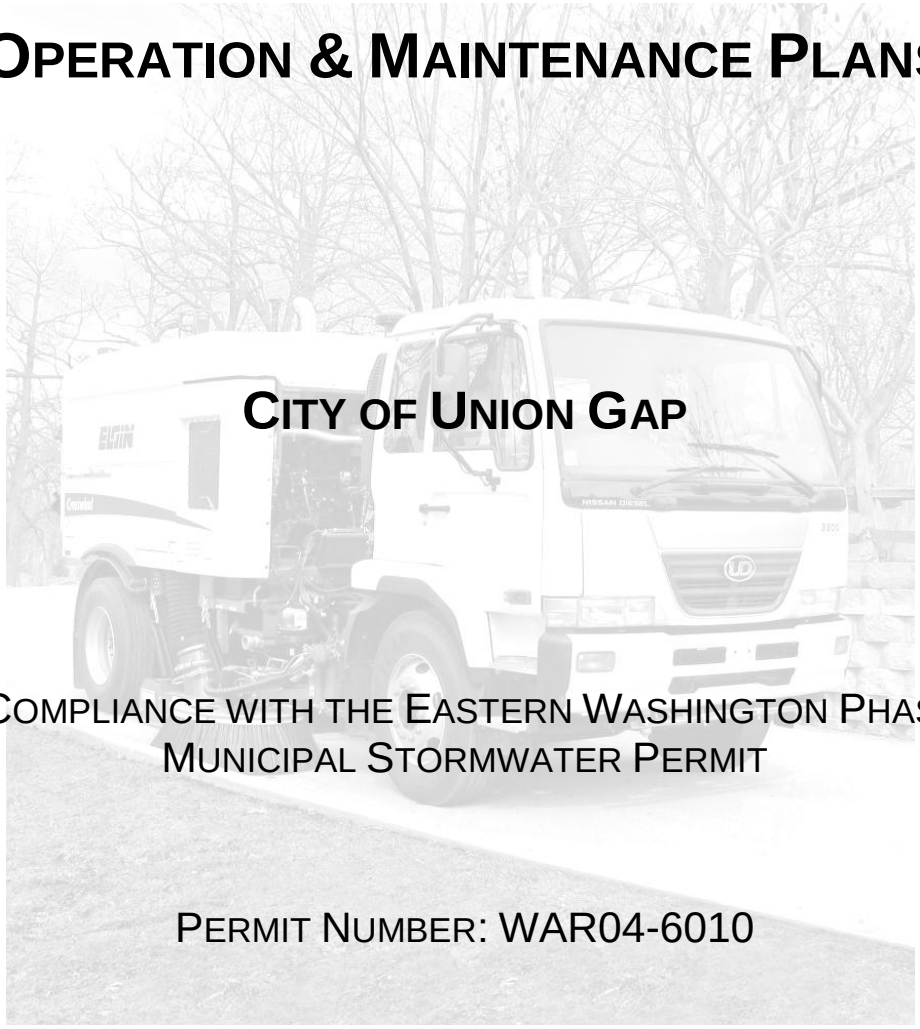
STORMWATER POLLUTION PREVENTION AND GOOD HOUSEKEEPING

OPERATION & MAINTENANCE PLANS



CITY OF UNION GAP

IN COMPLIANCE WITH THE EASTERN WASHINGTON PHASE II MUNICIPAL STORMWATER PERMIT

PERMIT NUMBER: WAR04-6010

Regional Stormwater Management Program

November 23, 2009

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Acknowledgements

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Name:	Municipality and Division:
Primary Author	
Matt Durkee	Yakima County Surface Water Management
Reviewers	
Brian Cochrane	Yakima County Surface Water Management
Terry Keenhan	Yakima County Surface Water Management
Matt Pietrusiewicz	Yakima County Road Maintenance
Dave Veley	Yakima County Equipment Rental & Revolving Fund
Ken Woodward	Yakima County Facilities Services
Dan Garcia	Yakima County Sheriff
Debbie Sugden	Yakima County Food Services
Robin Russell	Yakima County Printing
Scott Shafer	City of Yakima Wastewater
Shelley Willson	City of Yakima Wastewater Collections
Randy Meloy	City of Yakima Engineering
Joseph Rosenlund	City of Yakima Streets and Traffic
Wayne Deason	City of Yakima Streets and Traffic
Richard Wonner	City of Yakima Fleet and Public Works Facilities
Ken Wilkinson	City of Yakima Parks and Recreation
Dave Brown	City of Yakima Water and Irrigation
Randy Pitmey	City of Yakima City Hall Maintenance
Dave Willson	City of Yakima Fire
Keith Emhoff	City of Yakima Police
Shane Fisher	City of Sunnyside Public Works
Matt Cobb	City of Union Gap Public Works
Mike Redmond	Yakima Air Terminal - McAllister Field
Eric Mercado	Yakima Air Terminal - McAllister Field
Greg Lybeck	State Fair Park
Steve Sires	State Fair Park

Best management practices (BMPs) and facility specific thresholds to initiate cleaning, repair, and corrective actions were either taken directly or adapted from the Ecology Eastern Washington Stormwater Manual (2004).

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Abbreviations and Acronyms

AKART – All Known, Available, and Reasonable methods of control and Treatment

BMP – Best Management Practice

Co-Permittees – Yakima County, City of Yakima, City of Union Gap, City of Sunnyside

DEM – Digital Elevation Model

DID – Drainage Improvement Districts

Ecology – Washington State Department of Ecology

GIS – Geographical Information Systems

HHW – Household Hazardous Waste

IDDE – Illicit Discharge Detection and Elimination

IDP – Illicit Discharge Potential

ILA – Interlocal Agreement or Intergovernmental Local Agreement

MS4 – Municipal Separate Storm Sewer System

NPDES – National Pollutant Discharge Elimination System

NOV – Notice of Violation

O&M – Operation and Maintenance

POTW – Publicly Owned Treatment Works

RCW – Revised Code of Washington State

RSL – Regional Stormwater Lead

RSPG – Regional Stormwater Policy Group

RSWG – Regional Stormwater Working Group

RSWMP – Regional Stormwater Management Program

SOP – Standard Operating Procedure

SWPPP – Stormwater Pollution Prevention Plan

TMDL – Total Maximum Daily Load

UA – Urbanized Area

UGA – Urban Growth Area

UIC – Underground Injection Control

USEPA – United States Environmental Protection Agency

WAC – Washington Adminstrative Code

YCHD – Yakima County Health District

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1. Introduction

The following set of Stormwater Pollution Prevention and Good Housekeeping Operation and Maintenance (O&M) Plans provide guidance to the City of Union Gap to prevent pollutants generated by municipal operations and activities from entering the stormwater drain system.

These plans are required by the Pollution Prevention and Good Housekeeping for Municipal Operations portion (S5.B.6) of the Eastern Washington Phase II National Pollutant Discharge Elimination System (NPDES) Stormwater permit. The City of Union Gap obtained coverage under this permit from the Washington Department of Ecology (Ecology) for discharging stormwater to waters of the state.

Why Stormwater Pollution Prevention?

Many municipal activities can result in stormwater pollution if not conducted properly. Activities such as vehicle maintenance, fueling, and landscaping could produce pollutants that could be carried away by stormwater. Hydrocarbons and heavy metals are deposited on public streets and parking areas from clutch and brake wear, vehicle exhaust, and leaking motor fluids. The cleaning of buildings and walls can introduce soap and particulates, including paint chips, to the storm drain system if precautions are not taken.

Pollutants carried into the storm drain system by stormwater eventually are discharged to surface or ground waters. These pollutants may adversely impact receiving water quality and threaten aquatic life, wildlife, and human health (Table 1).

Figure 1. Stormwater runoff from a building roof.

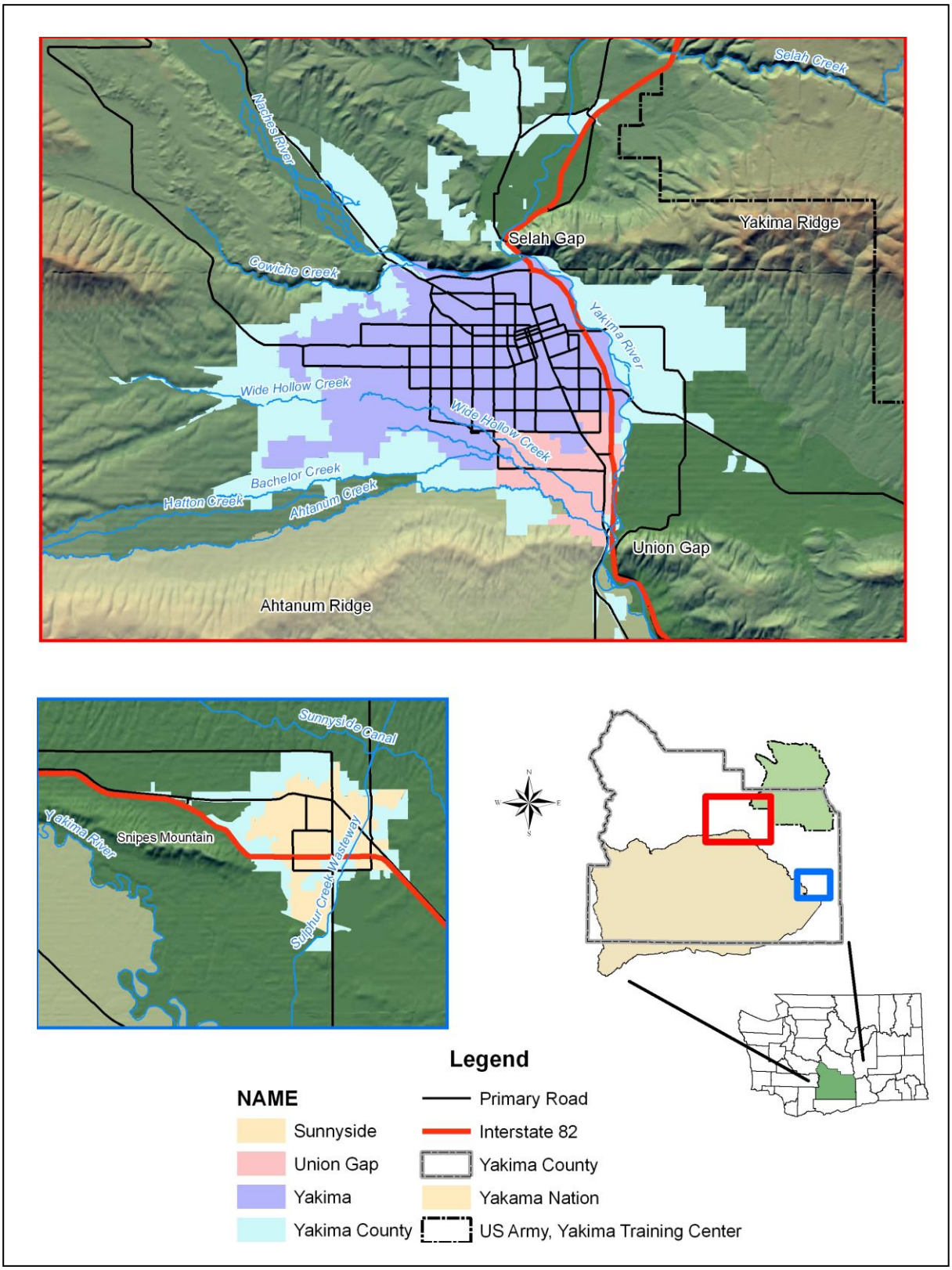


Figure 2. Regional Stormwater Management Program (RSWMP) member NPDES permit areas. City of Union Gap displayed as pink.

