the resource allocation. The primary objective of IVM is to optimize turfgrass quality and health utilizing best management practices to reduce pest infestation and turfgrass resistance to stress. The primary cultural

practices include mowing, fertilization, and irrigation. Secondary cultural practices include practices such as aeration, topdressing, verticutting, and overseeding.

Primary Cultural Practice

- Mowing

Mowing is performed as needed based on growth conditions and playability needs. During peak growing season, mowing of greens will occur daily, tees, collars, approaches and fairways twice weekly, and rough areas will be mowed once a week. Mowing heights are expected to vary from .110 - .156 on greens, .400 - .600 on Tees & Fairways, and 1-2 inches in the rough.

- Fertilization

Management of nutrient availability is crucial in maintaining turfgrass. Management of turf fertility involves the understanding of soil composition, plant nutrient requirements, fertility management history, use of soil test information, and applications of the appropriate fertilizer with the proper application timing. The objective of the fertilizer program is to provide optimal nutrient availability to the turf while simultaneously avoiding the application of excess nutrients to avoid nutrient runoff/leaching to groundwater, disease development and weed infestation. Accordingly, every effort will be made to minimize fertilizer application in an effort to find a balance between optimizing turf quality and preventing nutrient runoff.

- Turfgrass Nutrient Requirements

The major nutrients for turfgrass health are nitrogen, phosphorus, potassium (NPK) along with calcium, magnesium, and sulfur. Essential minor nutrients include iron, boron, copper, manganese, molybdenum, zinc, chlorine, and nickel. The availability of nutrients to turfgrass is influenced markedly by the pH of the soil. Consequently, maintenance of the appropriate pH is an important component of the fertilization program. Whenever possible, slow release fertilizers will be used as the primary source of nutrients, with adjustments being made for special needs and conditions. Greens

fertilization programs may also include light applications of soluble foliar-adsorbed applied on a frequent basis.

➤ pH

Maintenance of the proper soil pH is essential in optimizing the availability of nutrients, and also is important in minimizing overall turfgrass stress. When the soil pH requires adjustment to the more alkaline pH, lime will be added until the targeted pH is obtained. When soil requires adjustments to a more acidic pH, ammonium sulfate or another acidifying product will be added until the targeted pH is obtained.

Pest Threshold Levels

Damage threshold level for turfgrass is defined as the number of pests detected within a specified area that may lead to corrective action to reduce the density of the specific pest below the damage threshold level. The threshold must be evaluated by trained staff and educated decisions must be made to mitigate damage from pests.

Pest Monitoring and Pest Control

The intensity and frequency of monitoring will be adjusted based on the likelihood or presence of pest infestation (i.e. seasonal) or in situational/site specific instances. All monitoring observations of potential pest infestation will be reported to City staff. The IVM process and strategies will be implemented continuously and appropriate corrective action will be implemented as necessary.

The pest control strategy is sequential and consists of using cultural practices as the first line of defense. Pest control strategy must be developed on a case by case basis with all potential control options given consideration. The decision to implement chemical pest control measures beyond cultural, biological, or mechanical practices will be based on the review of relevant safety, scientific, economic, and environmental information. All products used for pest control will be those approved for use by the Environmental Protection Agency and will be approved by City and County Staff.

Fungal Disease

Within the overall spectrum of pest management, fungal disease represents the most serious and consistent threat to turfgrass health, and is of concern primarily on greens and tees. Greens and tees will be inspected regularly for symptoms of fungal disease. The primary means of identifying fungal disease will be diagnosis by the

Superintendent. However, in some instances symptoms consistent with fungal disease may have alternative causes (nutrient deficiency, insects, etc.). When uncertainty regarding potential fungal disease is encountered, samples will be sent to a plant pathology laboratory for confirmation of the presence of fungal pathogens. More frequent monitoring of greens and tees will occur when conditions favor the development of these pathogens.

An essential aspect of preventing the development of fungal disease is the optimization of turf vigor through routine cultural practice. In addition, fungal disease control is dependent on the understanding of disease cycle and conditions that promote disease development, the correct recognition of disease symptoms, and the selective use of the appropriate fungicide agents when necessary. Specific cultural practices will be employed to minimize the potential for fungal disease, which are described below. In general, if these measures fail and symptoms of fungal infestation exceeds defined damage thresholds, fungicide applications may be necessary to control disease.

Non-Turfgrass Areas

These areas consist of bunkers, flower beds, aquatic areas, and buffer zones. These will play a less significant role in the overall environmental health of the property. However, they play a significant role in the overall aesthetic and operational aspects of the course.

➤ Bunkers

Bunker maintenance will involve routine maintenance that includes hand raking, edging, and removal of debris.

➤ Flower Beds

A number of flower beds exist around the grounds. These areas are aesthetically significant and grab the eye of patrons upon approach to the property. High standards of maintenance will be expected and performed in these areas.

➤ Aquatic areas

Ponds can be used for irrigation holding and aesthetic ponds exist throughout the course. Ponds play an important role in the playability and design of the current course layout.

➤ Buffer Zones

Buffer zones currently exist adjacent to the waterways and forest management locations. In these areas, special care

and consideration are given when making fertilizer and fungicide applications, with a goal of limiting fertilizer, fungicide and broadleaf herbicide use.

Trails

The City maintains a number of trails that may be affected by different pest issues and pest management practices may vary accordingly.

Pest Tolerance Thresholds for Trails

The following summarizes the pest tolerance thresholds for trails:

- Invasive plants should be controlled in conjunction with ecosystem restoration efforts on any park trail as resources permit.
- Noxious weeds should be controlled, when found, according to state of Washington requirements. Weeds are generally found on trails and require control only when beginning to compromise trail function. Insect pests that pose a risk to the public (e.g., hornets) should be controlled.

Pest Management Strategies for Trails

The following summarizes pest management strategies for trails:

Weed Control

- Weeds on trails are generally tolerated until they begin to interfere with trail function. When control is necessary, the primary method is increasing mulch on, or re-surfacing, the trail surface.
- Chemical weed control is often not necessary on trail surfaces, but should be used only as a last resort for controlling particularly difficult weeds. In the cases where chemical weed control is indicated, the following guidelines should be observed:
 - The least toxic, least residual herbicide should be used for spot treatments.
 - General broadcast treatments should be avoided.
 - Timing of such applications should be made to avoid contact with the public to the maximum extent possible.
 - The site that has been treated should be posted.
- Specific weeds of concern:
 - Ivy
 - Scotch broom
 - Blackberry

- Tansy
- Poison Oak

Insect Control

- Only insects that can cause a health risk (such as wasps and hornets) are controlled on trails. When insect control on trails is necessary, chemical control with an approved insecticide is acceptable and only the individual nests should be treated.

Newly Planted Areas in an Urban Setting

Plant Establishment

Care should be taken to ensure good establishment of desired plants. Due to the physical constraints of many of the sites there is a possibility that the root systems could be compromised and prone to root disease. Plant selection will be very important for keeping plants healthy. Planting the areas heavily can be a good tool to help prevent weeds but can also then allow for issues with diseases. Most roots are located in the top 6-24 inches of the soil. Soil compaction and improper watering can injure roots and lead to disease and insect damage. Care should be taken during installation to ensure root health.

Types of Root Diseases in Newly Planted Areas

The two basic types of fungi that cause root diseases are those that kill feeder roots and those that cause decay in the large, woody roots. Many fungi occur on small feeder roots. The more common organisms are species of *Phytophthora*, *Pythium* and *Fusarium*. These break down the feeder roots and reduce the tree's mineral- and water-absorbing capability. Fungi that attack large, woody roots suppress growth, decay food-transporting cells, reduce food storage and reduce structural support for the tree.

Signs and typical symptoms associated with root diseases often are confused with mineral deficiencies because high numbers of dead roots reduce water and mineral uptake. Symptoms of root disease include small, yellow, chlorotic foliage; reduced growth; scorch; tufted leaves at the end of branches; and branch dieback. Fungal fruiting bodies (mushrooms or conks) at the base of the tree, as well as white fungal growth under the bark, also indicate root disease. Symptoms of root problems from construction damage or other detrimental activities may appear one to several years after the damage occurred. Direct examination can verify a disease. Carefully excavate roots by removing a small patch of the bark. A brown coloration beneath the bark indicates a dead root, while a healthy root usually appears white or light-colored.

Weed Management

Weed control will have to be a continual effort and should be set on a time schedule of visiting the area throughout the season. During installation care should be taken to ensure the soils are as weed free as possible. Physical removal of weeds in established beds is going to be key. There will need to be long term management to maintain a low threshold of weeds.

