Operations & Maintenance Practices and Polices Manual

February 2015

Prepared by:
City of Kenmore
Public Works

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FOREWORD

The City of Kenmore Operations & Maintenance (O&M) Policies and Procedures Manual was developed to comply with requirements of the Federal Clean Water Act-National Pollutant Discharge Elimination System Program and the Western Washington Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology. The intent of these policies and procedures is to reduce stormwater impacts and pollutants in discharges from O&M activities. This manual provides a general overview of what industry standard Best Management Practices (BMPs), policies, procedures, practices, standards or plans are used by City of Kenmore O&M staff, contractors or partners when conducting specific O&M activities.

ACKNOWLEDGEMENTS

City of Kenmore, Public Works Department
Richard Sawyer, Surface Water Program Manager
Jennifer Gordon, Public Works Operations Manager
Arthur Simpson, Surface Water Technician

VERSIONS

2015 OMPPM – February 5, 2015

OMPPM Version 1.2 – 3/13/2012

OMPPM Version 1.1 – 12/29/2010

OMPPM Version 1.0 – 2/4/2010

OVERVIEW

The City of Kenmore (Kenmore) is responsible for the operation and maintenance (O&M) of its infrastructure, including: streets, traffic (signs & markings and traffic signals), surface water and parks. Many O&M activities have the potential to adversely impact the environment. In particular, contaminated runoff poses a significant risk to the quality of surface and ground waters.

Since the passage of the federal Clean Water Act, requirements for cities and counties to control the quality of stormwater runoff have become more stringent. In particular, Kenmore has been issued a Western Washington Phase II Municipal Stormwater Permit (Permit) from the Washington State Department of Ecology (Ecology) in 2007, 2012 and 2013. The Permit requires that standards, policies and procedures be developed for a list of specific O&M activities as part of Kenmore's Stormwater Management Program (SWMP). The structure of this document will be modeled after these requirements. This document, the Operations and Maintenance Policies and Procedures Manual (OMPPM) is intended to compliment the SWMP and the City's Surface Water Master Plan.

DOCUMENT STRUCTURE

The Permit, which can be downloaded in its entirety on Washington State Department of Ecology's webpage, outlines six sections of O&M requirements that must be implemented by the City.

Section 1 requires the development of maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington (SMMWW). Current maintenance standards in Kenmore were adopted from the 2009 King County Surface Water Design Manual (SWDM) and are provided in Appendix A. Public and private surface water facilities are inspected and maintained to these standards.

Section 2 requires the development of an inspection program that consists of three elements. First, the City must annually inspect all municipally owned or operated permanent stormwater treatment and flow control BMPs/facilities, other than catch basins. Second, the City must "spot check" potentially damaged permanent treatment and flow control BMPs/facilities (other than catch basins) after major storms. Major storms are defined as a 24 hour storm event with a 10 year or greater recurrence interval. Third, the City must inspect all the catch basins owned or operated by Kenmore by August 1, 2017 then at least every two years thereafter.

Section 3 requires the implementation of practices, policies and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by Kenmore, and road maintenance activities under the functional control of Kenmore.

Section 4 requires an ongoing training program for employees of Kenmore whose construction, operations or maintenance job functions may impact stormwater quality. This section describes relevant training for Kenmore staff and appendix E provides up to date training logs for Kenmore personnel.

Section 5 requires development of a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards and material storage facilities owned or operated by Kenmore. Kenmore stores sweeping materials at a facility located in Rhododendron Park. Kenmore also utilizes the Lake Forest Park maintenance yard, and a copy of this facility's SWPPP can be obtained by contacting Lake Forest Park.

ACRONYMS AND DEFINITIONS

BMP means Best Management Practice.

Best Management Practice means a schedule of activities, prohibitions of practices, physical structures, maintenance procedures and other management practices undertaken to reduce or prevent increases in runoff quantity and pollution.

CESCL means Certified Erosion and Sediment Control Lead.

Certified Erosion and Sediment Control Lead means an individual who has satisfied the requirements set forth in Ecology's Stormwater Management Manual for Western Washington (Volume II, Chapter 4, BMP C160) for the designation of certified erosion and sediment control lead.

Ecology means the Washington State Department of Ecology.

ESC means Erosion and Sediment Control.

Facility means drainage facilities, including either flow control or water quality facilities.

Flow Control Facility means a drainage facility designed to mitigate the impacts of increased surface and storm water runoff generated by site development in accordance with the drainage requirements in KMC Chapter 13.35. Flow control facilities are designed either, to hold water for a considerable length of time and then release it by evaporation, plant transpiration, or infiltration into the ground, or to hold runoff for a short period of time and then release it to the conveyance system.

Maintenance (also Operations and Maintenance) means those usual activities taken to prevent a decline, lapse, or cessation in the use of currently serviceable structures, facilities, equipment, or systems if there is no expansion of the structure, facilities, equipment, or system and there are no significant hydrologic impacts. Maintenance includes the repair or replacement of non-functional facilities and the replacement of existing structures with different types of structures, if the repair or replacement is required to meet current engineering standards or is required by one or more environmental permits and the functioning characteristics of the original facility or structure are not changed.

NPDES means National Pollutant Discharge Elimination System.

National Pollutant Discharge Elimination System means the part of the federal Clean Water Act which requires point source discharges to obtain permits. These permits, referred to as NPDES permits, are administered by the Washington State Department of Ecology.

OMPPM means Operations and Maintenance Policies and Procedures Manual.

O&M means Operations and Maintenance. See Maintenance.

RRMPG means Regional Road Maintenance Endangered Species Act Program Guidelines.

Regional Road Maintenance Endangered Species Act Program Guidelines means the manual developed by the Regional Road Maintenance Technical Working Group that provides a consistent, Regional Program that can be used by any agency wishing to limit, reduce or eliminate the prohibition on take of threatened species under the 4(d) Rule (NMFS), special 4(d) rule and/or Section 7 take exemption (USFWS).

SPPM means the Stormwater Pollution Prevention Manual.

Stormwater Pollution Prevention Manual means the manual referenced in KMC 13.45, Water Quality, including supporting documentation referenced or incorporated in the manual, describing best management practices and procedures for eliminating or reducing surface, storm and ground water contamination from existing facilities and existing and new activities not covered by the SWDM.

SWDM means 2009 King County Surface Water Design Manual.

SMMWW means the 2005 Ecology Stormwater Management Manual for Western Washington.

Water Quality Facility means a drainage facility designed to reduce pollutants once they are already contained in surface and storm water runoff. Water quality (WQ) facilities are a structural component of best management practices (BMPs). When used singly or in combination, WQ facilities reduce the potential for contamination of both surface and ground waters.

WQ means water quality.

SECTION 1 – MAINTENANCE STANDARDS

Ordinance 10-0305, approved by Kenmore City Council on January 11, 2010, adopted the 2009 King County Surface Water Design Manual (SWDM). Appendix A of the SWDM contains maintenance standards for flow control, conveyance and water quality facilities in Kenmore (equivalent to Ecology's 2005 Stormwater Management Manual for Western Washington). Prior to January 11, 2010 Kenmore used the maintenance standards in the 1998 King County Surface Water Design Manual.

The City will adopt new maintenance standards that are as protective, or more protective, of facility function than those specified in Ecology's 2012 Stormwater Management Manual for Western Washington by December 31, 2016.

The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facilities required condition at all times between inspections.

Unless there are circumstances beyond Kenmore's control, when as inspection identifies an exceedence of the maintenance standard, maintenance shall be performed:

- Within 1 year for typical maintenance of facilities, except catch basins
- Within 6 months for catch basins
- Within 2 years for maintenance that requires capital construction of less than $25,000

Circumstances beyond Kenmore's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedence of the required timeframe, Kenmore shall document the circumstances and how they were beyond their control.

A copy of the SWDM maintenance standards can be found in appendix A of this document.

SECTION 2 – INSPECTION PROGRAMS

Facility Inspections

Storm water facilities are engineered facilities that are designed to convey storm runoff, remove pollutants, and control flow rates. The City categorizes surface and storm water facilities as either privately or publicly maintained.

Publicly maintained facilities are often developed as part of a plat or subdivision and are transferred to the City after successfully passing a two year maintenance defect inspection (with associated repairs if needed). Publicly maintained facilities are required to be in the right-of-way, dedicated tract or easement. Currently, Kenmore inspects and conducts maintenance on 175 publicly maintained facilities, annually (Map 2-1, Table 2-1). Another 18 facilities are currently under bond and will eventually be added to the City's public facility list. Kenmore contracts with Lake Forest Park, King County Roads Maintenance and private contractors to conduct facility maintenance.

Privately maintained facilities are developed as part of a private development and are privately owned and maintained. Often, these facilities are part of a commercial or industrial development but can include plats and subdivision facilities that are not accepted by the City. Currently, Kenmore inspects 107 privately maintained facilities, annually (Map 2-2, Table 2-2). Upon inspection, Kenmore staff provide maintenance correction lists to private facility owners which outline any necessary work needed to comply with maintenance standards. Property owners are required to conduct any needed maintenance on privately maintained facilities.

Catch Basin Inspections

The Permit requires that all catch basins and inlets owned or operated by Kenmore be inspected and maintained once by August 1, 2017 and then every two years thereafter. Before 2010, catch basins and associated conveyance structures were inspected and maintained as needed. In 2010, Kenmore began conducting annual inspections of publicly owned and operated catch basins and associated conveyance structures, which exceeds Permit requirements. In addition to maintenance needs, Kenmore inspectors check catch basins for water quality issues, such as illicit discharges. Catch basin cleaning is conducted by a private contractor and a new contract is implemented every two to three years. Lake Forest Park and King County Roads Maintenance conduct conveyance system maintenance as needed.

Spot Check Inspections

Spot checks of potentially damaged permanent treatment and flow control facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval) are required. During the ten year span from 2005 through 2014, three storm events met, or were close to, the definition of a major storm. In reality, Kenmore conducts spot check inspections more frequently to ensure that facilities are functioning properly. Kenmore contracts with Lake Forest Park to conduct these inspections.

Applicable permanent treatment and flow control facilities that could potentially be damaged after major storms are at a risk for the following; high potential for flood damage, high potential for debris accumulation, high potential for control structure failure and/or documented historical problems. Facilities that go into overflow as designed are not considered at risk. Currently, the City inspects many culvert crossings, ditches, roadway areas and facilities susceptible to flooding (Map 2-3) after major storm events.

24-hour-10-year recurrence interval rainfall in Kenmore ranges from 2.3 to 2.5 inches of rain in a 24 hour period. Refer to Figure 2-1 for details (10-Year 24-Hour isopluvials taken from SWDM).

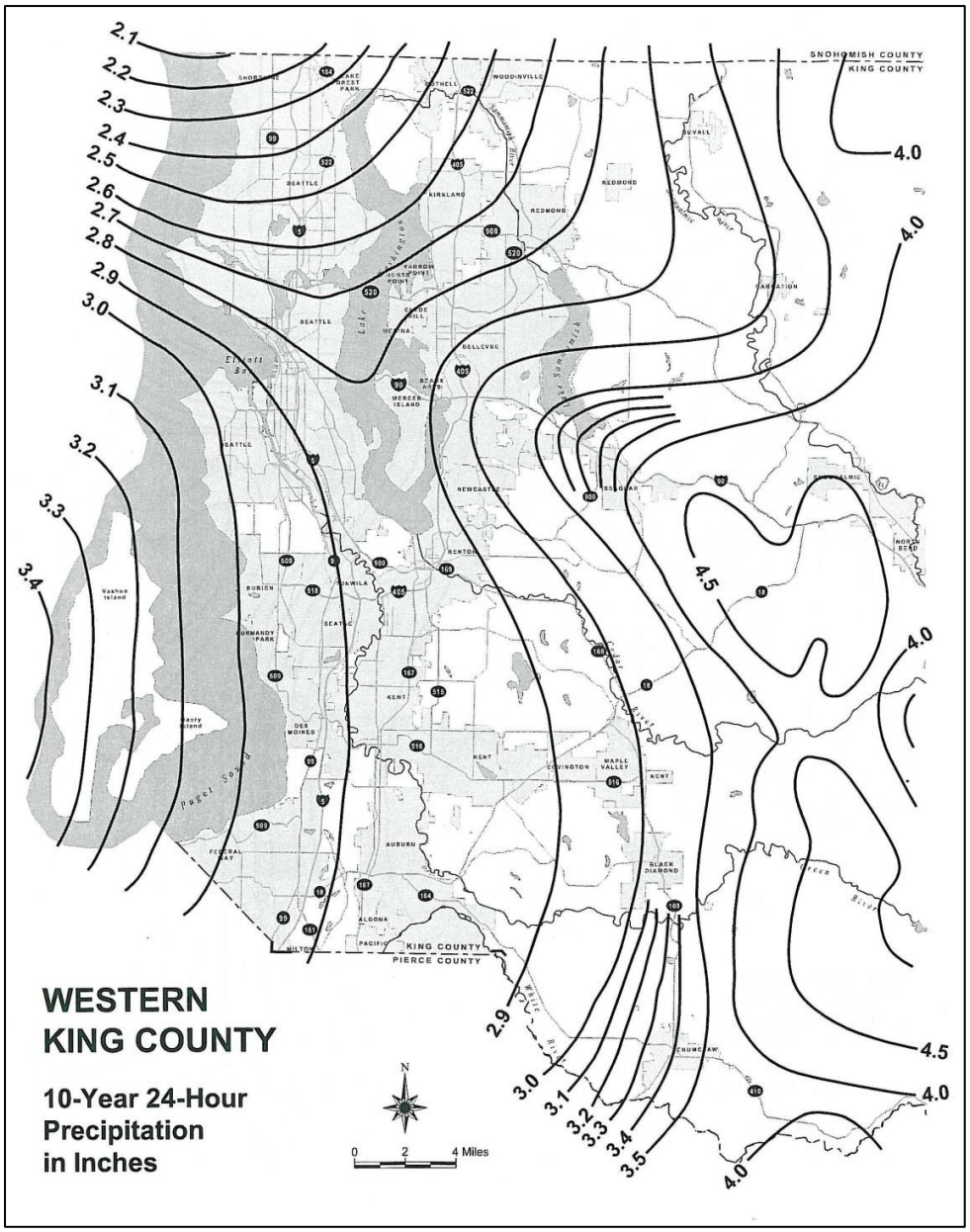

FIGURE 2-1 Isopluvials for 10-year 24-hour recurrence interval rainfall storm events for Western Washington. Taken from King County Surface Water Design Manual.

MAP 2-1 PUBLICLY MAINTAINED FACILITIES

TABLE 2-1 PUBLICLY MAINTAINED FACILITIES

MAP 2-2 PRIVATELY MAINTAINED FACILITIES

TABLE 2-2 PRIVATELY MAINTAINED FACILITIES

MAP 2-3 STORM SPOT CHECKS

SECTION 3 – PRACTICES, POLICIES & PROCEDURES

Practices, policies and procedures (hereby referred to as policies) have been developed by Kenmore to reduce the impacts associated with runoff from lands owned or maintained by Kenmore, which include streets, parking lots, roads, buildings, parks, open space, road rights-of-way, maintenance yards and stormwater facilities owned or maintained by Kenmore. This section describes Kenmore's O&M policies by describing typical O&M activities and how they are applied to various publicly owned and maintained lands.