Table 1. Common Stormwater Pollutants, Sources, and Impacts (adapted from Rabasca and Rinehart, 2006).

Common Stormwater Pollutants, Sources, and Impacts		
Pollutant	**Sources**	**Impacts**
Sediment	Construction sites Eroding stream banks & lakeshores Winter sand & salt application Vehicle & boat washing Agricultural sites	Plant & fish habitat damage; Transport attached oils, nutrients, and other pollutants; Increased maintenance costs, flooding
Nutrients	Fertilizers Malfunctioning septic systems Livestock, bird/pet waste Vehicle & boat washing Grey Water Decaying grass & leaves Sewer overflows Leaking trash containers Leaking sewer lines	Nuisance/ toxic algal blooms; Low levels of dissolved oxygen (can kill aquatic organisms)
Hydrocarbons (petroleum compounds)	Vehicle & equipment leaks Vehicle & equipment emissions Pesticides Fuel Spills Equipment cleaning Improper fuel storage & disposal	Toxic to humans & aquatic life at low levels
Heavy Metals	Vehicle brake & tire wear Vehicle/equipment exhaust Batteries Galvanized metal Paint & wood preservatives Fuels Pesticides Cleaners	Toxic at low levels Drinking water contamination
Pathogens (Bacteria)	Livestock, bird, and pet wastes Malfunctioning septic systems Sewer overflows Damaged sanitary sewer lines	Risk to human health leading to closure of shellfish and swimming areas; Drinking water contamination

What are Best Management Practices (BMPs)?

The methods of improving stormwater quality, and thus surface water and groundwater, are called best management practices (BMPs). BMPs include a variety of managerial, operational, and structural measures that will improve water quality by reducing the amount of contaminants in stormwater (Clark County, 2009).

BMPs may be separated into three categories:

- Operational (Source Control)
  - Non-structural practices that prevent or reduce pollutants from entering stormwater.

- Structural (Source Control)
  - Physical or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater.

- Treatment
  - Settling basins or vaults, oil/water separators, biofilters, wet ponds, infiltration systems, and emerging technologies such as media filtration.

BMPs may also be split into those that should *always* be implemented and those that should be *whenever possible*. This gives some flexibility in situations where it is not practical or possible to always implement every BMP.

Water Quality Standards Violation

If Ecology determines that a discharge from the municipal separate storm sewer is causing or contributing to a violation of Water Quality Standards additional BMPs not currently listed in this document for an activity may be required. BMPs implemented whenever possible may need to be always implemented.

The City of Union Gap would be responsible for reporting to Ecology current BMPs in use, additional BMPs to be implemented, and a schedule for implementation. Ecology would need to approve this report and may require modifications as needed.

Required Components for All O&M Plans

- BMPs that will protect water quality, reduce the discharge of pollutants to the maximum extent possible, and satisfy all known, available, and reasonable methods of prevention, control, and treatment.

- O&M standards within this plan must be at least as protective as those included in Chapters 5, 6, and 8 of the Ecology Eastern Washington Stormwater Manual (2004) or another technical stormwater manual approved by Ecology.

- Low impact development (LID) techniques should be considered for all new and redeveloped municipal facilities.

- Water conservation measures should be considered for all landscaped area, parks, and open spaces.

- Record keeping shall be done pursuant to the requirements in NPDES permit Section S9 *Reporting and Record Keeping.*

- Include a schedule of inspections and identify the department responsible for performing each activity.

Required Facility or Activity O&M Plans

- Stormwater Collection and Conveyance System
- Roads, Highways, and Parking Lots
- Vehicle Fleets
- Municipal Buildings
- Parks and Open Space
- Construction Projects
- Industrial Activities
- Material Storage Areas, Heavy Equipment Storage Areas, and Maintenance Areas
- Flood Management Projects
- Other Facilities

2. Stormwater Collection and Conveyance System

Please see the City of Union Gap Stormwater Collection and Conveyance System O&M Plan which is currently a standalone document due to its length and the detail of information included for each type of stormwater facility.

3. Roads and Parking Lots

This O&M Plan will address street sweeping and cleaning, street repair and maintenance, and winter activities performed on roads and parking lots. Public streets and roadways can comprise as much as 10 to 20% of total impervious surface cover in suburban watersheds and as much as 20 to 40% in highly urban subwatersheds (Novotney, 2008).

Pollution in the form of particulate matter or “street dirt” tends to accumulate along street curbs and roadways in between rainfall events. Sources of pollutants include vehicle emissions, vehicle wear and tear, breakup of street surfaces, littering, organic material, and sanding.

Pollution prevention practices established in this O&M plan will be implemented for all roads and parking lots with more than 5,000 square feet of pollutant generating impervious surface that are owned, operated, or maintained by the City of Union Gap (Figure 2).

The City of Union Gap Public Works Department is responsible for all Road and Parking Lot O&M activities.

This plan specifically covers the following:

- Street Sweeping and Cleaning

- Street Repair and Maintenance
  - Road Surface Maintenance
  - Pavement Marking
  - Roadside Feature Maintenance (signs, guard rail, etc.)
  - Roadside Vegetation Control
  - Dust Control

- Winter Activities
  - Anti-Icing
  - De-Icing & Sanding
  - Snow Removal Practices
  - Snow Disposal Areas
  - Material Storage Areas

- Record Keeping

BMPs that should always be implemented and those that should be whenever possible are presented for each activity.

3.1 Street Sweeping and Cleaning

The City of Union Gap performs street sweeping for aesthetics and to remove sand and litter from streets and curb gutters. This removes pollutants which could be carried away by stormwater and eventually end up in surface and ground waters.

Street Sweeping and Cleaning Schedule	
Frequency	**Timing**
Minimum of Two Times Per Year For All Streets and Roads Minimum of Three Times Per Year For Major Arterials	March and Feb. - All Streets and Roads June and July - Major Arterials Sept. and Oct. - All Streets and Roads

BMPs that could be implemented to protect water quality and increase efficiency:

Always:

- Use regenerative air sweepers to perform street sweeping on curb and gutter streets. A mechanical sweeper is available as a back-up.

Whenever Possible:

- Sweep streets prior to catch basin cleaning.
- Consider increased street sweeping to reduce catch basin cleaning frequencies.
- Conduct sweeping at optimal frequencies. Optimal frequencies are those scheduled sweeping intervals that produce the most cost-effective annual reduction of pollutants normally found in stormwater and can vary depending on land use, traffic volume, and rainfall patterns.
- Find a sweeping frequency that is most efficient in relation to disposing of wastes. Increased sweeping frequency may allow for fewer trips to drop off waste. Most efficient may be in middle (moderate number of load drop offs and sweeping frequency).
- Train operators in those factors that result in optimal pollutant removal. These factors include sweeper speed, brush adjustment and rotation rate, sweeping pattern, maneuvering around parked vehicles, and interim storage and disposal methods.
- Consider the use of periodic parking restrictions in low to medium density single-family residential areas to ensure the sweeper's ability to sweep along the curb.

3.1.1 Proper Waste Disposal

Proper disposal of cleaning wastes from roads, highways, and parking lots is important to prevent pollutants from entering the stormwater conveyance system or surface waters and to keep solid wastes from impeding flow or causing damage to the stormwater system.

Dangerous Cleaning Waste

Determination must be made as to whether the cleaning wastes are considered dangerous waste. Studies have shown this is usually **not** the case, but it is possible spills or high average daily traffic counts could lead to waste being considered dangerous.

Cleaning wastes suspected to be dangerous **should not** be collected with other wastes. These wastes should only be collected by an employee experienced in handling dangerous waste and the Dangerous Waste Regulations (Chapter 173-303 WAC) should be followed. Testing should be based on probable contaminants.

Detailed guidance for disposal of both dangerous and normal cleaning waste is available is Appendix 8B of the Ecology Eastern Washington Stormwater Manual. This guidance is the same as for stormwater system cleaning wastes.

Normal Cleaning Waste

Road and parking lot wastes are currently brought to the Public Works Department Maintenance Facility and placed in a contained bunker for drying.

If necessary, solid wastes could be disposed at the Terrace Heights Landfill. An Interlocal Agreement (ILA) with the City of Yakima may be developed in the future to provide for disposal of street sweeping wastes.

Road Sweeping Non-Collection (if applicable)

Sweepings are brushed off the road surface onto road shoulders and into ditch sides. This is only performed on roads without curb, gutters, and stormwater collection inlets.

Sweepings shall not be brushed into wet ditches, streams, ponds, or wetlands.

3.2 Street Repair and Maintenance

Regular municipal street repair and maintenance such as pavement marking, patching, resurfacing, sealing, and right-of-way maintenance can generate a range of stormwater pollutants. These pollutants could include metals, chlorides, hydrocarbons, nutrients, sediment, and trash.

3.2.1 Road Surface Maintenance

Tasks include using asphaltic concrete and other materials for patching potholes, filling cracks, paving shoulders, and overlaying roads.

BMPs that could be implemented to protect water quality:

Always:

- Prevent debris, oils, cleaning agents, and sediment from entering the storm drain system. If feasible, block inlets and ditches.
- Carry spill control kit
- Sweep or vacuum dust and debris before using water to clean up work sites.

Whenever Possible:

- Avoid work in wet weather
- Properly contain and dispose of any residue from cleaning tools. Use heat to clean equipment where possible, avoiding solvents. Minimize vehicle and equipment cleaning on-site.

3.2.2 Pavement Marking

Tasks include striping roadway surfaces and applying other markings such as hot plastic material to define special traffic control features.

BMPs that could be implemented to protect water quality:

Always:

- Prevent paint from entering storm sewers and water bodies.
- Store paint in spill proof containers or covered areas
- When cleaning equipment, use methods that properly contain and dispose of unused paint, cleaning materials, and other spent materials.
- When removing markings, prevent debris from entering the storm sewer. Clean up debris from grinding or power washing and dispose according to standard procedures.
- Sweep or vacuum dust and debris before using water to clean up work sites.

3.2.3 Sign, Guard Rail, Traffic Signal, and Other Road Feature Maintenance

Maintenance activities performed on structures associated with roads, highways, and parking areas. Sediment, paint, and debris are the primary sources of water quality impacts associated with these activities.

BMPs that could be implemented to protect water quality:

Always:

- Prevent disturbed soil from entering storm sewer, ditches, or surface water bodies.
- Prevent pollutants such as paint and debris from entering storm sewers, etc.
- Carry a spill control kit

Whenever Possible:

- Minimize the area of soil disturbance
- If soil is disturbed, use sediment trapping and cover BMPs. Seed disturbed soils if the area will sustain vegetation.

3.2.4 Roadside Vegetation Control

Mowing and chemical application maintains sight distances, controls unwanted vegetation growth, and controls noxious weeds. It is possible that products used during these activities could impact water quality.