Weeds that might become an issue in newly planted areas:

- Ivy
- Common groundsel
- Vinca
- Birdsfoot trefoil
- Bindweed
- Sheperd's purse
- Invasive grasses
 - Quack grass
 - Cheatgrass
- Horsetail
- Shot Weed Bittercress
- Chicory
- Perennial Pea Vine
- Black Medic

RODENTS AND OTHER VERTEBRATES

This section establishes guidelines for management procedures for rodents and other vertebrate pests such as moles, mice, and gophers. Management of these pests differs greatly from typical landscape pest management and brings with it a specific set of issues that must be addressed.

The presence of rats and mice in park structures and landscapes is considered a health and safety problem because they can vector diseases to humans. Moles and gophers can create turf and landscape problems. Rodent tunneling and hilling can be tolerated in many park areas; however, damage from rodent activities cannot be tolerated. Such soil disturbance can present safety hazards for park users, particularly in turf areas.

Mechanical control of burrowing rodents such as moles and gophers is allowed with an Ornamentals and Turf category endorsement of the Public Pesticide Applicators license. Where a need exists, gophers and moles may be mechanically trapped in tunnels by licensed personnel. Care shall be taken to assure that set traps are hidden from view and do not create a safety hazard for park visitors. Rat and mouse control within structures such as community centers should be carried out by a qualified structural pest management contractor that utilizes sound IPM principles. Rodent IPM is best addressed through reduction in available food and harborage, however there may be situations where other measures are necessary. Use of pesticides for rodents and other vertebrate pests must occur within an IPM framework and employ materials and methods approved by supervisors. Rodenticides and other vertebrate pesticides may have potential for secondary toxicity to non-target organisms and may pose a potential threat to park users with access to baited areas. Therefore, if rodenticides are used by staff it will occur only through means such as locked bait boxes and not through general or rodent burrow distribution. If employees wish to utilize rodenticides, they must maintain a valid pesticide license with a Rodent certification endorsement.

OPERATIONAL GUIDELINES

Certification

As required by regulation, applicators to the rights of way must hold a valid herbicide certification from the Washington Department of Agricultural, or be working under the direction of a licensed applicator.

Herbicide Application Restrictions

In addition to the applicable rules and regulations, applicators will adhere to the following operational guidelines:

- Weather - Herbicide applications will be restricted during certain adverse weather conditions, such as rain or wind. Herbicide applications will not be made during periods of moderate or heavy rainfall. Foliar applications are effective in light mist situations; however, any measurable rainfall that creates leaf runoff will wash the herbicide off target. If foliar applications are interrupted by unexpected rainfall, the treatment will not resume until the rain ends and active leaf runoff has ceased. Cut stump treatments will not be made during measurable precipitation. Cut stump treatments will cease during measurable precipitation and will not resume until precipitation has ceased. Excessive wind can create drift during foliar applications. Significant herbicide drift can cause damage to desirable vegetation on or off the roadside. Cut

stump treatments are much less affected by the wind, as they are applied in close proximity to the ground level.

- During periods of wind which are strong enough to bend the tops of the main stems of tree species on the roadside, the applicator will periodically observe the application of the foliar treatment to insure that there is no significant movement of the herbicide. If the applicator can see the herbicide moving off target, the application will immediately stop until the wind has subsided enough to permit further applications.
- All herbicide solutions to be used for a foliar application will contain low drift agents. Low-drift agents will be added to the foliar herbicide mixture as per the low-drift agent label. In moderate wind conditions, as per label recommendations, more low-drift may be added, at the discretion of the applicator to control increased drift. Foliar treatments will not be made to target vegetation that exceeds twelve feet in height.
- Individual landowners may opt to maintain their own area without the use of pesticides. Landowners must sign up for the City “no spray” agreement and clearly mark their area. A copy of the agreement can be found in Appendix F.

Herbicide Application Equipment

Calibration - Foliar application equipment will be calibrated at the beginning of the season, in accordance with the manufacturer’s recommendations. Foliar application equipment will be calibrated to maintain pressures not exceeding sixty PSI at the nozzle and applicator nozzles will be adjusted to apply a coarse spray to minimize drift. Cut stump treatment squirt bottle nozzle will be adjusted to minimize the herbicide splash and overspray.

Cleaning- Cleaning of any equipment used by any sub-contractor of the City shall be done at the City facility or the contractor’s facility and in accordance with EPA guidelines and product and equipment labels.

Mixing – Cleaning the amount of herbicide necessary to carry out the vegetation control, based on monitoring results, will ensure that there will be no waste and minimize potential problems.

Vehicles – The vehicles performing the spray operations will be equipped with a bag of absorbent activated charcoal; leak-proof containers; a broom and a shovel in case of minor spills; a log of the herbicides carried on the vehicle will be kept on the vehicle, as well as herbicide labels, fact sheets, and this plan.

Sensitive Area Restrictions – In defined sensitive areas, limited herbicide use is allowed. Herbicides must be used at the minimum labeled rate for the control of targeted species.

Citizen Involvement

Citizens play a key role in participating in maintaining parks and public spaces through the ADOPT-A-SPOT Program. This program is a volunteer opportunity which enables individuals, families, civic clubs, garden clubs, businesses, churches, and other organizations to maintain various City areas, such as: Trails, parkways, mini-parks, sections of parks, monuments/historical markers, and other public areas. This program provides an opportunity for citizens to better connect with their community. Projects include park clean ups, landscaping, tree planting, weeding, and general sprucing up.

Volunteers will use manual methods of maintenance. Due to rules and regulation of pesticide application on public spaces, volunteers are prohibited from using any product as chemical means of control. Those restrictions cover products including regulated over the counter synthetic pesticides and any home remedies. All applications of pesticides, organic or synthetic, must be done by individuals who hold a valid Washington State Pesticide license or are under the supervision of a licensed applicator.

See Appendix: C for the Adopt-A-Spot description and application.

Justification of Herbicide/Pesticide Use

Pesticide is a general term for any substance (including organic substances) intended for preventing, destroying, repelling, or mitigating any pest. Pests consist primarily of unwanted vegetation and invasive weeds, but can also include insects, disease organisms, rodents, and other organisms. To manage these pests, staff will select the best methods available. When it is necessary to use pesticides as part of an IVM approach, staff will work to minimize risk by careful product selection and application. When developing and updating the IVM program the best expert scientific opinion is relied upon on to inform staff about potential materials and methods. Assessments from regulatory agencies, state university extension scientists and other experts in the field provide much useful specific information. Using the latest pertinent studies as part of our process, decisions will be made on these authoritative sources, best solutions can be obtained within the IVM framework. Part of a complete IVM approach, includes judicious use of carefully selected pesticides that can be an important tool in ensuring quality landscapes and healthy and diverse natural areas. Pesticide applicators are required to comply with all pesticide label directions, federal, state, and local pesticide regulations, and

applicable safety laws. Misuse of pesticides will not be tolerated. All applications must comply with State and Federal laws.

Pesticides are used in those cases where there are no effective or economically viable alternatives. It is recognized that overuse and other inappropriate use of pesticides can actually exacerbate the pest problem (e.g. destruction of natural enemies of pests, development of pesticide resistance, etc.) and trigger further unnecessary use of pesticides.

Pesticides often play a key role in pest management programs. They should not be used as the sole source for management but they may be the only control method available. Some benefits associated with the use of pesticides are their effectiveness, the speed of control measures are a key component to integrated pest management.

Allowable Herbicide/Pesticide Use

The City proposes to use or allow the use of pesticides in the following categories of outdoor public places that it owns or controls in the City and Local Government Area:

- Public parks, reserves, street closures and other green open space areas;
- Sports fields, ovals and courts & skate facilities;
- Planter boxes and flower displays;
- Street Trees and street bases/squares;
- Civic spaces;
- Road edges, sidewalks, streetscape planting, signs, guardrails, paths and stairways;
- Outdoor swimming pool surrounds;
- Footpaths, laneways and public roads;
- Drains (only in consultation with WSU Extension);
- Public toilets

Pesticide Risk Reduction

Although pesticides continue to play an important role in pest management, they also pose risks to human health and the environment. Pesticide risk reduction and risk management are thus essential to proper and responsible use of pesticides.

Hazard means the inherent property of a substance, agent or situation having the potential to cause undesirable consequences (e.g. properties that can cause adverse effects or damage to health, the environment or property);

Risk is a function of the probability of an adverse health or environmental effect, and the severity of that effect, following exposure to a pesticide.

Risk can thus be reduced by using less hazardous products and/or by reducing exposure to the product.