Typical O&M activities are described in detail in *O&M Activity Worksheets* included in section 3.1. Descriptions of O&M policies for specific land uses and associated O&M activities are provided in *O&M Land Use Worksheets* included in section 3.2.

SECTION 3.1 O&M ACTIVITY WORKSHEETS

The following O&M Activity Worksheets address the following 15 activities:

(1) Pipe cleaning,
(2) Cleaning of culverts that convey stormwater in ditch systems,
(3) Ditch maintenance,
(4) Street cleaning,
(5) Road repair and resurfacing, including pavement grinding,
(6) Snow and ice control,
(7) Utility installation,
(8) Pavement striping maintenance,
(9) Maintaining roadside areas, including vegetation management,
(10) Dust control,
(11) Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and presticides using alternatives that minimize environmental impacts,
(12) Sediment and erosion control,
(13) Landscape maintenance and vegetation disposal,
(14) Trash and pet waste management, and
(15) Building exterior cleaning and maintenance.

Each O&M Activity Worksheet contains the following sections:

Description – A short description of what typical maintenance in the category includes.

Performance Criteria – A general description of Kenmore practices that promote proper structure operation and reduces stormwater impacts associated with runoff.

Maintenance Standard – Any applicable maintenance standards are referenced in this section. Maintenance standards are differentiated from procedural criteria by the fact that they have a numeric threshold versus un-quantified observations (i.e. clean a structure when you have x amount of material versus clean a structure when material accumulation is judged to be an issue). Currently, maintenance

standards only apply to flow control and water quality stormwater facilities and stormwater conveyance structures.

Current Contracts – Many activities are contracted to outside agencies or private contractors. This section will reference the appropriate entity contracted to do the activity. Companies or agencies conducting work in Kenmore are expected to comply with Kenmore and Permit regulations.

Policy, Procedure, BMP – This section outlines what policies, procedures or BMPs are applicable to road maintenance activities conducted by Kenmore or contracted businesses/agencies. This section often references the Regional Road Maintenance Program Guidelines (RRMPG), which can be found on King County's webpage (http://www.kingcounty.gov). The RRMPG were developed by a consortium of public agencies in 2002 in an effort to create O&M policies that jurisdictions could utilize to reduce road maintenance activities' impacts on surface waters and habitat. The effort was driven by the 1999 listings of several salmonids under the Endangered Species Act. Additionally, Kenmore has adopted the 2009 Kenmore Stormwater Pollution Prevention Manual which outlines Best Management Practices (BMPs) for property and business owners in Kenmore. BMPs may be schedules of activities, prohibitions of practices, physical structures, maintenance procedures and other management practices undertaken to reduce or prevent increases in runoff quantity and pollution.

O&M ACTIVITY 1 – PIPE CLEANING

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 1 – PIPE CLEANING

DESCRIPTION:

Removal of dirt, debris and other materials from enclosed drainage systems by using a vactor with a jet rodder.

PROCEDURAL CRITERIA:

Enclosed drainage systems should be cleaned of trash, debris, sediment and/or any other material when they are functionally restricted.

MAINTENANCE STANDARD (if applicable):

King County Surface Water Design Manual, Appendix A, Section 6 – Conveyance Pipes and Ditches (also in found in appendix A of this manual)

Current Contracts (Updated JAN 2015):

- Innovative Vacuum Services, Inc. (12-C1075)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #3 – Cleaning enclosed drainage systems
Part 2 BMPs (2.166) – Vactoring

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 2 – CLEANING OF CULVERTS THAT CONVEY STORMWATER IN DITCH SYSTEMS

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 2 – CLEANING OF CULVERTS THAT CONVEY STORMWATER IN DITCH SYSTEMS

DESCRIPTION:

Removal of dirt, debris and other materials from culverts by using a vactor with a jet rodder.

PERFORMANCE CRITERIA:

Culverts should be cleaned of trash, debris, sediment and/or any other material when they are functionally restricted.

MAINTENANCE STANDARD (if applicable):

King County Surface Water Design Manual, Appendix A, Section 6 – Conveyance Pipes and Ditches (also in found in appendix A of this manual)

Current Contracts (Updated JAN 2015):

- Innovative Vacuum Services, Inc. (12-C1075)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #3 – Cleaning enclosed drainage systems
Part 2 BMPs (2.166) – Vactoring

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 3 – DITCH MAINTENANCE

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 3 – DITCH MAINTENANCE

DESCRIPTION:

All ditch maintenance activities using a front end loader, a Drott, vactor or a backhoe.

PERFORMANCE CRITERIA:

Ditches should be routinely maintained to ensure adequate roadside drainage. Bucket ditching should be performed when using a road grader in impractical due to: extreme depth of ditch, short distances between culverts or spot cleaning.

MAINTENANCE STANDARD (if applicable):

King County Surface Water Design Manual, Appendix A, Section 6 – Conveyance Pipes and Ditches (also in found in appendix A of this manual)

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- Innovative Vacuum Services, Inc. (12-C1075)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions: Maintenance Category #4 – Open drainage systems

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 4 – STREET CLEANING

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 4- STREET CLEANING

DESCRIPTION:

Removal of dirt, debris and other material by vacuum sweeping. Removal of sand after snow and ice control operations.

PERFORMANCE CRITERIA:

Sweeping provides a safe roadway surface for the traveling public, minimizes contamination of stormwater and reduces airborne dust. Roadways should be swept when they begin to show an accumulation of material and after snow and ice control operations where sand has been used.

MAINTENANCE STANDARD (if applicable):

- Not applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #8 – Street surface cleaning
Part 2 BMPs (2.152) – Sweeping

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 5 – ROAD REPAIR AND RESURFACING, INCLUDING PAVEMENT GRINDING

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 5 – ROAD REPAIR AND RESURFACING, INCLUDING PAVEMENT GRINDING

DESCRIPTION:

Repair, replace, install or maintain roadway surfaces. Activities include, but are not limited to: pothole and square cut patching; removing paved surface or roadway base; repairing roadway base; repaving; adding gravel or grading roads; access roads, or ROW surfaces; dust control; extending pavement edge; paving graveled shoulder; crack sealing; overlay; chip seal; and resurfacing.

PERFORMANCE CRITERIA:

Road repairs are performed to provide a safe roadway surface for the traveling public and to reduce further roadway deterioration or failure. Potholes are repaired as they occur within established guidelines to reduce accidents, vehicle damage and adverse environmental impacts.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #1 – Roadway surface
Maintenance Category #12 – Concrete

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 6 – SNOW AND ICE CONTROL

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 6 – SNOW AND ICE CONTROL

DESCRIPTION:

Road maintenance crews are responsible for sanding and plowing operations during periods of freezing weather. Snow and ice removal is considered to be work of such importance that it is classified as an emergency operation. Safety for the traveling public and road department personnel shall be given primary consideration at all times. Snow and ice removal reduces vehicle accidents that may adversely impact sensitive areas. Post-event cleanup is considered a continuation of the event and removal of sediment from the road surface reduces sediment loading and preserves water quality.

PERFORMANCE CRITERIA:

Snow and ice control is performed during periods of freezing weather when slippery road conditions pose a risk to the safety of the traveling public.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions: Maintenance Category #10 – Snow and ice control

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 7 – UTILITY INSTALLATION

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 7 – UTILITY INSTALLATION

DESCRIPTION:

Water and sewer utilities are owned and operated, within Kenmore ROW, by the Northshore Utility District. Electric and gas utilities are owned and operated, within Kenmore ROW, by PSE. Communication utilities are owned and operated, within Kenmore ROW, by various companies.

PERFORMANCE CRITERIA:

Utility maintenance is required to provide a safe and consistent service of water, sewer, power and communications in Kenmore. Utility work is administered through Right-of-Way permits.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Utility Franchise Agreements

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #1 – Roadway surface
Maintenance Category #12 – Concrete
Maintenance Category #13 – Sewer Systems
Maintenance Category #14 – Water Systems

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 8 – PAVEMENT STRIPING MAINTENANCE

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 8 – PAVEMENT STRIPING MAINTENANCE

DESCRIPTION:

Pavement striping is required for a functioning and safe roadway.

PERFORMANCE CRITERIA:

Pavement striping maintenance is needed when existing (or lack of) striping impairs the function and/or safety of the roadway.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- King County Roads Maintenance ILA (98-C15)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions: Maintenance Category #1 – Roadway surface

Follow state and federal guidelines for handling paint and other traffic marking materials.

Stripe roadways in dry weather.

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 9 – MAINTAINING ROADSIDE AREAS, INCLUDING VEGETATION MGMT.

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 9 – MAINTAINING ROADSIDE AREAS, INCLUDING VEGETATION MANAGEMENT

DESCRIPTION:

Maintenance on roadside areas improve drainage, restore proper grade, restore filtering capability, maintain vegetation to provide adequate sight distance, smooth rutting and remove buildup of sediment before entering drainage system.

PERFORMANCE CRITERIA:

Maintenance of roadside areas is needed when proper drainage is compromised, sight distance is below acceptable levels or roadway safety is being impaired.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)
- Northwest Landscaping Services Contract (13-C1160)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
Maintenance Category #1 – Roadway surface
Maintenance Category #7 – Gravel Shoulders
Maintenance Category #15 – Vegetation

Have all applicable environmental/regulatory permits on site during project.

Have spill kits available.

Monitor BMPs during and following project until site conditions stabilize.

Remove BMPs according to RRMPG.

O&M ACTIVITY 10 – DUST CONTROL

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 10 – DUST CONTROL

DESCRIPTION:

Dust control is the use of water, products and/or measures for reducing wind erosion. Particles moved by wind may cause air pollution, soil loss and/or water quality degradation.

PERFORMANCE CRITERIA:

Any maintenance activity that has the potential to produce dust or any kind of airborne matter needs to apply dust control BMPs.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Applicable to any work in Kenmore with all contracts

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions:
All maintenance categories.
Part 2 BMPs (2.61) – Dust Control

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-44 (Dust Control and Soil Erosion and Sediment Control for Manufacturing and Other Commercial Operations)

O&M ACTIVITY 11 – APPLICATION OF FERTILIZERS, PESTICIDES AND HERBICIDES

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 11 – APPLICATION OF FERTILIZERS, PESTICIDES AND HERBICIDES

DESCRIPTION:

Pesticides and herbicides are chemicals or biological agents applied to a target pest as a control measure. Fertilizers are chemical or natural substances composed of target nutrients added to soil or land to increase fertility.

PERFORMANCE CRITERIA:

Application of fertilizers, pesticides and herbicides may be needed to effectively maintain healthy, vibrant landscapes in Kenmore.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)
- King County CWP Contract (09-C787)
- Northwest Landscape Services Contract (13-C1160)

Policy, Procedure, BMP:

Pesticides and Herbicides

For application of pesticides and herbicides refer to Appendix B – City of Kenmore Integrated Pest Management (IPM) Manual.

Fertilizers

Nutrient runoff pollution is the most severe problem facing local waterways. Runoff that carries excess nitrogen increases the growth of algae and reduces water clarity, which stresses underwater plant and animal life. The Public Works Department is committed to maintaining healthy landscapes with the minimal use of pesticides and fertilizers.

The following is a list of things to be considered and evaluated before the decision to apply fertilizer to City maintained landscapes and grounds:

- Plant Identification
  - Trees
  - Shrubs
  - Turf
  - Perennials and Annuals
- Plant location
  - Parks (Active and Passive)
  - City Hall Grounds
  - Rights- of – Way (street trees and parking strips)
- Plant age
- Soil type
- Proximity to waterways
- Plant health evaluation
- Application timing
- Fertilizer type
  - 100% Organic
  - Organic-Synthetic Blends
  - Synthetic
- Appropriate fertilizer application rate

Once a full evaluation has been completed, a fertilizer application may be determined to be beneficial. All fertilizer applications will be recorded and logged. Fertilizers shall be purchased in the appropriate amounts for the specific application and should not be purchased in excessive amounts. If fertilizers are to be stored, they will be stored in a secured, weatherproof container.

O&M ACTIVITY 12 – SEDIMENT AND EROSION CONTROL

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 12 – SEDIMENT AND EROSION CONTROL

DESCRIPTION:

Activities can expose soil and dirt making it vulnerable for erosion, which may cause sediment to enter local surface waters and negatively impact wildlife, water quality and habitat.

PERFORMANCE CRITERIA:

Any maintenance activity that has the potential to cause erosion and sediment transport must apply erosion and sediment control BMPs.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Applicable to any work in Kenmore.

Policy, Procedure, BMP:

Construction related policies are described in Appendix D of the King County Surface Water Design Manual (Erosion and Sediment Control Standards).

Maintenance related policies are described in BMPs in the Regional Road Maintenance Program Guidelines (RRMPG), which include all maintenance categories and Part 2 BMPs (2.61) – Dust Control.

In general, sediment should never be allowed to leave a work site unless appropriate BMPs are utilized and specific conditions allowed by appropriate permits have been satisfied.

O&M ACTIVITY 13 – LANDSCAPE MAINTENANCE AND VEGETATION DISPOSAL

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 13 – LANDSCAPE MAINTENANCE AND VEGETATION DISPOSAL

DESCRIPTION:

Activities include repair, replacement, installation, removal and/or maintenance of landscaping on publicly maintained lands and rights-of-way. Vegetation and landscape maintenance includes, but is not limited to mechanical, chemical, cultural and biological control. It also includes the systems and structures that support the vegetation and landscaping.

PERFORMANCE CRITERIA:

The primary purpose of vegetation and landscape maintenance is to promote, maintain, sustain, manage or encourage vegetation growing on publicly maintained lands and rights-of-way to comply with a variety of regulations and standards.

MAINTENANCE STANDARD (if applicable):

- King County Surface Water Design Manual, Appendix A, Various Sections (All sections that include a landscaping and/or vegetation component)

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)
- King County CWP Contract (09-C787)
- Total Landscape Contract (01-C121)
- Northwest Landscape Services Contract (13-C1160)

Policy, Procedure, BMP:

Refer to the BMPs in the Regional Road Maintenance Program Guidelines (RRMPG) for proper actions: Maintenance Category #15 – Vegetation

Refer to O&M Activity Sheet 11 for application of fertilizers, pesticides and herbicides

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-26 (Landscaping Activities and Vegetation Management)

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-5 (Storage of Pesticides and Fertilizers)

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-3 (Storage of Liquid Materials in Portable Containers)

Mowed turf areas are completed by mulching mowers and all clean green debris is properly recycled.

O&M ACTIVITY 14 – TRASH AND PET WASTE MANAGEMENT

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 14 – TRASH AND PET WASTE MANAGEMENT

DESCRIPTION:

Trash accumulates on publicly maintained lands and rights-of-way in designated containers and in non-designated areas (litter). Residents bring their pets to various public areas including parks, streets and buildings.

PERFORMANCE CRITERIA:

Trash should be removed from City maintained lands and rights-of-way if present.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County Roads Maintenance ILA (98-C15)
- King County CWP Contract (09-C787)

Policy, Procedure, BMP:

Loose trash is picked up and disposed of properly by maintenance crews and King County Community Work Program crews.

The city participates in the "Adopt a Street" Program which requires a minimum of two trash pick-up events annually by the adopter.

King County Metro Transit maintains trash receptacles located at various bus stops throughout the city.

Streets are mechanically swept and stormwater conveyance systems are cleaned of trash by vactor crews.

Pet waste bags and disposal containers are offered at public parks. Pet waste left at public buildings is collected and disposed of.