BMPs that could be implemented to protect water quality:

Always:

- Perform mowing and chemical application to the extent needed. Natural vegetation is left in place to the extent possible, considering safety for visibility and ditch flow capacity.
- Never apply pesticide into water unless specifically labeled for that use. Some pesticides are labeled for this type of application and may require a NPDES permit.
- Avoid applications within 100 feet of a water body.
- Avoid application on or near most stormwater collection or conveyance facilities excluding dry roadside ditches.
- Follow product labels for application of any pesticides.
- Time pesticide application when runoff is unlikely.
- Use the lowest possible dose rate to achieve the desired level of vegetation control.

Whenever Possible:

- Use integrated pest management practices that consider cultural, biological, mechanical, or engineering controls before chemical controls.
- Use products specifically labeled for dry ditches when treating roadside ditches.
- Use products with low water solubility and low persistence.

3.2.5 Dust Control

Dust control suppressants not only control dust but also reduce labor and equipment costs by tightly binding and stabilizing road surfaces. This maintains a high percentage of fines on the road surface and reduces grading (Environment Canada, 2007).

While there are numerous benefits to the use of chemical based dust suppressants, excessive use or poor application practices can have negative environmental impacts, see 3.3.1 Anti-icing for impacts of materials such as magnesium chloride. Lignin products have a high biological oxygen demand in aquatic systems. Spills or runoff into surface or groundwaters may create low dissolved oxygen conditions resulting in fish kills or increases in groundwater concentrations of iron, sulfur compounds, and other pollutants (Ecology, 2003).

BMPs that could be implemented to protect water quality:

Always:

- Follow product labels and maintain equipment for proper application.
- Use only local and(or) state government approved dust suppressant chemicals such as those listed in Ecology Publication #96-433 (Appendix A).

Whenever Possible

- Do not apply product during or just before a rainfall that may wash product from the surface (e.g. summer thunderstorms). This enhances product performance as well as protecting water quality and roadside vegetation.
- Restrict use of product if within 25 feet of a body of water. May also need to evaluate areas of shallow groundwater for the possibility of product migration.
- Calibrate application equipment to evenly distribute products at a rate to optimally bind surfaces. Excess material can be tracked onto connecting roads, generate complaints from motorists, and is a waste of material.

3.3 Winter Activities

Winter operation activities include anti-icing, de-icing, and snow removal/disposal on roads, highways, and parking lots. Storage areas for materials such as de-icer and sand associated with these activities will also be mentioned.

While these activities are required for public safety, excessive use or poor application practices of even the best available products can produce preventable negative environmental impacts on both water quality and plants. If an acetate is included with calcium or magnesium anti/de-icers, it could increase biochemical oxygen demand (BOD) of streams, causing the depletion of dissolved oxygen. Conductivity may increase with the addition of calcium, magnesium, and acetate ions. Acetate could increase alkalinity, and consequently pH (Tanner and Wood, 2000). Sands washed into the stormwater system not only add sediment to receiving waters, but could also carry pollutants (See Table 1).

Anti- and de-icers that cause the least adverse environmental impact while still providing adequate public safety should be selected (may include those chemicals mentioned above).

3.3.1 Anti-Icing

No anti-icing liquids are currently utilized by the City of Union Gap. In the future if anti-icing liquids are applied, the following BMPs could be implemented.

Anti-icing liquids may be applied prior to predicted snow or freezing rain events. It is applied to road sections known to be more prone to becoming icy such as bridges, north facing grades, and shaded areas. Application rates vary depending upon the forecasted temperature and snow accumulations.

BMPs that could be implemented to protect water quality:

Always:

- Apply at appropriate rate to provide public safety, avoid excessive application.
- Follow manufacturer's recommendations.
- Sweep streets in early spring to collect accumulated anti-icer material from the winter season.

3.3.2 De-Icing & Sanding

Rock salt type material and sand is applied to major arterial streets. Other priority areas include streets near schools, stop signs, and hills. During light snowfalls or when freezing rain occurs, spot application is applied at locations such as signalized intersections, stop signs, bridges, curves, hills, or other areas as requested. Plowing and sanding operations are scheduled to facilitate the morning commute.

BMPs that could be implemented to protect water quality:

Always:

- Apply amount of material necessary to provide vehicle traction.
- Allow maximum melting of ice or snow by the rock salt type material before plowing or reapplication.
- Sweep streets in early spring to collect accumulated rock salt type material and sand after the winter season.

3.3.3 Snow Removal Practices

When snow accumulations reach three inches, the City of Union Gap will plow the major arterial streets and streets near schools, stop signs, and hills. Snow is pushed to the side of streets by snow plows. Avoid covering stormwater system inlets when plowing so that snowmelt can drain.

Large snow accumulation may warrant snow to be removed from the central business district by loaders and dump trucks.

3.3.4 Snow Disposal Areas

Snow removed from the central business district after large accumulations is taken to undeveloped fields at Fulbright Park.

Snow is not disposed of within 25 feet of surface waters, 75 feet from private water supplies, 200 feet from any community water supply, and at least 400 feet from any municipal wells.

Debris contained within the snow is cleared after snowmelt occurs.

3.3.5 Material Storage Areas

The City of Union Gap makes an effort to only purchase the amount of material that is anticipated to be needed for the upcoming winter. This allows most if not all of the material to be expended and none carried over in storage throughout the remainder of the year.

Anti-icing Materials

No anti-icing liquids are currently used.

De-icing Materials

Rock salt type material is stored at the Public Works Department Maintenance Facility in uncovered contained bunkers.

Sand

Sand is stored at the Public Works Department Maintenance Facility in uncovered contained bunkers.

BMPs that could be implemented to protect water quality:

Operational BMP

- Do not hose down the contained stockpile area to a storm drain, or a conveyance to a storm drain, or to a receiving water.

Structural BMPs

Choose one or more of the source control BMP options below for stockpiles greater than five cubic yards of erodible or water soluble materials, such as road deicing salts and sand.

- Store in a building or paved and bermed covered area; or
- Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material.
- Pave the area and install a stormwater drainage system. Place curbs, or berms along the perimeter of the area to direct the runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater and leachable materials; or
- For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and any catch basins as needed to prevent erosion and discharge of the stockpiled material off-site or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without conveying through a treatment BMP.

Treatment BMP

- Convey contaminated stormwater from the stockpile area to a wet pond, wet vault, settling basin, media filter, or other appropriate treatment system depending on the contamination.

3.4 Record Keeping

The City of Union Gap Public Works Department is responsible for all record keeping of road, highway, and parking lot maintenance activities. This may be able to be completed through current accounting procedures.

Records may need to be provided to the Public Works Director for inclusion in the annual Stormwater Program Plan report.

The following are of most interest:

- Street sweeping and cleaning (frequency and quantity of material collected),
- Winter anti-icing and de-icing/sanding (frequency, quantity, and type of material per road segments)
- Dust control (frequency, quantity, and type of material per road segments)

All records are required to be kept for at least five years in accordance with the Reporting and Record Keeping portion of the NPDES permit.

4. Vehicle Fleets

This O&M plan will address storage, washing, and maintenance of municipal vehicle fleets.

Pollutant sources include parts/vehicle cleaning, spills/leaks of fuel and other liquids, vehicle wash water, replacement of liquids, outdoor storage of batteries/liquids/parts, and vehicle parking. Pollutants could include toxic hydrocarbons and other organic compounds, oils and greases, metals, and suspended solids.

BMPs given for vehicle storage, washing, and maintenance are adapted from the Ecology Eastern Washington Stormwater Manual, 2004.

4.1 Storage

Vehicle storage areas such as covered and open parking lots are identified. BMPs to minimize contamination of stormwater from parking lot cleaning and from drips or leaks are presented.

Vehicle Storage Locations and Description:

Public Works Maintenance Facility
A majority of vehicles are stored inside or undercover. Some implements are stored outside. Drip pans are utilized for many vehicles.

Ahtanum Youth Activities Park
Vehicles are stored in two outside parking lots.

City Hall
A small number of vehicles (approx. 4) are stored outside at City Hall.

Fire Department
All vehicles are stored inside.

Police Station
Many vehicles are taken to private residences while employees are off duty.
The remainders of vehicles are stored in a parking lot outside the Police Station.

BMPs that could be implemented to protect water quality:

Operational BMPs:

- If the parking lot is washed, discharge the water into a sanitary sewer if allowed. Do not discharge to a storm drain or receiving water.

  Report any spills to the storm drain system to the Public Works Director.

- Sweep parking lots, storage areas, etc. regularly.

Treatment BMPs:

- An oil removal system such as an American Petroleum Institute (API) (also called baffle type) or coalescing plate (CP) oil and water separator, catch basin filter, or equivalent BMP, approved by the local jurisdiction, is applicable for parking lots meeting the threshold vehicle traffic intensity level of a high-use site.

  Vehicle high-use site characteristics include the following (Ecology 2004):

  - Is subject to an expected average daily traffic (ADT) count equal or greater than 100 vehicles per 1,000 square feet of gross building area; or
  - Is subject to storage of a fleet of 25 or more diesel vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.).

4.2 Washing

Vehicle washing facilities owned and operated by the City of Union Gap are identified. In addition to soapy wash water, debris containing pollutants may accumulate on vehicles prior to washing and may wash off. Vehicle fluids also may wash off adding to the pollutant load of the wash water.

Vehicle Washing Facility Locations and Description:

The City of Union Gap maintains the following designated wash down facilities.

Public Works

The Public Works vehicle washing facility is located at the Public Works Maintenance Facility. The facility is located outside, but all runoff is contained inside the facility. The facility contains a holding area so all runoff evaporates. All Public Works vehicles are washed at this facility.

Fire Station

Fire Department vehicles are washed at the fire station. Wash water drains into a contained system separate from the MS4.

All Other Departments

All other City of Union Gap vehicles are washed at commercial facilities.

BMPs that could be implemented to protect water quality:

Structural Source Control BMPs:

Always:

- Conduct vehicle equipment washing at either commercial or municipal facilities that drain to the sanitary sewer.
- Any outside washing in a designated wash area will include the following features:
    - Paved area
    - Spill containment pad to prevent the runoff of stormwater to adjacent areas.
    - Collect wash water in a pad drain system which drains to a sump and then to a sanitary sewer (if allowed). Sump must have a positive control outlet valve for spill control with live containment volume and oil/water separation. See Ecology Stormwater Manual for additional requirements.
    - Water should only be discharged to the storm drain system or surface waters if it is first treated and an NPDES permit is in place.

Whenever Possible:

- Wash area should be well marked.

- Use phosphate-free biodegradable detergents.
- Consider recycling wash water
- Because soluble/emulsifiable detergents can be used in the wash medium, the selection of soaps and detergents and treatment BMPs should be considered carefully. Oil/water separators are ineffective in removing emulsified or water soluble detergents.

4.3 Maintenance

Vehicle repair/maintenance facilities operated by the City of Union Gap are identified. Pollutants from vehicle fluids and cleaners are the primary concern for stormwater contamination.