The Reduced-Risk Pesticide List at Appendix A is the result of a multi-step process that involved both environmental scientists and pest managers. The list was developed based on:

1. A hazard assessment of both the active ingredients and the formulated product;
2. Consideration of the potential human and environmental exposure that may result from use of the product in the particular application proposed by staff; and
3. A decision by staff, in consultation with the Washington State University Extension Office, as to whether a product should be added to the list, and if so, whether it requires a “limited use,” “special concern, or “approved product” categorization. Those products designated as “approved products” are the products which will be most frequently used and generally the least hazardous herbicides/pesticides on the list

Step 1: Hazard Assessment

Summarizes the hazards associated with pesticide products and places the products into Hazard Tiers (Table 1) based on the toxicity of the active ingredient(s) and the other ingredients (if they are identified) in the product. The specific hazards assessed are described in Table 2 and the ingredients in the product are evaluated for each category and ranked as high, moderate or low hazard, according to the criteria in Table 3.

Step 2: Exposure Assessment

The hazard review and tier ranking process is the first step toward placing a pesticide on the Reduced-Risk Pesticide List. A critical second step is review by City and County staff. Staff discusses each proposed addition/deletion to the list and reviews:

- The potential for human exposure or environmental release for each proposed product. Products such as containerized baits, for example, use very small amounts of active ingredient encased in a protective covering. These would therefore pose less exposure potential than, say, aerosol spray products.
- The effectiveness of each proposed product. Does the product work as intended?

- The need for the product. Is this kind of pest management action truly necessary?
- If so, is this the least-hazardous product available for the task?

Step 3: Placement on Reduced-Risk Pesticide List

Staff makes recommendations for additions/deletions to the list. These recommendations are then reviewed by Staff and Washington State University Extension Office. If the decision is made to list a product, it is categorized in one of three ways:

Approved products are products that are generally the least hazardous herbicides/pesticides on the list.

Limited Use: These products include specific restrictions on allowable situations.

Special Concern: These are pesticide products that pose the greatest health or environmental concerns, but which are nevertheless considered the least-hazardous chemical alternative for a particular purpose.

Most Restricted: City staff will consult with the Washington State University Extension Office prior to use of these products (for example, any product containing neonicotinoids)

For special, unforeseen, or emergency situations, City Departments must be granted a formal exemption by the Washington State University Extension Office to use products not found on the Reduced Risk Pesticide List. Most exemptions granted will be for pilot testing of new, safer products.

Insufficient measures to reduce risk to acceptable levels can result in adverse effects of pesticide use on agricultural production, health, the environment and trade. This is particularly the case when pesticides are used inappropriately.

Pesticide Selection and Methods

When choosing a pest management method or herbicide/pesticide product from the reduced risk pesticide list, all personnel should consider the following factors and any additional factors relevant to the selection:

- Nature of the site
 - Erosion susceptibility and potential movement of soil through runoff.
 - The intended use and function of the landscape.
 - The feasibility of the method given the area and scope of the problem.

- The relative importance and public expectation of a site or plantings.
- Site conditions such as soil type, grade, drainage patterns, and presence of surface water.
- Possible health and safety effects
 - Consider both short and long term toxicological properties and any other related potential health effects of the materials or methods, both to the applicator and the public.
 - Equipment operation safety issues for both the operator and the public.
 - Worker safety and worker injury issues involved with carrying out the method.
- Possible environmental effects
 - Consider both acute and chronic toxicity and any other related potential effects of the material or method to non-target organisms including mammals, birds, amphibians, fish, invertebrates and other organisms.
 - Environmental effects from potential bioaccumulation.
 - Potential impacts to non-target plants and other organisms from materials or methods.
 - Potential impacts to federally listed threatened or endangered species.
 - Possible introduction or establishment of invasive plants.
- Costs

Both short and long term costs as they relate to:

 - Costs of the material or method. Application and labor costs.
 - Length and quality of pest control.
 - Feasibility of using a particular method or product.
- Characteristics of the product
 - Target pests and target sites of the product being used.
 - Possible residual effect, decomposition pathways, rates, and breakdown products.
 - Volatility and flammability.
 - Product formulation and package size.
 - Leachability, solubility, and surface and soil bonding characteristics of the product.
 - Ease of cleaning equipment after use.
 - Positive and negative synergistic effects of pesticide combinations.

Natural Weed Control:

Organic pesticides include bacteria, viruses, and fungi that are classified as pesticides based on use, not origin. Pesticides approved for organic gardening or turf must be regulated in the same manner as conventional pesticides.

Several biological pesticides are effective only if used at the early stages of an outbreak. Insecticidal soap, sucrose octanoate esters and horticultural oils work by suffocating the target pests. The sulfur products elemental sulfur, lime-sulfur and copper sulfate all have similar modes of action. Botanical and fungal insecticides comprise some of the most toxic compounds used for organic production.

For example, most organic or natural insecticides are only effective against young larvae and are ineffective on adults.

Various natural substances have been tried as herbicides with mixed success. Clove oil is a botanical that is effective. Corn gluten meal can inhibit the germination and emergence of broadleaf weeds. Concentrated acetic acid is known to have herbicidal properties. While vinegar is one natural source of acetic acid, the substance can also be synthesized. Only non-synthetic forms of acetic acid are permitted but have no residual control and must be applied frequently. The frequent use of acetic acid can have ecological impacts that include acidification of water and soils. To be sold as an herbicide in the US, acetic acid must be registered with EPA for that use. Natural arsenic is prohibited as an herbicide. Synthetic micronutrients such as boron and zinc may not be misused as herbicides.

Organic does not always mean better. Studies reveal some organic pesticides can have a higher environmental impact than conventional pesticides because the organic product may require larger doses. Environmental sciences professor Rebecca Hallett and PhD candidate Christine Bahlai compared the effectiveness and environmental impact of organic pesticides to those of conventional and novel reduced-risk synthetic products. All products used on public lands must be certified by the EPA and must be vetted as effective at controlling problems while being an economically viable option.

From Christine Bahlai: "In terms of making pest management decisions and trying to do what is best for the environment, it's important to look at every compound and make a selection based on the environmental impact quotient rather than if it's simply natural or synthetic. It's a simplification that just doesn't work when it comes to minimizing environmental impact."

The most commonly used product is Vinegar. Though thought to be benign, there is research to show that vinegar breaks down the soil structure and kills beneficial microorganisms. In areas where it is applied, vinegar can render the soil sterile for several years.

Appendix A

Reduced Risk Pesticides Approved for Use

Pesticides vary widely in their characteristics and their legally labeled uses. Not every registered pesticide will be appropriate for use within our IPM/ IVM programs. Also, certain pesticides may be suitable for one kind of park site or purpose but not for others. Pesticides must be carefully evaluated for their suitability for specific program use before they are included on an approved list.

City staff and landscape professionals will consider the following criteria when selecting IVM strategies that include pesticide use:

- Human health and safety
- Minimal impact on the natural controls for the particular pest
- Minimal negative impacts to non-target organisms
- Minimal environmental damage
- Maximize potential for long term control
- Be operationally effective and feasible
- Be cost effective in the short and long term

The City will only allow the use of pest control products that have received Federal registration. To receive a federal registration number, manufacturers are required to demonstrate that the products do not pose a significant health concern, as long as they are used in accordance to the label. City staff applying pest control products will be familiar with the Operational Guidelines, including the Justification for Herbicide/Pesticide Use section, and the Safety Data Sheet prior to pesticide application.

IPM/ IVM program needs for various pesticides change over time as new pest challenges arise. Also, pesticide material availability changes as products, active ingredients, and label uses are added or removed. Information about pesticides may change over time and this may influence their suitability for IPM program use. For these reasons, approved lists need to be flexible to allow for additions and deletions.

Consider using a pesticide at its lowest effective rate that is short-lived in the environment and is least toxic to beneficial organisms and the environment. When possible, alternate pesticide use by substituting different pesticides, each with unique chemical modes of action, to help prevent resistance.

Commonly used and approved active ingredients include but are not limited to Glyphosate, Triclopyr, 2,4-d, Imazapyr, and MCPA.