The public is responsible for collecting their pet waste and properly disposing of it in the garbage. The City provides education and outreach to promote this behavior.

O&M ACTIVITY 15 – BUILDING EXTERIOR CLEANING AND MAINTENANCE

City of Kenmore

O&M ACTIVITY WORKSHEET

ACTIVITY 15 – BUILDING EXTERIOR CLEANING AND MAINTENANCE

DESCRIPTION:

Public buildings must be maintained and cleaned in order to function properly and promote a professional and welcoming environment to Kenmore residents and visitors.

PERFORMANCE CRITERIA:

Buildings are maintained and cleaned as needed.

MAINTENANCE STANDARD (if applicable):

- Not Applicable

Current Contracts (Updated JAN 2015):

- Lake Forest Park ILA (00-C48, 00-C86)
- King County CWP Contract (09-C787)
- Total Landscaping Contract (01-C121)

Policy, Procedure, BMP:

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-15 (Pressure Washing of Buildings, Rooftops, and Other Large Objects)

Refer to the Kenmore Stormwater Pollution Prevention Manual BMP A-29 (Building Repair, Remodeling, and Construction)

SECTION 3.2 O&M LAND USE WORKSHEETS

Kenmore owns approximately 94 properties in addition to all of the public Right-of-Way (See Map 4-1, Table 4-1). King County owns approximately 29 properties in Kenmore and is responsible for O&M of these properties (and any other requirements set forth by King County's Phase I Permit). Washington State owns four properties in Kenmore (St. Edwards Park) and is responsible for O&M on these parcels. City of Seattle owns four properties in Kenmore (Tolt Pipeline) and is responsible for O&M on these parcels. Kenmore does not own or maintain any maintenance yards; however Kenmore does utilize the Lake Forest Park maintenance yard located in Lake Forest Park, WA. Lake Forest Park maintains a Stormwater Pollution Prevention Plan (SWPPP) for that facility. Kenmore and Lake Forest Park store sweeper materials at Rhododendron Park before transporting it to a proper disposal facility. A SWPPP for this storage facility is provided in Section 5.

Land use categories included with the O&M Land Use Worksheets include:

- Right-of-Way
- Parks
- Developed Parcels
- Undeveloped Parcels
- Stormwater Facilities

Each O&M Land Use Worksheet contains the following sections:

Description – A short description of what typical maintenance in the category includes

Applicable O&M Activities – O&M activities that apply to the land use are stated. Refer to the corresponding O&M Activity Worksheet for more detailed information.

Notes – Additional information pertaining to that land use.

MAP 3-1 PUBLIC PROPERTIES

TABLE 3-1 PUBLIC PROPERTIES

RIGHT-OF-WAY

City of Kenmore
O&M LAND USE WORKSHEET
RIGHT-OF-WAY

DESCRIPTION:
Kenmore operates and maintains all the right-of-way within the city. The right-of-way is dominated by paved roadway surfaces, but also includes undeveloped land, sidewalks, landscaping, utilities, etc. Stormwater facilities, if applicable, are inspected and maintained under section 2 of the OMPPM. Maintenance activities, including pipe cleaning, culvert cleaning, ditch maintenance, street cleaning, road repair, snow & ice control, utility installation, pavement striping and roadside area maintenance are covered under section 3 of the OMPPM.

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	X
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	X
O&M Activity 7 – Utility installation	X
O&M Activity 8 – Pavement striping maintenance	X
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	X
O&M Activity 10 – Dust control	X
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	X
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:

PARKS

LINWOOD PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – LINWOOD PARK

DESCRIPTION:
Linwood Park is located at 601 NE 193RD ST. It is approximately 3 acres in size and drains to Lake Washington via Stream 0056. Amenities include:

- playground equipment
- open grass areas
- benches
- picnic tables
- trash receptacles

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:

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LOG BOOM PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – LOG BOOM PARK

DESCRIPTION:

Log Boom Park is located at 17415 61ST AVE NE. It is approximately 16 acres in size and drains to Lake Washington. Amenities include:

- public pier
- paved parking
- fishing
- playground equipment
- bike racks
- picnic table
- benches
- restrooms
- trash receptacles
- daytime moorage

APPLICABLE O&M ACTIVITIES:

O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	X
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	X
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X

NOTES:

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MOORLAND PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – MOORLANDS PARK

DESCRIPTION:

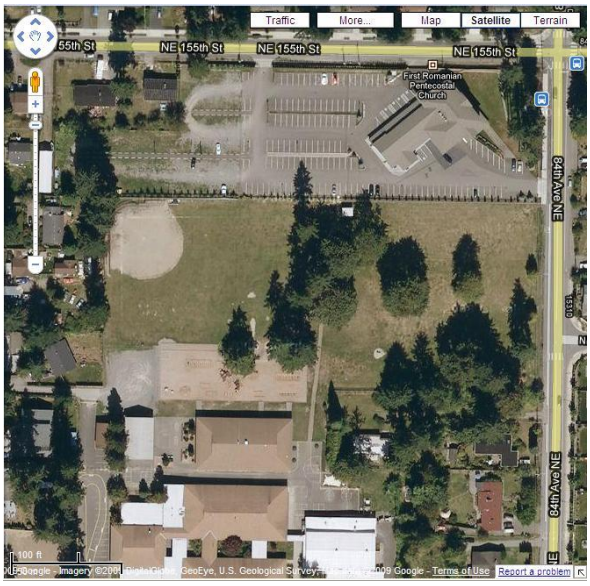
Moorland Park is located at 15221 84TH AVE NE. It is approximately 5 acres in size and drains to Lake Washington via unnamed streams and Sammamish River. Moorlands Park is owned by Kennore, but it is maintained by the Northshore School District through ILA 00-C88. Amenities include:

- picnic tables
- playground
- trash receptacles
- baseball field
- basketball court

APPLICABLE O&M ACTIVITIES:

O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:



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NORTHSHORE SUMMIT PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – NORTHSHORE SUMMIT PARK

DESCRIPTION:

Northshore Summit Park is located at 6200 NE 193RD ST. It is approximately 3.5 acres in size and drains to Tributary 0056. Amenities include:

- picnic tables
- playground
- gravel trails
- trash receptacles
- benches
- Surface Water Facility

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:

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RHODODENDRON PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – RHODODENDRON PARK

DESCRIPTION:

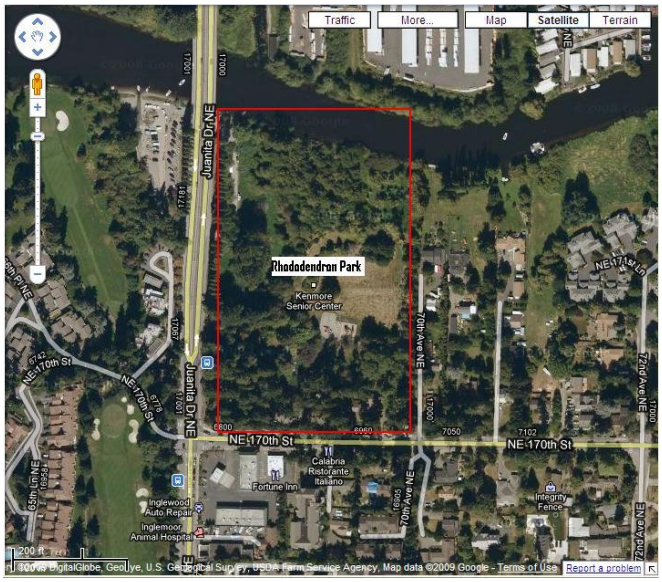
Rhododendron Park is located at 6910 NE 170TH ST. It is approximately 13 acres in size and drains to Lake Washington via Sammamish River. Amenities include:

- picnic tables
- covered picnic shelter
- cooking facilities
- playgrounds
- restroom facilities
- gravel and paved trails
- trash and recycling receptacles
- senior center
- paved parking

APPLICABLE O&M ACTIVITIES:

O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	X
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	X
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	X
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	X
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X

NOTES:



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WALLACE SWAMP CREEK PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – WALLACE SWAMP CREEK PARK

DESCRIPTION:
Wallace Swamp Creek Park is located at 19851 73RD AVE NE. It is approximately 17 acres in size and drains to Lake Washington via Swamp Creek. Amenities include:

- Trails
- Picnic tables
- Surface Water Facility
- Paved parking
- Gravel trails

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	X
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	X
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	X
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:

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SQUIRES LANDING PARK

City of Kenmore
O&M LAND USE WORKSHEET
PARKS – SQUIRES LANDING PARK

DESCRIPTION:
Squire's Landing Park is located at 7515 NE 175TH ST. It is approximately 40 acres in size and drains to Swamp Creek and Sammamish River. Amenities include:

- trails
- parking
- boat House
- water Access

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	
O&M Activity 3 – Ditch maintenance	
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X

NOTES:

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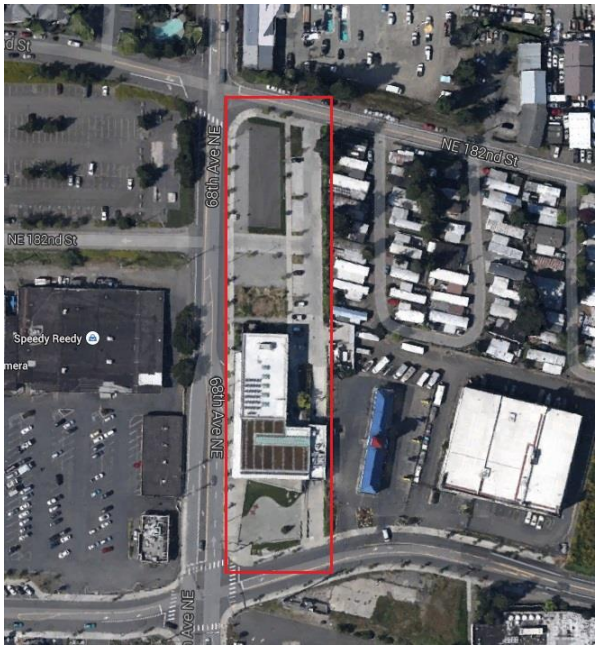
DEVELOPED PARCELS

CITY HALL

City of Kenmore **O&M LAND USE WORKSHEET** **DEVELOPED PARCELS – CITY HALL**	
DESCRIPTION: City Hall is located at 18120 68TH AVE NE. It is approximately 1.6 acres in size and drains to Swamp Creek.	
APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	
O&M Activity 3 – Ditch maintenance	
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	X
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	X
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X

NOTES:



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KENMORE VILLAGE & POST OFFICE

City of Kenmore **O&M LAND USE WORKSHEET** **DEVELOPED PARCEL – KENMORE VILLAGE**	
DESCRIPTION: Kenmore Village occupies 3 parcels in Kenmore on NE 181ST ST & 68TH AVE NE. The properties are approximately 4.8 acres in size and drain to Sammamish River. The site is undergoing development and the configuration and ownership may change in 2015 or sometime after.	
APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	
O&M Activity 3 – Ditch maintenance	
O&M Activity 4 – Street cleaning	X
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	X
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X
NOTES:	

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UNDEVELOPED PARCELS

City of Kenmore
O&M LAND USE WORKSHEET
UNDEVELOPED PARCELS

DESCRIPTION:
The City owns approximately 14 undeveloped parcels. 9 of these properties were purchased in the Swamp Creek flood plain, 3 properties are within the Sammamish River floodplain (Inglewood Wetlands), and two are roadside parcels.

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	
O&M Activity 3 – Ditch maintenance	
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	
O&M Activity 12 – Sediment and erosion control	
O&M Activity 13 – Landscape maintenance and vegetation disposal	
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	

NOTES:
For locations refer to:
Map 4-1, Table 4-1 (Public Lands)

STORMWATER FACILITIES

City of Kenmore
O&M LAND USE WORKSHEET
STORMWATER FACILITIES

DESCRIPTION:
Stormwater facilities are engineered facilities that are designed to convey storm runoff, remove pollutants, and to control flow rates. Kenmore has adopted the facility management process used by King County.

Approximately 40 Kenmore properties contain stormwater facilities. Appendix A of the SWDM addresses sediment and erosion control, landscape maintenance and vegetation disposal and trash management.

APPLICABLE O&M ACTIVITIES:	
O&M Activity 1 – Pipe Cleaning	X
O&M Activity 2 – Cleaning of culverts that convey stormwater in ditch systems	X
O&M Activity 3 – Ditch maintenance	X
O&M Activity 4 – Street cleaning	
O&M Activity 5 – Road repair and resurfacing, including pavement grinding	X
O&M Activity 6 – Snow and ice control	
O&M Activity 7 – Utility installation	
O&M Activity 8 – Pavement striping maintenance	
O&M Activity 9 – Maintaining roadside areas, including vegetation mgmt.	X
O&M Activity 10 – Dust control	
O&M Activity 11 – Application of fertilizers, pesticides, and herbicides	X
O&M Activity 12 – Sediment and erosion control	X
O&M Activity 13 – Landscape maintenance and vegetation disposal	X
O&M Activity 14 – Trash and pet waste management	X
O&M Activity 15 – Building exterior cleaning and maintenance	X

NOTES:

For locations refer to:
Map 2-2, Table 2-2 (Public Stormwater Facilities)
Map 2-3, Table 2-3 (Private Stormwater Facilities)

SECTION 4 - TRAINING

Training is required for Kenmore employees whose construction, operations or maintenance job functions may impact water quality. Relevant training addresses the importance of protecting water quality, the requirements of this Permit, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns, including potential illicit discharges.

The City of Kenmore contracts out most O&M work. The city has approximately six staff that oversees all components of O&M activities and contracts. The Permit does not require Kenmore to provide, oversee or enforce any training programs for its contractors, however, Kenmore expects any O&M contractor conducting work for Kenmore or on Kenmore's behalf to fully comply with any federal, state and local water quality regulations including the provisions set forth in the Permit.

For more specific information on current Kenmore contractors' training records please contact:

Current Kenmore O&M Contractors

Updated February 2015

NAME/ORGANIZATION	CONTACT	PHONE	ADDRESS	SERVICE
KING COUNTY WATER AND LAND RESOURCES DIVISION	ADMIN	(206)477-4800	201 S JACKSON ST STE 600 SEATTLE, WA 98104	ENGINEERING/ WQ AUDITS
KING COUNTY ROAD SERVICES DIVISION – MAINTENANCE & OPERATIONS	ADMIN	(206)296-8100	155 MONROE AVE NE RENTON, WA 98056	FACILITY MAINTENANCE
KING COUNTY COMMUNITY WORK PROGRAM	ADMIN	(206)477-0667	400 YESLER WAY RM 260 SEATTLE, WA 98104	VEGETATION & LANDSCAPE MAINTENANCE
LAKE FOREST PARK	FRANK ZENK	(206)368-5440	17425 BALLINGER WAY NE LAKE FOREST PARK, WA 98155	GENERAL OPERATIONS AND MAINTENANCE
INNOVATIVE VACUUM SERVICES	ROBERT WINSKOSKI	(206)783-3317	20909 70TH AVE W EDMONDS, WA 98026	VACTORING
TOTAL LANDSCAPING CORPORATION	MAIN LINE	(425)820-4358	6013 238TH ST SE WOODINVILLE, WA 98072	LANDSCAPE MAINTENANCE
NORTHWEST LANDSCAPE SERVICES	MAINLINE	(425)481-0919	7627 W BOSTIAN RD WOODINVILLE, WA 98072	LANDSCAPE MAINTENANCE
JSH PROPERTIES	MAINLINE	(425)455-0500	10655 NE 4TH ST #901 BELLEVUE, WA 98004	PROPERTY MANAGEMENT
WASTE MANAGEMENT	MAINLINE	(800)592-9995	6311 234TH ST SE WOODINVILLE, WA 98072	WASTE DISPOSAL MANAGEMENT

SECTION 5 – SWPPP

CITY OF LAKE FOREST PARK MAINTENANCE YARD

Kenmore does not own or maintain any maintenance yards; however Kenmore does utilize the Lake Forest Park maintenance yard located in Lake Forest Park, WA. Lake Forest Park is responsible for maintaining a Stormwater Pollution Prevention Plan (SWPPP) for this facility.