Vehicle Repair/Maintenance Facility Locations and Description:

The City of Union Gap maintains a full service repair facility at the Public Works Maintenance Facility for Public Works vehicles. All work is completed either indoors or undercover. Major repair work is completed by commercial automotive/machine repair shops.

Vehicles from all other City of Union Gap departments are taken to commercial automotive shops for repairs and maintenance.

BMPs that could be implemented to protect water quality:

Operational BMPs:

Always:

- Inspect all incoming vehicles, parts, and equipment stored temporarily outside for leaks.
- Use drip pans or containers under parts or vehicles that drip or are likely to drip liquids.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination.
- Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.
- Do not pour/convey wash water, liquid waste, or other pollutants into storm drains or to surface water. Check with local jurisdiction to convey to sanitary sewer.
- Do not connect maintenance and repair shop flood drains to storm drains or surface water. To allow for snowmelt during the winter a drainage trench with a sump for particulate collection can be installed and used only for draining the snowmelt and not for discharging any vehicular or shop pollutants.

Whenever Possible:

- Store damaged vehicles inside a building or covered area.
- Clean parts with aqueous detergent based solutions or non-chlorinated solvents, such as kerosene or high flash mineral spirits, and(or) use wire brushing or sand blasting. Avoid using toxic liquid cleaners.
- Avoid hosing down work areas. Use dry methods for cleaning leaked fluids.

- Recycle greases, used oil, oil filters, antifreeze, cleaning solutions, automotive batteries, etc.
- Do not mix dissimilar or incompatible waste liquids stored for recycling.

5. Municipal Buildings

This O&M plan will address cleaning, washing, painting, and other maintenance activities associated with municipal buildings owned and maintained by the City of Union Gap. Maintenance activities could be performed by municipal staff or contractors.

If liquids or other substances from these activities reach storm drain systems it is possible that they could eventually pollute surface or ground waters. Potential pollutants include organic compounds, oils, and greases, heavy metals, and suspended solids.

City of Union Gap Owned and Maintained Building Complexes:

- Public Works Maintenance Facility
- City Hall
- Youth Center
- Fire Station
- Police Station
- Well/Pump Houses
- Parks Department
    - Ahtanum Youth Activities Park
    - Fullbright Park & Central Washington Agricultural Museum

The Public Works Department is responsible for all Municipal Building O&M activities associated with buildings owned and maintained by the City of Union Gap.

BMPs are organized by those that should *always* be applied and those that should be applied *whenever possible* for many of the activities. BMPs may be broken into two categories including *operational* and *structural*.

BMPs presented are adapted from the Ecology Eastern Washington Stormwater Manual, 2004 and the Clark County Pollution Control Manual, 2009.

5.1 Cleaning and Washing

Cleaning and washing activities could include washing of carpet and other interior items with mobile equipment or pressure washing of buildings, rooftops, and other large objects. Wash water from interior and exterior washing could be contaminated with suspended solids, heavy metals, and other pollutants.

BMPs that could be implemented to protect water quality:

Always:

- Dispose of carpet or interior waste water to the sanitary sewer. Do not dispose of any of this waste water outdoors or to a storm drain system.

  Report any spills or accidental discharges to the storm drain system to the Public Works Director.

- Collect wash water from building structures and convey it to appropriate treatment, such as a sanitary sewer system. If it contains oils, soaps, or detergents then it could drain to soils that have sufficient natural attenuation capacity for dust and sediment. A sump pump, wet vacuum, or similarly effective device could be used to collect the runoff and loose materials.
- Cover any inlets to the storm drain system that waste water from exterior pressure washing could drain to.

Whenever Possible:

- Avoid using excessive amounts of water for interior and exterior washing.
- Recycle the wash water.

5.2 Painting

Activities could include painting of interior or exterior building surfaces. Pollutant sources include surface preparation and application of paints, finishes, and(or) coatings to buildings. Potential pollutants include organic compounds, oils, and greases, heavy metals, and suspended solids.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs:

- Never dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain system inlet.

  Report any spills or accidental discharges to the storm drain system to the Public Works Director.

- Train employees in the careful application of paints, finishes, and coatings to reduce misuse and over spray. Use ground or drop cloths underneath outdoor painting, scraping, sandblasting work, and properly clean and temporarily store collected debris daily.

- Wipe up spills with rags and other absorbent materials immediately. Do not hose down the area to a storm drain, receiving water, or conveyance ditch to receiving water.

- Use a storm drain cover, filter fabric, or similarly effective runoff control device if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the workday. Collect contaminated runoff and solids, and properly dispose of such wastes before removing the containment device(s) at the end of the workday.

- Use a ground cloth, pail, drum, drip pan, tarpaulin, or other protective device for activities such as paint mixing and tool cleaning outside or where spills can contaminate stormwater. Properly dispose of all wastes and prevent all uncontrolled releases to the air, ground, or water.

- Clean brushes and tools covered with non-water based paints, finishes, or other materials in a manner that allows collection of used solvents (e.g., paint thinner, turpentine, xylol, etc.) for recycling or proper disposal.

- Store toxic materials under cover (tarp, etc.) during precipitation events and when not in use to prevent contact with stormwater.

Structural BMP:

- Enclose and(or) contain all work while using a spray gun or conducting sand blasting and in compliance with applicable air pollution control, Occupational Safety and Health Administration (OSHA), and Washington Industrial Safety and Health Act

(WISHA) requirements. Do not conduct outside spraying, grit blasting, or sanding activities during windy conditions which render containment ineffective.

Whenever Possible:

Operational BMPs:

- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain.
- Recycle paint, paint thinner, solvents, pressure wash water, and any other recyclable materials.
- Use efficient spray equipment, such as electrostatic, air-atomized, high volume/low pressure, or gravity feed spray equipment.
- Purchase recycled paints, paint thinner, solvents, and other products, if feasible.

5.3 Other Maintenance Activities

Other maintenance activities could include labor activities associated with general building repair work, remodeling of existing buildings, or construction of buildings.

Stormwater runoff from these activities can be contaminated with toxic hydrocarbons in solvents, other toxic organic compounds, suspended solids, heavy metals, abnormal pH, and oils and greases.

BMPs that could be implemented to protect water quality:

Always:

- Dispose of toxic substances or liquids properly. Never dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain system inlet.

  Report any spills or accidental discharges to the storm drain system to the Public Works Director.
- Use a storm drain cover if dust, grit, wash water, or other pollutants may escape the work area and enter a storm drain inlet. Collect any accumulated runoff and solids with wet vacuums and brooms as needed.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities, such as paint mixing and tool cleaning.
- Store and maintain a spill control kit and ensure employees are familiar with proper spill control procedures.

6. Parks and Open Space

Operation and maintenance activities associated with parks and open space have been broken into the following required components by the NPDES Permit:

- Proper Application of Pesticides, Herbicides, and Fertilizer
- Sediment and Erosion Control
- Landscape Maintenance
- Vegetation Disposal
- Trash Management
- Building Exterior Cleaning and Maintenance

Poor management practices or product use within parks and open space may lead to stormwater contamination. Possible stormwater pollutants from these activities could include toxic organic compounds, heavy metals, oils, total suspended solids, coliform bacteria, fertilizers, plant materials that decompose, and pesticides.

The City of Union Gap owns and maintains the following parks and open spaces where the outlined O&M activities will incorporate the following BMPs. These will be implemented by municipal staff or contractors:

City of Union Gap Parks and Open Spaces:

- Ahtanum Youth Activities Park
- Cahalan Park
- Loudon Park
- Fullbright Park
- Pioneer Graveyard (East Ahtanum Rd.)
- 2504 S. 3rd Ave. Open Space (11 acre property next to Wide Hollow Creek)
- Lawn, Landscape, and Right-of-Way
    - Police Station
    - Fire Station
    - City Hall and Youth Council
    - Public Works Maintenance Facility
    - Valley Mall Blvd. Turf Medians
    - North Rudkin Rd. Turf Shoulder
    - Wagon Landscaping (Old Town Road and S. 1st St.)
    - “Quest Triangle” (Main St. and Locust, utility right-of-way)

The City of Union Gap Parks Department is responsible for all Parks and Open Space O&M activities associated with city owned and maintained parks and open spaces. This includes any recordkeeping associated with pesticide and fertilizer application.

BMPs are also organized by those that should *always* be applied and those that should be applied *whenever possible* for many of the activities. BMPs may also be broken into two categories including *operational* and *structural*.

Most BMPs presented are adapted from the Ecology Eastern Washington Stormwater Manual, 2004. BMPs for trash management and erosion and sediment control are adapted from the Guidelines and Standard Operating Procedures Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping for Stormwater Phase II Communities in New Hampshire.

6.1 Proper Application of Pesticides, Herbicides, and Fertilizer

Activities could include application of pesticides (including herbicides) and fertilizer on lawns, golf course lawns, or associated landscaping.

6.1.1 Pesticides (including Herbicides)

Pesticides are used to control weeds, insects, mold, bacteria, and other pests. Examples include weed control on golf course lawns, access roads, and utility corridors. Toxic pesticides such as pentachlorophenol, carbamates, and organophosphates can be released to the environment by leaching and dripping from treated parts, container leaks, product misuse, and outside storage of pesticide contaminated materials and equipment.

BMPs that could be implemented to protect water quality:

Always:

- Maintain healthy turf through soil conditioning, proper water application, seed mixtures, and careful fertilizer applications. Healthy turf resists disease and weed infestations, reducing the need for pesticide and herbicide applications.
- Develop and implement an Integrated Pest Management (IPM) Plan and use pesticides only as a last resort.

  An IPM Plan outline could include:

  - Identify problem pests and their life cycle.
  - Tolerance thresholds for pests.
  - Monitoring to detect and prevent pest problems.
  - Modifications to the maintenance program to promote healthy plants and discourage pests.
  - Identify cultural, physical, mechanical, or biological controls to use first when pests exceed the tolerance thresholds. Try to keep pests from exceeding tolerance thresholds.
  - Evaluation and recordkeeping of the effectiveness of the control, and modify maintenance practices to support lawn or landscape recovery and prevent recurrence.
- Implement a pesticide-use plan and include at a minimum: a list of selected pesticides and their specific uses; brands, formulations, application methods and quantities to be used; equipment use and maintenance procedures; safety, storage, and disposal methods; and monitoring, record keeping, and public notice procedures. All procedures shall conform to the requirements of Chapter 17.21 Revised Code of Washington (RCW) and Chapter 16-228 Washington Administrative Code (WAC).

- Choose the least toxic pesticide available that is capable of reducing the infestation to acceptable levels. The pesticide should readily degrade in the environment and(or) have properties that strongly bind it to the soil. Any pest control used should be conducted at the life stage when the pest is most vulnerable.
- Apply the pesticide according to label directions. Under no conditions shall pesticides be applied in quantities that exceed manufacturer's instructions.
- Mix the pesticides and clean the application equipment in an area where accidental spills will not enter surface or ground waters, the storm drain system, and will not contaminate soil.
- Store pesticides in enclosed areas or in covered impervious containment. Do not hose down the paved areas to a storm drain or conveyance ditch. Ensure spills/leaks are cleaned up and are not discharged to storm drain system. Store and maintain appropriate spill cleanup materials in a location known to all near the storage area.
- Assure pesticide application equipment must be capable of immediate shutoff in the event of an emergency.
- Avoid spraying non-permitted pesticides within 100 feet of open waters including wetlands, ponds, streams, sloughs, and any drainage ditch or channel that leads to open water except when approved by Ecology and the City of Union Gap. Sensitive areas including wells, creeks, and wetlands could be flagged prior to spraying if there is uncertainty of where the boundary is located.
- Complete public posting of the area to be sprayed prior to application as required by the City of Union Gap or by Ecology.
- Spray applications should only be conducted during weather conditions as specified in the label direction and applicable local and state regulations. Do not apply rain or immediately before expected rain.