Note All Chemical treatments, including organic materials, will only be applied by licensed staff that will follow All WSDA rules and regulations.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
3336F SDS	Fungicide	Approved Product	Golf course, Turf, parks	For control of various diseases and can be use on all fine turf applications such as commercial and home lawns.
Actinovate 73314-1 SDS	Fungicide	Approved Product	Golf course, Turf, parks	A patented beneficial microorganism (Streptomyces lydicus strain WYEC 108) that attacks root rot and foliar fungal diseases on lawns, perennials, annuals, trees, shrubs, vegetables, herbs and much more. Effective against: brown patch; take-all patch; dollar spot; downy mildew; powdery mildew; grey mold; root rot; damping off; crown rot; black spot; leaf spots; rusts.
Advion Ant Bait Arena (Dupont) 352-664 SDS	Insecticide	Special Concern	Golf course, Park Structures	Control of nuisance ant colonies (excluding carpenter ants) with the active ingredient indoxacarb, an insecticide that acts through ingestion by ants. The bait's slow-acting poison provides enough time for foraging ants to return to nest sites and contaminate other colony members including larvae and queens, eventually destroying the entire colony.
Advion Ant Gel (Dupont) 352-746 SDS		Special Concern	Facilities, Golf Course, Park Structures	ADVION® ant gel is designed for use as a spot or crack and crevice treatment to control ants in residential structures and the non-food /non-feed areas of commercial, industrial,

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
				public and institutional buildings/structures, including restaurants, warehouses, food processing plants, supermarkets, hospitals, nursing homes, motels, hotels, schools, laboratories, computer facilities, aircraft, buses, boats/ships, trains, pet shops and zoos.
Agri-Fos Systemic Fungicide 71962-1 MSDS	Fungicide	Approved Product	Golf Course, Parks, City Forest, Plant Beds	For use on high-value oaks (<i>Quercus</i> spp.) susceptible to Sudden Oak Death, or in experiments with Sudden Oak Death control. When labelling permits, use on an experimental basis for Anthracnose control on sycamores.
AmTide EPA Reg. No. 83851-12 MSDS	Insecticide	Limited Use	Golf Course, Parks, City Forest, Plant Beds	Systemic product that will move up into the plant system after being absorbed by the roots. Place AmTide Imidacloprid 2F T and O near to the portion of the plant that is growing so the chemical can be absorbed. Use a fertilizer containing nitrogen, where it applies, in the solution to enhance the intake of the active ingredient by the plant. Applications can be foliar or soil applications (drenches, broadcast spray, drenches, etc.). A foliar application will provide local systemic activity.
Aquamaster Herbicide 524-343 MSDS	Herbicide	Limited use	Golf Course, Sidewalks,	Terrestrial uses: Spot application of areas inaccessible or too dangerous

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Use near water			ROW, Plant Beds, Parks	for hand methods, right of ways, utility access, or fire prevention. Use for cracks in hardscape, decomposed granite and edging only as last resort. OK for renovations but must put in place weed prevention measures. Aquatic uses: May damage non-target plants. Use for emergent plants in ponds, lakes, drainage canals, and areas around water or within watershed areas.
Bond Spreader-Sticker 34704-50033 MSDS	Adjuvant	Approved Product		Combines the adherence ability of a latex polymer with super coverage of non-ionic surfactants. Bond Max promotes rapid spreading for a uniform protective film across the plant surface, thereby enhancing the effectiveness of pesticide sprays.
Casoron EPA Reg. No. 400-168 MSDS	Herbicide	Approved Product	Golf Course, ROW, Plant Beds, Parks	Pre-emergence herbicide that kills selective weeds and grasses. Casoron 4G controls weeds before they emerge from the ground, by forming an herbicidal vapor barrier in the upper layer of the soil when activated by rainfall or irrigation water. Should be applied before weed seed germination and emergence from the soil (usually from mid-winter to early spring). A single application will usually provide season-long weed control. - handles many problem weeds in and around established woody landscape

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
				ornamentals, non-crop areas, fruit and nut trees and nurseries.
Competitor EPA Reg No. 2935-50173 MSDS	Adjuvant	Approved Product		Aquatically certified ESO with a nonionic surfactant. Enhances wetting and spreading, Assists absorption of active ingredients by increasing their coverage on the target surface. Environmentally friendly, 100% biodegradable and specially formulated for use with aquatic pesticides.
ContraC all-weather Blox EPA Reg. No. 12455-79 MSDS 28772-56-7	Rodenticide Bait	Limited Use	City facilities and city owned properties.	For control of rats and other rodents. Treatment by licensed staff only.
CrossBow EPA Reg No. 62719-260 MSDS	Herbicide	Limited Use	Golf Course, Turf, Parks, plant beds, Forestry	Post-emergent product that targets woody plants and brush – such as blackberries and poison oak – as well as annual and perennial broadleaves, while leaving grasses unharmed.
Debug Turbo EPA Reg No. 70310-5 SDS	Nematicide	Approved Product	Golf Course, Turf, Parks, plant beds	This product is intended for use as an antifeedant, insect repellent, growth regulator and as a pesticide to control insects on agricultural crops. this product should not pose any health concerns if used in accordance with the label directions.
Dithane SDS	Fungicide	Limited Use	Golf Course, Turf, Parks, plant beds, Forests	Broad spectrum ornamental contact fungicide for preventative control of rust, scab and other key diseases

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Docket® DF EPA Reg No. 50534-202-100 SDS	Fungicide	Approved Product	Golf Course, Turf, Parks, plant beds, Forests	Disease control agent that controls a broad spectrum of plant diseases.
Docket® WS, EPA Reg No. 50534-209-100 SDS	Fungicide	Approved Product	Golf Course, Turf, Facilities	For Turf and ornamental diseases.
Dorado EPA Reg No. 100-741 SDS	Fungicide	Limited Use	Golf Course, Turf, Facilities	For Turf and ornamental diseases.
Eco Exempt Jet Wasp and Hornet Killer SDS	Insecticide	Approved Product		Preferred alternative to Wasp Freeze but may not act quickly enough during late summer, when yellow jackets are most aggressive.
Enstar II Insect Growth Regulator (Enstar 5E) EPA Reg No. 2724-476 MSDS	Insecticide	Special Concern	Greenhouse	Targets greenhouse insects at all stages of their life cycle. It mimics juvenile growth hormones that prevent whiteflies, aphids, thrips, scales, mealy bugs and fungus gnats from completing their life cycle, while adult females start laying sterile eggs once they come in contact with the active ingredient (S)-Kinoprene.
Essentria IC3 Exempt/ Natural SDS	Insecticide	Approved Product	Golf Course, Turf, Facilities, Greenhouse	To control accessible, exposed stages of crawling insects. Most effective results are achieved when used as part of a treatment protocol that includes physical, environmental and other chemical pest control measures.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Fiesta EPA Reg No. 67702-26 SDS	Herbicide	Approved Product	Golf Course, Turf, Parks, ROW	For use on sports fields and golf courses as appropriate to treat broadleaf weeds. Treated weeds, moss or algae will turn brown or black. Occasionally a darkening of the grass leaf blades can occur after treatment; however the grass will recover within a few days to weeks.
Fosphite Fungicide EPA Reg No. 68573-2 SDS	Fungicide	Approved Product	Golf Course	Only for use on golf courses. A fungicide for the control of downy mildew, Phytophthora, pythum and various other diseases on agricultural and greenhouse crops. for Turf and forestry applications and domestic trees including conifers, pines, and oaks.
Garlon 4 Ultra 62719-527 SDS	Herbicide	Limited Use	ROW, Facilities, Parks, Forest	Noxious weed control. Use only for targeted treatments of high profile or highly invasive exotics. Follow label requirements regarding exposure to mist.
Garlon 3A 62719-37 SDS	Herbicide Aquatic	Limited Use	ROW, Facilities, Parks, Forest, retention ponds. Used for noxious weed control	For the control of woody plants, broadleaf weeds and vines. May be used near and in standing water sites such as marshes, wetlands, and the banks of ponds and lakes.
Greenmatch EX exemptprod-011/ Natural SDS	Herbicide	Limited Use	ROW, sidewalks, plant beds,	A contact, non-selective, broad spectrum, foliar herbicide. Product does not translocate.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Habitat 241-426 SDS	Herbicide Aquatic	Limited Use	ROW, Facilities, Parks, Forest, retention ponds. Used for noxious weed control	helps protect and reclaim aquatic environments by improving habitat and rising land values for humans and wildlife alike. Specially formulated for use in aquatic applications, Habitat is the most effective tool on the market today for long-term control of emergent, shoreline and wetland woody invasive species in or near water.
Heritage Fungicide 100-1093 SDS	Fungicide	Limited Use	Golf Course, Turf, Parks	Consider/emphasize use of compost tea for preventative; improve aeration and monitoring programs. To be used only as a spot treatment on high profile sports greens.
JT Eaton Bait Block Rodenticide EPA Reg. No. 56-42 MSDS 82-66-6	Rodenticide	Limited Use	Sewer manholes and sewer facilities	For control of rats within the sewer system.
Kaligreen 11581-2 SDS	Fungicide	Limited Use		
Milestone 62719-519 SDS	Herbicide	Limited Use	ROW, Facilities, Park, Open spaces, Forest. Used primarily for noxious weed control	For Control of susceptible weeds and certain woody plants, including invasive noxious weeds.
Millennium™ Ultra 2 228-332 SDS	Herbicide	Limited Use	Golf course, Turf, Parks, plant beds, ROW	Post-emergence selective herbicide specially formulated to control clover and other broadleaf weeds in a single