Lake Forest Park can be contacted at:

Frank Zenk
Director of Public Services
(206) 368-5440

17425 Ballinger Way NE
Lake Forest Park, WA 98155

CITY OF KENMORE RHODODENRON FACILITY SWPPP

GENERAL FACILITY INFORMATION

Kenmore and Lake Forest Park utilize a small paved area in Rhododendron Park for storage and transportation of sweeping materials. Rhododendron Park is located at 6910 NE 170TH ST in Kenmore, WA. The facility is located in the southwestern corner of the park and is accessible via a city only access driveway off of NE 170TH ST (Map 6-1). Site runoff is contained in an underground tank. Solids are consolidated and removed from the site and disposed of appropriately. Solids consist primarily of sediment and vegetation debris. Small amounts of trash can also be present in solids.

STORMWATER POLLUTION PREVENTION TEAM

NAME/TITLE	RESPONSIBILITY	CONTACT INFO
RICHARD SAWYER KENMORE SURFACE WATER MANAGER	OPERATIONS/MAINTENANCE CESCL LIC# UW-260364	425-398-8900
JENNIFER GORDON KENMORE O&M MANAGER	OPERATIONS/MAINTENANCE CESCL LIC# UW-321938	425-398-8900
SCOTT WALKER LFP PW SUPERINTENDENT	OPERATIONS/MAINTENANCE	206-957-2825

SITE MAP

The facility site is located in the southwestern corner of Rhododendron Park at 6910 NE 170TH ST in Kenmore, WA (FIG 6-1).

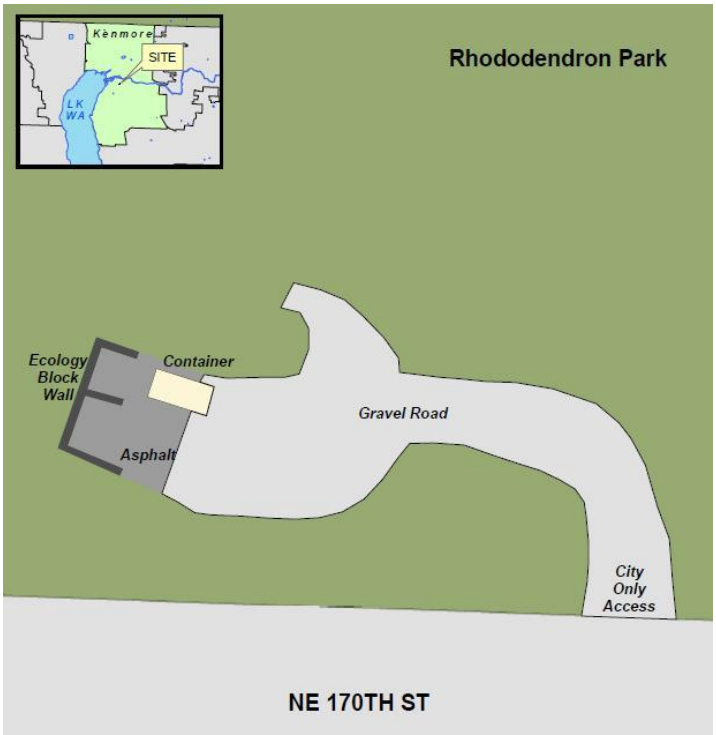


FIG 6-1 Facility is located at southwestern corner of Rhododendron Park.

FACILITY DRAINAGE

The materials storage area drains to an enclosed underground tank (FIG 6-2). The tank is comprised of two interconnected polyethylene 1700 gallon cisterns.

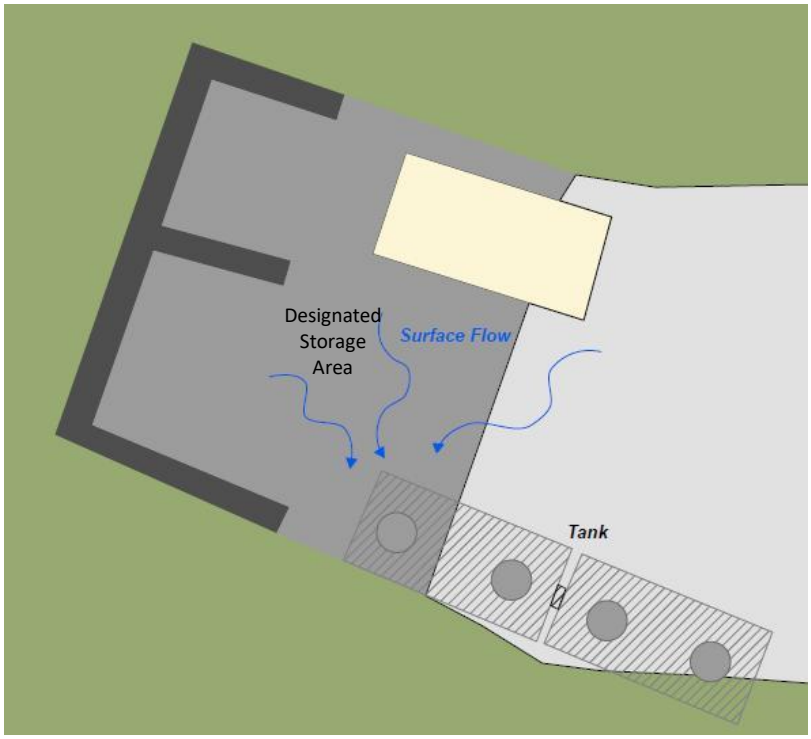


FIG 6-2 Paved area of facility drains to enclosed tank.

NONSTRUCTURAL CONTROLS

- Solids are removed from site regularly in transport container.
- Enclosed detention tank is pumped regularly.
- No storage of hazardous materials.
- No storage of materials outside designated storage areas.

STRUCTURAL CONTROLS

- Enclosed detention tank.
- Ecology block walls contain materials on site.
- Site perimeter is bermed with natural vegetation.
- Site is signed for City access only.

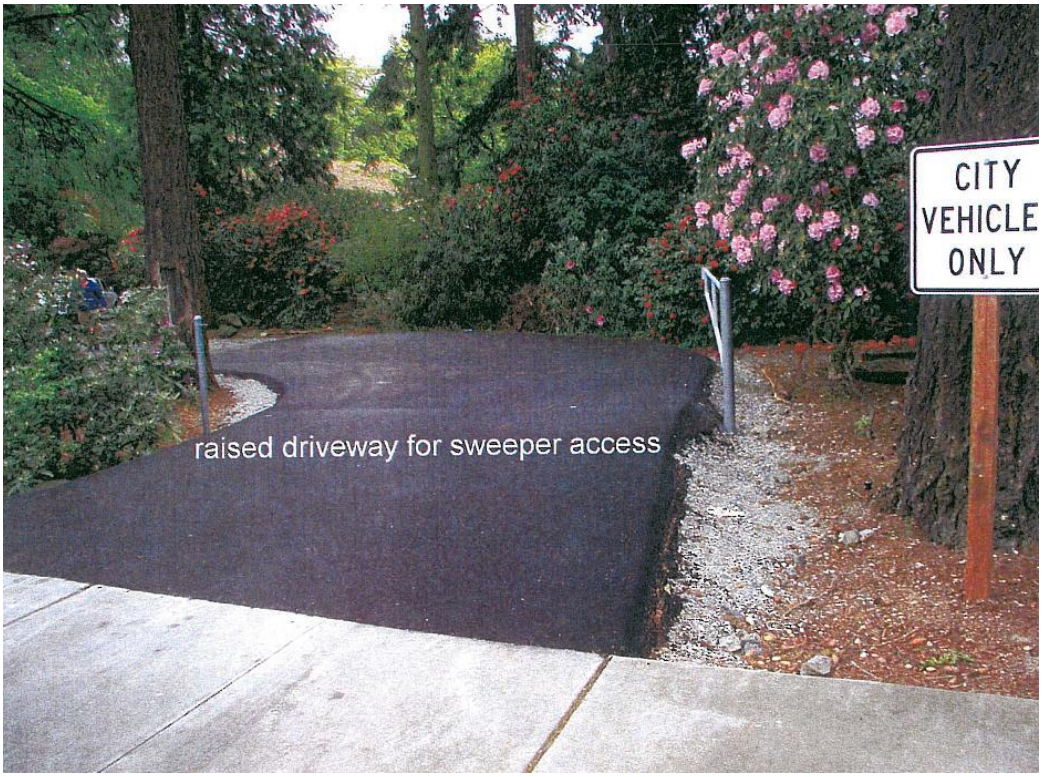
NON STORMWATER DISCHARGES

- The site does not have non-stormwater discharges when properly maintained.
- Enclosed detention tank does not discharge (containment only).

FACILITY PHOTOS

View of Facility looking west from entrance.

View of facility from north looking south. All surface runoff is collected in drain.



Entrance to facility from NE 170TH ST.

MAINTENANCE

Liquids are removed from the holding tanks approximately every 2-3 months depending on weather.

Solids are hauled from the site approximately twice per month, depending on quantity and season, in covered 20 yard Waste Management containers.

ANNUAL REVIEW

This SWPPP will be reviewed annually to account for any potential changes to the site, operations and/or personnel.

APPENDIX A – SWDM MAINTENANCE STANDARDS

NO. 1 – DETENTION PONDS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Top or Side Slopes of Dam, Berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
Storage Area	Sediment accumulation	Accumulated sediment that exceeds 10% of the designed pond depth.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.
	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
Inlet/Outlet Pipe.	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.

NO. 1 – DETENTION PONDS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Emergency Overflow/Spillway	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.
	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger or any exposure of native soil on the spillway.	Spillway restored to design standards.

NO. 2 – INFILTRATION FACILITIES			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Storage Area	Sediment accumulation	If two inches or more sediment is present or a percolation test indicates facility is working at or less than 90% of design.	Facility infiltrates as designed.
Infiltration Tank Structure	Plugged air vent	Any blockage of the vent.	Tank or vault freely vents.
	Tank bent out of shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape.	Tank repaired or replaced to design.

NO. 2 – INFILTRATION FACILITIES			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**
	Gaps between sections, damaged joints or cracks or tears in wall	A gap wider than ½-inch at the joint of any tank sections or any evidence of soil particles entering the tank at a joint or through a wall.	No water or soil entering tank through joints or walls.
Infiltration Vault Structure	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch, any evidence of soil entering the structure through cracks or qualified inspection personnel determines that the vault is not structurally sound.	Vault is sealed and structurally sound.
Inlet/Outlet Pipes	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Filter Bags	Plugged	Filter bag more than $^1/_2$ full.	Replace filter bag or redesign system.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Pre-settling Ponds and Vaults	Sediment accumulation	6" or more of sediment has accumulated.	Pre-settling occurs as designed

NO. 2 – INFILTRATION FACILITIES			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**
Infiltration Pond, Rock Filter	Plugged	High water level on upstream side of filter remains for extended period of time or little or no water flows through filter during heavy rain storms.	Rock filter replaced evaluate need for filter and remove if not necessary.
Infiltration Pond Emergency Overflow Spillway	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. Rip-rap on inside slopes need not be replaced.	Spillway restored to design standards.
	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.

NO. 3 – DETENTION TANKS AND VAULTS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Tank or Vault Storage Area	Trash and debris	Any trash and debris accumulated in vault or tank (includes floatables and non-floatables).	No trash or debris in vault.
	Sediment accumulation	Accumulated sediment depth exceeds 10% of the diameter of the storage area for ½ length of storage vault or any point depth exceeds 15% of diameter. Example: 72-inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than ½ length of tank.	All sediment removed from storage area.
Tank Structure	Plugged air vent	Any blockage of the vent.	Tank or vault freely vents.
	Tank bent out of shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape.	Tank repaired or replaced to design.
	Gaps between sections, damaged joints or cracks or tears in wall	A gap wider than ½-inch at the joint of any tank sections or any evidence of soil particles entering the tank at a joint or through a wall.	No water or soil entering tank through joints or walls.
Vault Structure	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch, any evidence of soil entering the structure through cracks or qualified inspection personnel determines that the vault is not structurally sound.	Vault is sealed and structurally sound.
Inlet/Outlet Pipes	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.

NO. 3 – DETENTION TANKS AND VAULTS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

NO. 4 – CONTROL STRUCTURE/FLOW RESTRICTOR			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Structure	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the structure opening or is blocking capacity of the structure by more than 10%.	No Trash or debris blocking or potentially blocking entrance to structure.
		Trash or debris in the structure that exceeds $^1/_3$ the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the structure.
		Deposits of garbage exceeding 1 cubic foot in volume.	No condition present which would attract or support the breeding of insects or rodents.
	Sediment	Sediment exceeds 60% of the depth from the bottom of the structure to the invert of the lowest pipe into or out of the structure or the bottom of the FROP-T section or is within 6 inches of the invert of the lowest pipe into or out of the structure or the bottom of the FROP-T section.	Sump of structure contains no sediment.
	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable).	Frame is even with curb.
		Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab.	Frame is sitting flush on top slab.
	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet, any evidence of soil particles entering structure through cracks, or maintenance person judges that structure is unsound.	Structure is sealed and structurally sound.
		Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering structure through cracks.	No cracks more than $^1/_4$ inch wide at the joint of inlet/outlet pipe.
	Settlement/ misalignment	Structure has settled more than 1 inch or has rotated more than 2 inches out of alignment.	Basin replaced or repaired to design standards.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the structure at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Ladder rungs missing or unsafe	Ladder is unsafe due to missing rungs, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
FROP-T Section	Damage	T section is not securely attached to structure wall and outlet pipe structure should support at least 1,000 lbs of up or down pressure.	T section securely attached to wall and outlet pipe.

NO. 4 – CONTROL STRUCTURE/FLOW RESTRICTOR			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
		Structure is not in upright position (allow up to 10% from plumb).	Structure in correct position.
		Connections to outlet pipe are not watertight or show signs of deteriorated grout.	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed.
		Any holes—other than designed holes—in the structure.	Structure has no holes other than designed holes.
Cleanout Gate	Damaged or missing	Cleanout gate is missing.	Replace cleanout gate.
		Cleanout gate is not watertight.	Gate is watertight and works as designed.
		Gate cannot be moved up and down by one maintenance person.	Gate moves up and down easily and is watertight.
		Chain/rod leading to gate is missing or damaged.	Chain is in place and works as designed.
Orifice Plate	Damaged or missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
	Deformed or damaged lip	Lip of overflow pipe is bent or deformed.	Overflow pipe does not allow overflow at an elevation lower than design
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Metal Grates (If Applicable)	Unsafe grate opening	Grate with opening wider than $^{7}/_{8}$ inch.	Grate opening meets design standards.
	Trash and debris	Trash and debris that is blocking more than 20% of grate surface.	Grate free of trash and debris. footnote to guidelines for disposal
	Damaged or missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.
Manhole Cover/Lid	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open structure requires urgent maintenance**.	Cover/lid protects opening to structure.
	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to Remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 5 – CATCH BASINS AND MANHOLES

ERROR! NO TABLE OF CONTENTS ENTRIES FOUND.