Whenever Possible:

- Consider alternatives to the use of pesticides such as covering or harvesting weeds, substitute vegetative growth, and manual weed control.
- Consider the use of soil amendments, such as compost, that are known to control some common diseases in plants, such as Phytium root rot, ashy stem blight, and parasitic nematodes.

  The following are three possible mechanisms for disease control by compost addition:

  1. Successful competition for nutrients by antibiotic production;

  2. Successful predation against pathogens by beneficial microorganism; and

  3. Activation of disease-resistant gens in plants by composts.

  Installing an amended soil/landscape system can preserve both the plant system and the soil system more effectively. This type of approach provides a

soil/landscape system with adequate depth, permeability, and organic matter to sustain itself and to continue working as an effective stormwater infiltration system and a sustainable nutrient cycle.

- Evaluate pesticide effectiveness for possible improvement. Records should be kept showing the applicability and inapplicability of the pesticides considered.
- Develop an annual evaluation procedure including a review of the effectiveness of pesticide applications, impact on buffers and sensitive areas (including potable wells), public concerns, and recent toxicological information on pesticides used/proposed for use.

  If individual or public potable wells are located in the proximity of commercial pesticide applications contact the regional Ecology hydrogeologist to determine if additional pesticide application control measures are necessary.
- Use rinsate from equipment cleaning and(or) triple-rinsing of pesticide containers as product or recycle into product.
- Assure the application equipment used is capable of immediate shutoff in the event of an emergency.

6.1.2 Fertilizers

Fertilizers are applied to soil or plant leaves to improve the health and productivity of soil and plants by providing nutrients encouraging plant growth. Nitrogen and phosphorus enrichment from fertilizers can result in negative environmental impacts including frequent algal blooms in water bodies. These blooms decrease dissolved oxygen in water causing death of desirable aquatic animals and plants.

Besides the possibility of eventually flowing into surface waters, nitrogen derived from fertilizers which enters groundwater may increase nitrate levels. This could pose a health risk to humans who rely on drinking water from wells.

BMPs that could be implemented to protect water quality:

Always:

- Evaluate soil nutrient levels through regular testing to ensure the best possible efficiency and economy of fertilization. Turf grass is most responsive to nitrogen fertilization, followed by potassium and phosphorus. Fertilization needs vary by site depending on plant, soil, and climatic conditions. For details on soils testing, contact the local Natural Resources Conservation Service or Cooperative Extension office.
- Apply fertilizers according to label directions.
- Apply fertilizers in amounts appropriate for the target vegetation and at the time of year that minimizes losses to surface and ground waters.
    - Do not fertilize during a drought or when the soil is dry.
    - Alternatively, do not apply fertilizers within three days prior to predicted rainfall. The longer the period between fertilizer application and either rainfall or irrigation, the less fertilizer runoff occurs.
- Time the fertilizer application to periods of maximum plant uptake. Generally fall and spring applications are recommended, although WSU turf specialists recommend four fertilizer applications per year.
- Properly trained persons should apply all fertilizers. Fertilizers should not be applied to grass swales, filter strips, or buffer areas that drain to sensitive water bodies unless approved by the City of Union Gap Parks Department Manager.

Whenever Possible:

- Use natural compost and organic fertilizers instead of synthetic fertilizers.
- Use slow release fertilizers such as methylene urea, isobutylidene diurea (IDBU), or resin coated fertilizers, when appropriate, generally in the spring. Use of slow release fertilizers is especially important in areas with sandy or gravelly soils.

6.2 Sediment and Erosion Control

Sediment and erosion control activities could be associated with grading, soil transfer, vegetation removal, or other landscaping activities. Pollutants may attach to sediment which runs off into the storm drain system or directly to receiving waters.

BMPs that could be implemented to protect water quality:

Always:

- Implement erosion control techniques or devices to stabilize disturbed areas. Use mulch or other erosion control measures when soils are exposed for more than a week.
- Minimize land disturbance.
- Minimize slope lengths.
- Implement effective site planning to avoid sensitive areas.
- Obtain coverage or a waiver under Ecology's Construction Stormwater General Permit if the project size is one (1) acre or greater. Local jurisdiction requirements may also apply.

Whenever Possible:

- Avoid land disturbance during months with higher runoff rates.
- Install erosion control blankets when seeding near drainage ways.
- Protect natural vegetation, especially near water bodies, wetlands, and steep slopes.

6.3 Landscape Maintenance

In addition to pesticide and fertilizer application, landscape maintenance activities could include shrub pruning, mowing, trimming, irrigation, improving topsoil, runoff drainage, etc.

BMPs that could be implemented to protect water quality:

Always:

- Use mulch or other erosion control measures when soils are exposed for more than a week.

Whenever Possible:

- Install engineered soil/landscape systems to improve the infiltration and regulation of stormwater in landscaped areas.
- Store and maintain appropriate oil and chemical spill cleanup materials in readily accessible locations if oil or other chemicals are handled. Ensure that employees are familiar with proper spill cleanup procedures.
- During landscaping repair, till fertilizers into the soil rather than dumping or broadcasting onto the surface. Determine the proper fertilizer application for the types of soil and vegetation encountered.
- During landscaping repair, till a topsoil mix or composted organic material into the soil to create a well-mixed transition layer that encourages deeper root systems and drought-resistant plants.
- Assure plants are receiving appropriate amount of water from irrigation. Improper irrigation can encourage pest problems, leach nutrients, and make a lawn completely dependent on artificial watering.
- Conduct mulch-mowing.
- Use manual and(or) mechanical methods of vegetation removal rather than applying herbicides.
- Aerate lawns regularly in areas of heavy use where soil tends to become compacted. Aeration should be conducted while the grasses in the lawn are growing rapidly.

6.4 Vegetation Disposal

Vegetation disposal may be required for activities including mowing, weeding, pruning, and trimming. Improper disposal of vegetation could carry pollutants into or hinder the proper function of the storm drain system.

The City of Union Gap currently disposes vegetation from parks and open spaces primarily by two methods:

- Mulch-mowing
- Terrace Heights Landfill (yard and wood waste diversion program)

BMPs that could be implemented to protect water quality:

Always:

- Dispose of collected vegetation properly. Do not dispose of collected vegetation into waterways or storm drainage systems.

Whenever Possible:

- Conduct mulch-mowing.
- Use manual and(or) mechanical methods of vegetation removal rather than applying herbicides.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation by composting.
- Consider using growth regulating products to reduce the frequency of mowing and quantity of clippings.

6.5 Trash Management

Activities include collection, storage, and transportation of trash at park and open spaces. Garbage and leachate can be transported by stormwater and enter the storm drain system and receiving waters.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs:

- Cover rubbish bins to keep rubbish and leachate and wind and rain out.

Whenever Possible:

Operational BMPs:

- Store garbage containers beneath a covered structure or inside to prevent contact with stormwater.
- Locate dumpsters on a flat, concrete surface that does not slope or drain directly into the storm drain system.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks regularly, and have repairs made immediately.
- Request/use dumpsters without drain holes.
- Dispose of hazardous waste and gasoline/oil contaminated materials properly, not in a dumpster or trash bin.

Structural BMP:

- Install berms, curbing, or vegetation strips around storage areas to control water entering/leaving storage areas.

6.6 Building Exterior Cleaning and Maintenance

See Chapter 5 Municipal Buildings. Most BMPs presented in Chapter 5 would apply to exterior cleaning and maintenance of buildings associated with parks and open space. Buildings related to Parks and Open Space are also included with the other municipal buildings in Chapter 5.

7. Construction Projects

Public construction projects shall comply with the requirements applied to private projects. All construction projects owned and operated by the Permittee that are required to have a NPDES permit shall be covered under either the *General NPDES Permit for Stormwater Discharges Associated with Construction Activities* or another NPDES permit that covers stormwater discharges associated with the activity. All public projects shall include construction and post-construction controls selected and implemented pursuant to the requirements in Appendix 1 of the Ecology Eastern Washington Phase II Municipal Stormwater Permit (Appendix B) and applicable municipal code requirements for drainage, construction sediment control, and post-construction stormwater treatment requirements.

8. Industrial Activities

All facilities owned or operated by the City of Union Gap that are required to have NPDES permit coverage shall be covered under the *General NPDES Permit for Stormwater Discharges Associated with Industrial Activities* or another NPDES permit that covers stormwater discharges associated with the activity.

City of Union Gap facilities currently covered under the Industrial NPDES permit include:

- None at this time

The following guidance identifies municipal facilities subject to the Washington State Industrial Stormwater General Permit. This guidance was adapted from Ecology's *Guidance Manual for Preparing/Updating a Stormwater Pollution Prevention Plan for Industrial Facilities* (Appendix C) and Ecology's *Stormwater Discharges Associated with INDUSTRIAL Activity Brochure and Permit Application*. Appendix D1-D4 include the 2010 Industrial Stormwater General Permit Focus Sheet, Permit, Permit Application, and Permit Changes.

What Type of Facilities Need An Industrial NPDES Permit?

Any facility included in Table 2 that discharges stormwater to a **surface water or into a storm drainage system that later discharges to a surface water** must apply for a stormwater permit.

What Type of Facilities Do Not Need An Industrial NPDES Permit?

- Facilities that discharge all stormwater associated with industrial activity to the ground (e.g. infiltration basins, dry wells, drain fields). There are a few exceptions.
- Facilities that discharge all stormwater to a combined sewer system.
- Facilities owned and operated by the federal government or are on Tribal land, or facilities that discharge directly to Tribal waters meeting EPA approved water quality standards.
- Facilities that qualify for "Conditional No Exposure." However, facilities must re-apply every five (5) years or thirty (30) days after the effective date reissuance of the industrial stormwater general permit, whichever comes first.

Table 2. Examples of municipal industrial facilities that would require Industrial NPDES Permit coverage if discharging stormwater to surface waters either directly or via a storm drainage system.

Municipal Industrial Facility Examples	**Description and Standard Industrial Classification (SIC)**
Hazardous Waste Treatment, Storage, or Disposal	Including those operating under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA).
Landfills, Land Application Sites, and Open Dumps	Facilities receive or have received any industrial wastes (waste that is received from any industrial facilities, including those subject to regulation under Subtitle D of RCRA).
Recycling Facilities	Facilities involved in recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile recyclers, including but limited to those classified as SIC 5015 and 5093.
Transportation Facilities	Those classified under the following SICs which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations: 40 – Railroad Transportation, 41 – Local and Interurban Passenger Transportation, 45 – Transportation by Air.
Sewage Treatment Plants	Those with a design flow of one million gallons per day or more.