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
				application. Millennium Ultra 2's composition of 2, 4-D, clopyralid and dicamba provides one of the most effective liquid formulations for broad-spectrum weed control available in the market today.
Nufarm Polaris Herbicide 241-426-228 SDS	Herbicide	Limited Use	Golf course, Turf, Parks, plant beds, ROW	Post-emergent herbicide effectively manages of grasses and broadleaf weeds plus many brush and vines species in order to prepare timber tracts for planting. Provides superb control to a wide variety of broadleaf weeds, brush and vine species and is an economical alternative to mechanical methods. The product encourages seedling survival by removing competition for sunlight, moisture, nutrients and rooting space.
Ortho Home Defense Max Spray (Scotts) EPA Reg. No.239-2663 MSDS 019541007	Insecticide spray treatment	Approved Product	City facilities and buildings, exterior perimeter	For control of insects.
Oust EPA Reg. No. 352-622 SDS	Herbicide	Limited Use	Forestry, Turf	Broad spectrum weed control product that can be used at varying rates for bare ground treatments, selective weeding on roadsides and in other industrial turf applications, or in forestry situations.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Podium 100-937 SDS	Growth Regulator	Limited Use	Golf course, Turf, Parks,	For the reduction of vertical growth of warm and cool season turf grasses. To benefit increased turf density and increase color.
Roundup Pro Herbicide 524-475 MSDS	Herbicide	Limited Use	ROW, Facilities, Park, Open spaces, Forest, plant beds, sidewalks	Used primarily for noxious weed control. Spot application of areas inaccessible or too dangerous for hand methods, right of ways, utility access, or fire prevention. Use for cracks in hardscape, decomposed granite and edging only as last resort. OK for renovations but must put in place weed prevention measures. Note prohibition on use within buffer zone (generally 60 feet) around water bodies in red-legged frog habitat.
Roundup Promax EPA Reg No. 524-579 SDS	Herbicide	Limited Use	ROW, Facilities, Park, Open spaces, Forest, plant beds, sidewalks. Used primarily for noxious weed control	Use of Aquamaster + Competitor is preferred except in situations where rain fastness is needed. Spot application of areas inaccessible or too dangerous for hand methods, right of ways, utility access, or fire prevention. Use for cracks in hardscape, decomposed granite and edging only as last resort. OK for renovations but must put in place weed prevention measures. Note prohibition on use within buffer zone (generally 60 feet) around water bodies in red-legged frog habitat.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Sapphire MSDS	Herbicide	Limited Use	Golf course	Only use on City-owned golf courses.
Secure 71512-20-100 SDS	Fungicide	Approved Product	Golf course	Secure is a broad spectrum fungicide for use to control disease of turf grasses on golf courses only.
Sluggo Slug and Snail Bait	Molluscicide	Approved Product	Facilities, Parks, plant beds, Greenhouse	
Stalker herbicide EPA Reg No. 241-398 SDS	Herbicide	Limited Use	ROW, Facilities, Park, Open spaces, Forest, plant beds, sidewalks	Used primarily for noxious weed control. For invasive species in natural areas where other alternatives are ineffective, especially for invasive legumes and composites such as yellow star thistle and purple star thistle.
Surflan EPA Reg. No. 70506-43 SDS	Pre-emergent Herbicide	Limited Use	Parks, Open spaces, Forests, Golf Course	Pre-emergence seed killer. It is an effective pre-emergent seed and weed control on a broad spectrum of weeds and grasses.
Talstar Professional Insecticide Spray EPA Reg. No. 82657-04357-55-9 MSDS 1349-A	Insecticide Spray	Limited Use	City facilities and buildings.	For control of carpenter ants and wood destroying insects. Applied by licensed City staff only.
Terro Liquid Ant Bait EPA Reg. No. 0-70923-00100-2 MSDS No. 5-1013	Insecticide Bait	Approved Product	City facilities, buildings and city owned properties.	For control of stink ants, pavement ants and garbage ant infestations.

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
T M 4.5 SDS	Fungicide	Approved Product	Turf, Parks, Golf Courses	
Torque EPA REG. NO. 69361-27-1001 SDS	Fungicide	Limited Use	Turf, Parks, Golf Courses	Torque provides long-lasting curative and preventive control against tough ornamental diseases such as scabs, phomopsis, mildews and rusts. Plus, it's easy-to-use, water-based liquid suspension formula prevents settling after mixing.
Turflon Ester EPA Reg. No. 62719-258 SDS	Herbicide	Limited Use	Turf, Parks, Golf Course, Open spaces, Forest, plant beds	Targeted treatment of turf; broadcast application. Note prohibition on use within buffer zone (generally 60 feet) around water bodies. With a new non-petroleum methylated seed oil (MSO) solvent, Turflon® Ester Ultra specialty herbicide offers broad-spectrum postemergence control of early emerging, hard-to-control weeds, including wild violet, oxalis, spurge, clover, dandelion, ground ivy, lespedeza and plantain.
Turfshide EPA Reg. No. 5481-8992 SDS	Fungicide	Limited Use	Turf, Parks, Golf Courses	Prevent soil-borne diseases in turf and labeled ornamentals. TURFCIDE® is an excellent solution for control of persistent diseases of turf — from snow mold and brown patch to leaf spot and dollar spot. Preventative applications may be made in spring and fall. For control of existing turf disease, TURFCIDE should be treated at

Product Name & EPA #	Type	Use Category	Location for Use	Product Use and limitations
Turfshide EPA Reg. No. 5481-8992 SDS				first sign of symptoms. Applied as a soil treatment, TURFCIDE also provides protection against a variety of soil-borne diseases in greenhouses, shadehouses, nurseries, landscapes and field grown ornamentals as well as in interiorscapes. It is available in both granular and liquid formulations. Always refer to the specimen label use and rate recommendations before applying to turf or ornamentals.
Wasp & Hornet Spray EPA Reg. No. 3862-174-66603 MSDS	Insecticide Spray	Limited Use	City facilities and buildings. City owned properties, ROW and open spaces.	Control of Wasps, Bees and Hornet nests for the safety of the public and city staff.

Note: The use of neonicotinoid products will be avoided. Any products containing neonicotinoids will have the highest restriction of use.

Appendix B

Organic/Natural Control Measures

The following list is some of the most commonly used “natural” control measures. The table identifies the product use information and the concerns. The concerns section will address other ecological impacts and also time constraints of staff.

Product & license information	Target Pest	Product/ Use information	Concerns
Avenger®	Weed Killer	Non-selective, post-emergence herbicide that quickly and effectively kills weeds, grasses and broadleaves	Must be applied frequently. Therefore time is a limiting factor
Apple Cider Vinegar Not Licensed for use in public areas	Fungicide & fertilizer	Apple cider vinegar can contain up to 30 trace elements, including petroleum products. If used improperly it will burn desirable plants.	Not labeled for use as a pesticide in Washington. Overuse may lead to changes in soil pH and or may move off site and flow into adjacent drainages.
BurnOut II	Herbicide	BurnOut II Weed & Grass Killer is non selective pesticide to solve weed or grass problems. This blend includes a mix of vinegar, clove oil and other compounds that cause problem plants to wilt.	Product can run off of “target areas” if there is insufficient organic material to capture the product.
C-cide MSDS	Herbicide	Citric acid	
Corn meal	Fungicide & Herbicide	Use as a top dressing to smother weeds and as a mild fungicide. A limitation of the product is that it must be frequently reapplied but can then also build up and create an impenetrable substance.	Must use in large amounts and frequently to be effective. Product may run off from target area and clog drains and increase organic material in aquatic areas.