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure	Sediment	Sediment exceeds 60% of the depth from the bottom of the catch basin to the invert of the lowest pipe into or out of the catch basin or is within 6 inches of the invert of the lowest pipe into or out of the catch basin.	Sump of catch basin contains no sediment.
	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the catch basin opening or is blocking capacity of the catch basin by more than 10%.	No Trash or debris blocking or potentially blocking entrance to catch basin.
		Trash or debris in the catch basin that exceeds $^1/_3$ the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the catch basin.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within catch basin.
		Deposits of garbage exceeding 1 cubic foot in volume.	No condition present which would attract or support the breeding of insects or rodents.
	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable).	Frame is even with curb.
		Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab.	Frame is sitting flush on top slab.
	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet, any evidence of soil particles entering catch basin through cracks, or maintenance person judges that catch basin is unsound.	Catch basin is sealed and structurally sound.
		Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	No cracks more than $^1/_4$ inch wide at the joint of inlet/outlet pipe.
	Settlement/ misalignment	Catch basin has settled more than 1 inch or has rotated more than 2 inches out of alignment.	Basin replaced or repaired to design standards.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the catch basin at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.

NO. 5 – CATCH BASINS AND MANHOLES

ERROR! NO TABLE OF CONTENTS ENTRIES FOUND.

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Metal Grates (Catch Basins)	Unsafe grate opening	Grate with opening wider than $^{7}/_{8}$ inch.	Grate opening meets design standards.
	Trash and debris	Trash and debris that is blocking more than 20% of grate surface.	Grate free of trash and debris. footnote to guidelines for disposal
	Damaged or missing	Grate missing or broken member(s) of the grate. **Any open structure requires urgent maintenance**.	Grate is in place and meets design standards.
Manhole Cover/Lid	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open structure requires urgent maintenance**.	Cover/lid protects opening to structure.
	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to Remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 6 – CONVEYANCE PIPES AND DITCHES			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Pipes	Sediment & debris accumulation	Accumulated sediment or debris that exceeds 20% of the diameter of the pipe.	Water flows freely through pipes.
	Vegetation/roots	Vegetation/roots that reduce free movement of water through pipes.	Water flows freely through pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Damage to protective coating or corrosion	Protective coating is damaged; rust or corrosion is weakening the structural integrity of any part of pipe.	Pipe repaired or replaced.
	Damaged	Any dent that decreases the cross section area of pipe by more than 20% or is determined to have weakened structural integrity of the pipe.	Pipe repaired or replaced.
Ditches	Trash and debris	Trash and debris exceeds 1 cubic foot per 1,000 square feet of ditch and slopes.	Trash and debris cleared from ditches.
	Sediment accumulation	Accumulated sediment that exceeds 20% of the design depth.	Ditch cleaned/flushed of all sediment and debris so that it matches design.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Vegetation	Vegetation that reduces free movement of water through ditches.	Water flows freely through ditches.
	Erosion damage to slopes	Any erosion observed on a ditch slope.	Slopes are not eroding.
	Rock lining out of place or missing (If Applicable)	One layer or less of rock exists above native soil area 5 square feet or more, any exposed native soil.	Replace rocks to design standards.

NO. 7 – DEBRIS BARRIERS (E.G., TRASH RACKS)			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed.**
Site	Trash and debris	Trash or debris plugging more than 20% of the area of the barrier.	Barrier clear to receive capacity flow.
	Sediment accumulation	Sediment accumulation of greater than 20% of the area of the barrier	Barrier clear to receive capacity flow.
Structure	Cracked broken or loose	Structure which bars attached to is damaged - pipe is loose or cracked or concrete structure is cracked, broken of loose.	Structure barrier attached to is sound.
Bars	Bar spacing	Bar spacing exceeds 6 inches.	Bars have at most 6 inch spacing.
	Damaged or missing bars	Bars are bent out of shape more than 3 inches.	Bars in place with no bends more than ¾ inch.
		Bars are missing or entire barrier missing.	Bars in place according to design.
		Bars are loose and rust is causing 50% deterioration to any part of barrier.	Repair or replace barrier to design standards.

NO. 8 – ENERGY DISSIPATERS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed.**
Site	Trash and debris	Trash and/or debris accumulation.	Dissipater clear of trash and/or debris.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Rock Pad	Missing or moved Rock	Only one layer of rock exists above native soil in area five square feet or larger or any exposure of native soil.	Rock pad prevents erosion.
Dispersion Trench	Pipe plugged with sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed so that it matches design.
	Not discharging water properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench).	Water discharges from feature by sheet flow.
	Perforations plugged.	Over 1/4 of perforations in pipe are plugged with debris or sediment.	Perforations freely discharge flow.
	Water flows out top of "distributor" catch basin.	Water flows out of distributor catch basin during any storm less than the design storm.	No flow discharges from distributor catch basin.
	Receiving area over-saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
Gabions	Damaged mesh	Mesh of gabion broken, twisted or deformed so structure is weakened or rock may fall out.	Mesh is intact, no rock missing.
	Corrosion	Gabion mesh shows corrosion through more than ¼ of its gage.	All gabion mesh capable of containing rock and retaining designed form.
	Collapsed or deformed baskets	Gabion basket shape deformed due to any cause.	All gabion baskets intact, structure stands as designed.
	Missing rock	Any rock missing that could cause gabion to lose structural integrity.	No rock missing.
Manhole/Chamber	Worn or damaged post, baffles or side of chamber	Structure dissipating flow deteriorates to ½ or original size or any concentrated worn spot exceeding one square foot which would make structure unsound.	Structure is in no danger of failing.
	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch or any evidence of soil entering the structure through cracks, or maintenance inspection personnel determines that the structure is not structurally sound.	Manhole/chamber is sealed and structurally sound.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the structure at the joint of the inlet/outlet pipes.	No soil or water enters and no water discharges at the joint of inlet/outlet pipes.

NO. 9 – FENCING			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Erosion or holes under fence	Erosion or holes more than 4 inches high and 12-18 inches wide permitting access through an opening under a fence.	No access under the fence.
Wood Posts, Boards and Cross Members	Missing or damaged parts	Missing or broken boards, post out of plumb by more than 6 inches or cross members broken	No gaps on fence due to missing or broken boards, post plumb to within 1½ inches, cross members sound.
	Weakened by rotting or insects	Any part showing structural deterioration due to rotting or insect damage	All parts of fence are structurally sound.
	Damaged or failed post foundation	Concrete or metal attachments deteriorated or unable to support posts.	Post foundation capable of supporting posts even in strong wind.
Metal Posts, Rails and Fabric	Damaged parts	Post out of plumb more than 6 inches.	Post plumb to within 1½ inches.
		Top rails bent more than 6 inches.	Top rail free of bends greater than 1 inch.
		Any part of fence (including post, top rails, and fabric) more than 1 foot out of design alignment.	Fence is aligned and meets design standards.
		Missing or loose tension wire.	Tension wire in place and holding fabric.
	Deteriorated paint or protective coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.	Structurally adequate posts or parts with a uniform protective coating.
	Openings in fabric	Openings in fabric are such that an 8-inch diameter ball could fit through.	Fabric mesh openings within 50% of grid size.

NO. 10 – GATES/BOLLARDS/ACCESS BARRIERS			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Chain Link Fencing Gate	Damaged or missing members	Missing gate.	Gates in place.
		Broken or missing hinges such that gate cannot be easily opened and closed by a maintenance person.	Hinges intact and lubed. Gate is working freely.
		Gate is out of plumb more than 6 inches and more than 1 foot out of design alignment.	Gate is aligned and vertical.
		Missing stretcher bar, stretcher bands, and ties.	Stretcher bar, bands, and ties in place.
	Locking mechanism does not lock gate	Locking device missing, no-functioning or does not link to all parts.	Locking mechanism prevents opening of gate.
	Openings in fabric	Openings in fabric are such that an 8-inch diameter ball could fit through.	Fabric mesh openings within 50% of grid size.
Bar Gate	Damaged or missing cross bar	Cross bar does not swing open or closed, is missing or is bent to where it does not prevent vehicle access.	Cross bar swings fully open and closed and prevents vehicle access.
	Locking mechanism does not lock gate	Locking device missing, no-functioning or does not link to all parts.	Locking mechanism prevents opening of gate.
	Support post damaged	Support post does not hold cross bar up.	Cross bar held up preventing vehicle access into facility.
Bollards	Damaged or missing	Bollard broken, missing, does not fit into support hole or hinge broken or missing.	No access for motorized vehicles to get into facility.
	Does not lock	Locking assembly or lock missing or cannot be attached to lock bollard in place.	No access for motorized vehicles to get into facility.
Boulders	Dislodged	Boulders not located to prevent motorized vehicle access.	No access for motorized vehicles to get into facility.
	Circumvented	Motorized vehicles going around or between boulders.	No access for motorized vehicles to get into facility.

NO. 11 – GROUNDS (LANDSCAPING)			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash or litter	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Trees and Shrubs	Hazard	Any tree or limb of a tree identified as having a potential to fall and cause property damage or threaten human life. **A hazard tree identified by a qualified arborist must be removed as soon as possible.**	No hazard trees in facility.
	Damaged	Limbs or parts of trees or shrubs that are split or broken which affect more than 25% of the total foliage of the tree or shrub.	Trees and shrubs with less than 5% of total foliage with split or broken limbs.
		Trees or shrubs that have been blown down or knocked over.	No blown down vegetation or knocked over vegetation. Trees or shrubs free of injury.
		Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Tree or shrub in place and adequately supported; dead or diseased trees removed.

NO. 12 – ACCESS ROADS			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Trash and debris exceeds 1 cubic foot per 1,000 square feet (i.e., trash and debris would fill up one standards size garbage can).	Roadway drivable by maintenance vehicles.
		Debris which could damage vehicle tires or prohibit use of road.	Roadway drivable by maintenance vehicles.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Blocked roadway	Any obstruction which reduces clearance above road surface to less than 14 feet.	Roadway overhead clear to 14 feet high.
		Any obstruction restricting the access to a 10- to 12 foot width for a distance of more than 12 feet or any point restricting access to less than a 10 foot width.	At least 12-foot of width on access road.
Road Surface	Erosion, settlement, potholes, soft spots, ruts	Any surface defect which hinders or prevents maintenance access.	Road drivable by maintenance vehicles.
	Vegetation on road surface	Trees or other vegetation prevent access to facility by maintenance vehicles.	Maintenance vehicles can access facility.
Shoulders and Ditches	Erosion	Erosion within 1 foot of the roadway more than 8 inches wide and 6 inches deep.	Shoulder free of erosion and matching the surrounding road.
	Weeds and brush	Weeds and brush exceed 18 inches in height or hinder maintenance access.	Weeds and brush cut to 2 inches in height or cleared in such a way as to allow maintenance access.
Modular Grid Pavement	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Damaged or missing	Access surface compacted because of broken on missing modular block.	Access road surface restored so road infiltrates.

NO. 13 – BASIC BIOFILTRATION SWALE (GRASS)			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Any trash and/or debris accumulated in the bioswale.	No trash or debris in bioswale.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Swale Section	Sediment accumulation	Sediment depth exceeds 2 inches in 10% of the swale treatment area.	No sediment deposits in grass treatment area of the bioswale.
		Sediment inhibits grass growth over 10% of swale length.	Grass growth not inhibited by sediment.
		Sediment inhibits even spreading of flow.	Flow spreads evenly through swale
	Erosion/scouring	Eroded or scoured swale bottom due to channelization or high flows.	No eroded or scoured areas in bioswale. Cause of erosion or scour addressed.
	Poor vegetation coverage	Grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom.	Swale has no bare spots and grass is thick and healthy.
	Grass too tall	Grass excessively tall (greater than 10 inches), grass is thin or nuisance weeds and other vegetation has taken over.	Grass is between 3 and 4 inches tall, thick and healthy. No clippings left in swale. No nuisance vegetation present.
	Excessive shade	Grass growth is poor because sunlight does not reach swale.	Health grass growth or swale converted to a wet bioswale.
	Constant baseflow	Continuous flow through the swale, even when it has been dry for weeks or an eroded, muddy channel has formed in the swale bottom.	Baseflow removed from swale by a low-flow pea-gravel drain or bypassed around the swale.
	Standing water	Water pools in the swale between storms or does not drain freely.	Swale freely drains and there is no standing water in swale between storms.
	Channelization	Flow concentrates and erodes channel through swale.	No flow channels in swale.
Flow Spreader	Concentrated flow	Flow from spreader not uniformly distributed across entire swale width.	Flows are spread evenly over entire swale width.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 14 – WET BIOFILTRATION SWALE			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Any trash and/or debris accumulated at the site.	No trash or debris at the site.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Swale Section	Sediment accumulation	Sediment depth exceeds 2 inches in 10% of the swale treatment area.	No sediment deposits in treatment area.
	Erosion/scouring	Eroded or scoured swale bottom due to channelization or high flows.	No eroded or scoured areas in bioswale. Cause of erosion or scour addressed.
	Water depth	Water not retained to a depth of about 4 inches during the wet season.	Water depth of 4 inches through out swale for most of wet season.
	Vegetation ineffective	Vegetation sparse, does not provide adequate filtration or crowded out by very dense clumps of cattail or nuisance vegetation.	Wetland vegetation fully covers bottom of swale and no cattails or nuisance vegetation present.
	Insufficient water	Wetland vegetation dies due to lack of water.	Wetland vegetation remains healthy (may require converting to grass lined bioswale)
Flow Spreader	Concentrated flow	Flow from spreader not uniformly distributed across entire swale width.	Flows are spread evenly over entire swale width.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 15 – FILTER STRIP			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Any trash and debris accumulated on the filter strip.	Filter strip free of any trash or debris
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Grass Strip	Sediment accumulation	Sediment accumulation on grass exceeds 2 inches depth.	No sediment deposits in treatment area.
	Erosion/scouring	Eroded or scoured swale bottom due to channelization or high flows.	No eroded or scoured areas in bioswale. Cause of erosion or scour addressed.
	Grass too tall	Grass excessively tall (greater than 10 inches), grass is thin or nuisance weeds and other vegetation has taken over.	Grass is between 3 and 4 inches tall, thick and healthy. No clippings left in swale. No nuisance vegetation present.
	Vegetation ineffective	Grass has died out, become excessively tall (greater than 10 inches) or nuisance vegetation is taking over.	Grass is healthy, less than 9 inches high and no nuisance vegetation present.
Flow Spreader	Concentrated flow	Flow from spreader not uniformly distributed across entire swale width.	Flows are spread evenly over entire swale width.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 16 – WETPOND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Any trash and debris accumulated on the wetpond site.	Wetpond site free of any trash or debris.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Side Slopes of Dam, Berm, internal berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
Top or Side Slopes of Dam, Berm, internal berm or Embankment	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
	Irregular surface on internal berm	Top of berm not uniform and level.	Top of berm graded flat to design elevation.
Pond Areas	Sediment accumulation (except first wetpool)	Accumulated sediment that exceeds 10% of the designed pond depth.	Sediment cleaned out to designed pond shape and depth.
	Sediment accumulation (first wetpool)	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches.	Sediment storage contains no sediment.
	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
	Water level (first wetpool)	First cell empty, doesn't hold water.	Water retained in first cell for most of the year.