9. Material Storage Areas, Heavy Equipment Storage Areas, and Maintenance Areas

The Municipal NPDES permit requires the City of Union Gap to develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to protect water quality at each material storage area, heavy equipment storage area, and maintenance area owned or operated by the City of Union Gap.

Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. Facilities covered under the *General NPDES Permit for Stormwater Discharges Associated with Industrial Activities* or another NPDES permit that covers stormwater discharges associated with the activity are excluded from this requirement.

SWPPP Objectives

1. To implement and maintain best managements practices (BMPs) that identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants.

2. To prevent violations of surface water quality, groundwater quality, and sediment management standards.

3. To prevent adverse impacts to receiving water by controlling peak rates and volumes of stormwater runoff.

4. To eliminate the discharges of unpermitted illicit discharges to stormwater drainage systems.

City of Union Gap Material Storage, Heavy Equipment Storage, and Maintenance Areas

- Public Works Maintenance Facility Storage
- Ahtanum Youth Park
- Central Washington Agricultural Museum

The following provides guidance for developing a SWPPP. Generic SWPPP forms (example and blank) are provided in Appendix E.

This SWPPP development guidance and generic SWPPP were adapted from the following documents:

City of Mt. Vernon Fir Street Maintenance Facility Stormwater Pollution Prevention Plan.

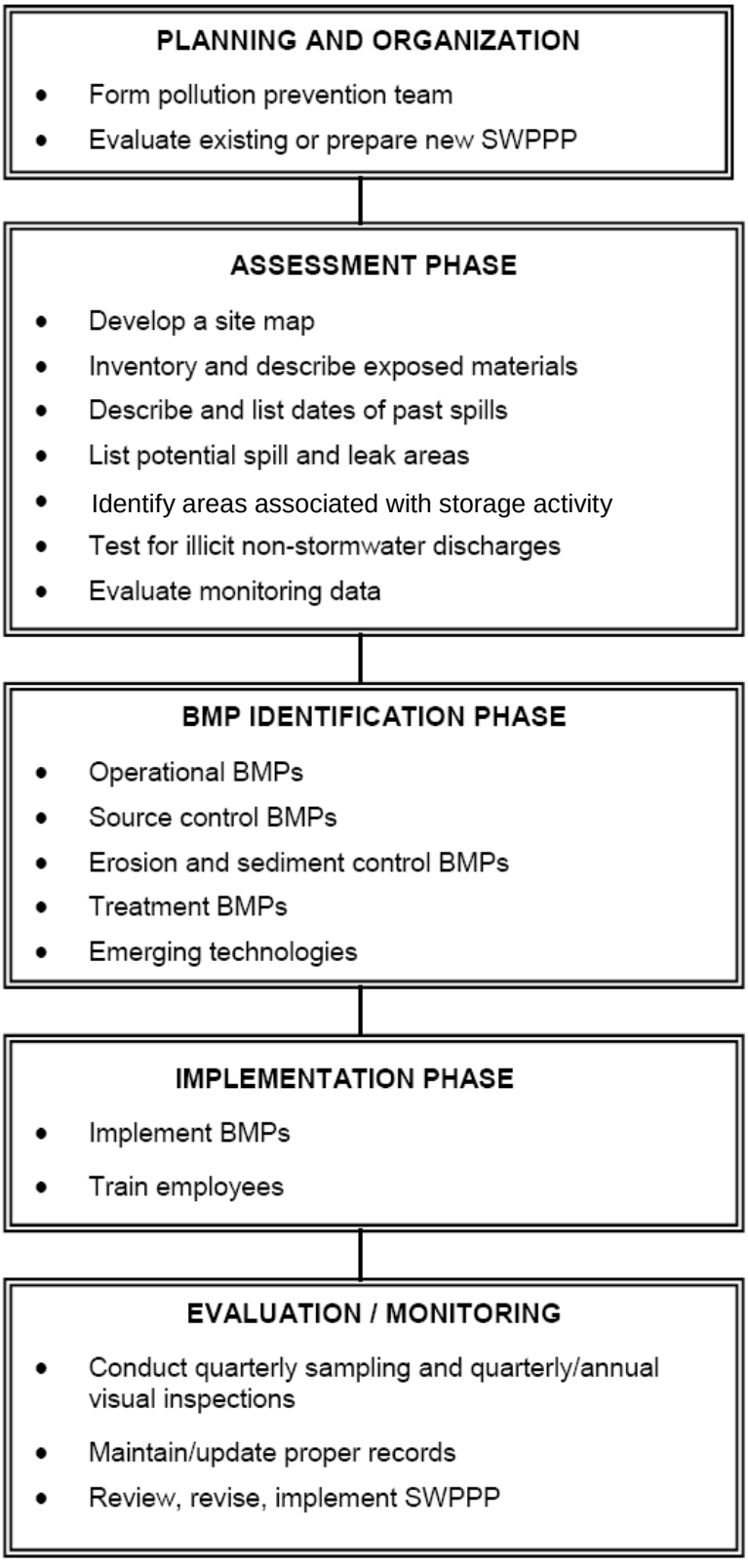
City of Seattle Generic Stormwater Pollution Prevention Plan

Ecology Guidance Manual for Preparing/Updating a Stormwater Pollution Prevention Plan for Industrial Facilities

Ecology Stormwater Management Manual for Eastern Washington

Yakima County Regional Stormwater Manual

SWPPP PREPARATION FLOWCHART



9.1 Facility Assessment

A description, site map, and materials inventory of the storage area may be useful in identifying where stormwater could come in contact with materials and eventually enter the storm drain system or surface waters.

9.1.1 Description of the Storage Area

Provide a description of the storage area, what kinds of materials are stored, and a general layout.

9.1.2 Site Map

A site map includes the following:

- Material storage areas
- Heavy equipment storage areas
- Maintenance areas
- Other Significant features noted and labeled
- Building and paved areas
- Pollutant contact areas (actual and potential)
- Stormwater drainage system structures
- Stormwater drainage areas (all areas draining to point of discharge to surface and ground waters)
- Surface water locations (including wetlands and drainage ditches)
- Significant soil erosion areas (existing and potential)

9.1.3 Material and Equipment Inventory

Identify and list materials handled, treated, stored, or disposed of that could be exposed to stormwater or snow melt and result in stormwater pollution of a significant amount. Include the location and quantity (by volume or weight).

The worksheets in Appendix E may be used to list materials and equipment including the following:

- Sand, rock, gravel, rock salt, etc.
- Liquid materials stored and/or transferred outdoors
- Materials handled indoors that could be tracked outdoors by equipment or vehicles.
- Hazardous substances
- Fertilizers and pesticides
- Vegetation waste and other waste materials
- Any other materials which could be carried away by stormwater and cause a violation of water quality standards.
- Equipment stored outside

9.2 Identifying Areas Associated with the Storage Activity

Identify and list pollutant generating areas associated with the storage activity. This could also be included on the Generic SWPPP worksheets.

Associated areas could include the following:

- Loading and unloading areas (dry or liquid materials)
- Dust or particulate generating services
- On-site solid waste or residual treatment, storage, or disposal
- Material handling sites
- Vehicle fueling and petroleum transfer areas
- Outdoors storage and stockpile areas

9.3 Identify Past Spills and Leaks

List any significant leaks or spills of oils and toxic/hazardous pollutants during the past three years. This provides additional information on potential sources of stormwater contamination.

9.4 Monitoring Plan (Visual Inspection)

Conduct quarterly visual inspections of the storage areas. Inspect discharge points to ground, the storm drain system, and surface waters. If possible, conduct one annual inspection during a storm event and one annual inspection during a dry period (at least one week).

The inspection should include the following:

- Verify:
    - The descriptions of the pollutant sources are accurate
    - Site map reflects current conditions
    - Structural and non-structural BMPs are implemented, maintained, and adequate. Adjust BMPs as needed and modify the SWPPP accordingly.
- Inspect for presence of floating materials including oil and grease, visible sheen, discoloration, turbidity, and odor in the stormwater discharges and in outside vehicle maintenance/repair.

Identify who is responsible for periodic inspections of storage areas. The Generic SWPPP worksheets in Appendix E could be used during an inspection.

9.5 Illicit Discharges

Material Storage, heavy equipment storage, and maintenance areas should be monitored periodically for illicit discharges, illicit connections, or illegal dumping.

Illicit discharges are the ***introduction of non-stormwater runoff, sewage, or hazardous materials*** into the public storm drain system through illicit connections and illegal dumping.

Illicit connections are ***physical connections to the storm drain system that have not been approved for storm water drainage by the facility owner and/or functions to convey a prohibited pollutant***. Examples include an internal plumbing connection (e.g., washing machine or garage floor drain) or a service lateral cross-connection.

Illegal dumping is the ***intentional or inadvertent dumping of prohibited materials*** into the conveyance system, streets, inlets or basins, and the improper disposal of material on land that is then discharged to the Municipal Separate Storm Sewer System (MS4) when it rains.

Examples:

- Sanitary wastewater from improper sewage connections, exfiltration, or leakage
- Effluent from improperly operating/ or designed septic tank systems
- Fruit packing wash water
- Surface flow and irrigation drainage from feed lots and hobby farms
- Commercial car wash wastewaters
- Radiator flushing wastewaters
- Engine degreasing wastes
- Improper oil disposal
- Leaky underground storage tanks
- Excess fertilizer or pesticides
- Laundry wastes
- Spills from roadway or other accidents
- Dewatering of construction sites
- Improper disposal of household toxic wastes
- Chemical, hazardous materials, and garbage
- Swimming pool cleaning wastewater and filter backwash

Report any suspected illicit discharges, connections, or dumping observed in storage areas or elsewhere to a supervisor. These reports should be forwarded to the illicit discharge hotline phone number (**509) 574-2300** or e-mail (PublicServicesIllicitDischarge@co.yakima.wa.us).

9.6 Best Management Practices (BMPs)

This section presents operational, structural source control, and treatment best management practices (BMPs) that when implemented may reduce the pollutant load that stormwater carries away from material storage, heavy equipment storage, and maintenance areas into the storm drain system or surface waters.

Worksheets in Appendix E may be used to track which BMPs have been implemented and which BMPs need to be implemented in the future.

Operational BMPs

Non-structural practices that prevent or reduce pollutants from entering stormwater:

- Formation of a Pollution Prevention Team
- Good Housekeeping
- Preventative Maintenance
- Spill Prevention and Reporting and Emergency Cleanup
- Reporting and Recordkeeping
- Inspections
- Employee Training on Maintaining and Implementing the SWPPP

Structural Source and Flow Control BMPs

Physical or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater or control flow.

Treatment BMPs

Physical or mechanical structures/devices that treat stormwater before it is discharged to a surface water. Examples include settling basins or vaults, oil/water separators, biofilters, wet ponds, infiltration systems, and emerging technologies such as media filtration.

Water Quality Standards Violation

BMPs not currently listed in this document for an activity may be required if Ecology determines that a discharge from the municipal separate storm sewer is causing or contributing to a violation of Water Quality Standards.

In response to a water quality violation, the City of Union Gap is responsible for reporting to Ecology current BMPs in use, additional BMPs to be implemented, and a schedule for implementation. Ecology would need to approve this report and may require modifications as needed.