Product & license information	Target Pest	Product/ Use information	Concerns
Compost teas	Fertilizer & mild fungicide	This multi-purpose fluid can contain beneficial microbes and soluble nutrients that can be a mild fungicide and disease controller.	
Ecosmart MSDS	Weed & Grass Killer	Active ingredient: 2-Phenethyl Propionate, eugenol.	
Herbicidal Soap EPA Reg. No. 67702-8-54705 MSDS	Kills moss, algae and weeds	HERBICIDAL SOAP is a fast-acting weed, algae and moss killer. It does not stain concrete, pavement, stucco or wood. HERBICIDAL SOAP is a non-selective herbicide that can control some annual weeds. This product is not recommended for use of persistent perennial weeds.	WARNING: Causes substantial but temporary eye injury. Causes skin irritation. Harmful if inhaled. Avoid breathing vapor or spray mist. Do not get in eyes, on skin or on clothing. Wear eye protection. This product may be hazardous to aquatic invertebrates. Do not apply directly to water. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Avoid runoff to water bodies or drainage systems.
WEED ZAPPER EPA Reg. No. 1203-68	Weed killer	A liquid, nonselective, persistent, general herbicide designed for use where control of all vegetation is desired. Translocation and root absorption of component herbicide produce extensive kill of weeds, and provides long term residual control.	Hazardous to Humans and Domestic Animals. Causes severe eye and skin damage. This product is toxic to fish and wildlife. Birds and other wildlife in treated areas may be killed. Do not apply directly to water. Do not apply when weather conditions favor drift from area treated. Do

Product & license information	Target Pest	Product/ Use information	Concerns
			not contaminate water by cleaning of equipment or disposal of waste.
<p>Bioganic Killer</p> <p>Not Licensed for public use</p>	Insecticide and repellent	Green Light Products are unique, patented formulations made from plant oils and other ingredients widely used as food and cosmetic additives	
<p>Worry Free®</p> <p>EPA Registration Number: 82052 – 3 - 33116</p> <p>MSDS</p>	Weed & Grass Killer		
<p><u>Concern®</u></p>	Kills moss, algae, weeds	Active ingredient: 3.68% Ammonium salt of fatty acids	

Appendix C

Adopt-A-Spot Program

Adopt-a-Spot Volunteer Job Description & Application

Division/District: City Parks and Public Lands

Project Duration: On-going, year round, unless area is snow covered

Volunteer Leaders and their teams are essential in helping the City preserve and maintain open space, parks and trail areas. Volunteer leaders recruit and manage volunteers to serve as assistants to the Adopt-a-Spot program. They lead volunteer events throughout the year, helping to preserve their designated Adopt-a-Spot area by pulling noxious plants, doing trash sweeps, and potentially participating in planting and seeding projects.

Duties and Responsibilities

Adopters must be ready to provide at least 60 hours in the group's designated adopted spot. This should ideally be spread out 6 – 8 hours a month during the year.

- Volunteer Leaders will oversee and coordinate these projects, recruiting volunteers to visit the assigned open space area to complete a 1 – 3 hour project 2 – 6 times a month during the year. They'll complete tasks focusing on noxious/invasive plant pulls, but also encompassing trash sweeps, graffiti and transient camp reporting, and other necessary tasks.
- If the Volunteer Leader is interested in hosting a planting, seeding, painting, or other more intensive project in their adopted area, they must email the Project Supervisor and this must be approved through the Parks Department.
- Volunteer Leaders are responsible for asking the Project Supervisor for any materials or staff assistance needed at least 2 weeks in advance.
- Volunteer Leaders are responsible for submitting a post project evaluation form each time they host a project at their site. This is emailed to the Project Supervisor within three days of the event.
- Volunteer Leaders will take pictures of volunteer projects and send them to the Project Supervisor with the post project evaluation form.

Working Conditions/Physical Demands

- Ability to work outdoors in 1 – 3 hour intervals in varying degrees of heat and cold, with the possibility of rain, snow, and wind.
- Ability to lift or carry heavy objects or bags. All lifting and carrying must be reasonable to the volunteer's ability.
- Ability to walk distances of up to 2 miles while carrying tools and equipment.

Job Requirements

- Open to following instructions from staff.
- Ability to work in a safe manner while outdoors in multi-use areas.
- Ability to communicate with co-workers, other volunteers, and members of the general public in a courteous, tactful, and professional manner.
- Willingness to commit to coordinating volunteer projects regularly throughout the year.
- Ability to track and report volunteer participation and complete other evaluation forms in a timely manner.
- Willingness to commit to the program for at least one year.

Supplies and Equipment to be used*

Supplies, materials, and equipment will be provided by staff. Volunteers may also use their own tools and equipment but only to complete specified tasks. Safety equipment will be provided when appropriate. Provided equipment may include:

- Trash bags
- Noxious weed Bags when appropriate
- Gloves (provided by volunteers)
- Loppers
- Garden Probes
- Hand Pruners
- Hand Trowels
- Shovels
- Wheelbarrows
- Brooms
- Garden Carts
- Scoops
- Dustpans

*Volunteers should not use any herbicides (organic or synthetic) on public properties. Only WSDA licensed staff should apply any product to publicly owned and maintained properties.

Volunteer Application

Volunteer leads must represent a group of two or more persons. If you are an individual wishing to participate in this program, please contact us to discuss other options regarding your involvement in program stewardship opportunities.

Group leader: _____

Organization/ name of group: _____

Email: _____ phone: _____

Mailing address: _____

Secondary Contact person: _____ Phone: _____

Preferred adoption site: _____

Approximate # of participants: _____

Participant Name: _____ Participant Name: _____

Participant Name: _____ Participant Name: _____

Participant Name: _____ Participant Name: _____

Participant Name: _____ Participant Name: _____

Participant Name: _____ Participant Name: _____

Participant Name: _____ Participant Name: _____

Are there any minors in your group? _____

Participant Name: _____ Parent/ guardian: _____

Participant Name: _____ Parent/ guardian: _____

Participant Name: _____ Parent/ guardian: _____

Participant Name: _____ Parent/ guardian: _____

Participant Name: _____ Parent/ guardian: _____

On behalf of _____ (Group), I have read and agree to the following terms and conditions of the Adopt-a-Spot Program. I agree to abide by all applicable procedures as directed to me by the Open Space Lands Program as an adopter and enforce such policies for the group. I understand my responsibility regarding my group's participation and understand the potential hazards accompanying such work. I understand that if I fail to maintain the area that staff will intervene to manage the location. Staff will select appropriate tools. I will notify the City of any changes in the group's leadership or contact information. I further acknowledge the City may request a criminal history background check on any member of the volunteer group; however, no background check will be performed without that member's permission.

Applicant Name: _____

Applicant Signature: _____ Date: _____

Appendix D

Pesticide Spill Standard Operating Procedure

When a pesticide spill occurs, specific procedures should be followed for providing first aid, notifying proper authorities, and cleaning up and decontaminating the spill area. Personnel working with pesticides, or in areas containing pesticide chemicals, should be adequately trained for quick evacuation and proper spill prevention and emergency procedures as follows:

A. Determine the pesticide involved in the spill incident. Information such as the formulation, percent active ingredient, and manufacturer's name and address should be obtained from the Material Safety Data Sheet (MSDS).

B. All persons working with pesticides should be trained in basic first aid procedures. It must be emphasized that when managing any spill the most immediate concern is for the health and well-being of persons in and around the immediate spill area. Safety and first aid kits and personal protective equipment should be maintained at pest control storage areas and carried on vehicles used for pest control operations. In addition to MSDSs, the telephone numbers of the local medical unit and poison control center should be posted in conspicuous locations and always carried by pest control personnel when on the job.

C. It is recognized that pesticide spill emergencies will differ, but the immediate concern should be to minimize contamination of personnel. Although the sequence may vary, the following basic procedures should be accomplished as rapidly as possible:

PRIOR TO ENTERING A CONTAMINATED AREA, DON PERSONAL PROTECTIVE EQUIPMENT (PPE).

Care of Injured

1. Quickly assess the spill to determine if personnel are involved.
2. Eliminate all sources of ignition (e.g., pilot lights, electric motors, gasoline engines) in order to prevent the threat of fire or explosion from inflammable vapors (if present).
3. If personnel are involved, the rescuer should quickly don necessary protective equipment and remove the injured to a safe location upwind from the spill. If the spill occurs in an enclosed area, doors and windows should be opened to enhance ventilation of the area.
4. Remove contaminated clothing from the victim and/or rescuer, and wash affected areas of body with soap and water. Administer first aid as required by the symptoms/signs and label, which may include flushing contaminated eyes with clean water for 15 minutes.
5. Obtain medical assistance for injured or contaminated persons. Do not leave injured or incapacitated persons alone. Always instruct someone to

stay with them until proper medical assistance is provided or a physician has been informed of the incident.

D. Secure the spill site from entry by unauthorized personnel by roping off the area and posting warning signs. The boundary should be set at a safe distance from the spill. If necessary, obtain assistance from police or fire security unit to ensure site security

E. Spilled pesticides must be contained at the original site of the spill. The pesticide must be prevented from entering storm drains, wells, water systems, ditches, and navigable waterways by following these procedures:

Containment and Control

1. Don appropriate protective equipment from a spill kit.
2. Prevent further leakage by repositioning the pesticide container.
3. Prevent the spill from spreading by trenching or encircling the area with a dike of sand, absorbent material, or, as a last resort, soil or rags.
4. Cover the spill. If the spill is liquid, use an absorbent material appropriate to the type of material. If dry material, use a polyethylene or plastic tarpaulin and secure. NOTE: Use absorbent materials sparingly as they also must be disposed of as wastes.