NO. 16 – WETPOND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
	Algae mats (first wetpool)	Algae mats develop over more than 10% of the water surface should be removed.	Algae mats removed (usually in the late summer before Fall rains, especially in Sensitive Lake Protection Areas.)
Gravity Drain	Inoperable valve	Valve will not open and close.	Valve opens and closes normally.
	Valve won't seal	Valve does not seal completely.	Valve completely seals closed.
Emergency Overflow Spillway	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.
	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. Rip-rap on inside slopes need not be replaced.	Spillway restored to design standards.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 17 – WETVAULT			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Trash and debris accumulated on facility site.	Trash and debris removed from facility site.
Treatment Area	Trash and debris	Any trash and debris accumulated in vault (includes floatables and non-floatables).	No trash or debris in vault.
	Sediment accumulation	Sediment accumulation in vault bottom exceeds the depth of the sediment zone plus 6 inches.	No sediment in vault.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Vault Structure	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch, any evidence of soil entering the structure through cracks, vault does not retain water or qualified inspection personnel determines that the vault is not structurally sound.	Vault is sealed and structurally sound.
	Baffles damaged	Baffles corroding, cracking, warping and/or showing signs of failure or baffle cannot be removed.	Repair or replace baffles or walls to specifications.
	Ventilation	Ventilation area blocked or plugged.	No reduction of ventilation area exists.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Gravity Drain	Inoperable valve	Valve will not open and close.	Valve opens and closes normally.
	Valve won't seal	Valve does not seal completely.	Valve completely seals closed.
Access Manhole	Access cover/lid damaged or difficult to open	Access cover/lid cannot be easily opened by one person. Corrosion/deformation of cover/lid.	Access cover/lid can be opened by one person.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Access doors/plate has gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.

NO. 18 – STORMWATER WETLAND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Trash and debris accumulated on facility site.	Trash and debris removed from facility site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Side Slopes of Dam, Berm, internal berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
Top or Side Slopes of Dam, Berm, internal berm or Embankment	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
	Irregular surface on internal berm	Top of berm not uniform and level.	Top of berm graded flat to design elevation.
Pond Areas	Sediment accumulation (first cell/forebay)	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches.	Sediment storage contains no sediment.
	Sediment accumulation (wetland cell)	Accumulated sediment that exceeds 10% of the designed pond depth.	Sediment cleaned out to designed pond shape and depth.
	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
	Water level (first cell/forebay)	Cell does not hold 3 feet of water year round.	3 feet of water retained year round.

NO. 18 – STORMWATER WETLAND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
	Water level (wetland cell)	Cell does not retain water for at least 10 months of the year.	Water retained at least 10 months of the year or wetland plants are surviving.
	Algae mats (first cell/forebay)	Algae mats develop over more than 10% of the water surface should be removed.	Algae mats removed (usually in the late summer before Fall rains, especially in Sensitive Lake Protection Areas.)
	Vegetation	Vegetation dead, dying or not meeting original planting specifications.	Plants in wetland cell ssurviving and not interfering with wetland function.
Gravity Drain	Inoperable valve	Valve will not open and close.	Valve opens and closes normally.
	Valve won't seal	Valve does not seal completely.	Valve completely seals closed.
Emergency Overflow Spillway	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.
	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. Rip-rap on inside slopes need not be replaced.	Spillway restored to design standards.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 19 – SAND FILTER POND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Site	Trash and debris	Trash and debris accumulated on facility site.	Trash and debris removed from facility site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover (not in the treatment area)	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Pre-Treatment (if applicable)	Sediment accumulation	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches.	Sediment storage contains no sediment.
	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
	Water level	Cell empty, doesn't hold water.	Water retained in first cell for most of the year.
	Algae mats	Algae mats develop over more than 10% of the water surface should be removed.	Algae mats removed (usually in the late summer before Fall rains, especially in Sensitive Lake Protection Areas.)
Pond Area	Sediment accumulation	Sediment or crust depth exceeds ½-inch over 10 % of surface area of sand filter.	No sediment or crust deposit on sand filter that would impede permeability of the filter section.
	Grass (if applicable)	Grass becomes excessively tall (greater than 6 inches) or when nuisance weeds and other vegetation start to take over or thatch build up occurs.	Mow vegetation and/or remove nuisance vegetation.
Side Slopes of Pond	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.

NO. 19 – SAND FILTER POND			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**
Sand Filter Media	Plugging	Drawdown of water through the sand filter media, takes longer than 24 hours, and/or flow through the overflow pipes occurs frequently. A sieve analysis of >4% -100 or >2% -200 requires replacing sand filter media.	Sand filter media surface is aerated and drawdown rate is normal.
	Prolonged flows	Sand is saturated for prolonged periods of time (several weeks) and does not dry out between storms due to continuous base flow or prolonged flows from detention facilities.	Excess flows bypassed or confined to small portion of filter media surface.
	Short circuiting	Flows become concentrated over one section of the sand filter rather than dispersed or drawdown rate of pool exceeds 12 inches per hour.	Flow and percolation of water through the sand filter is uniform and dispersed across the entire filter area and drawdown rate is normal.
	Media thickness	Sand thickness is less than 6 inches.	Rebuild sand thickness to a minimum of 6 inches and preferably to 18 inches.
Underdrains and Clean-Outs	Sediment/debris	Underdrains or clean-outs partially plugged or filled with sediment and/or debris. Junction box/cleanout wyes not watertight.	Underdrains and clean-outs free of sediment and debris and are watertight.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Rock Pad	Missing or out of place	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil.	Rock pad restored to design standards.
Flow spreader	Concentrated flow	Flow from spreader not uniformly distributed across sand filter.	Flows spread evenly over sand filter.

NO. 20 – SAND FILTER VAULT			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Trash and debris accumulated in facility.	Trash and debris removed from facility.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Pre-Treatment Chamber	Sediment accumulation	Sediment accumulation in first chamber exceeds the depth of the sediment zone plus 6 inches.	Sediment storage contains no sediment.
Sand Filter Media	Sediment accumulation	Sediment depth exceeds ½-inch on sand filter media.	Sand filter freely drains at normal rate.
	Trash and debris	Trash and debris accumulated in vault (floatables and non-floatables).	No trash or debris in vault.
	Plugging	Drawdown of water through the sand filter media, takes longer than 24 hours, and/or flow through the overflow pipes occurs frequently. A sieve analysis of >4% -100 or >2% -200 requires replacing sand filter media.	Sand filter media drawdown rate is normal.
	Short circuiting	Seepage or flow occurs along the vault walls and corners. Sand eroding near inflow area. Cleanout wyes are not watertight.	Sand filter media section re-laid and compacted along perimeter of vault to form a semi-seal. Erosion protection added to dissipate force of incoming flow and curtail erosion.
Vault Structure	Damaged to walls, frame, bottom and/or top slab.	Cracks wider than ½-inch, any evidence of soil entering the structure through cracks or qualified inspection personnel determines that the vault is not structurally sound.	Vault replaced or repaired to provide complete sealing of the structure.
	Ventilation	Ventilation area blocked or plugged.	No reduction of ventilation area exists.
Underdrains and Cleanouts	Sediment/debris	Underdrains or clean-outs partially plugged or filled with sediment and/or debris or are not watertight.	Underdrains and clean-outs free of sediment and debris and sealed.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.

NO. 20 – SAND FILTER VAULT			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

NO. 21 – STORMFILTER® (CARTRIDGE TYPE)			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Any trash or debris which impairs the function of the facility.	Trash and debris removed from facility.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Life cycle	System has not been inspected for three years.	Facility is re-inspected and any needed maintenance performed.
Vault Treatment Area	Sediment load on vault floor	Greater than 2 inches of sediment.	Vault is free of sediment.
	Sediment load on top of cartridges	Greater than ½ inch of sediment.	Vault is free of sediment.
	Multiple scum lines above top of cartridges	Thick or multiple scum lines above top of cartridges. Probably due to plugged canisters or underdrain manifold.	Cause of plugging corrected, canisters replaced if necessary.
Vault Structure	Damage to wall, Frame, Bottom, and/or Top Slab	Cracks wider than ½-inch and any evidence of soil particles entering the structure through the cracks, or qualified inspection personnel determines the vault is not structurally sound.	Vault replaced or repaired to design specifications.
	Baffles damaged	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.	Repair or replace baffles to specification.
Filter Media	Standing water in vault	9 inches or greater of static water in the vault for more than 24 hours following a rain event and/or overflow occurs frequently. Probably due to plugged filter media, underdrain or outlet pipe.	No standing water in vault 24 hours after a rain event.
	Short circuiting	Flows do not properly enter filter cartridges.	Flows go through filter media.
Underdrains and Clean-Outs	Sediment/debris	Underdrains or clean-outs partially plugged or filled with sediment and/or debris.	Underdrains and clean-outs free of sediment and debris.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 21 – STORMFILTER® (CARTRIDGE TYPE)			
Maintenance Component	**Defect or Problem**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

NO. 22 – BAFFLE OIL/WATER SEPARATOR			
Maintenance Component	**Defect**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Any trash or debris which impairs the function of the facility.	Trash and debris removed from facility.
	Contaminants and pollution	Floating oil in excess of 1 inch in first chamber, any oil in other chambers or other contaminants of any type in any chamber.	No contaminants present other than a surface oil film.
Vault Treatment Area	Sediment accumulation	Sediment accumulates exceeds 6 inches in the vault.	No sediment in the vault.
	Discharge water not clear	Inspection of discharge water shows obvious signs of poor water quality- effluent discharge from vault shows thick visible sheen.	Effluent discharge is clear.
	Trash or debris accumulation	Any trash and debris accumulation in vault (floatables and non-floatables).	Vault is clear of trash and debris.
	Oil accumulation	Oil accumulations that exceed 1 inch, at the surface of the water in the oil/water separator chamber.	No visible oil depth on water.
Vault Structure	Damage to Wall, Frame, Bottom, and/or Top Slab	Cracks wider than ½-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound.	Vault replaced or repaired to design specifications.
	Baffles damaged	Baffles corroding, cracking, warping and/or showing signs of failure as determined by maintenance inspection personnel.	Repair or replace baffles to specifications.
Gravity Drain	Inoperable valve	Valve will not open and close.	Valve opens and closes normally.
	Valve won't seal	Valve does not seal completely.	Valve completely seals closed.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.

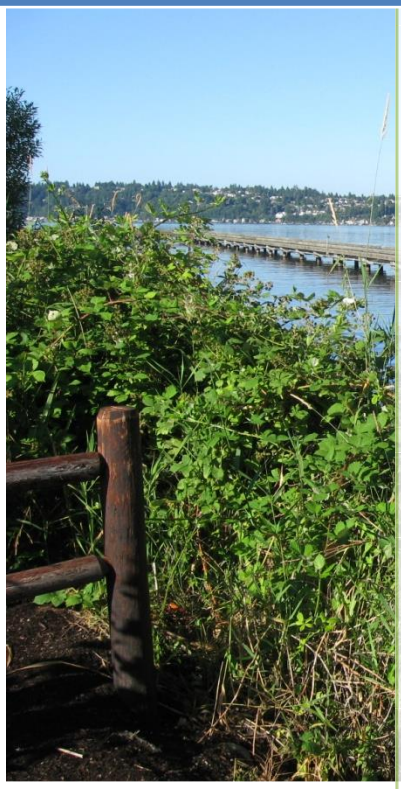
NO. 22 – BAFFLE OIL/WATER SEPARATOR			
Maintenance Component	**Defect**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or cover/lid.	Lifting rings sufficient to lift or remove cover/lid.

NO. 23 – COALESCING PLATE OIL/WATER SEPARATOR			
Maintenance Component	**Defect**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Site	Trash and debris	Any trash or debris which impairs the function of the facility.	Trash and debris removed from facility.
	Contaminants and pollution	Floating oil in excess of 1 inch in first chamber, any oil in other chambers or other contaminants of any type in any chamber.	No contaminants present other than a surface oil film.
Vault Treatment Area	Sediment accumulation in the forebay	Sediment accumulation of 6 inches or greater in the forebay.	No sediment in the forebay.
	Discharge water not clear	Inspection of discharge water shows obvious signs of poor water quality - effluent discharge from vault shows thick visible sheen.	Repair function of plates so effluent is clear.
	Trash or debris accumulation	Trash and debris accumulation in vault (floatables and non-floatables).	Trash and debris removed from vault.
	Oil accumulation	Oil accumulation that exceeds 1 inch at the water surface in the in the coalescing plate chamber.	No visible oil depth on water and coalescing plates clear of oil.
Coalescing Plates	Damaged	Plate media broken, deformed, cracked and/or showing signs of failure.	Replace that portion of media pack or entire plate pack depending on severity of failure.
	Sediment accumulation	Any sediment accumulation which interferes with the operation of the coalescing plates.	No sediment accumulation interfering with the coalescing plates.
Vault Structure	Damage to Wall, Frame, Bottom, and/or Top Slab	Cracks wider than ½-inch and any evidence of soil particles entering the structure through the cracks, or maintenance inspection personnel determines that the vault is not structurally sound.	Vault replaced or repaired to design specifications.
	Baffles damaged	Baffles corroding, cracking, warping and/or showing signs of failure as determined by maintenance/inspection person.	Repair or replace baffles to specifications.
Ventilation Pipes	Plugged	Any obstruction to the ventilation pipes.	Ventilation pipes are clear.
Shutoff Valve	Damaged or inoperable	Shutoff valve cannot be opened or closed.	Shutoff valve operates normally.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the vault at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 23 – COALESCING PLATE OIL/WATER SEPARATOR			
Maintenance Component	**Defect**	**Condition When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

NO. 24 – CATCHBASIN INSERT			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance is Needed**	**Results Expected When Maintenance is Performed**
Media Insert	Visible Oil	Visible oil sheen passing through media	Media inset replaced.
	Insert does not fit catch basin properly	Flow gets into catch basin without going through media.	All flow goes through media.
	Filter media plugged	Filter media plugged.	Flow through filter media is normal.
	Oil absorbent media saturated	Media oil saturated.	Oil absorbent media replaced.
	Water saturated	Catch basin insert is saturated with water, which no longer has the capacity to absorb.	Insert replaced.
	Service life exceeded	Regular interval replacement due to typical average life of media insert product, typically one month.	Media replaced at manufacturer's recommended interval.
	Seasonal maintenance	When storms occur and during the wet season.	Remove, clean and replace or install new insert after major storms, monthly during the wet season or at manufacturer's recommended interval.

City of Kenmore IPM Manual



City of Kenmore

February 2010

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INTRODUCTION

The City's parks and natural areas are a reflection of the values of the community. The Public Works Department strives to ensure that public landscapes remain attractive while meeting the expectations of its users as well as preserve natural ecosystems for the future. Park landscapes including trees, shrubs, flower beds, ponds, streams, rivers and lakes make up these open spaces which require maintenance and protection from damage by both humans as well as biological pests.