9.6.1 Source Specific BMPs

The following are source specific BMPs related to material storage, heavy equipment storage, and maintenance areas. These BMPs may overlap those to be implemented for the other municipal O&M plans.

BMPs may also be split into those that should *always* be implemented and those that should be *whenever possible*. This gives some flexibility in situations where it is not practical or possible to always implement every BMP.

The BMPs provided are organized into the following groups:

- Winter Road Maintenance Material Storage Areas
- Heavy Equipment Storage Areas
- Vehicle and Equipment Maintenance Areas
- Pesticide and Fertilizer Storage Areas
- Vegetation Disposal Storage Areas
- Trash Storage Areas
- Fueling Stations
- Liquid or Solid Material Loading and Unloading Areas
- Transfer of Small Quantities from Tanks and Containers
- Spills of Oils and Hazardous Substances
- Storage of Liquid, Food Waste, or Dangerous Waste Containers
- Storage or Transfer (Outside) of Solid Raw Materials, By- Products, or Finished Products

Winter Road Maintenance Material Storage Areas

See BMPs listed in Chapter 3.3 Winter Materials.

Heavy Equipment Storage Areas

See BMPs listed in Chapter 4.1 Vehicle Fleet Storage.

Vehicle and Equipment Maintenance Areas

See BMPs listed in Chapter 4.3 Vehicle Fleet Maintenance.

Pesticide and Fertilizer Storage Areas

See BMPs listed in Chapter 6.1 Proper Application of Pesticides, Herbicides, and Fertilizer.

Vegetation Disposal Storage Areas

See BMPs listed in Chapter 6.4 Vegetation Disposal.

Trash Storage Areas

See BMPs listed in Chapter 6.5 Trash Management.

Fueling Stations

A fueling station is a facility dedicated to the transfer of fuels from a stationary pumping station to mobile vehicles or equipment. It includes above or under-ground fuel storage facilities. Stormwater contamination is caused by leaks/spills of fuels, lube oils, radiator coolants, and vehicle wash water.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs

- Prepare an emergency spill response and cleanup plan (per BMPs for Spills of Oil and Hazardous Substances) and have designated trained person(s) available either on-site or on call at all times to promptly and properly implement that plan and immediately clean up all spills. Keep suitable cleanup materials, such as dry absorbent materials, on-site to allow prompt cleanup of a spill. An existing emergency spill response plan may be used to implement this BMP.

- Train employees on the proper use of fuel dispensers. Post signs in accordance with the Uniform Fire Code (UFC). Post “No Topping Off” signs (topping of gas tanks may cause spillage and vents gas fumes to the air). Make sure that automatic shutoff on the fuel nozzle is functioning properly.

- The person conducting the fuel transfer must be present at the fueling pump during fuel transfer, particularly at unattended or self-serve stations.

- Keep drained oil filters in a suitable container or drum.

Structural Source Control BMPs

- Design the fueling island to control spills (dead-end sump or spill control separator in compliance with the UFC), and to treat collected stormwater and(or) wastewater to required levels. Slope the concrete containment pad around the fueling island toward drains; either trench drains, catch basins, and(or) a dead-end sump. The slope of the drains shall not be less than 1 percent (Section 7901.8 of the UFC). Drains to treatment shall have a shutoff valve, which must be closed in the event of a spill. The spill control sump must be sized in compliance with Section 7901.8 of the UFC.

- Design the fueling island as a spill containment pad with a sill or berm raised to a minimum of four inches (Section 7901.8 of the UFC) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. Raised sills are not required at open-gate trenches that connect to an approved drainage-control system.

- The fueling pad must be paved with Portland cement concrete, or equivalent. Asphalt is not considered an equivalent material.

- The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad. The roof or canopy should, at a minimum, cover the spill containment pad (within the grade break or fuel dispensing area) and preferably extend several additional feet to reduce the introduction of windblown rain. Convey all roof drains to storm drains outside the fueling containment area.

- Stormwater collected on the fuel island containment pad must be conveyed to a sanitary sewer system, if approved by the sanitary authority; or to an approved treatment system such as an oil/water separator and a water quality treatment BMP (such as media filters and biofilters). Discharges from treatment systems to storm drains, to surface water, or to the ground must not display ongoing or recurring visible sheen and must not contain greater than a significant amount of oil and grease.

- Alternatively, stormwater collected on the fuel island containment pad may be collected and held for proper off-site disposal.

- Conveyance of any fuel-contaminated stormwater to a sanitary sewer must be approved by the local jurisdiction and must comply with pretreatment regulations (WAC 173-216-060). These regulations prohibit discharges that could “cause fire or explosion.” An explosive or flammable mixture is defined under state and federal pretreatment regulations based on a flash point determination of the mixture. If contaminated stormwater is determined not to be explosive, then it could be conveyed to a sanitary sewer system.

- Transfer the fuel from the delivery tank trucks to the fuel storage tank in impervious contained areas and ensure that appropriate overflow protection is used. Alternatively, cover nearby storm drains during the filling process and use drip pans under all hose connections.

Additional BMP for Vehicles Ten Feet in Height or Greater:

A roof or canopy may not be practicable at fueling stations that regularly fuel vehicles ten feet in height or greater. At those types of fueling facilities, the following BMPs apply, as well as the applicable BMPs and fire prevention (UFC requirements) of this BMP for fueling stations:

- If a roof or canopy is impractical the concrete fueling pad must be equipped with emergency spill control that includes a shutoff valve for the drainage from the fueling area. The valve must be closed in the event of a spill. An electronically actuated valve is preferred to minimize the time lapse between spill and containment. Spills must be cleaned up and disposed off-site in accordance with BMPs for Spills of Oil and Hazardous Substances.

- The valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the sewer authority, or to oil removal treatment such as an American Petroleum Institute (API) or Coalescing Plate (CP) oil/water separator, catchbasin insert, or equivalent treatment, and then to a basic treatment BMP. Discharges from treatment systems to storm drains, or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain greater than a significant amount of oil and grease.

An explosive or flammable mixture is defined under state and federal pretreatment regulations, based on a flash point determination of the mixture. If contaminated stormwater is determined not to be explosive or flammable, then it could be conveyed to a sanitary sewer system.

Liquid or Solid Material Loading and Unloading Areas

Loading/unloading of liquid and solid materials at industrial and commercial facilities are typically conducted at shipping and receiving, outside storage, fueling areas, etc. Materials transferred can include products, raw materials, intermediate products, waste materials, fuels, scrap metals, etc. Leaks and spills of fuels, oils, powders, organics, heavy metals, salts, acids, alkalis, etc. during transfer are potential causes of stormwater contamination. Spills from hydraulic line breaks are a common problem at loading docks.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs:

At All Loading/Unloading Areas:

- A significant amount of debris can accumulate at outside, uncovered loading/unloading areas. Sweep these surfaces frequently to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered, for a period of time, by containers, logs, or other material after the areas are cleared.
- Place drip pans, or other appropriate temporary containment device, at locations where leaks or spills may occur, such as hose connections, hose reels, and filler nozzles. Drip pans shall always be used when making and breaking connections. Check loading/unloading equipment, such as valves, pumps, flanges, and connections regularly for leaks and repair, as needed.

At Tanker Truck and Rail Transfer Areas to Above/Below-Ground Storage Tanks:

- To minimize the risk of accidental spillage, prepare an “Operations Plan” that describes procedures for loading/unloading. Train the employees, especially fork lift operators, in its execution and post it, or otherwise have it readily available to employees.
- Report spills that could constitute a threat to human health, welfare, or the environment to the local Stormwater authority and to Ecology. Prepare and implement an Emergency Spill Cleanup Plan for the facility (BMP Spills of Oil and Hazardous Substances) which includes the following BMPs:
    - Ensure the cleanup of liquid/solid spills in the loading/unloading area immediately, if a significant spill occurs, and upon completion of the loading/unloading activity, or at the end of the working day.
    - Retain and maintain an appropriate oil spill cleanup kit on-site for rapid cleanup of material spills. (See BMP “Spills of Oil and Hazardous Substances.”) Ensure that an employee trained in spill containment and cleanup is present during loading/unloading.

Structural Source Control BMPs:

At All Loading/Unloading Areas:

- Consistent with Uniform Fire Code requirements and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building, under a roof, lean-to, or other appropriate cover.
- Berm, dike, and(or) slope the loading/unloading area to prevent run-on of stormwater and to prevent the runoff or loss of any spilled material from the area.
- Pave and slope loading/unloading areas to prevent the pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they should be placed in designated “alleyways” that are not covered by material, containers or equipment.

Whenever Possible:

Structural Source Control BMP:

- For the transfer of pollutant liquids in areas that cannot contain a catastrophic spill, install an automatic shutoff system in case of unanticipated off-loading interruption (e.g., coupling break, hose rupture, overfill, etc.).

At Loading and Unloading Docks:

- Install/maintain overhangs, or door skirts that enclose the trailer end to prevent contact with rain water.
- Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
- Retain on-site the necessary materials for rapid cleanup of spills.

At Tanker Truck Transfer Areas to Above/Below-Ground Storage Tanks:

- Pave the area on which the transfer takes place. If any transferred liquid, such as gasoline, is reactive with asphalt, pave the area with Portland cement concrete.
- Slope, berm, or dike the transfer area to a dead-end sump, spill containment sump, a spill control (SC) oil/water separator, or other spill control device. The minimum spill retention time should be 15 minutes at the greater flow rate of the highest fuel dispenser nozzle through-put rate, or the peak flow rate of the 6-month, 24-hour storm event over the surface of the containment pad, whichever is greater. The volume of the spill containment sump should be a minimum of 50 gallons with an adequate grit sedimentation volume.

Spills of Oils and Hazardous Substances

Owners or operators of facilities engaged in drilling, producing, gathering, storing, processing, transferring, distributing, refining, or consuming oil and(or) oil products are required by federal law to have a "Spill Prevention and Control Plan." A spill control plan is required if: the unburied oil storage capacity of the facility is 1,320 gallons or more, or any single container with a capacity in excess of 660 gallons, could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines {40 CFR 112.1 (b)}. Onshore and offshore facilities that could not, due to their locations, reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines are exempt from these regulations {40 CFR 112.1(1)(i)}. Owners of businesses that produce dangerous wastes are also required by state law to have a spill control plan. These businesses should refer to Ecology's *Stormwater Management Manual for Eastern Washington*. The federal definition of "oil" is: oil of any kind or any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs:

The businesses and public agencies identified that are required to prepare and implement an Emergency Spill Cleanup Plan shall implement the following:

- Prepare an Emergency Spill Control Plan (SCP) that includes:
    - A description of the facility, including the owner's name and address;
    - The nature of the activity at the facility;
    - The general types of chemicals used or stored at the facility;
    - A site plan showing the location of storage areas for chemicals, the locations of storm drains, the areas draining to them, and the location and description of any devices to stop spills from leaving the site, such as positive control valves;
    - Cleanup procedures;
    - Notification procedures to be used in the event of a spill, such as notifying key personnel. Agencies such as Ecology, local fire department, Washington State Patrol, and the local jurisdiction, shall be notified; and
    - The name of the designated person with overall spill cleanup and notification responsibility.