F. Adequate cleanup of spilled pesticides is essential in order to remove any health or environmental hazards. When cleaning up pesticide spills, it is advisable NOT TO WORK ALONE and to make sure the area is properly ventilated and that appropriate protective equipment is used by all personnel. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses. However, if the release is not an incidental release, only qualified, trained emergency personnel should undertake cleanup operations.

1. Dry spills (dusts, wettable powders, granular formulations) should be picked up in the following manner:
 - (a) immediately cover powders, dusts, or granular materials to prevent them from becoming airborne. This can be done by placing a polyethylene or plastic tarpaulin over the spilled material. Weight the ends of the tarp, especially the end facing into the wind. Begin cleanup operations by systematically rolling up the tarp while simultaneously sweeping up the spilled pesticide using a broom and shovel or dust pan. While sweeping, avoid brisk movements in order to keep the dry pesticide from becoming airborne. If indoors, a cover may not be necessary. When practical, a light sprinkling of water may be used instead of a cover.
 - (b) Collect the pesticide and place in plastic or metal containers. Heavy-duty plastic bags should be used as a last resort as many pesticides may eat

through the plastic bags. Properly secure and label the bags, identifying the pesticide and possible hazards. Set the bags aside for later disposal.

2. Liquid spills should be cleaned up by placing an appropriate absorbent material (floor sweeping compound, sawdust, sand, etc.) over the spilled pesticide. Work the absorbent into the spill using a broom or other tool to force the absorbent into close contact with the spilled pesticide. Collect all spent absorbent material and place into a properly labeled leak-proof container.
3. Depending upon the spilled substance, contaminated soil may have to be removed to depths where no detectable amounts of the substance are evident. Residues may need to be placed in leak-proof containers and labeled.

After these preliminary stages of cleanup have taken place, it may be necessary to further decontaminate and neutralize the area. This is particularly recommended if highly hazardous pesticides are involved. Often a mixture of full-strength bleach and hydrated lime is effective for pesticide decontamination. Work the solution into the spill area with a coarse broom. Add absorbent material to soak up the cleaning solution. Sweep and dispose of the contaminated material. Repeat the procedure until the area is thoroughly decontaminated.

When large amounts of pesticides are spilled on soils, effective decontamination is often not possible. In these instances, the top 2-3 inches of soil should be removed and disposed of. Cover the remaining soil with at least 2 inches of lime, then cover with fresh topsoil.

Where minor spills occur on soil, activated charcoal may be used in cleanup. The charcoal may absorb and tie-up enough chemical to avoid significant long-term injury. Before a spill ever occurs, call your chemical retailer or manufacturer to get information on cleanup of specific chemicals. They can also provide you with special safety advice and other information.

REPORTING

Spills on public property and all spills involving pesticides that are considered to be highly hazardous must be immediately reported to local and state emergency planning personnel. Police or fire officials typically are local contacts to whom such spills should be reported. These agencies will advise you of the proper procedures for cleaning and disposing of accidentally released pesticides. Failure to report such spills is considered to be a violation of the Emergency Planning and Community Right-to-Know Act.

If spills occur within the drinking water source protection areas (Figures 1-6), the spill must also be reported to the Water Utility Manager(360-509-0746) within 24 hours.

Appendix E

Example of Newspaper Announcement:

City of Bremerton

Notice of Herbicide Application

The City of Bremerton will be hand-applying a diluted solution of the herbicide Imazapyr to city arterial street sidewalks beginning April 14, 2014, depending on weather. Imazapyr is recommended by the Washington State University, Kitsap County Extension, as a substitute for the herbicide Glyphosate. This application will be performed by licensed applicators to control weed growth in the concrete expansion joint between the curb/sidewalk, and at the back of sidewalks if needed. Two to three applications of herbicide will be applied throughout the growing season. The streets are:

Kitsap Way, freeway interchange to Callow
6th Street, Callow to Washington
11th Street, Washington to Kitsap Way
Callow, 11th to 1st
Warren Avenue, Burwell to Sheridan
Wheaton Way, Sheridan to Riddell
Burwell, Washington to Callow
Park, Burwell to 11th
Washington, 2nd to 11th
Naval, 1st to 11th
Perry, E. 11th to NE Stone Way
Schley, Samara to Sheridan
National, Kitsap Way to Burwell
Auto Center Way, Loxie Eagans to Kitsap Way
Sheridan, Wheaton Way to Cherry, South Side of Street
Lebo, Wheaton Way to Lion's Park Boat Ramp
Sylvan, Wheaton Way to Olympus

Please contact the City at 473-5920 or Bremerton1@ci.bremerton.wa.us to notify the City if you would prefer the herbicide not be applied to your street frontage. No Spray signs are available for your use. Residents are responsible for controlling vegetation growth on their sidewalk frontage in that case. The Imazapyr Safety Data Sheet is available at the City of Bremerton's web site, www.ci.bremerton.wa.us or 360-473-5920.

Appendix F

City of Bremerton Road Side Right of Way OWNER WILL MAINTAIN AGREEMENT "NO SPRAY"

This application will establish an agreement between City of Bremerton and the property owner to establish an "owner will maintain" area along the City Right of Way. As a property owner in City of Bremerton, I am requesting the City NOT spray adjacent to my property in 20____. I understand that it is now my responsibility to adequately maintain the vegetation along my right of way. I understand that if I do not maintain the area that this agreement becomes null and void and the right of way will be maintained by City staff.

Date: _____ Print Name: _____

Agreement Address: _____ Phone Number: _____

Additional Information: _____

Check One: No Herbicides: _____ No Herbicides or Mechanical Treatment: _____

Installation Instructions

- (1) I agree to post "*owner will maintain*" signs on the borders of my property to clearly mark it. I understand that if I do not properly place the signs so they are clearly visible, then the City may, without prior notice, treat the described area. (signs will be provided by the City and may be obtained at the City Public Works office)
- (2) I agree to periodically inspect the signs for visibility and replace them when needed.
 - a. Place sign with "Owner Will Maintain" on right of way/property line; never place a sign on the shoulder of the road
 - b. Place signs with "Owner Will Maintain" at beginning and end of area not to be treated
- (3) I agree to control undesirable vegetation within the street right of way (or sidewalk) as follows:
 - a. Maximum height of vegetation along the ditches and right of way line should be not higher than one foot
 - b. For sidewalks, remove all sod build-up and trim weeds to 1" or less
 - c. Vegetation must not hinder traffic visibility
 - d. Vegetation must not encroach onto the roadway surface
 - e. All Designated Noxious Weeds must be removed from the right of way. If noxious weeds are not maintained, the City reserves the right to remove noxious weeds through herbicide spot treatments.
- (4) This agreement shall remain in force without need of renewal when all the following conditions exist:
 - a) Agreement is filed with the City,
 - b) Approved signage is clearly displayed,
 - c) Right of way is properly maintained within City Standards,

I hereby agree to adequately control vegetation on the right of way.

Signature: _____

Please Note: If a Noxious Weed is identified during the spray year in your area, pesticide will be applied regardless of the no-spray request. If you have a no-spray request for the current year in which a public health threat is identified, you will be given a 24 hour notice before spraying begins.

Also Please Note: This "no spray" agreement is separate and not related to the Pesticide Sensitive Individual Registration program administered under RCW 17.21.430 by the Washington State Department of Agriculture. Additional information on this program is attached at Appendix G.

Appendix G

WSDA Pesticide Sensitive Individuals Registration Program



FACT SHEET

Registration of Pesticide Sensitive Individuals

This fact sheet summarizes the provisions passed by the Washington State Legislature for pesticide sensitive individuals which includes the development and distribution of a list of pesticide-sensitive individuals by the department to certified applicators.

- * Individuals desiring to be placed on the list must submit to WSDA the application form provided by the department. A physician who currently holds a license to practice medicine in Washington State must certify that an individual is sensitive to pesticides.
- * The application form must be completed with all requested information. Incomplete applications will not be accepted. Inaccurate information may interfere with the ability to provide adequate notification.
- * The pesticide sensitive list will be mailed to certified applicators by January 1 (with a registration cut-off date of December 1), and June 15 (with a registration cut-off date of April 15) of each year. Registration cut-off dates are set to allow time for updating and printing the list. If the inclusion of a name on the list occurs after one of the registration cut-off dates, a person may want to notify the certified applicators in their area of their sensitivity status.
- * All individuals who have applied to be on the pesticide sensitive list will receive verification that their name has been added to the list.
- * Certified applicators making landscape or right-of-way applications are required to notify any person on the pesticide sensitive list of any pesticide application to an adjoining property.
- * It is the pesticide sensitive individual's responsibility to notify the department of any changes in their name and address, changes in information concerning adjoining properties, or any change in their sensitivity to pesticides.
- * The pesticide sensitive individual list expires December 31 of each year. The department will mail renewal applications in October of each year to all individuals on the list.