Integrated pest management (IPM) is a sustainable approach to managing pests by combining biological, cultural, physical and chemical methods in a way that will minimize the effects on the environment, minimize domestic and health risks, while considering budgetary restrictions. The objectives of the IPM program are:

To protect the health, safety, and welfare of the community

To provide efficient cost effective maintenance of the City's park resources, which includes non-chemical controls whenever possible

To design new and renovate existing landscape areas that suit site conditions with sustainable maintenance practices, thus providing a comprehensive stewardship of parks and natural resources

To restore, create and protect environmentally valuable areas such as wetlands and riparian areas, aquatic and terrestrial wildlife habitat, forests, and meadow areas.

DEFINITIONS

Integrated Pest Management (IPM) – A decision-making process to determine if, where, when and how pest problems will be managed. An IPM program includes all potential pest control strategies, but focuses on non-chemical controls whenever possible, in order to perpetuate a sustainable environment. The following four pest control methods may be employed in an IPM program:

Cultural Control: The use of 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: The use of a variety of tools and equipment for the purpose of eliminating pests.

Biological Control: The use of biological control agents that act as predators or parasites of pest species or the use of other beneficial organisms that improve plant health by enhancing soil quality.

Chemical Control: The application of various agricultural products such as herbicides, insecticides or fungicides or other chemical compounds to a target pest as a means of control.

MSDS – Material Safety Data Sheets or MSDS are prepared by manufacturers of chemical products to relay the necessary safety and protective information to users about the said chemical compounds.

Pesticide – Any material including agricultural chemicals, herbicides, insecticides and fungicides, or biological agents applied to a target pest as a control measure.

Pest – The word "pest" has been broadly defined in this document to include "injurious" insect species, plant pathogens, noxious or invasive vegetation, vertebrate animals such as rodents, structural pests or any other factor that creates an unhealthy environment for landscapes and structures.

Threshold – The term "threshold" refers to the point at which pest injury can no longer be tolerated without compromising the health or aesthetic value of a plant, ecosystem or other assets of value including human health. Once a threshold is being approached, some control measure may be necessary to suppress pest activity to acceptable levels.

BACKGROUND

Policies and Regulations

By legal definition, a pesticide is any substance for which a manufacturer or distributor claims pesticidal value. Today there are more than 32,000 pesticide products registered to destroy, prevent, attract, or in some manner, control pests.

The first act of pesticide control was passed in 1910 called the Insecticide Act of 1910. Since then there has been the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (FIRFA) and more recently, the Federal Environmental Pesticide Control Act of 1972. The major provisions of this act are:

- All pesticides must be registered with the U.S. Environmental Protection Agency (EPA). Qualified states may also register pesticides under special conditions.
- All pesticides will be classified for either general or restricted use.
- Only certified applicators, or those under their supervision, may apply restricted use pesticides. States have the authority to certify applicators.
- Use of pesticide inconsistent with labeling instructions is prohibited.
- Violators may be fined or imprisoned or both.

Other important regulations pertain to working within a protected areas, such as wetlands and riparian corridors, steep slopes and native growth protection areas. Certain activities are restricted in these areas and may require special permits granted by the City of Bellevue and other regulatory agencies. Further description of these areas and their restrictions will be described in specific chapters of this manual.

Pesticide Use Decision

The following agencies and individuals are involved in the determination of when to use pesticides in the City of Kenmore.

- The **Washington State Department of Agriculture (WSDA)** sets the overall policy for pesticide use in the state of Washington. The approved chemical list can be seen on their website at www.agr.wa.gov.
- The **Washington Department of Ecology (WDOE)** 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 impacts levels on non-target plants.
- The **Public Works Operations Manager** is responsible for upholding and applying City's pesticide policies and procedures within their areas of control. They are also responsible for ensuring that any personal protective equipment (PPE) is available and properly fitted for use by applicable staff for any chemical application.
- The **City's Contractors**, under the direction of the Public Works Operations Manager, will determine the most appropriate control measure for actual landscape pest situations, including selecting the most appropriate pesticide products, if necessary. They are also responsible for the safe storage and handling of pesticides, spill responses, and related training.
- The **Public Works Operations Manager** is responsible for ensuring that City Contractors and Public Works staff are maintaining their mandatory annual recertification training for all licensed pesticide applicators, officially called "Pesticide Operators" that may be performing pesticide applications to any City owned properties.

Pest Management Guidelines

The following pest management guidelines generally apply to all City of Kenmore's Parks and other public landscapes:

- City landscapes will be designed to minimize pest management. Where resources are available and existing design themes will not be compromised, modifying landscapes will be considered to reduce pest management.
- All reasonable, cost effective non-chemical pest control options will be considered first before resorting to the use of pesticides.
- Public Works will practice IPM in all pest management situations, understanding that some situations will require the use of a pesticide product.
- Certain levels of pest problems or populations will be accepted within established thresholds. Those thresholds will vary with the pest and the landscape setting.
- Public Works will not perform prophylactic or calendar-based pesticide applications.
- Only pesticides approved for that particular use will be used for the prescribed applications. When pesticides are applied, the smallest effective area will be treated, and the application will be timed to minimize public contact and the effects on the environment.
- Whenever possible, pesticide applications will be carefully timed to control the pest and reduce the need for re-treatment.
- In accordance with the Washington State Licensing Guidelines, all staff and contractors who are engaged in the use, application and storage of pesticides shall have a current Washington State

Pesticide License. Contractors must notify the Public Works Department prior to the application of any pesticide for approval to use such pesticides.

- Public Works pesticide applicators shall strictly observe all pesticide products label requirements. All chemicals used on City property will have an MSDS on file, and will be available to all staff, contractors and the public upon request.
- Pesticides shall not be used to control plants with edible fruit during the fruiting season unless the plant being controlled is not of sufficient size to produce fruit. Fruiting plants such as blackberries should be first cut to the ground, allowed to re-sprout and then chemically controlled before the plant can produce fruit. Plants controlled in this manner should never be allowed to produce fruit in the future.
- All sites where pesticides have been applied shall be posted, as required by the Washington State Department of Agriculture (WSDA). As required by the WSDA, all applications of pesticides will be recorded.
- Public Works will continue its aggressive training program for all staff that apply pesticides, and will continue to emphasize learning new pest control techniques, as they are available.
- Public Works will continue to field test alternative controls to pesticide use and will implement successful control options as budget allows.
- To promote public understanding and support of the benefits of the IPM program, educational assistance and information will be provided to the public regarding the use of pesticides.
- The City shall comply with all Federal, State and Local regulations pertaining to the application, handling, storage, and disposal of pesticides.

Components of an IPM Program

IPM involves a structured decision-making process that embodies the philosophy and components of the IPM system. Through the following applications, as well as the proceeding guidelines, a well managed IPM program can be implemented.

- **Identification of pest populations:** Identify the nature, location, scale and the intensity of the problem.
- **Determine plant injury levels:** Define the tolerance levels for aesthetic and economic injuries. Prescribe the point at which actions must be taken to avoid exceeding the tolerance level.
- **Design and implement the pest management treatment:** Research all possible options and design strategies. Non-target organisms must be considered at this time. Use of pesticides is limited to situations where other cultural and biological options are not likely to be successful within the context of available resources. The pesticide chosen shall be the least toxic of those available and with the minimal of impact, as defined by that chemical's use.
- **Evaluate results.** Conduct follow-up inspections to support evaluation:
- Did the pest population decline to acceptable levels?
- Was there a negative impact on non-target organisms?
- Do the host plants appear to be able to thrive following a successful treatment?

- **Adjust and extend program as indicated.** Decide whether further treatment will be necessary, either on a temporary or permanent basis. If the treatment is to be on a permanent basis, schedule to plan potential site modifications to eradicate the problem or prevent future recurrences.
- **Create documentation of all research, monitoring, and application data.** A comprehensive system of forms for monitoring data and documenting treatment is a key component of a successful IPM program.
- **Share pest management information with decision-makers and maintenance staff.** Professional staff must know the degree to which landscape pest management programs impact existing staff, maintenance budgets, and park assets. Only through such understanding and ongoing communication can the best long-term strategies be developed for managing pest populations.

IPM Alternatives Selection Hierarchy

The following selection rationales are used as a guide in determining whether pesticides shall be used in place of other control methods:

- Proper planning and management decisions begin the IPM process.
- Cultural methods of vegetation and pest control are preferred and will be employed first.
- If unsuccessful, mechanical means of vegetation and pest control will be employed next where feasible, and then,
- Biological means of vegetation and pest control will be employed next where they are practical and feasible.
- Pesticides will only be used when no other feasible method exists that will control the pest within the realities of the location, site conditions, budget and other relevant considerations. At the same time, it is recognized that pesticide use is a legitimate element of an IPM program.

BEST MANAGEMENT PRACTICES

Storage and Use Guidelines

Every employee has a personal responsibility to themselves, other staff, and the public to follow safe work practices when storing or using pesticides.

Management Practices

- Always read the label of the chemical that you will be using.
- Store and handle all chemicals or fertilizers in a manner that minimizes worker exposure and potential for contamination of surface and ground water.
- Always have the correct Material Safety Data Sheet (MSDS) on hand for all chemicals or fertilizers at your site (required by law).
- Always check the MSDS for the type of protection needed and the recommended re-entry time before the chemical is applied.

- When possible, purchase the smallest amount of any pesticide needed and avoid stockpiling of chemicals.
- Store fertilizer in a separate weatherproof area.
- All spray equipment shall be maintained in proper working order and stored in an OSHA-approved site.
- All protective gear (masks, filters, rain gear) will be stored separately from any possible contamination.
- Store and mix all chemicals in a WSDA-approved storage and mixing area. Label storage area with an NFPA-coded sign to protect Fire Department or Hazmat personnel in case of emergency.
- Any pesticides in inventory that are no longer needed for use will be disposed of through hazardous materials disposal practices.
- A pesticide inventory is maintained by the Resource Management Division.

Pesticide Application Equipment

Pesticide application for all listed areas will be carried out by hand with directed, low-volume, single-wand sprayers, wiping, daubing and painting equipment, injection systems, or drop spreaders. Typically, applications are done with backpack sprayers, but may also include sprayers with larger fill tanks providing the same kind of hand application method is used. These methods of delivery result in low-volume applications at low nozzle pressures. This practice minimizes the formation of fine mists that can result in pesticide drift. These practices also help ensure that the pesticide applied will reach only its intended target. In large open turf areas, boom type sprayers may also be employed. Boom sprayers are efficient and expedient, used to destroy weeds species after they have exceeded the acceptable threshold level.

Personal Protective Equipment (PPE)

The table on the following page shows the personal protective equipment required by City, state and federal regulations for pesticide use.

Chemical Application near Watercourses & Aquatic Habitats

Generally, the use of chemical products within 50 feet of a watercourse shall be prohibited in favor of an alternative control method. If a pesticide or herbicide must be applied within the 50 foot buffer, only products registered for use near water bodies shall be used, and great care will be taken to ensure that the product does not migrate into the watercourse either through drift or by overland flow. Weather conditions must be monitored carefully to avoid applying a chemical near a watercourse immediately before heavy rains. Soil conditions and site topography must also be carefully studied to determine the appropriate timing of a chemical application **and/or whether a chemical should even be applied at the site.**

Personal Protective Equipment (PPE) Guide for Using Pesticides			
Pesticide Formulation	LABEL SIGNAL WORD		
	Caution	Warning	Danger
Dry	• long-legged pants • long-sleeved shirt • shoes & socks	• long-legged pants • long-sleeved shirt • shoes & socks • wide-brimmed hat • gloves	• long-legged pants • long-sleeved shirt • shoes & socks • hat • gloves • cartridge or canister respirator if dusts in air or if label precautionary statement says "Poisonous or fatal if inhaled"
Liquid	• long-legged pants • long-sleeved shirt • shoes & socks • wide-brimmed hat • gloves	• long-legged pants • long-sleeved shirt • shoes & socks • wide-brimmed hat • rubber gloves • goggles if required label precautionary statement • cartridge or canister respirator if label precautionary statement says "Do not breathe vapors or spray mist" or "Poisonous if inhaled"	• long-legged pants • long-sleeved shirt • rubber boots • rubber gloves • goggles or face shield if required label precautionary statement • cartridge or canister respirator if label precautionary statement says "Do not breathe vapors or spray mist" or "Poisonous if inhaled"
Liquid when mixing	• long-legged pants • long-sleeved shirt • shoes & socks • wide-brimmed hat • gloves • rubber apron	• long-legged pants • long-sleeved shirt • shoes & socks • wide-brimmed hat • rubber gloves • goggles or face shield • rubber apron • Respirator if label precautionary statement says: "Do not breathe vapors or spray mist" or "Poisonous (or fatal or harmful) if inhaled"	• long-legged pants • long-sleeved shirt • rubber boots • wide-brimmed hat • rubber gloves • rubber apron • canister respirator
Liquid (prolonged exposure to spray)	• long-legged pants • long-sleeved shirt • boots • rubber gloves • waterproof wide brimmed hat	• water-repellent long-legged pants & long sleeved shirt • rubber boots • rubber gloves • rubber apron • waterproof wide brimmed hat • face shield • cartridge or canister respirator	• waterproof suit • rubber boots • rubber gloves • rubber apron • waterproof hood or wide brimmed hat • face shield • canister respirator

IPM BEST MANAGEMENT PRACTICES

Public Works maintains a wide variety of landscape types, each with unique pest control issues and control measures. For these reasons, the pest control measures specific to each landscape are dealt with separately in this section. If chemical applications are required, only chemicals approved for a specific location will be used in that location.

Control of Special Pests

- **Blackberries –** An aggressive, invasive plant, blackberry will overtake a disturbed site at an alarming rate. Mechanical control is not very effective by itself. But combined with chemical control measures and replanting of the site, effective control can be maintained. Chemical applications shall be kept to the area of infestation. Treatment efforts should include re-vegetating the site with desirable plant species.
- **Scotch Broom –** An unruly plant, it thrives on disturbed sites. It is difficult to control, and spreads rapidly. The seeds and flowers are toxic, making it a high priority for eradication. Manual control can have some effect, but it must done at the proper time of year. Chemical control can also be effective, but requires follow up management techniques until full eradication occurs. Chemical applications shall be kept to the area of infestation.
- **English Ivy –** A very aggressive, invasive, introduced plant, Ivy is difficult to control or eradicate. Manual or mechanical control is somewhat effective, but highly time consuming. A combination of mechanical and chemical control is more effective, and spread can be kept to a minimum, with continuous control measures. Chemical applications shall be kept to the area of infestation.
- **Horsetail –** One of the most tenacious weeds in the Northwest gardens is horsetail. It is almost impossible to control manually or mechanically. Horsetail can be controlled with herbicides. As with other chemical controls, chemical application shall be contained to the area of infestation. Horsetail is an indication of high water content in soil, so any use of herbicides should be well thought out and carefully timed.
- **Garden Slugs –** As in all Northwest gardens, garden slugs can have a significant impact on park floral beds. Approved control strategies include manual control and careful use of chemical control products. One non-toxic chemical that is found to work is iron phosphate, which is biodegradable and is even healthy for garden soil.
- **Rats –** Rats are only somewhat of a pest problem in Bellevue parks. Bellevue does have some natural predators of rats which helps alleviate many of the problems that could occur. They do pose a human health risk and will be controlled in given situations. The common method of control is baiting with an approved rat bait/trap. Extreme caution must be taken to place rat bait in locations where people or domestic animals cannot access it.
- **Mice –** Mice are becoming an increasing human health problem from Hanta virus. Mice control is not currently a major pest control issue in Parks facilities, but increased control measures may be required in the future based on the history of the virus.