  An existing emergency spill response plan may be used to implement this BMP.

- Train key personnel in the implementation of the Emergency SCP. Prepare a summary of the plan and post it at appropriate points in the building, identifying the spill cleanup coordinators, location of cleanup kits, and phone numbers of regulatory agencies to be contacted in the event of a spill;
- Update the SCP regularly;
- Immediately notify Ecology and the local jurisdiction if a spill may reach sanitary or storm sewers, groundwater, or surface water, in accordance with federal and Ecology spill reporting requirements;
- Immediately cleanup spills. Do not use emulsifiers for cleanup unless an appropriate disposal method for the resulting oily wastewater is implemented. Absorbent material shall not be washed down a floor drain or storm sewer; and,
- Locate emergency spill containment and cleanup kit(s) in high potential spill areas. The contents of the kit shall be appropriate for the type and quantities of chemical liquids stored at the facility.

Whenever Possible:

Operational BMP:

- Spill kits should include appropriately lined drums, absorbent pads, and granular or powdered materials for neutralizing acids or alkaline liquids, where applicable. In fueling areas, absorbent should be packaged in small bags for easy use and small drums should be available for storage of absorbent and(or) used absorbent. Spill kits should be deployed in a manner that allows rapid access and use by employees.

Storage of Liquid, Food Waste, or Dangerous Waste Containers

Steel and plastic drums with volumetric capacities of 55 gallons or less are typically used at industrial facilities for container storage of liquids and powders. The BMPs specified below apply to container(s) located outside a building used for temporary storage of accumulated food wastes, vegetable or animal grease, used oil, liquid feedstock or cleaning chemical, or dangerous wastes (liquid or solid), unless the business is permitted by Ecology to store the wastes. Leaks and spills of pollutant materials during handling and storage are the primary sources of pollutants. Oil and grease, acid/alkali pH, BOD, COD are potential pollutant constituents.

Store containers in impervious containment under a roof or other appropriate cover, or in a building. For roll containers (for example, dumpsters) that are picked up directly by the collection truck, a filet can be placed on both sides of the curb to facilitate moving the dumpster. If a storage area is to be used on-site for less than 30 days, a portable temporary secondary system can be used in lieu of a permanent system as described above.

BMPs that could be implemented to protect water quality:

Always:

Operational BMPs:

- Place tight-fitting lids on all containers.
- Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
- Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers daily for leaks/spills. Replace containers, and replace and tighten bungs in drums, as needed.
- Businesses accumulating dangerous wastes that do not contain free liquids need only to store these wastes in a sloped designated area with the containers elevated or otherwise protected from stormwater run-on.
- Drums stored in an area where unauthorized persons may gain access must be secured in a manner that prevents accidental spillage, pilferage, or any unauthorized use.
- If the material is a dangerous waste, the business owner must comply with any additional Ecology requirements.
- Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code.
- Cover dumpsters, or keep them under cover, such as a lean-to, to prevent the entry of stormwater. Replace or repair leaking garbage dumpsters.
- Drain dumpsters and(or) dumpster pads to sanitary sewer. Keep dumpster lids closed. Install waterproof liners.

Structural Source Control BMPs:

- Keep containers with dangerous waste, food waste, or other potential pollutant liquids inside a building, unless this is impracticable due to site constraints or Uniform Fire Code requirements.
- Store containers in a designated area, which is covered, bermed or diked, paved, and impervious, in order to contain leaks and spills. The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.
- For liquid wastes, surround the containers with a dike. The dike must be of sufficient height to provide a volume of either: 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater, or, if a single container, 110 percent of the volume of that container.
- Where material is temporarily stored in drums, a containment system can be used as illustrated, in lieu of system above.
- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer.

Treatment BMPs:

- For contaminated stormwater in the containment area, connect the sump outlet to a sanitary sewer, if approved by the local jurisdiction, or to appropriate treatment, such as an API or CP oil/water separator, catch basin filter or other appropriate system (see Chapter 6). Equip the sump outlet with a normally closed valve to prevent the release of spilled or leaked liquids, especially flammables (compliance with Fire Codes), and dangerous liquids. This valve may be opened only for the conveyance of contaminated stormwater to treatment.
- Another option for discharge of contaminated stormwater is to pump it from a dead-end sump or catchment to a tank truck or other appropriate vehicle for off-site treatment and(or) disposal.

Storage or Transfer (Outside) of Solid Raw Materials, By- Products, or Finished Products

Solid raw materials, by-products, or products, such as gravel, sand, salts, topsoil, compost, logs, sawdust, wood chips, lumber and other building materials, concrete, and metal products, are typically stored outside in large piles, stacks, etc. at commercial or industrial establishments. Contact of outside bulk materials with stormwater can cause leachate and(or) erosion of the stored materials. Contaminants include TSS, BOD, organics, and dissolved salts (sodium, calcium, and magnesium chloride, etc).

Provide impervious containment with berms, dikes, etc. and(or) cover to prevent run-on and discharge of leachate pollutant(s) and TSS.

BMPs that could be implemented to protect water quality:

Always:

Operational BMP:

- Do not hose down the contained stockpile area to a storm drain, or a conveyance to a storm drain, or to receiving water.

Structural Source Control BMP Options:

Choose one or more of the source control BMP options listed below for stockpiles greater than five cubic yards of erodible or water soluble materials, such as soil, road deicing salts, compost, unwashed sand and gravel, sawdust, etc. Also included are outside storage areas for solid materials, such as logs, bark, lumber, metal products, etc.

- Store in a building or paved and bermed covered area; or
- Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material as illustrated; or
- Pave the area and install a stormwater drainage system. Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater (e.g., pooling) and leachable materials in compost, logs, bark, wood chips, etc.; or
- For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material off-site or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without conveying through a treatment BMP.

Treatment BMP:

Convey contaminated stormwater from the stockpile area to a wet pond, wet vault, settling basin, media filter, or other appropriate treatment system depending on the contamination.

Whenever Possible:

Operational BMPs:

- Maintain drainage areas in and around storage of solid materials with a minimum slope of 1.5 percent to prevent pooling and to minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter where it can be collected, or to internal drainage “alleyways” where material is not stockpiled.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials.
- If and when feasible, collect and recycle water-soluble materials (leachates) to the stockpile.
- Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers near the storage area.

9.6.2 Operation and Maintenance

Implement procedures for operation and maintenance (O&M) for structural source control and treatment BMPs. Generic procedures for common BMPs can be found in the City of Union Gap Stormwater Collection and Conveyance System Operation and Maintenance Plan.

10. Flood Management Projects

The City of Union Gap will assess water quality impacts in the design of all new flood management projects that are associated with the Municipal Separate Storm Sewer System (MS4) or that discharge to the MS4. This will include considering use of controls that minimize impacts to site hydrology and still meet project objectives.

Existing flood management projects that are associated with the MS4 or that discharge to the MS4 may be reviewed and evaluated to determine whether changes or additions should be made to improve water quality.

Traditional approaches of flood management often include projects such as widening channels, dredging riverbeds, or creating dikes, levees, or embankments. While the purpose of these controls are to increase the capacity of the main channel or decrease the amount of water moving into the main channel, water quality may not always be taken into consideration (Ecology, 2003).

The City of Union Gap Public Works Department is responsible for flood management project design.

10.1 Water Quality Impact Assessment

Assess the need for structural BMPs such as booms or other devices to collect trash to be installed with the flood management project.

10.2 Existing Flood Management Projects Associated with the MS4

City of Union Gap flood management projects associated with or discharge to the MS4 include:

- None at this time

11. Other Facilities

Other facilities owned by the City of Union Gap that would reasonably be expected to discharge contaminated runoff include:

- Potable Waterline and Fire Hydrant Flushing

11.1 Potable Water Source Discharges

Planned discharges from potable water sources, including water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water may be discharged to the Multiple Separate Storm Sewer System (MS4) or public Underground Injection Controls (UICs) under certain conditions. The discharges must be dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4 or public UICs (Yakima County, 2009). The municipal stormwater permit prohibits discharges that are not pH adjusted and de-chlorinated. Washington water quality standards state that pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 or 0.5 units (depending on the species present in the receiving water).

Water discharged from water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water may cause a number of environmental impacts if chlorine and pH exceed certain thresholds. Excessive chlorine concentrations may kill nitrifying bacteria and other aquatic life necessary for sustenance for the aquatic food chain/nutrient cycling. Spikes of ammonia and nitrite, through gill necrosis, result in respiratory failure or suffocation. Flushing at high velocities may cause soil erosion and uproot vegetation (Santa Cruz, 2008).

However, care must also be taken during the dechlorination process because over-application of commonly used chemicals such as sodium metabisulfate and sulfur dioxide may deplete the dissolved oxygen concentration or alter pH of receiving waters.

Field Methods for Residual Chlorine Measurement

Many common methods for chlorine measurement such as water quality test strips, swimming pool test kits, and orthotolidine indictor kits lack sensitivity required for ensuring regulatory compliance.

A colorimetric kit supplied by Hach Company is widely used to monitor dechlorination in the field. The kit can measure free or combined chlorine residuals at concentrations of 0 to 4.5 mg/L with a detection limit of 0.1 mg/L. In this method, a pre-measured amount of reagent is added to the water sample, mixed well, and the sample is analyzed for total residual chlorine concentration. A liquid crystal detector indicates the chlorine concentration is solution based on the intensity of the color formed (Tikkanen et al., 2001).

Industrial Testing Systems, Inc. at Rock Hill, South Carolina has developed chorine-monitoring strips for measuring free and combined chlorine at a wide range of residual chlorine concentration (0.02 to 750 mg/L).concentrations. This method may be useful in measuring residual chlorine concentrations in superchlorinated water without having to dilute the samples (Tikkanen et al., 2001).

Dechlorination Methods

Various dechlorinating methods exist, including discharging to stormwater sewer systems. The most common include a dechlorinating diffuser and chemical tablet chamber which water passes through before being discharged. Other emerging chemical and non-chemical technologies may provide an alternative.

Non-Stormwater Sewer System Practices

- Discharge to Sanitary Sewer
- Discharge to Retention Tank
- Land Application

Discharge to MS4 or UICs

- Dechlorinating Diffuser and Chemical Tablet Chamber
- Vitamin C (in ascorbic acid and sodium ascorbate form)
    - Safe and environmentally friendly alternative to sulfur-based compounds.
- Dechlorination Mats/Strips
    - Emerging technology to facilitate effective contact between the flow and sodium sulfite tablets during dechlorination.
    - The dechlor mat or strip is laid across the flow path or over the storm drain.
- Venturi Based Dechlorination Devices
    - Feeds chemical solutions into chlorinated water flow while attached to the downstream end of a hose connected to fire hydrants.

The above methods were compiled from the following sources:

Chlorine Concerns and the Endangered Species Act: Vitamin C and Fish
(Peterka, 2002)

Guidance Manual for Disposal of Chlorinated Water
(Tikkanen et al., 2002)

Best Management Practices (BMPs) for Municipal Operations
(City of Santa Cruz, 2008)

References

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Yakima County, 2009, Regional Stormwater Illicit Discharge Model Ordinance.

Appendix. (Included as Separate Documents)