If you have any questions or require additional information, please contact the Pesticide Management Division, Compliance Branch at telephone (360) 902-2073.

Pesticide Sensitive Individual application: <http://www-stage.agr.wa.gov/PestFert/Pesticides/docs/SensIndivApplic4112.pdf>



PESTICIDE SENSITIVE INDIVIDUAL APPLICATION

Washington State Department of Agriculture
Pesticide Management Division
PO Box 42589
Olympia, WA 98504-2589

Return application to address shown above right

PART I – Pesticide Sensitive Individual

Based on the information provided on the completed form below, I request that my name be placed on the Washington State Department of Agriculture List of Pesticide Sensitive Individuals. I understand that this is an annual registration, and the list will expire each year on December 31. It is my responsibility to renew this registration, and to notify the department of any changes in the information below.

SIGNATURE DATE

NOTE: The list of Pesticide Sensitive Individuals is distributed by January 1 and June 15 of each year to certified applicators likely to make landscape applications. If you register after distribution of the list, you may wish to notify certified applicators operating in your area.

Please Print Legibly or Type the Below Requested Information

LAST NAME		FIRST NAME		MIDDLE INITIAL
PHYSICAL ADDRESS – Street Address			APT. #	DAY TIME PHONE NUMBER ()
CITY	STATE	ZIP		EVENING PHONE NUMBER ()
COUNTY OF RESIDENCE		EMAIL ADDRESS		
MAILING ADDRESS – If different than above				
CITY		STATE	ZIP	
Is your residence located within a multi-family dwelling? (Please check one): <input type="checkbox"/> Yes <input type="checkbox"/> No If your answer is YES, please complete the following:				
MANAGER'S / OWNER'S NAME			PHONE NUMBER ()	
ADDRESS			APT. #	
CITY	STATE	ZIP	APARTMENT COMPLEX NAME (IF APPLICABLE)	

Pesticide Sensitive Individual: Please also complete Part III on Page 2, then have your physician complete Part II below

PART II – Physician's Medical Certification

I currently hold a license to practice medicine in the state of Washington, and I certify that the above-named individual is sensitive to pesticides.

PHYSICIAN'S SIGNATURE DATE

PRINT OR TYPE PHYSICIAN'S NAME			PHONE NUMBER ()	
BUSINESS ADDRESS			SUITE #	
CITY	STATE	ZIP	FAX NUMBER	
WEBSITE ADDRESS			EMAIL ADDRESS	

Bremerton Integrated Vegetation Management Plan April 2022 () Page 78

PART III – Adjacent Properties

The following properties are adjacent (*directly connecting*) properties next to your property. (DO NOT INCLUDE ADDRESSES ACROSS THE STREET FROM YOUR RESIDENCE.) This portion must be completed to provide adequate notification of anticipated pesticide applications.

1 STREET ADDRESS – <i>Street No., Name, Apt. #</i>		CITY	STATE	ZIP
PROPERTY OWNER – LAST NAME		FIRST NAME		PHONE NUMBER ()
2 STREET ADDRESS – <i>Street No., Name, Apt. #</i>		CITY	STATE	ZIP
PROPERTY OWNER – LAST NAME		FIRST NAME		PHONE NUMBER ()
3 STREET ADDRESS – <i>Street No., Name, Apt. #</i>		CITY	STATE	ZIP
PROPERTY OWNER – LAST NAME		FIRST NAME		PHONE NUMBER ()
4 STREET ADDRESS – <i>Street No., Name, Apt. #</i>		CITY	STATE	ZIP
PROPERTY OWNER – LAST NAME		FIRST NAME		PHONE NUMBER ()
5 STREET ADDRESS – <i>Street No., Name, Apt. #</i>		CITY	STATE	ZIP
PROPERTY OWNER – LAST NAME		FIRST NAME		PHONE NUMBER ()

Please mail this completed form to:

WSDA, Pesticide Management Division, P.O. Box 42589, Olympia, WA 98504-2589.

A copy will be returned to you with the section below completed as verification that your name has been placed on the list.

PART IV – Department Verification

Your receipt of this document is verification that your name has been placed on the Washington State Department of Agriculture Individuals Sensitive to Pesticide List. It is your responsibility to notify the department of any change in your address, telephone number, ownership of adjacent property, or change in your pesticide sensitivity condition.

_____ DEPARTMENT REPRESENTATIVE

_____ DATE PLACED ON REGISTER

_____ IDENTIFICATION NUMBER

_____ EXPIRATION DATE

Appendix H Reference Information

Plan Examples

City of Calgary Integrated Pest Management Plan

(<http://www.calgary.ca/CSPS/Parks/Documents/Planning-and-Operations/Pest-Management/integrated-pest-management-plan.pdf?noredirect=1>)

City of Portland Parks & Recreation's Integrated Pest Management Program

(<http://eastportland.org/portland-parks-recreations-integrated-pest-management-program>)

City of San Francisco's Reduced Risk Pesticide List

(http://www.sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf)

City of Seattle Public Works and Parks Department IPM

(<http://www.seattle.gov/parks/projects/BMP/chapter3.pdf>)

City of Eugene IPM-Policy and Operations Manual

(https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0CCYQFjAB&url=http%3A%2F%2Fwww.eugene-or.gov%2FDocumentCenter%2FHome%2FView%2F3330&ei=VXmVIbBBdDWoASVjoGADw&usg=AFQjCNHYK-67PZOB8Bmx4GIXbv5Kb_4iGQ&sig2=mwH8s8T8V_KCpbkFhvwnfQ&bvm=bv.86475890.d.cGU)

City of Vancouver BC Parks and recreation IPM guide (<http://www.cnv.org/Parks-Recreation-and-Culture/Parks-and-Greenways/~media/City%20of%20North%20Vancouver/Documents/Plans%20Policies%20and%20Bylaws/Integrated%20Pest%20Management%20Policy.ashx>)

General Information

Washington State Department of Agriculture 2013 Annual Report to the Legislature

(<http://www.growersleague.org/support-files/pesticide-management-annual-report-to-legislature-2013.pdf>)

Washington State Department of Agriculture No-spray Buffer Zones

(<http://agr.wa.gov/PestFert/natresources/buffers.aspx>)

Washington State University Urban IPM and Pesticide Safety Education materials

(<http://pep.wsu.edu/library.html>)

Washington State Department of Agriculture, 2013 Surface water monitoring Program for Pesticides in Salmon-Bering Streams. (<http://agr.wa.gov/FP/Pubs/docs/411-SWM2013Report.pdf>)

San Miguel County Noxious Weed Management plan (Adopted October 2002) :
http://www.coopext.colostate.edu/sanmiguel/SMCweeds/SMCweeds_docs/SM%20Co%20weed%20plan%202002.pdf

Cornell 2014 guide to Turf Management – <http://store.cornell.edu/p-189426-2014-cornell-guide-for-commercial-turfgrass-management.aspx>

Environmental fate of pesticides

LP Wackett - Environmental microbiology, 2007 - Wiley Online Library
... Environmental fate of pesticides. An annotated selection of World Wide Web sites relevant to the topics in environmental microbiology. Lawrence P. Wackett.

Washington Department of Agriculture Non-Agricultural pesticide use in Puget Sound Counties
<http://agr.wa.gov/FP/Pubs/docs/103-409PSReportfinal2014.pdf>

Washington Department of Ecology, 2011. Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in the Puget Sound Basin 2007-2011. Publication Number 11-03-055, 297 pages The 2014/2015 Action Agenda for Puget Sound
http://www.psp.wa.gov/downloads/2014_action_agenda/Final%202014%20action%20agenda%20update/2014-2015_Action_Agenda_for_Puget_Sound.pdf

JN Seiber - 2002 - Assessing the transport and fate of pesticides in the environment is complicated. There are a myriad of transport and fate pathways at the local, regional, and global levels.

EPA Integrated Pest Management (IPM) Principles
<http://www.epa.gov/opp00001/factsheets/ipm.htm>

Colorado Environmental Program Least-toxic Products by Product Name
http://www.austintexas.gov/sites/default/files/files/Watershed/growgreen/least_toxic_products_by_product_name.pdf

Oregon Pesticide Fact Sheet: Glyphosate
<http://www.oregon.gov/odf/privateforests/docs/glyphosate.pdf>

Washington Toxics Coalition, use of various publications
<http://www.watoxics.org/publications>

USGS Pesticides in the Nation's Streams and Ground Water, 1992–2001—A Summary
<http://pubs.usgs.gov/fs/2006/3028/>