- **Yellow Jackets, Hornets, and Wasps –** These insects often require control in parks. Control is typically through use of an approved insecticide. Only individual nests are treated and only if the nest poses an imminent risk to humans using park facilities.
- **Vector-borne Disease –** Here in the Pacific Northwest, vector-borne diseases are only starting to become an issue. The most significant is mosquito-borne diseases, such as the West Nile Virus. Complete control of mosquito infestations is near impossible, but cultural control can have some effect, such as removing any standing-stagnant water from any sites. Larvicides may also be used to control mosquito infestations if it's determined that public health concerns warrant their use.

IPM for Plant Beds

Plant beds are defined as non-turf planted areas that include woody plant material such as shrubs and trees and ground covers. The category also includes floral color displays containing herbaceous plants such as perennials, annuals, and bulbs. The most serious pest management issue in plant beds is weed control. If not controlled, weeds not only make a plant bed look unkempt but, more importantly, can out-compete desirable landscape plants resulting in a loss of assets.

Pest Tolerance Thresholds

- In general, weeds are not tolerated in park plant beds.
- Insect pests are tolerated, unless they pose a threat to humans.
- Diseased plants are not tolerated and are usually removed.

Pest Management Strategies

Weed Control

- Weeds are controlled by hand pulling, or by mechanical methods in larger plant beds.
- Plant beds will be mulched after planting to suppress new weed growth.
- Use of landscape fabric can be used.
- Herbicides can be sprayed, if necessary.

Disease Control

- Diseased plants shall be hand pulled from plant bed and discarded appropriately.
- Disease resistant plants shall be planted in all parks plant beds, whenever possible.

IPM for Trees

Trees are an integral part of most landscapes, whether formal or natural, and are considered an asset. They provide shade, clean the air of pollutants, modify both micro and macro climates, and provide visual relief to the urban environment. Because trees are often very large and tall, accessing and managing insects and disease can be quite difficult and costly.

Pest Tolerance Thresholds

- In general, insect and disease pests in trees are tolerated
- Insect or disease pests in selected, high-value specimen trees may be subject to control measures.

Pest Management Strategies

Physical Damage to Trees

Physical damage to trees can be a major factor in overall loss of trees. This damage most often occurs in one of two ways. One is when trees are repeatedly struck by mowing equipment. A second form of injury is by string trimmers, which can damage bark leading ultimately to tree loss. Many trees are also lost to lack of appropriate care during construction projects within existing parks.

- 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, a mower or trimmer never has to come close enough to the tree to cause damage. The tree mulch ring will need to be kept free of grass and weeds.
- All pruning for tree health reasons and for hazard reduction will be done in conformance with the International Society of Arboriculture standards.

Insect Control

Public Works does not actively control insect pests in trees. This is particularly true of large trees where the control of the pest might require the use of large aerial spray equipment, which carries with it a high probability of the insecticide applied leaving the area due to wind drift. For example, Public Works does not spray aphids despite the “honeydew” problem associated with them. When insect pests are controlled in trees, the following measures are used:

- Trees that are highly susceptible to specific insect pests (such as blue spruce and spruce aphids) may be removed from the landscape and replaced with resistant species.
- When possible, 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 in very selected situations. These situations include pests on specimen quality trees at special gardens or in high visibility locations where the presence of the pest threatens the life of the tree. In these situations, general foliar applications will not be made unless the potential for product drift can be controlled.
- New injection technology may allow for systemic control of certain insect pests with minimal or no impact to human or environmental health. Public Works will continue to explore this technology as a potential control in the future for insect pests that may threaten the health of valuable park trees.

Disease Control

Most diseases are tolerated in trees, unless they lead to a tree becoming a hazard to the surrounding environment. As with insecticides, it is unlikely that Public Works will subscribe to general foliar applications of fungicides or similar pesticide products to control disease pests in trees. The following are control measures that can be performed:

- Trees that are susceptible to particular disease pathogens may be removed from the landscape and replaced with resistant varieties.
- When possible, parts of trees affected by disease should be pruned out and properly disposed 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 in very selected situations. These cases include specimen quality trees in special gardens or in high-visibility park locations where the presence of the disease threatens the life of the tree. In these situations, general foliar applications will not be made unless the potential for product drift can be controlled.
- New "injection" technology may allow for systemic control of certain disease in trees pests with minimal or no impact to human or environmental health. Parks will continue to explore this technology as a potential control for disease pests that may threaten valuable trees in City parks.

IPM for Turf

Public works maintains variety of turf types. These include park lawn areas (both formal and informal), meadow areas and other turf types. Each of these turf types has different pest management challenges, and practices may vary accordingly.

Pest Tolerance Thresholds

- Some level of weed, insect, and disease pests are tolerated in general park lawn areas.
- Pests in highly maintained turf such as athletic fields, bathing beaches and other high-
- visibility/high-use areas are generally controlled through good turf cultural practices.
- Because of the unique conditions present on golf courses, a variety of pest control
- measures are used, including mechanical, cultural and chemical.

Pest Management Strategies

Broadleaf Weeds

Weeds in turf are tolerated, to some level, with the exception a few high-visibility park turf areas. When control is necessary, the primary method is through the following cultural practices:

- careful monitoring of watering practices
- fertilization

- aeration
- top-dressing
- over-seeding

By performing these cultural practices, park turf is made healthier and better able to compete with various broadleaf weeds. Chemical weed control will be used only as a last resort for controlling particularly difficult weeds in high-visibility turf areas.

- In these limited situations the least toxic, least residual pesticide will be used for spot treatments.
- General broadcast treatments will generally be avoided.
- Timing of such applications will be made to avoid contact with the public to the extent possible.
- Posting of the site that has been treated will meet or exceed legal requirements.

Insect Control

The only real insect pest currently of significance for turf in the Kenmore area is the European Crane Fly. While it can be quite damaging to turf areas, the crane fly is not controlled by prophylactic means.

- Chemical control is used only in the very limited circumstances to turf of very high visibility and value such as selected high-visibility/high-use turf areas.
- Any chemical applications will 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” or least toxic product available.

Disease Control

General Park Turf

Disease in general park turf is typically tolerated and not actively controlled.

- In high-use/high-visibility park turf areas, disease will be controlled to a considerable degree by performing sound cultural practices.
- Pesticides may be used as a last resort to control disease in park turf areas.

Grass Trimming Abatement

The control of grass growing along fence lines and around trees, bollards, posts and other landscape features is a regular maintenance activity that helps preserve the asset by allowing large riding lawn mowers to steer clear of objects. This is especially important around trees where impact from mower damage can easily lead to tree loss. At the same time, keeping this grass controlled allows Parks to present parks that appear clean and well kept. This grooming affects how the public uses our facilities.

Well-maintained parks are subject to less vandalism and related misuse. The following are BMPs for grass trimming:

- **String trimmers or push mowers.** The grass is trimmed using gas-powered string trimmers or push-type lawn mowers. This labor-intensive practice is costly and produces noise and air pollution.
- **Herbicide.** Applications are performed annually or semi-annually, to provide pre-emergent control of weed and grass seed not yet germinated in tree mulch rings, plant beds and similar areas.

IPM for Natural and Sensitive Areas

Natural areas are City-owned property with critical environmental resources. These sensitive habitats shelter native ecosystems and wildlife habitat. For the purposes of this IPM manual, these resource assets are divided into three major groups:

- Wetlands, riparian corridors, shorelines and aquatic habitats
- Forests
- Meadows

Pest Tolerance Thresholds

For all natural and sensitive areas:

- Invasive plants are generally not tolerated. Invasive plants will be controlled in conjunction with natural resource enhancement efforts in these environments as resources permit and where control can be practically achieved.
- Noxious weeds will not be tolerated and will be controlled when found in conformance with State of Washington mandate.
- Only insect pests that pose a risk to the public (such as hornets) or to the resource (such as gypsy moth) will be controlled.
- Plant diseases will generally be tolerated unless: a specific control can be employed that will be effective in ensuring the health of particularly valuable assets; or if they pose a threat to other plant populations outside of the natural area; or if they pose an unacceptable risk to the public.
- Herbicide Use: The use of herbicides in any natural environment must be carefully considered. Herbicides will be used for weed control in natural areas only when other control measures have been tried and failed, and only if control can be achieved through the use of a herbicide, and is imperative to the health of the site. For wetland or water environments, only approved wetland herbicides will be used.

When needed, herbicide use practices are as follows:

- Cut and stem treatment (daubing or painting) is the preferred choice for natural area management.

- Certain invasive plants are difficult to treat and control in their mature form. If possible, remove existing growth manually or mechanically. Wait for new growth to become established. Then treat with the appropriate and approved herbicide.

Pest Management Strategies

Weed Control

An overriding principle of IPM is the maintenance of healthy plant communities. That means weed control of the following types:

- **Timed mowing.** Carefully timed mowing before seed set can effectively reduce weed seed sources. Frequent mowing can eliminate blackberry and other woody species.
- **Mulching.** Mulching around the base of plantings is widely accepted as a horticultural practice for soil fertility and weed control. In most instances, composted wood chips or onsite recycle leaf litter are adequate materials. Avoid wood chips from diseased trees. Mulch should be between 2 to 3 inches deep for best results.
- **Weed watch during mulching.** Care must be given to not incorporate new weed problems when importing mulch materials.

Woody Brush Control

The control of woody brush, like blackberry, is very important in certain park locations. Often these plants are found in transition areas between developed park areas and natural areas. If not controlled, woody brush can easily over take forest-edge environments, eliminating vital habitat opportunities. Control measures for woody brush include the following:

- Manual or mechanical removal using hand tools or gas-powered equipment. Special tools are now available for removing woody brush. In many areas, this can provide effective control.
- Chemical control can be employed when other measures are not mechanically or economically feasible. Spot applications are preferred, whenever possible, to large area applications.

Insect Control

Insects like the European and Asian Gypsy moth and the Asian Long Horned Beetle can potentially devastate Bellevue's urban forest. Parks will cooperate with state and federal agencies in their monitoring and control programs to prevent the introduction of these pests.

Disease Control: Root Rots

Even native forests can have serious disease problems. Root rots are the most serious problem, leading often to the death of significant trees. Several strategies help control root rot in forests:

- inoculate with mycorrhizae
- remove infected wood

- plant resistant varieties
- treat resulting stumps with borax on Western Hemlock
- do not change site conditions on mature trees

Stump Re-Sprouting Control

Often there is a need to remove small trees and prevent re-sprouting of a stump. Methods for controlling the re-sprouting of stumps include the following:

- If the location of the stump(s) will allow access by equipment, then they can be mechanically removed providing the location is not within an environmentally critical area.
- Small stumps may be removed manually providing they are not on steep slopes or in other environmentally critical areas.
- The re-sprouting of stumps can also be controlled by painting newly cut stump surfaces with an herbicide. Care will be taken to limit the application of the selected herbicide to the stump surface only.

Invasive Plant Control

Invasive plant control shall follow the guidelines established by *King County Noxious Weed Boards*. Except in the case of Class A weeds, the goal is suppression of weed populations to below threshold (damage causing) levels. Eradication of certain ecological weeds (blackberry or ivy) in all of the City's natural areas is neither feasible nor cost-effective. However, controlling spread of the problem and eradicating it in certain priority locations are Public Works goals.

Control methods include:

- Use **extent of removal** and **type of habitat** to determine the pest control method.
- Large areas that are totally infested can be mowed. Areas that are interspersed with invasive pests require more selective procedures such as manual removal.
- Heavy equipment or manual removal can be used on firm soils. On either steep or saturated soil, use techniques that will minimize site or slope disturbance.
- Where mechanical or manual removal is neither possible nor practical but control is essential, careful and selective use of an approved herbicide is permitted. Use of these chemicals shall conform to the guidelines listed below in "Herbicide Use."
- Re-establishing a new native planting regime as quickly as possible following the removal of invasive plants is critical to successful forest restoration. These new plantings will require care for several years to guarantee establishment.
- Preserve established native plants when possible rather than reestablishing new plants after the clearing of invasives.
- Public education and outreach concerning plant identification and management techniques will also aid the City in controlling noxious weeds.

Nuisance Wildlife Control

Mountain beavers, moles, coyotes, beavers, opossums, raccoons, waterfowl and other species can be destructive to natural areas when their activities are excessive. Overall, Parks does not encourage the interference with wildlife, and prefers to leave them to their natural behaviors. If control of wildlife is deemed necessary, Public Works will work with the most appropriate agency to formulate a control solution.

IPM for Trails

Pest Tolerance Thresholds

- Invasive plants that invade the trail area are generally not tolerated. Invasive plants will be controlled in conjunction with ecosystem restoration efforts on any park trail as resources permit.
- Noxious weeds will not be tolerated and will be controlled when found in conformance with State of Washington mandate.
- Weeds are generally found on trails and many will be tolerated. Weeds that begin to form a hindrance of trail function will be eradicated.
- Only insect pests that pose a risk to the public (e.g. hornets) will be controlled.

Pest Management Strategies

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, trail surface. Chemical weed control is often not necessary on trail surfaces, but will be used only as a last resort for controlling particularly difficult weeds.

- In these rare situations the least toxic, least residual herbicide will be used for spot treatments.
- General broadcast treatments will be avoided.
- Timing of such applications will be made to avoid contact with the public to the extent possible.
- Posting of the site that has been treated will be done as legally required.

Insect Control

Overall, insects on trails are tolerated. Only insects that can cause a health risk are controlled. Wasps and hornets are some of the few insects that will be eradicated immediately when encountered. When this is necessary, chemical control, with an approved insecticide, is the preferred method, and only the individual nests will be treated.

TRAINING

Because IPM is an ecologically sophisticated process that requires professional expertise in vegetation and pest management, it demands trained field personnel that are knowledgeable about:

- Ecological interactions and relationships among vegetation and pests;
- Potential tools and materials that can be used to effectively manage vegetation and pests by manipulating environmental conditions; and
- Correct timing for implementing specific management practices relative to vegetation and pest biology.

Educational and career opportunities in IPM will enhance crew professionalism, their knowledge of current vegetation and pest management practices, and their stewardship of managed landscapes.

APPENDIX C – O&M CONTRACTS AND AGREEMENTS

NAME	CONTRACT/AGREEMENT	DESCRIPTION	YEAR	TERM
King County Roads	98-C15	Roads Maintenance ILA	10/29/1998	Renews Annually
Lake Forest Park	00-C48	PW Admin ILA	2000	Renews Annually
Lake Forest Park	00-C86 & addenda, amendments	PW Admin ILA	2000	Renews Annually
Northshore ILA	00-C88 (Component of)	Moorlands Park Agreement	6/13/1995	Renews every 5 years after 2005
Total Landscape Corporation	01-C121	Contract for Services	2001	Renews Annually
JSH Properties	12-C1058	Property Management Agreement	9/1/2012	8/31/2013
Northwest Landscape Services	13-C1160	Contract for Services	6/17/2013	6/30/2015
King County CWP	11-C936	Agreement for Services	1/1/2011	12/31/2011
Innovative Vacuum Services	12-C1075 (Amended 1/2015)	Contract for Services	2012	3 Years
Waste Management		Services Agreement	4/14/2009	Renews Annually